4.7 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section describes the environmental and regulatory setting of the project site and vicinity with respect to floodplains, groundwater hydrology and quality, and surface water hydrology and quality. This analysis is based on the Tidal Hydraulics Study for the Colorado Lagoon Restoration Project EIR (April 14, 2008) prepared by Moffatt & Nichol and found in Appendix G. This analysis is also based on several other documents previously prepared for the project site by the City of Long Beach (City) and Moffatt & Nichol. A complete list of references used in this section can be found in Chapter 11.0.

4.7.1 EXISTING ENVIRONMENTAL SETTING

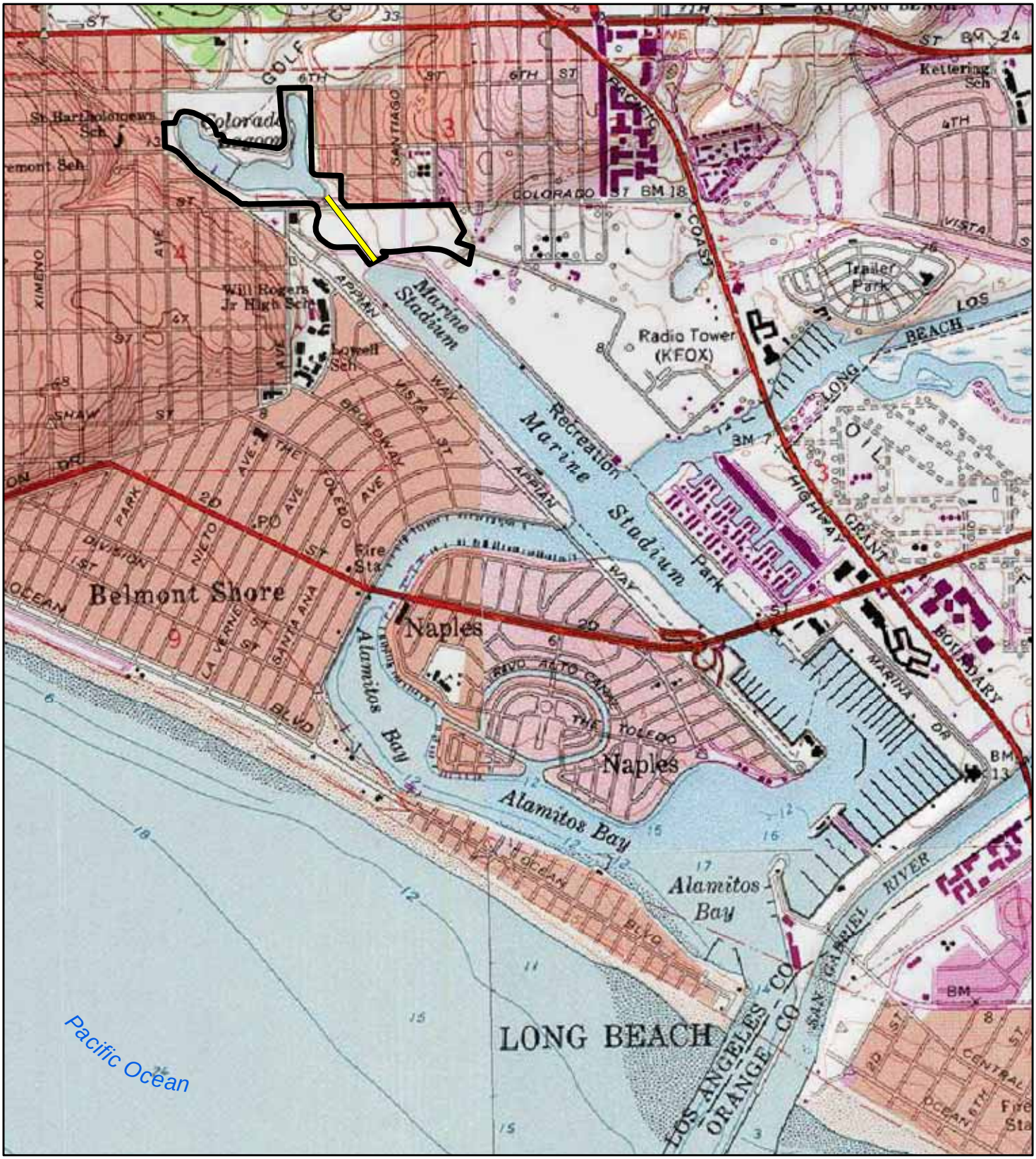
Regional Watershed

The project site is located in the San Gabriel River watershed. The watershed drains 689 square miles from Los Angeles, Orange, and San Bernardino Counties and is bounded by the San Gabriel Mountains to the north, a large portion of San Bernardino and Orange Counties to the east, the Los Angeles River watershed to the west, and the Pacific Ocean to the south. The San Gabriel River's headwaters originate in the San Gabriel Mountains, while the lower part of the river flows through a concrete-lined channel before becoming a soft-bottom channel near its termination at the Pacific Ocean. The project site is located within the Los Cerritos Channel and Alamitos Bay Water Management Area (WMA) of the San Gabriel River watershed. The WMA is located between the Los Angeles and San Gabriel Rivers and drains to the same general area as the San Gabriel River. The Los Cerritos Channel and Alamitos Bay comprise the main water bodies of the WMA.[1]

Alamitos Bay, located in the southeastern portion of the City near the Los Angeles County/ Orange County border, is composed of Marine Stadium, a recreation facility used for boating, water skiing, and jet skiing; Long Beach Marina, which contains seven smaller basins for recreational craft and a boatyard; a variety of public and private berths; and the Bay proper, which includes several small canals, a bathing beach, and several popular clamming areas. Colorado Lagoon (Lagoon) has a tidal connection with Alamitos Bay through an existing culvert that connects to Marine Stadium[2] (Figure 4.7.1).

1 County of Los Angeles, Department of Public Works, San Gabriel River Watershed, http://dpw.lacounty.gov/wmd/watershed/sg/ accessed 01/30/07.

2 Los Cerritos Channel and Alamitos Bay Watershed Management Area, December 2007.



LSA

FIGURE 4.7.1

LEGEND

Project Boundary

Culvert

0 750 1,500 Feet

Colorado Lagoon Restoration Project

Existing Lagoon-Bay Tidal Connection

SOURCE: USGS 7.5' QUAD - Long Beach ('81); CALIF.

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Local Watershed

The Lagoon is a relatively small tidal lagoon connected to Alamitos Bay and the Pacific Ocean through a tidal culvert to Marine Stadium. It serves three main functions: hosting sensitive habitat, providing public recreation, and retaining and conveying storm floods.[1]

The Lagoon watershed lies entirely within the boundaries of the City (Figure 4.7.2). The Lagoon watershed is identified as Basin 21 in the City of Long Beach Storm Water Management Plan. Basin 21 is 1,172 acres (ac) and is made up of 773 ac of residential, 125 ac of commercial, 55 ac of institutional, and 219 ac of open space.[2] The watershed ranges in elevation from 125 feet above mean sea level (amsl) at the northwestern portion to sea level within the Lagoon.[3] The watershed is almost entirely built out; remaining open space includes the City Recreation Park Area, consisting of two golf courses and adjacent park areas, the Pacific Electric (PE) right-of-way (ROW) greenbelt, and to a lesser degree the picnic and park areas surrounding the Lagoon.[4]

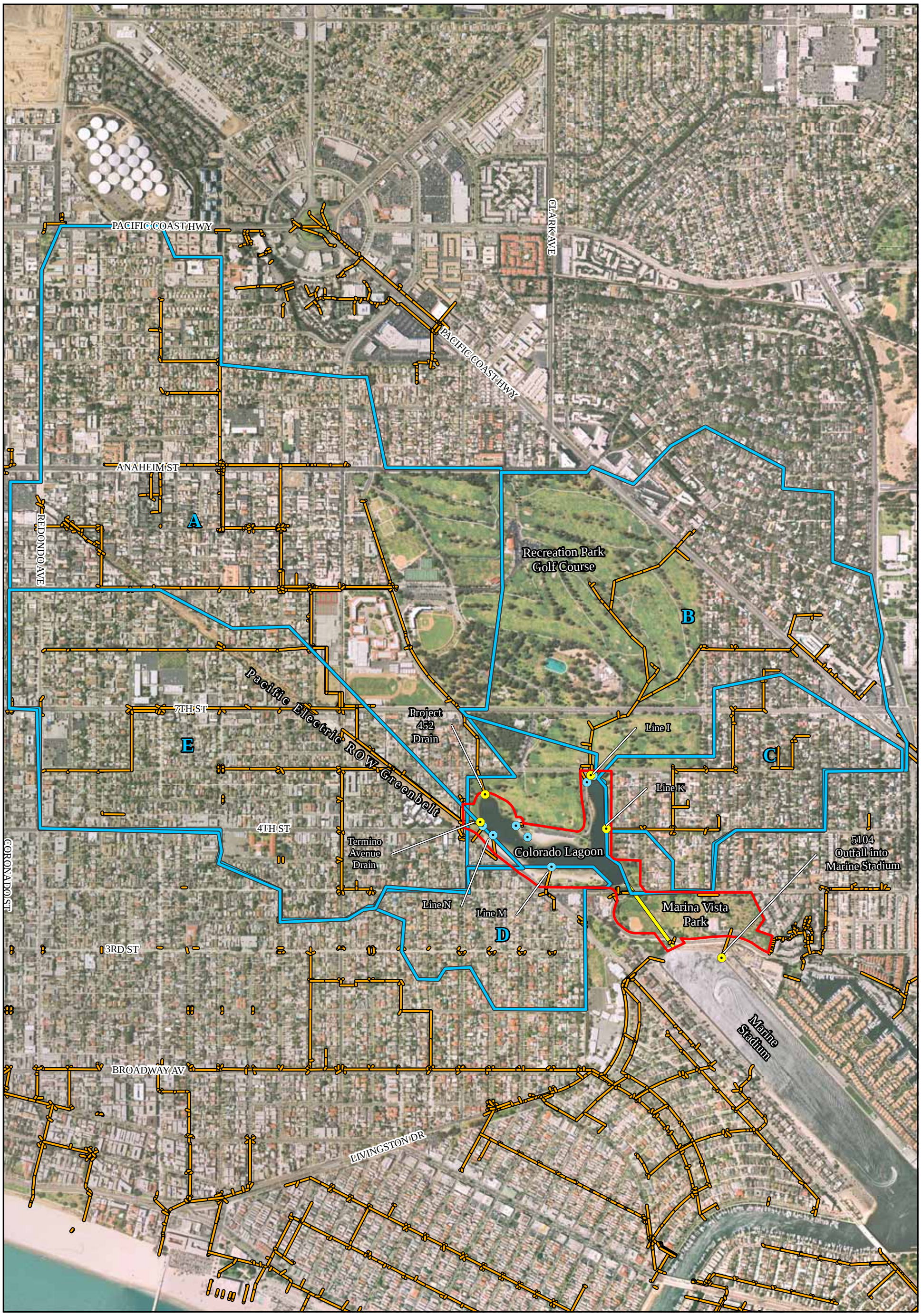
Surface Water

Surface water runoff within the watershed occurs as overland runoff into curb inlets and catch basins, and as sheet flow near the shores of the Lagoon. There are five major storm drain systems in the area; four of the major systems outfall into the Lagoon, and the fifth major system outfalls into Marine Stadium. Currently, the County of Los Angeles Termino Avenue Drain Project (TADP) is undergoing environmental review. This project would realign the Termino Avenue Drain (TAD) to discharge into Marine Stadium instead of into the Lagoon, as it does currently; the TADP would also include a low-flow diversion system to divert non-storm flows from the storm drain to an existing County sanitary sewer line. Therefore, with implementation of the TADP, three of the major storm drain systems would outfall into the Lagoon, and two major storm drain systems would outfall into Marine Stadium.

Seven minor/local storm drains also discharge into the Lagoon. With implementation of the TADP, three minor/local storm drains would be redirected to discharge into Marine Stadium, leaving four minor/local storm drains discharging into the Lagoon. Additional information on the TADP can be found in Section 3.0 of this EIR.

The Lagoon watershed can be broken down into five subbasins (Figure 4.7.2). Each subbasin discharges to the Lagoon through the individual storm drainage systems. The subbasins are as follows:[5]

1 Colorado Lagoon Restoration Feasibility Study Final Report, Moffatt & Nichol, February 4, 2005.
2 Long Beach Stormwater Management Plan, August 2001.
3 Colorado Lagoon Watershed Impacts Report/Restoration Feasibility Study, HDR and CGvL, July 30, 2004.
4 Ibid.
5 Ibid.



L S A

LEGEND

- Project Boundary
- Sub-basins
- Existing Storm Drain Pipelines
- Major System Outfall
- Local Drain
- Culvert

N

0 500 1,000

FEET

FIGURE 4.7.2

Colorado Lagoon Restoration Project

Colorado Lagoon Watershed and Sub-basins

SOURCE: AirPhoto USA (06/07); TBM (2007).

I:\CLB0702\GIS\Watershed_Sub_Basins_11x17.mxd (4/9/2008)

- **Subbasin A** discharges to the Lagoon via a 63-inch (in) reinforced concrete pipe (Project 452 drain). This drain discharges into the northern tip of the West Arm. This major storm drain has the second highest flow discharging into the Lagoon. The drainage pattern is generally to the south and east. Subbasin A represents the highest concentration of commercial uses within the Lagoon watershed (Basin 21). There are currently three retail gasoline stations, seven automotive repair facilities, one car wash, and various restaurants concentrated mainly along Anaheim Street, Redondo Avenue, and to a lesser degree, 10th Street.
- **Subbasin B** discharges to the Lagoon via a 54 in reinforced concrete pipe at the north part of the north arm (Line I). The drainage pattern is generally to the southwest. Subbasin B contains predominantly park/golf course open space uses with some residential uses in the northeast corner. However, oil well production, the most notable industrial use located in the Lagoon watershed, is located in this subbasin.
- **Subbasin C** discharges to the Lagoon via a 48 in reinforced concrete pipe at the midpoint of the north arm (Line K). The drainage pattern is generally to the southwest. Subbasin C contains almost entirely residential uses, with a few commercial uses at the eastern boundary.
- **Subbasin D** discharges to the Lagoon via a 24 in reinforced concrete pipe at the south part of the west arm. The drainage pattern is generally to the northeast. Subbasin C contains almost entirely residential uses, with some schools and other public facilities.
- **Subbasin E** discharges to the Lagoon via a 48 in reinforced concrete pipe (TAD) at the west arm. The drainage pattern is generally to the southeast. Subbasin E contains a high concentration of commercial uses. There are currently four retail gasoline stations, three automotive repair facilities, one car wash, and various restaurants concentrated mainly along East 7th Street, Redondo Avenue, and to a lesser degree, 4th Street. Several other smaller storm drains serve the areas immediately adjacent to the Lagoon. As stated above, this drain is currently proposed by the County of Los Angeles to be modified to no longer discharge into the Lagoon. The proposed alignment is assumed to be in place at the time of construction for the proposed project.

Tidal Culvert

The Lagoon is hydraulically connected to Marine Stadium through a culvert that allows tidal exchange between the two water bodies. The tidal culvert itself is a reinforced concrete box, which was designed with two distinctive cross sections. From the Lagoon side, the tidal culvert has a design cross-section of 14 x 7 ft for a linear length of approximately 160 ft, then transitions to a design cross-section of 12 x 8 ft for approximately 700 ft.

The existing culvert has not been cleaned since it was built in the 1960s. The culvert is known to be impeded by a structural sill within the culvert, sediment that has accumulated on the bottom of the culvert, and marine growth that has accumulated on the sides and ceiling. The culvert was inspected on April 12, 2005, by Global Inshore. The inspection determined that the overall condition of the concrete surfaces is very good, with no spalling[1] or cracks observed throughout the interior of the culvert. The only anomalies found were missing concrete and exposed rebar on the undersides of the openings at each end of the culvert. A buildup of biological organisms, or biofouling (the undesirable

[1] Spalling is the result of water entering concrete and forcing the surface to peel or flake off. Spalling can cause crumbling and destruction of a structure.

accumulation of microorganisms, plants, and animals on artificial surfaces) along the walls, floor, and top of the culvert was found to be mainly clam and mussel growth. Some sand was observed mixed in with the biofouling buildup on the base of the culvert for the first 30 ft from the Lagoon, whereupon the base was free of all material.[1] The structural sill and extensive marine growth within the culvert impedes flows and limits the amount of tidal flushing between Marine Stadium and the Lagoon.[2] In addition, a 3.5 ft buildup of rocks is located 6 ft in from the opening of the culvert on the Marine Stadium side, further impeding flow out of the Lagoon.[3]

Tides

Since there are no tide stations at Alamitos Bay, the nearest Los Angeles Outer Harbor gauge was used as the ocean boundary tidal condition, as shown in Table 4.7.A. The diurnal tide range is approximately 5.49 ft from mean lower low water (MLLW) to mean higher high water (MHHW), and mean sea level (MSL) is at +2.82 ft relative to MLLW.[4]

Table 4.7.A: Recorded Water Levels at Los Angeles Outer Harbor (1983–2001 Tidal Epoch)

Description	Elevation (ft, MLLW)	Elevation (ft, NGVD29)
Extreme high water (1/27/83)	+7.82	+5.18
Mean higher high water (MHHW)	+5.49	+2.85
Mean high water (MHW)	+4.75	+2.11
Mean tidal level (MTL)	+2.85	0.21
Mean sea level (MSL)	+2.82	0.18
National Geodetic Vertical Datum 1929 (NGVD29)	+2.64	0.00
Mean low water (MLW)	+0.94	-1.70
Mean lower low water (MLLW)	0.00	-2.64
Extreme low water (12/17/33)	-2.73	-5.37

Source: Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.
ft = feet
NGVD29 = National Geodetic Vertical Datum of 1929

Seasonal variations in MSL can result in changes in tide levels of 0.5 ft in some areas, such as Los Angeles Outer Harbor. Superimposed on this cycle is a 4.4-year variation in the MSL that may increase the change in tidal levels by as much as 0.25 ft in Los Angeles Outer Harbor. Water level measurement data are typically analyzed over a tidal epoch[5] to account for these variations and obtain statistical water level information (e.g., MLLW and MHHW).[6]

1 Colorado Lagoon Culvert Inspection Report, Global Inshore Inc., April 12, 2005.
2 Opportunities and Constraints Report – Colorado Lagoon Restoration Feasibility Study, Moffatt & Nichol, September 15, 2004.
3 Colorado Lagoon Culvert Inspection Report, Global Inshore Inc., April 12, 2005.
4 Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.
5 A tidal epoch is a periodic variation in the rise of water above sea level over a period of 19 years.
6 Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.

Tidal Influence and Flushing

Numerical modeling of tidal and flood hydraulics was performed for the existing conditions of the Lagoon. The purpose of this modeling was to characterize the existing Lagoon hydraulics under both wet and dry weather conditions. The groundwater flow input into the Lagoon was not considered in the modeling since the groundwater level in the vicinity is lower than that in the Lagoon; therefore, the groundwater movement direction is from the Lagoon. Also, the groundwater movement compared to tidal exchange is negligible. Under the dry weather condition, the local storm drain inputs are not included in modeling, as the dry weather flow quantity is negligible compared to tidal exchange through the culvert. Under the dry weather condition, typically from May to October, the local storm drain inflow is negligible for the hydraulic regime. Tidal flows are the main driving force for the Lagoon circulation and water exchange. A 50-year storm event and an MHHW level at the ocean boundary were used in assessing flood flow impacts within the Lagoon because these conditions represent the worst-case scenario in terms of flood potential.[1]

The measured data indicate that the high tidal elevations in the Lagoon are close to the ocean tides; however, the time difference from the Lagoon reaching high tide levels is approximately 1 hour behind. The low tides are significantly muted by 1 ft during the neap[2] tidal cycle and 2–3 ft during the spring tidal cycle. The time difference from the Lagoon reaching high tide levels during spring tides is approximately 3 hours behind. Therefore, the water exchange between the Lagoon and Marine Stadium is reduced by 1–3 ft per tidal cycle compared to the full high tide range. Tidal muting and lag time in the Lagoon is an indication of circulation restriction.[3] The data also show that the tidal ranges were further reduced or muted because the tide gates are not currently able to open fully to their design capability due to degradation of the gates over the years.[4] As a result, tidal circulation and flushing is significantly reduced by the design and condition of the existing culvert.

The tidal prism (tidal volume exchanged in the Lagoon between spring high and low tides) is approximately 2.8 million cubic feet. This tidal prism essentially serves as the conveyor of relatively poorer-quality dry weather urban runoff and storm water from the Lagoon to Marine Stadium and the ocean. The residence time of the Lagoon water is approximately 8.5 days, while that for Marine Stadium is approximately 6.9 days under similar hydraulic conditions.[5] The tide range and phase in Marine Stadium are very similar to the ocean, indicating that Marine Stadium has much better tidal circulation. That is also evidenced by a visual comparison of the clarity of water in these two different water bodies. The water in Marine Stadium is clear and very similar to the ocean in appearance, while the Lagoon water is more turbid and less clear.[6]

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1 Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.

2 Neap tide is a period of lower than average tides. Spring tide is a period of higher than average tides. Both periods are based on the phases of the moon.

3 Ibid.

4 Opportunities and Constraints Report – Colorado Lagoon Restoration Feasibility Study, Moffatt & Nichol, September 15, 2004.

5 Development and Evaluation of Restoration Alternatives – Colorado Lagoon Restoration Feasibility Report, Moffatt & Nichol, November 11, 2004.

6 Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.

Flooding. The Lagoon watershed has a history of flooding problems because the existing drainage facilities of this watershed are not sufficient to convey the flow for a 50-year flood event.[1] The peak-flow rate during a 50-year storm event from the watershed entering the Lagoon is 802 cubic feet per second (cfs) with a runoff volume of 252.6 acre-feet (af).[2] Under a combined condition of a severe storm flood and an ocean high tide with the culvert open, the peak water level in the Lagoon reaches 5.7 to 5.9 ft, the same elevation as the boundary of the Lagoon along a short reach of approximately 200 ft near the intersection of East Colorado Street and East Eliot Street. The remaining Lagoon boundary varies from elevation 6.38 ft to approximately 8.0 ft. It takes a few days for the Lagoon water level to drop to within the normal tidal fluctuations.[3]

The County's TADP (which is scheduled for construction in 2009 and is assumed to be implemented prior to Phase 2 for purposes of this analysis) diverts a portion of the watershed area storm waters away from the Lagoon and directly into Marine Stadium. Based on information provided as part of the County's TADP, peak flow entering the Lagoon during a 50-year storm event would be decreased by approximately 391 cfs with a runoff volume decreased by 139.4 af as a result of implementation of the TADP. The TADP results in a significant reduction of water quantity entering the Lagoon during a 50-year storm event.[4] Therefore, implementation of the TADP provides enough freeboard to protect against flooding in the Lagoon during a 50-year storm event.

Pollutants of Concern. Several pollutants are commonly associated with urban storm water runoff, including sediment, nutrients, bacteria, oxygen-demanding substances, petroleum products, heavy metals, toxic chemicals, and floatables. Urban runoff pollutants and their impacts on water quality and aquatic habitat are described in more detail below.

Sediments. Natural sediment loads are important to downstream environments by providing habitat, substrate, and nutrition; however, increased sediment loads can result in several negative effects to downstream environments. Excessive sediment can be detrimental to aquatic life by interfering with photosynthesis, respiration, growth, and reproduction. In addition, pollutants that adhere to sediment, such as nutrients, trace metals, and hydrocarbons, can have other harmful effects on the aquatic environment when they occur in elevated levels.

Nutrients. Nutrients are typically composed of phosphorus and/or nitrogen. Fertilizers are a main source of nitrogen and phosphorus in urban runoff. Other sources of phosphorus in runoff are lawn clippings and tree leaves that accumulate on streets and in gutters. Elevated levels in surface waters cause algal blooms and excessive vegetative growth. As nutrients are absorbed, the

1 Termino Avenue Drain Hydrologic and Water Quality Analyses Report, Everest International Consultants, Inc., February 2007.
2 Ibid.
3 Tidal and Flood Hydraulics Study, Moffatt & Nichol, July 30, 2004.
4 Termino Avenue Drain, Draft Environmental Impact Report, Hydrology and Water Quality Section, Edaw, Inc., February 2007.

vegetative growth decomposes, utilizing oxygen in the process and reducing dissolved oxygen levels. Dissolved oxygen is critical for support of aquatic life.

The ammonium form of nitrogen (found in wastewater discharges) converts to nitrite and nitrate in the presence of oxygen, which further reduces the dissolved oxygen levels in water.

Kjeldahl-N is defined as the sum of organic nitrogen and ammonia nitrogen, and excludes nitrite and nitrate. Total inorganic nitrogen is comprised of ammonia and nitrate.

Heavy Metals. Bioavailable forms of trace metals are toxic to aquatic life. The most common metals found in urban runoff are lead, zinc, and copper. Other trace metals, such as cadmium, chromium, and mercury are typically not detected or detected at very low levels in urban runoff. Sources of heavy metals in surface waters include emissions and deposits from automobiles, industrial wastewater, and common household chemicals. Heavy metals that impair the Lagoon include lead, cadmium, copper, mercury, zinc, and silver.

Organic Compounds. Organic compounds are carbon-based and are found in pesticides, solvents, and hydrocarbons. Elevated levels can indirectly or directly constitute a hazard to life or health. During cleaning activities, these compounds can be washed off into storm drains. Dirt, grease, and grime may adsorb concentrations that are harmful or hazardous to aquatic life. Organic compounds that impair the Lagoon include polychlorinated biphenyls (PCBs).

Trash and Debris. Trash and debris can have a significant effect on the recreational value of a water body and aquatic habitat. It also can interfere with aquatic life respiration and can be harmful or hazardous to aquatic animals that mistakenly ingest floating debris.

Oxygen-Demanding Substances. Oxygen-demanding substances include plant debris (such as leaves and lawn clippings), animal wastes, and other organic matter. Microorganisms utilize dissolved oxygen during consumption of these substances, which reduces a water body's capacity to support aquatic life.

Petroleum Hydrocarbons. Petroleum hydrocarbons include oil and grease, benzene, toluene, ethyl benzene, xylene (constituents in gasoline), and polyaromatic hydrocarbons. Sources of petroleum hydrocarbons include parking lots and roadways, leaking storage tanks, auto emissions, and improper disposal of waste oil. Some of these materials can be toxic to aquatic life at low concentrations.

Bacteria and Viruses. Bacteria sampling and analysis are used to indicate relative levels of other pathogens such as viruses. Bacterial levels in urban runoff can exceed public health standards for water contact recreation. Bacteria levels in streams within natural watersheds also can exceed

standards for water contact recreation. A common source of bacteria is animal excrement, and other sources include soils and plant materials.

Pesticides. A pesticide is a chemical agent designed to control pest organisms. Pesticides can persist in the environment and can bioaccumulate (concentrate within the body) over several years, resulting in health problems for the affected organism. Organochlorine pesticides that impair the Lagoon include dichlorodiphenyltrichloroethane (DDT), chlordane, and dieldrin.

Selenium. Selenium is a naturally occurring element that persists in soils and aquatic sediments and can bioaccumulate through the food chain at levels that can cause adverse effects on higher-level aquatic life and wildlife, including fish and birds that prey on fish and invertebrates. Selenium can become mobilized and concentrated by weathering and evaporation in the process of soil formation and alluvial fan deposition in arid and semiarid climates. Moreover, selenium may be leached from sediments as a result of irrigation practices, elevation of the groundwater table, or other modifications in the natural hydrologic regime.

Sediment Quality

The 2004 Sediment Testing and Disposal Report (2004) provided the first comprehensive examination of sediment accumulation and contamination in the Lagoon since it was originally developed. The primary objective of the study was to document the extent of sediment contamination in the Lagoon. Testing was conducted in three areas of the Lagoon. These included the western arm (Area CL-1), the southern end at the nexus of the western and northern arms (Area CL-2), and the northern arm (Area CL-3) of the Lagoon. A total of three core samples were taken in each area and composited to form a single sample representing each region.[1]

California Code of Regulations Title 22 (Title 22) criteria were used to determine if any of the sediments sampled from the Lagoon contained contaminants at concentrations that were high enough to be considered hazardous waste. Results indicate that none of the contaminants exceeded the total threshold limit concentrations (TTLC; hazardous waste identification). Lead, however, was present in two samples at concentrations that were high enough to require waste extraction tests (WET) to determine whether elutriate[2] levels exceed the soluble threshold limit concentration (STLC; California toxicity thresholds for lead). WET extractions were run for lead in sediment composites from the west arm of the Lagoon and those from a southernmost site near the connection with Marine Stadium. Results indicated that elutriate concentrations from the western arm composite (11 milligrams per liter [mg/L]) exceeded the STLC of 5 mg/L. Results of this test indicate that sediments in the west arm of the Lagoon should be considered to be a Title 22 hazardous waste material if they were to be taken to a landfill. WET results for the central Lagoon indicate that sediments sampled from the area of the Lagoon near the tidal gates to Marine Stadium contain

1 Colorado Lagoon: Sediment Testing and Material Disposal Report, Kinnetic Laboratories, Inc. and Moffat & Nichol, July 30, 2004.

2 Material prepared from the sediment dilution water and used for chemical analyses and toxicity testing.

contaminants at concentrations below those considered to be hazardous waste material under Title 22 criteria.[1]

Results of the 2004 study demonstrate a clear pollution gradient within the Lagoon. The western arm contains high levels of lead as well as several organochlorine pesticides. Concentrations of total lead in the western arm sediment (409 milligrams per kilogram dry [mg/kg-dry]) exceed EPA Region IX Preliminary Remediation Goals for residential soils (400 mg/kg-dry). Based upon this criterion alone, reuse of the west arm sediment on site (for slope recontouring, for example) is not a feasible option. The use of remediation goals for residential soils is appropriate for this site because they are the most conservative factors (i.e., highest level of safety) for material reuse. Lead concentrations drop dramatically in the central Lagoon (81 mg/kg-dry) and north arm (40 mg/kg-dry). DDT compounds, chlordane, and dieldrin show similar trends with effects range medium (ERM) exceedances for each of these compounds in the western arm. Concentrations of DDT compounds are from 81 micrograms per kilogram dry (µg/kg-dry) in the western arm to 4.3 µg/kg-dry in the north arm. This was the only compound or group of compounds to exceed the effects range low (ERL) in the north arm. The contamination gradient for chlordane was exceptionally dramatic, with concentrations of 105 µg/kg-dry in the west arm, 3.3 µg/kg-dry in the central Lagoon, and below detection limits (<2.8 µg/kg-dry) in the north arm. Dieldrin, one of the compounds cited as causing impairment in tissues, was only detected in the western arm of the Lagoon, where it was present in excess of three times the ERM. PCBs were only detected in the western arm of the Lagoon, with concentrations just above the ERL. Polynuclear aromatic hydrocarbons (PAHs) followed the same trend, with phenathrene and acenaphthene being the only PAHs to exceed ERLs in the central Lagoon. None of the PAH compounds exceed these ERLs in the central Lagoon or the north arm, respectively.

In summary, the primary contaminants of concern (COC) identified in the Lagoon are lead and the three groups of organochlorine pesticides (DDT compounds, chlordane, and dieldrin). Secondary COC include PCBs and a number of metals, including cadmium, copper, mercury, silver, and zinc. Additional information regarding hazardous materials and hazardous waste can be found in Section 4.8 of this EIR.

Storm Drain Contaminants. As part of the City's storm water monitoring program, the Lagoon was selected as an appropriate area to conduct an initial pilot investigation designed to identify possible sources of COC within the storm drain system. The investigation collected storm drain sediments from the three main storm drains near the western arm of the Lagoon. During the field investigation it was discovered that all three of the major storm drain systems contributing runoff to the western arm of the Lagoon are interconnected at a number of locations in the upper portion of the watershed. The commingling of runoff in these three storm drain systems does introduce some difficulty in assessing sources of sediment-associated contaminants.[2]

The major candidate sources of contaminants to the Lagoon were considered to be the three storm drain systems that discharge to the western arm of the Lagoon. Two of these storm drains follow a

1 Colorado Lagoon: Sediment Testing and Material Disposal Report, Kinnetic Laboratories, Inc. and Moffat & Nichol, Revised October 27, 2006.

2 Stormwater Monitoring Report 2006/2007 NPDES Permit No. CA00403 (CI 8052) City of Long Beach, Kinnetic Laboratories, Inc., July 2007.

parallel pathway down the former PE ROW greenbelt before discharging through a common headwall into the Lagoon. Therefore, eroding soils from the former railroad ROW were also considered potential sources of contaminants and were included in the initial sampling effort. All initial sampling sites were located as close as possible to the Lagoon while at the same time avoiding areas too heavily influenced by the tide.[1] Areas heavily influenced by the tide have the potential to wash away soils in the storm drain.

The initial 2005 survey concluded that most COC occurred in highest concentrations at a site sampled in the TAD line. The study also concluded that soils from the former PE ROW contained relatively low concentrations of persistent, bioaccumulative, and toxic (persistent bioaccumulative toxic [PBT]) compounds of concern. The only 303(d) list contaminant of concern at this site was zinc. Silver was also present in similar concentrations, but this metal is not listed by the Regional Board as causing impairment.[2]

Sediments from TAD were found to have substantial levels of metals, primarily lead, copper, and zinc. Concentrations of lead in sediments from TAD were of major interest due to the fact that lead is one the primary COC in sediments within the Lagoon and found again at high levels in the 2005 storm drain investigation. DDT compounds were detected at all sites, with concentrations ranging from 9.9 to 160.7 nanograms per gram dry (ng/g-dry). Chlordane compounds were also detected at all sites. No other organochlorine pesticides were detected at any of the sites.[3]

Relatively low concentrations of persistent PBT compounds were present in sediments from the samples located in the upper portion of the watershed (areas north of 10th Street) that contributes flow to both TAD and Project 452 Drain. This suggests that upper portions of the watershed do not serve as significant sources of the primary COC in the Lagoon. Sediment sampled from the TAD in 2005 and 2007 exhibited elevated levels of lead. Lead concentrations at TAD were nearly five times those found in the contaminated sediments of the Lagoon. Concentrations of lead were over nine times those found in the Lagoon when all results were normalized to the fine-grained sediment. In addition, concentrations of copper, silver, zinc, DDT, and chlordane in storm drain sediments from throughout most of the watershed are typically one to three times the concentrations measured in sediments from the Lagoon. Concentrations of these contaminants in storm drain sediments indicate that sources of these contaminants are likely sufficient to maintain their current elevated levels in the Lagoon if measures are not taken to decrease sediment loads.[4]

Surface Water Quality

Since the Lagoon is a natural low point in the watershed, it accumulates pollutants deposited over the entire watershed that enter the storm drains by storm flows and dry weather runoff. Nonpoint sources found to be the major contributors to water pollution in the Lagoon are runoff from paved streets and parking lots, construction sites, soil erosion, pesticide/herbicide application from the adjacent golf

1 Stormwater Monitoring Report 2006/2007 NPDES Permit No. CA00403 (CI 8052) City of Long Beach, Kinnetic Laboratories, Inc., July 2007.
2 Ibid.
3 Ibid.
4 Ibid.

course, wash down at commercial sites, minor industrial operations such as oil well production, and atmospheric deposition of acidic and/or toxic air pollutants.[1]

Bacteria. The City of Long Beach Health Department conducts weekly sampling at three locations in the Lagoon as part of Assembly Bill 411 (AB 411)[2] sampling requirements. All sites are located on the pedestrian bridge that crosses the western arm of the Lagoon. With the possible exception of AB 411 sampling requirements, there have not been any consistent sampling programs in the Lagoon to document the concentrations of contaminants in water, sediment, and biota. The City Health Department has been conducting weekly surveys of indicator bacteria since January 2001. Exceedances of AB 411 or Basin Plan criteria at this location are often attributable to high levels of total coliform (>10,000 most probable number [MPN]/100 milliliters [ml]) or a combination of total coliform (> 1,000 MPN/100 ml) and *E. coli* concentrations that exceed 10 percent of the total coliform.[3]

Total and fecal coliform and enterococcal bacteria are used to indicate the likelihood of pathogenic organisms, such as viruses, in surface waters. The levels of these bacteria have been correlated to the incidence of illness in swimmers. The presence of coliform bacteria indicates potential health risks to users of recreational waters, and specifically, enterococcus bacteria have been shown to cause health risks, including stomach flu and other infections. The amount of these indicator bacteria in Southern California waters may be dependent on season and have been linked with rainfall amounts. All three monitoring locations in the Lagoon have had several advisory warnings over the past 2 years, whereby bacteria levels have exceeded State Standards.[4]

Groundwater Hydrology

The County of Los Angeles overlies 15 groundwater basins, as established by the Los Angeles Regional Water Quality Control Board (RWQCB) Water Quality Control Plan for the Los Angeles region (1994). The project site is situated within the Los Angeles-San Gabriel Hydrologic Unit, which covers most areas of the County as well as some small areas of southeastern Ventura County. Within this hydrologic unit, the project site is located in the Coastal Plain of Los Angeles Groundwater Basin and overlies the West Coast Subbasin (Basin No. 4-11.03).[5] The West Coast Subbasin covers an area

1 Colorado Lagoon Watershed Impacts Report/Restoration Feasibility Study, HDR and CGvL, July 30, 2004.

2 AB 411 established guidelines for ocean water quality in California. The law requires county health officials to test water at public beaches for harmful bacteria and notify the public when levels are too high. These and other bacterial surveys at California beaches only focus on bacteria that are believed to be "indicators" of pathogenic bacteria and viruses. Depending upon the source of the bacteria, these indicators may or may not provide an indication of a significant risk to people involved in water contact recreation.

3 Colorado Lagoon: Water Quality Assessment Report, Kinnetic Laboratories, Inc. and Moffat & Nichol, August 2004.

4 City of Long Beach Health Department, Water Quality Program, Recreational Water Monitoring, http://www.longbeach.gov/health/bureau/eh/water/water_samples.asp, accessed 03/26/08.

5 California Department of Water Resources, Groundwater Bulletin 118, Coastal Plain of Los Angeles County Groundwater Basin, West Coast Subbasin, February 27, 2004.

of 142 square miles and is bound by the Ballona Escarpment to the north, the Newport-Inglewood Fault Zone to the east, and the Pacific Ocean and Palos Verdes Hills to the south and west. Prior to discharge into San Pedro Bay, the Los Angeles and San Gabriel Rivers cross the subbasin through the Dominguez Gap and the Alamitos Gap, respectively. Groundwater recharge occurs primarily as a result of underflow from the Central Subbasin. Water spread in the Central Subbasin percolates into aquifers and eventually crosses through and over the Newport-Inglewood Fault Zone, supplementing the groundwater supply in the West Coast Subbasin. Additional recharge occurs from infiltration of surface inflow from the Los Angeles and San Gabriel Rivers and irrigation from fields, lawns, and industrial waters. The general regional groundwater flow pattern is southward and westward from the Central Coastal Plain, toward the ocean.[1]

Groundwater Quality. The character of water in the subbasin is variable. Seawater intrusion has produced deterioration of water quality over time. Early tests indicated that the water was sodium bicarbonate in character. It is questionable whether this is representative of the entire zone, because the higher quality water residing outside the subbasin is calcium bicarbonate in nature.[2] In the coastal region of this subbasin, the water is calcium chloride in character and then transitions into sodium bicarbonate further inland. Data from 45 public supply wells show an average total dissolved solids (TDS) content of 720 mg/L and a range of 170 to 5,510 mg/L.

4.7.2 REGULATORY SETTING

National Flood Insurance Act

The National Flood Insurance Act established the National Flood Insurance Program, which is based on the minimal requirements for floodplain management and is designed to minimize flood damage within Special Flood Hazard Areas. The project site is located in Flood Zone X and Flood Zone AE on the Flood Insurance Rate Map (FEMA FIRM Panel No. 0601360025C). Zone X is the designation of a 100-year flood area with average depths of less than 1 ft or with drainage areas less than 1 square mile. The federal government no longer requires flood insurance in this area. Zone AE includes areas with a 1 percent annual chance of flooding. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within this zone.

Water Quality

Clean Water Act. In 1972 the Federal Water Pollution Control Act (later referred to as the Clean Water Act [CWA]) was amended to require that the discharge of pollutants into waters of the United States from any point source be effectively prohibited unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. In 1987, the CWA was again amended to require that the United States Environmental Protection Agency (EPA) establish regulations for the permitting of storm water discharges (as a point source) by municipal and industrial facilities and construction activities under the NPDES permit program. The regulations

1 California Department of Water Resources, Groundwater Bulletin 118, Coastal Plain of Los Angeles County Groundwater Basin, West Coast Subbasin, February 27, 2004.

2 Ibid.

require that Municipal Separate Storm Sewer System (MS4) discharges to surface waters be regulated by an NPDES permit.

The CWA requires states to adopt water quality standards for water bodies and have those standards approved by the EPA. Water quality standards consist of designated beneficial uses for a particular water body (e.g., wildlife habitat, agricultural supply, fishing) along with water quality criteria necessary to support those uses. Water quality criteria are set concentrations or levels of constituents (such as lead, suspended sediment, and fecal coliform bacteria) or narrative statements that represent the quality of water that supports a particular use. Because California had not established a complete list of acceptable water quality criteria for toxic pollutants, the EPA Region IX established numeric water quality criteria for toxic constituents in the form of the California Toxics Rule (CTR).

When designated beneficial uses of a particular water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as impaired. Once a water body has been deemed impaired, a total maximum daily load (TMDL) must be developed for each impairing water quality constituent. A TMDL is an estimate of the total load of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (often with a "factor of safety" included, which limits the total load of pollutants to a level well below that which could cause the standard to be exceeded). Once established, the TMDL is allocated among current and future dischargers into the water body.

The receiving water for the project site, as described in greater detail below, is 303(d) list and is considered impaired for specific constituents.

California Porter-Cologne Act. The federal CWA places the primary responsibility for the control of water pollution and for planning the development and use of water resources within the states, although it does establish certain guidelines for states to follow in developing their programs.

California's primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and the RWQCB broad powers to protect water quality and is the primary vehicle for implementation of California's responsibility under the federal CWA. The Porter-Cologne Act grants the SWRCB and RWQCBs the authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require clean up of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, oil, or petroleum product.

Each RWQCB must formulate and adopt a water quality plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include in its region a regional plan with water discharge prohibitions applicable to particular conditions, areas, or types of waste. The RWQCBs are also authorized to enforce discharge limitations, take actions to prevent violations of these limitations from occurring, and conduct investigations to determine the water quality status of any of the waters of the state within their region. Civil and criminal penalties are also

applicable to persons who violate the requirement of the Porter-Cologne Act or SWRCB/RWQCB orders.

Water Quality Control Plan, Los Angeles River Basin (Basin Plan). The RWQCB has adopted a Basin Plan for its region of responsibility, which includes the City. The agency has delineated water resource area boundaries based on hydrological features. For purposes of achieving and maintaining water quality protection, specific beneficial uses have been identified for each of the hydrologic areas described in the Basin Plan. The Basin Plan also establishes implementation programs to achieve water quality objectives to protect beneficial uses and requires monitoring to evaluate the effectiveness of the programs. These objectives must comply with the State antidegradation policy (State Board Resolution No. 68-16), which is designed to maintain high-quality waters while allowing some flexibility if beneficial uses are not unreasonably affected.

Beneficial uses of water are defined in the Basin Plan as those necessary for the survival or well-being of humans, plants, and wildlife. Examples of beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms.

The following list summarizes the beneficial uses for the Lagoon as designated by the RWQCB:

- **Water Contact Recreation (REC-1):** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, whitewater activities, fishing, or use of natural hot springs.
- **Noncontact Water Recreation (REC-2):** Uses of water for recreational activities involving proximity to water but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Wildlife Habitat (WILD):** Uses of water that support terrestrial ecosystems, including but not limited to preservation and enhancement of terrestrial habitats, vegetation, wildlife (i.e., mammals, birds, reptiles, amphibians, invertebrates), and wildlife water and food sources.
- **Commercial and Sport Fishing (COMM):** Uses of water for commercial or recreation collection of fish, shellfish, or other aquatic organisms.
- **Shellfish Harvesting (SHELL):** Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

The Basin Plan lists a potential beneficial use as:

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

The RWQCB has designated narrative or numerical water quality objectives for all of its inland surface waters for several parameters; these objectives are listed in Table 4.7.B. If these objectives are exceeded, the RWQCB can use its regulatory authority to require municipalities to reduce pollutant loads to the affected receiving waters. The RWQCB utilizes water quality criteria, in the form of "…scientific information developed by the EPA regarding the effect a constituent concentration has on human health, aquatic life, or other uses of water," to develop its water quality objectives (RWQCB 1995).

California Toxics Rule. The California Toxics Rule (CTR) provides water quality criteria for certain potentially toxic compounds for inland surface waters, enclosed bays, estuaries, and waters designated with human health or aquatic life uses. Although the CTR criteria do not apply directly to the discharges of storm water runoff, the CTR criteria are utilized as benchmarks for toxics in urban runoff. The CTR and other water quality criteria and targets are used as benchmarks to evaluate the potential ecological impacts of storm water runoff to receiving waters. The CTR establishes acute and chronic surface water quality standards for certain water bodies. Acute criteria provide benchmarks for the highest permissible concentration, below which aquatic life can be exposed for short periods of time without deleterious effects. Chronic criteria provide benchmarks for an extended period of time (i.e., for four days or more) without deleterious effects. The acute CTR criteria have a shorter relevant averaging period (less than four days) and provide a more appropriate benchmark for comparison for storm water flows.

CTR criteria are applicable to the receiving water body and, therefore, must be calculated based on the probable hardness values[1] of the receiving waters. At higher hardness values for receiving waters, certain constituents, including copper, lead, and zinc, are more likely to be complexed (bound with) components in the water column. This, in turn, reduces the bioavailability and resulting potential toxicity of these metals.

Clean Water Act, Section 303, List of Water Quality Limited Segments. Data used by the Los Angeles RWQCB to identify the Lagoon as impaired is primarily from early evidence of high concentrations of certain contaminants in resident and transplanted bivalves that were first reported by the California Department of Fish and Game Mussel Watch Program in the 1980s. Further evidence of sediment and tissue contamination in the Lagoon was documented as part of surveys conducted by the State's Bay Protection and Toxics Control Program in the early 1990s. Based on this information, the Lagoon was placed on the 303(d) list for lead, zinc, chlordane, and PAHs in sediments. Organochlorine pesticides (chlordane, DDT, dieldrin, and PCBs) were also cited as

[1] Calcium, magnesium, and carbonate are the major components of hardness, which is the amount of dissolved minerals in water.

Table 4.7.B: Water Quality Standards and Benchmarks

Constituent	Basin Plan Objectives	California Toxics Rule[1]
Ammonia	Numeric objectives have only been established for COLD and WARM beneficial uses. Shall not be present at levels that when oxidized to nitrate, pose a threat to groundwater.	No standard or objective
Bacterial, Coliform	REC-1: Fecal coliform concentration shall not exceed a log mean of 200/100 mL (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000/100 mL. SHELL: The median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 mL, nor shall more than 10 percent of the samples collected during any 30-day period exceed 230/100 mL for a five-tube decimal dilution test or 330/100 mL when a three-tube decimal test is used.	No standard or objective
Bioaccumulation	Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels that are harmful to aquatic life or human health.	See levels for metals
Biological Oxygen Demand (BOD)	Waters shall be free of substances that result in increases in the BOD, which adversely affect beneficial uses.	No standard or objective
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	No standard or objective
Chemical Constituents	Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.	Includes pesticides and PCBs
Chemical Oxygen Demand (COD)	No standard or objective	No standard or objective
Chlorine, Total Residual	Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 mg/L and shall not persist in receiving waters at any concentration that causes impairment of beneficial uses.	No standard or objective
Color	Waters shall be free of coloration that causes nuisance or adversely affect beneficial uses.	No standard or objective
Total Copper	No standard or objective	0.009 mg/L
Exotic Vegetation	Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affect beneficial uses.	No standard or objective
Floating Material	Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.	No standard or objective
Total Lead	No standard or objective	0.025 mg/L

Table 4.7.B: Water Quality Standards and Benchmarks

Constituent	Basin Plan Objectives	California Toxics Rule[1]
Methylene Blue Activated Substances (MBAS)	Waters shall not have MBAS concentrations greater than 0.5 mg/L in waters designated MUN.	No standard or objective
Mineral Quality	No waterbody specific objectives	No standard or objective
Nitrogen (Nitrate, Nitrite)	Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen, 45 mg/L as nitrate, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.	No standard or objective
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water that cause nuisance or adversely affect beneficial uses.	No standard or objective
Oxygen, Dissolved	SPWN: Waters shall not be depressed below 7 mg/L as a result of waste discharges.	No standard or objective
Pesticides	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.	Chlordane: max conc. 2.4 g, continuous conc., 0.0043 g
pH	Inland water shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge.	No standard or objective
Total Phosphorus	No standard or objective	No standard or objective
Polychlorinated Biphenyls (PCBs)	Pass-through or uncontrollable discharges to waters, or at locations where the waste can subsequently reach waters, are limited to 70 pg/L (30-day average) for protection of human health and 14 ng/L (daily average) to protect aquatic life in inland fresh waters.	No standard or objective
Radioactive Substances	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.	No standard or objective
Solid, Suspended, or Settleable Materials	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	No standard or objective
Total Suspended Solids (TSS)	No standard or objective	No standard or objective
Total Dissolved Solids (TDS)	No standard or objective	No standard or objective

Table 4.7.B: Water Quality Standards and Benchmarks

Constituent	Basin Plan Objectives	California Toxics Rule[1]
Tastes and Odors	Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses.	No standard or objective
Temperature	The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated that such alteration in temperature does not adversely affect beneficial uses.	No standard or objective
Toxicity	All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life.	No standard or objective
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: • Where natural turbidity is between 0 and 50 National Turbidity Units (NTU), increases shall not exceed 20 percent. • Where natural turbidity is greater than 50 NTU, increases shall not exceed 10 percent.	No standard or objective
Total Zinc	No standard or objective	

Source: *Water Quality Control Plan, Los Angeles Region* (1995).
[1] Chronic toxicity values (over a 4-day period) in water with a hardness of 100 mg/L.
COLD = Cold Freshwater Habitat
g = grams
mg/L = milligrams per liter
ml = milliliter
MUN = Municipal and Domestic Supply
ng/L = nanograms per liter
pg/L = picograms per liter
REC-1 = Water Contact Recreation
SHELL = Shellfish Harvesting
SPWN = Spawning, Reproduction, and/or Early Development
WARM = Warm Freshwater Habitat

contributing to impairment due to bioaccumulation in tissues of fish and mussels. The RWQCB later listed the Lagoon as impaired for bacteria due to frequent beach advisories of elevated bacteria concentrations.[1]

The 2006 list of impaired waters (303[d] list) was approved by the SWRCB on October 25, 2006, and the EPA on November 30, 2006. The Lagoon was included on the list of impaired waters. On March 8, 2007, EPA partially disapproved California's 2004–2006 303(d) list; that is, it disapproved the State's omission of impaired waters that met federal listing regulations or guidance. EPA added 64 waters and 37 associated pollutants to the State's 303(d) list. EPA added a pollutant listing to the Lagoon 2006 303(d) list. Listings relevant to the project site are described in Table 4.7.C.

RWQCB TMDL Study. Section 303(d) of the Clean Water Act provides authority for completing TMDLs to achieve water quality standards and/or designated uses. The Los Angeles RWQCB is currently developing TMDLs for organochlorine pesticides, PCBs, sediment toxicity, PAHs, and metals in the Lagoon. The development of TMDLs will provide numeric targets for water and sediment quality and fish tissue. The Los Angeles RWQCB is aiming to complete TMDL allocations by July 2008 and obtain Regional Board approval by November 2008.

Table 4.7.C: Impaired Waters

Name	Watershed	Pollutant/ Stressor	Source	Proposed TMDL Date
Colorado Lagoon	San Gabriel	Chlordane (tissue & sediment)	Nonpoint	2019
		DDT (tissue)	Nonpoint	2019
		Dieldrin (tissue)	Nonpoint	2019
		Lead (sediment)	Nonpoint	2019
		PAHs (sediment)	Nonpoint	2019
		PCBs (tissue)	Nonpoint	2019
		Sediment toxicity	Nonpoint	2019
		Zinc (sediment)	Nonpoint	2019
Colorado Lagoon (3 segments: north, center, and south)	San Gabriel	Indicator bacteria	Nonpoint	2019
Alamitos Bay (4 segments: Shore float; 1st Street & Bayshore; 2nd Street Bridge & Bayshore; 56th Place – bayside)	San Gabriel	Indicator bacteria	Nonpoint	2019

Source: 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments; Environmental Protection Agency, Region 9 Water Program, EPA's Final Decision Regarding Waters Added to California's 2004–2006 303(d) List, 2006.
DDT = dichlorodiphenyltrichloroethane
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
TMDL = total maximum daily load

[1] Colorado Lagoon: Water Quality Assessment Report, Kinnetic Laboratories, Inc. and Moffat & Nichol, August 2004.

The TMDL study currently being conducted by the RWQCB is a separate yet complementary project to the proposed project. The TMDL study will further characterize the condition of the Lagoon, and will provide limitations on the discharge of pollutants of concern into the Lagoon for future development projects. The enforcement of TMDLs for the Lagoon would result in an improved quality of water entering the Lagoon.

Clean Water Act, Section 402, National Pollutant Discharge Elimination System. Direct discharges of pollutants into waters of the United States are not allowed, except in accordance with the NPDES program established in Section 402 of the CWA.

General Construction Activity Storm Water Permit. In accordance with NPDES regulations, the State of California requires that any construction activity disturbing 1 ac or more of soil comply with the State General Construction Activity Storm Water Permit (Water Quality Order 99-08-DWQ). To obtain authorization for proposed storm water discharges pursuant to this permit, the landowner (discharger) is required to submit a Notice of Intent (NOI) to the SWRCB, prepare a Storm Water Pollution Prevention Plan (SWPPP), and implement best management practices (BMPs) detailed in the SWPPP during construction activities. Dischargers are required to implement BMPs meeting the technological standards of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution. Certain discharges of non-storm water, such as irrigation and pipe flushing/testing are permitted as long as they do not cause or contribute to a violation of any water quality standard, violate any provision of the General Permit, require a non-storm water permit (such as that issued by RWQCB), or violate provisions of the Basin Plan. BMPs include programs, technologies, processes, practices, and devices that control, prevent, or remove or reduce pollution. A general description of typical construction BMPs is provided in Table 4.7.D. Permittees must also maintain BMPs and conduct inspection and sampling programs as required by the permit.

Groundwater Dewatering Permit. On August 7, 2003, the Los Angeles RWQCB approved the *Waste Discharge Requirement for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties* (Order No. R4-2003-0111, NPDES No. CAG994004). For coverage under this permit, a discharger is required to submit an application for coverage under the permit to the Los Angeles RWQCB. Under this permit, discharges must comply with discharge specifications, receiving water limitations, and monitoring and reporting requirements detailed in the permit.

Municipal NPDES Permit. The City has its own municipal NPDES Permit, *Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach*, Order No. 99-060 (NPDES No. CAS004003). This permit specifies that all new development and redevelopment projects that fall under specific priority project categories must comply with the *Los Angeles County Standard Urban Storm Water Mitigation Plan*

Table 4.7.D: Typical Construction BMPs

Construction BMPs for Incorporation, Where Applicable, into the SWPPP	Sediment	Nutrients	Pathogens	Pesticides	Metals	Other
Soil and slope stabilization utilizing the appropriate combination of natural and synthetic mattings, geotextiles, mulches, and temporary and permanent seeding.	X	X			X	
Temporary desilting basins constructed where necessary and consisting of ponds with outflow pipes designed to retain or detain runoff sufficiently to allow sediment to settle.	X	X			X	
Storm drain inlet protection utilizing an appropriate combination of barrier devices such as sandbags, straw rolls, hay bales, fiber rolls, gravel, silt fencing, screens, and temporary drain signs (raising awareness and limiting construction wastes from entering the storm drain system).	X	X			X	Trash
Energy dissipation devices installed where necessary and consisting of physical devices such as rock, riprap, and concrete rubble intended to prevent scour of downstream areas.	X	X			X	
On-site dust control and street sweeping employed when and where necessary, paying close attention to paved areas and areas susceptible to wind erosion (such as soil stockpiles).	X	X			X	Trash
Stabilized construction entrance consisting of pads of aggregate and located where traffic enters public ROW; when and where necessary, wash racks or tire rinsing may be employed (tire rinse waters being directed through on-site sediment control devices).	X				X	
Diversion structures consisting of devices such as silt fencing, temporary or permanent channels, V ditches, earthen dikes, downdrains, straw bales, and sandbag check dams should be utilized where necessary to divert storm water flows from disturbed areas.	X				X	Trash
Adherence to Groundwater Extraction Permit conducting the required testing, monitoring, and discharge provisions for activities, including dewatering and foundation dewatering.	X				X	
Construction housekeeping practices consisting of practices such as barricading catch basins and manholes during paving activities; utilizing plastic sheeting, secondary containment, or bermed areas for construction materials when necessary; removing construction debris in a timely fashion; designating and lining concrete wash out areas; and berming or locating sanitary facilities away from paved areas.	X		X		X	Trash
Fertilizer, pesticide, and soil amendment management, including not overapplying such materials.		X		X		

Source: *California Storm Water BMP Handbook—Construction Activity* (2003).
BMPs = best management practices
ROW = right-of-way
SWPPP = Storm Water Pollution Prevention Plan

(SUSMP) (March 2000). The following projects are subject to SUSMP requirements: hillside projects; home subdivisions of 10 units or more; new commercial developments of 100,000 square feet (sf) or more of impermeable areas; and projects located adjacent to or discharging into environmentally sensitive areas.

The SUSMP includes requirements for Site Design BMPs, Source Control BMPs, and Treatment Control BMPs. As labeled, Site Design BMPs are BMPs that are incorporated into the design of the project such as conserving natural areas and properly designing trash storage areas. Source Control BMPs are pollution prevention BMPs that can be structural or nonstructural practices. Examples include good housekeeping, stenciling of catch basins, protecting slopes from erosion, and maintenance of BMPs. Treatment Control BMPs are physical devices that remove pollutants from storm water and include biofilters, water quality inlet devices, detention basins, etc.

The specific SUSMP requirements are as follows:

- Postdevelopment peak storm water runoff discharge rates shall not exceed the estimated predevelopment rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.
- Conserve natural areas.
- Minimize storm water pollutants of concern. This requires the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the maximum extent practicable.
- Properly design outdoor material and trash storage areas.
- Properly design trash storage areas.
- Provide proof of ongoing BMP maintenance.
- Protect slopes and channels from erosion.
- Provide storm drain stenciling and signage.
- Design postconstruction structural or Treatment Control BMPs (unless specifically exempted) to mitigate (infiltrate or treat) a set volume of runoff using any of four methods (in general, the 85th percentile storm in a 24-hour period).

The proposed project is subject to the SUSMP requirements because it discharges to a designated environmentally sensitive area (Alamitos Bay).

City of Long Beach

A compliance summary of the City's NPDES and SUSMP regulations are set forth in Chapter 18.95 of the City of Long Beach Municipal Code.[1] The Long Beach Storm Water Management Plan (SWMP) provides the methods for implementing the requirements of the City's Municipal NPDES Permit.

[1] City of Long Beach Municipal Code, Chapter 18.95, http://www.longbeach.gov/cityclerk/lbmc/title-18/frame.htm, accessed 12/14/07.

4.7.3 METHODOLOGY

The effects of the proposed project are evaluated below to determine whether they will result in a significant adverse impact on the environment. Project impacts to hydrology and water quality were evaluated based on the proposed project's adherence to local, State, and federal standards; proposed land use; site design; and proposed BMPs for control of surface runoff and reduction of pollutants in runoff.

4.7.4 THRESHOLDS OF SIGNIFICANCE

The proposed project may result in a significant effect to hydrology and water quality if the proposed project will:

- Violate any water quality standards or waste discharge requirements;
- 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 level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- 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 that would result in substantial erosion or siltation on or off-site;
- 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;
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- 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 delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

4.7.5 PROPOSED PROJECT

The project consists of several components that are described in detail in Section 3.5 of this EIR. This section analyzes temporary construction and operational impacts that may result from the following proposed improvements:

- **Improvements Benefiting Water and Sediment Quality**
  - Clean culvert and remove tidal gates, sill, and other structural impedances.
  - Build open channel between the Lagoon and Marine Stadium (i.e., replace culvert).
  - Remove contaminated sediment in the western arm of the Lagoon.
  - Remove sediment in the central Lagoon area.
  - Upgrade the storm drains with trash separation devices, a sanitary sewer diversion system, and bioswales.
- **Habitat Improvements**
  - Remove the north parking lot, access road, and north shore restroom structure.
  - Recontour the side slopes of the Lagoon.
  - Revegetate Lagoon areas with various native plant species.
  - Import and plant eelgrass in the Lagoon and open channel.
  - Develop Bird Island.
- **Recreation Improvements**
  - Construct a walking trail along the Lagoon and open channel.
  - Reconfigure the sports fields in Marina Vista Park and rebuild two restroom structures.
- **Operational Components**
  - Implement trash management protocols.
  - Implement bird management protocols.
  - Modify sand nourishment practices.
- **Planning Components**
  - Local Coastal Program (LCP) Amendment
  - Zoning Code Amendment

Implementation of the proposed project would occur in two phases. It is anticipated that Phase 1 would involve the improvements at the Lagoon and the existing culvert, and Phase 2 would involve improvements within Marina Vista Park. Specifically, the improvements within Marina Vista Park are anticipated to occur at least 1 year following the commencement of Lagoon improvements depending upon the availability of funding. The project components of each phase are listed below.

- **Phase 1: Lagoon Improvements**
  - **1st Component:** Clean the culvert, and remove tidal gates, sill, and other structural impedances at the culvert.
  - **2nd Component:** Implement storm drain upgrades, including development of a storm water diversion system and bioswales.

- **3rd Component:** Dredge western arm and central Lagoon areas.
- **4th Component:** Remove the north parking lot, the East 6th Street access road, and restroom on the north shore of the Lagoon.
- **5th Component:** Recontour Lagoon slopes, develop Bird Island, and revegetate.
- **6th Component:** Develop the walking trail and viewing platform at the Lagoon.

- **Phase 2: Marina Vista Park Improvements**
  - **1st Component:** Construct two roadway bridges spanning the open channel at East Colorado Street and East Eliot Street. Demolish and replace two public restrooms. Build the open channel between the Lagoon and Marine Stadium.
  - **2nd Component:** Reconfigure the sports fields within Marina Vista Park. Develop a walking trail along the eastern side of the open channel and vegetation buffers on both sides of the channel.

4.7.6 IMPACTS AND MITIGATION MEASURES

Less Than Significant Impacts

The following impacts that could result from implementation of the proposed project were evaluated and considered less than significant.

Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood delineation map; and/or place within a 100-year flood hazard area structures that would impede or redirect flood flows.

As stated above, the project site is located in Flood Zone X and Flood Zone AE on the Flood Insurance Rate Map (FEMA FIRM Panel No. 0601360025C). The proposed project includes several water quality, habitat, operational, and recreational improvement components. No housing or habitable structures, other than two replacement restroom structures, are proposed. The water quality component includes construction of an open channel and two at-grade bridges. Combined with the reduction of low flow and storm flow entering the Lagoon due to the TADP, the proposed project components would enhance the existing flood conveyance facilities and increase flood protection over existing conditions. Therefore, the proposed project is expected to result in a beneficial effect related to flood protection.

There are two restroom structures proposed for demolition and reconstruction: one at Marina Vista Park and one at Marine Stadium. The proposed structures will replace the two existing restroom structures currently located at Marina Vista Park and Marine Stadium. There are also two proposed bridge structures that will span the proposed open channel. Although the proposed restroom structures and bridges will be placed within the Flood Zone AE, as the existing restroom structures and streets currently are, the proposed restroom structures and bridges will not impede or redirect flood flows. Sheet flow will continue to flow in the same manner as currently exists. Therefore, impacts related to floods from the proposed restroom and bridge structures are less than significant, and no mitigation is required.

Expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam; and/or expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

A tsunami is a sea wave generated by a large submarine landslide or an earthquake-related ground deformation beneath the ocean. Historic tsunamis have been observed to produce a run-up on shore of several tens of feet in extreme cases. Seiches are large oscillating waves generated in enclosed bodies of water in response to ground shaking. According to the City General Plan, Seismic and Safety Element, the proposed project is within a seiche and tsunami influence area.

Although extremely rare, the project site is located at the back of Alamitos Bay, which is adjacent to the Pacific Ocean and could potentially be affected by a storm surge associated with a tsunami. Due to the water-oriented nature and purpose of the project, the proposed improvements are creating no further risk than currently exists on site to withstand inundation from seiche or tsunami. The proposed project would not change or worsen this existing condition, and there is an established warning system in place that would provide early notification of an advancing tsunami that would allow for evacuation. Los Angeles County uses the Emergency Alert System (EAS) and Emergency News Network (ENN) to warn the public about an anticipated tsunami. A Tsunami Watch Bulletin is issued if an earthquake has occurred in the Pacific Basin and could cause a tsunami. A Tsunami Warning Bulletin is issued when an earthquake has occurred and a tsunami is spreading across the Pacific Ocean. When a threat no longer exists, a Cancellation Bulletin is issued. Using the Tsunami Warning and Watch Bulletin would provide time to allow coastal residents to evacuate and seek higher ground for shelter. This would greatly reduce injuries and loss of life.[1] Because the site is not located in a hilly area, it is not considered to be at a high risk for inundation by mudflow. Therefore, the impacts of the proposed project related to potential inundation of the Lagoon are considered less than significant, and no mitigation is required.

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 level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

The project site is not located within a groundwater recharge basin, and there are no production wells within the vicinity. Therefore, there would be no impact to groundwater supply with implementation of the proposed project. Due to the variable depth of groundwater at the project site, groundwater dewatering may be required during construction dredging activities. Dewatering activities would be temporary and the volume of groundwater that may be removed would not be substantial. Based on the proposed project (restoration project), groundwater withdrawal would not be required during operation of the project. Therefore, impacts to groundwater would not be significant, and no mitigation is required.

[1] Tsunami Hazards in the City of Long Beach, http://www.longbeach.gov/civica/filebank/blobdload.asp?BlobID=6274, April, 7, 2008.

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, or substantially increase the rate or amount of surface runoff in a manner in which would result in flooding on- or off-site; and/or create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Clean Culvert, Remove Tidal Gates, and Remove Sill/Structural Impedances. Clearing/cleaning the culvert of sediment, biofouling debris, and structural impedances would improve tidal exchange through the culvert, but would not alter the drainage pattern of the project site. Cleaning the culvert of impedances would not result in erosion or siltation on or off site. The Marine Stadium side of the culvert is currently lined with riprap that protects against erosion. The Lagoon side of the culvert outlets through a concrete box culvert that protects the sides of the Lagoon shore from erosion. In addition, water from Marine Stadium outlets to the Lagoon at the same water level as that in the Lagoon, thereby further limiting erosion potential. The effect of cleaning the culvert will be to increase the tide range and tidal prism over existing conditions. Increasing the tide range and tidal prism will enable more rapid tidal flushing and more frequent turnover of Lagoon water over existing conditions, which would improve water quality. However, the culvert cleaning would not increase tidal flushing so rapidly as to cause erosion at each end, as the culvert was designed to function at this capacity. Therefore, impacts from the culvert cleaning related to erosion are less than significant, and no mitigation is required. Impacts to water quality as a result of the culvert cleaning are discussed in more detail below.

Storm Drain Upgrades. The storm drain upgrade components of the Colorado Lagoon Restoration project would upgrade seven storm drains (three major system outfalls and four local drains) that discharge into the north shore of the Lagoon. The improvements consist of redirecting low flows from the three major system outfalls to a wet well (water storage area) that will discharge the low flows to the sanitary sewer system for treatment to minimize contamination of water and sediment. The size of the underground wet well would be approximately 40 x 40 ft and 12 ft deep. New diversion pipes would be installed underground to carry the diverted runoff from the storm drain outlet locations to the underground wet well. The underground wet well and aboveground pump station would be built on the golf course at the corner of East 6th Street and Park Avenue (refer to Figure 4.7.3).

In addition, trash separation devices on the same three major system outfall drains would be installed upstream of the diversion structure. The trash separation devices would trap trash and debris prior to entering the wet well for the diverted runoff and/or discharge into the Lagoon during storm events. Therefore, low-flows from Subbasins A, B, and C would be treated by trash separation devices and the sanitary sewer and would no longer discharge directly into the Lagoon. The storm drain improvements are shown on Figure 4.7.3.

LSA

0 100 200 Feet

- Project Boundary
- Major System Outfall with Trash Separation Device
- Local Drain
- Indicates Drain Diverted by Termino Project
- Proposed Open Channel (Top of Channel 100')
- Proposed Stormwater Diversion Pipes
- Proposed Wetwell
- Existing Storm Drain Pipelines
- Termino Avenue Storm Drain Alignment
- Impervious Asphalt Removal
- Proposed Bioswale
- Dredge Area
- Shrubs
- Vegetated Buffer/Berm

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

I:\CLB0702\GIS\WaterSedimentImprovements_Fig4.7.3.mxd (5/6/2008)

FIGURE 4.7.3

Colorado Lagoon Restoration Project

Proposed Water and Sediment Quality Improvements and Termino Avenue Drain Project

The storm drain upgrades would redirect low flows to the sanitary sewer system, but would not alter the drainage pattern of the site. Low flows will continue to flow toward the Lagoon but would be diverted to the sanitary sewer instead of entering the Lagoon. Therefore, the drainage pattern would not change from existing conditions, but the rate or amount of dry weather surface runoff discharging into the Lagoon would be less than existing conditions due to the dry weather runoff diversion to the sanitary sewer.

In addition to the proposed project storm drain component, the other major system outfall structure entering the Lagoon in the west arm is the TAD and is currently proposed as a separate project by the County of Los Angeles to be modified to no longer discharge into the Lagoon. Instead, the drain would bypass the Lagoon and discharge storm water flows into Marine Stadium and dry weather flows into the sanitary sewer system. The TADP would also redirect flows from three other local storm drains located on the south shore of the Lagoon that currently discharge into the Lagoon. The drains that would be diverted by the County TADP are shown on Figure 4.7.3. The implementation of the County TADP affects the proposed improvements to the Colorado Lagoon Restoration project because one major storm drain and three local storm drains on the south shore would no longer discharge into the Lagoon. The TADP would also abandon in-place the four existing drain discharge structures at the Lagoon (shown on Figure 4.7.3). Information on the TADP and its effect on the drainage pattern and erosion in the area can be found in the Draft Termino Avenue Drain Project Environmental Impact Report (February 2007). The proposed Lagoon project would close off the ends of these drains and remove the outlet structures.

Hydrologic analysis was prepared for the TADP EIR to characterize the existing conditions of the Lagoon and after implementation of the TADP. The hydrologic analysis included information on all the drains entering the Lagoon and Marine Stadium. Therefore, the hydrologic information was used to analyze the impacts of the proposed Lagoon project. The hydrologic analysis prepared for the TADP EIR was conducted to determine the flood impacts to the Lagoon and Marine Stadium attributed to changes under the TADP. The TADP will change the magnitude of the peak flood flows, as well as the timing of when the flood flows will enter Marine Stadium from the Lagoon.[1]

The hydrodynamic modeling for the TADP EIR was conducted based on the 25-hour and 50-year flood hydrographs for the storm drains discharging into the Lagoon and Marine Stadium. The peak flows and associated flood volumes for each of the storm drains in the Lagoon are summarized in Table 4.7.E for existing conditions and for conditions under implementation of the TADP.

As shown, implementation of the TADP would divert approximately 139.4 af of water from the Lagoon to Marine Stadium (TAD line and Lines M and N).[2] This results in a diversion of approximately 55 percent of the storm water volume currently entering the Lagoon. Therefore, implementation of the TADP will decrease flood elevations within the Lagoon to elevations below the lowest perimeter elevations surrounding the Lagoon, thereby confining flood waters to the Lagoon.[3] Therefore, storm flows from the remaining storm drains into the Lagoon will have enough

1 Termino Avenue Drain Hydrologic and Water Quality Analyses Report, Everest International Consultants, Inc., February 2007.
2 Ibid.
3 Ibid.

Table 4.7.E: 50-year Flood Event Peaks and Volume

Storm Drain Line	Existing Conditions		Termino Avenue Drain Project	
	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)
Termino Avenue Drain[1]	342	130.3[1]	703[1]	209.2[1]
Project 452[2]	119	53.4	97	12.1
Line I[2]	191	38.3	191	38.3
Line K[2]	99	21.4	99	21.4
Line L	2	0.1	2	.01
Line M[1]	42	8.4[1]	42[1]	8.4[1]
Line N[1]	7	0.7[1]	7[1]	0.7[1]

Source: Termino Avenue Drain Hydrologic and Water Quality Analyses Report, Everest International Consultants, Inc., February 2007.
[1] Flow would discharge to Marine Stadium as part of the Termino Avenue Drain Project.
[2] Dry weather flow would discharge to the wet well as part of the proposed project.
cfs = cubic feet per second; af = acre-feet

freeboard to protect against flooding near East Eliot Street, where historical flooding problems have existed. Therefore, the proposed project would not increase the rate or amount of surface runoff in a manner that would result in flooding on or off site, and no mitigation is required.

Replace Local Hard Drain Outlets in the Lagoon with Vegetated Bioswales. Flows from the four local storm drains that are not diverted to the wet well would flow into vegetated bioswales. Locations of these drains and proposed bioswales are shown on Figure 4.7.3. The swales are designed to be approximately 1,800 ft long, 3 ft deep, and 10 ft wide at the top. They are intended to be able to capture dry weather and storm water flows from the four drains and sheet flow from the golf course, and route them slowly toward the Lagoon to enable filtration and some infiltration. The proposed bioswales would not alter the overall drainage pattern of the site. Low flows and storm flows will continue to flow toward the Lagoon but would flow into the bioswale prior to discharge into the Lagoon. However, the existing drainage pattern would be maintained. In addition, the bioswale would promote infiltration and reduce the flow velocity of storm water runoff. Therefore, impacts associated with drainage and runoff volume are considered less than significant, and no mitigation is required.

Build Open Channel Between Lagoon and Marine Stadium and Construct Bridges. Creating an open channel where the culvert currently exists and building bridges over the channel would not alter the drainage pattern of the site. Flows would continue to move into and out of the Lagoon via the channel in the same manner as the culvert. However, the proposed channel would be more effective at conveying water flow to and from the Lagoon compared to the culvert. Similarly, implementation of the two bridges would not alter the drainage pattern of the site. Flows would continue to sheet flow over the bridge and collect in the surrounding storm drain system, as is currently the case. Therefore, the drainage pattern or the rate or amount of surface runoff would not change from existing conditions as a result of the proposed open channel and bridges.

The proposed open channel will be characterized by a soft bottom, gently sloping banks constructed with erosion-control blankets, and riprap on the curves to maintain the integrity of the channel design. There is existing riprap on the Marine Stadium side of the culvert that will be maintained during construction and after the channel is complete to prevent erosion of the newly constructed channel. Riprap would be placed on the Lagoon side of the channel entrance to prevent erosion. In addition, the use of erosion control blankets throughout the channel would also limit potential erosion impacts. Therefore, there would not be increased erosion within the proposed open channel or at the mouth of either side of the proposed open channel. In summary, the use of erosion-control blankets and riprap within the proposed open channel will reduce potential erosion impacts to less than significant levels.

Removal of North Parking Lot/Access Road and Restroom Structure. The parking lot component would remove the existing access road from East 6th Street and the parking lot on the north shore of the Lagoon and create native upland, salt marsh, and intertidal habitat areas around the Lagoon. This component also includes demolishing the existing restroom structure on the north shore of the Lagoon. Removal of the north parking lot, access road, and restroom structure would result in the decrease of approximately 2.26 ac of impervious surface. As a result of implementation of this component, the pervious area of the site would increase by 2.26 ac. Therefore, this component would result in a potential decrease in the surface runoff from the site and would have a positive impact on the site. Therefore, no mitigation is required.

Bird Island. Bird Island would be created by removing a portion of the existing bank by excavating soils on the inland portion of the island until an island is created. To prevent soil erosion over time, the island would be graded with appropriate slopes to prevent erosion, and an erosion control blanket would be installed on the newly graded slopes. With proper implementation of construction BMPs and proper design of the island (i.e., graded slopes and use of erosion control blankets), impacts related to the erosion of Bird Island would be less than significant.

Potentially Significant Impacts

The following impacts that could result from implementation of the proposed project were evaluated and considered potentially significant.

Violate any water quality standards or waste discharge requirements and/or otherwise substantially degrade water quality.

This section analyzes temporary construction and operational impacts that may result from improvements to water and sediment quality. Temporary impacts to water quality will occur as the result of construction of the physical improvements to the Lagoon. These project components include the culvert cleaning/removal of tidal gates/structural impedances, construction of the open channel and two bridges, removal of contaminated sediments, storm drain upgrades, replacement of local hard drain outlets with bioswales, removal of north parking lot and access road, side slope recontouring, habitat restoration, and Marina Vista Park improvements. The remaining project components are not analyzed below because they do not have any substantial hydrology or water quality impacts. The

improvement components are discussed below to demonstrate that the overall project will be beneficial to water quality.

Temporary Construction Impacts. The potential impacts of construction activities on water quality focus primarily on sediments, turbidity, and pollutants that might be associated with sediments (e.g., phosphorus and legacy pesticides). Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential mobilization (erosion) by rainfall/runoff and wind. Such activities include those that result in exposed soil, such as the removal of vegetation and existing structures from the site, grading of the site, and construction of new structures and landscaped areas. Environmental factors that affect erosion include topographic, soil, and rainfall characteristics. Nonsediment-related pollutants that are also of concern during construction include waste construction materials; chemicals, liquid products, and petroleum products used in building construction or the maintenance of heavy equipment; and concrete-related waste streams.

The proposed project includes several components that require excavation and stockpiling of building, soil, and vegetative materials. Each of these construction components has the potential to negatively impact water quality if proper construction BMPs are not implemented to protect the existing water quality. Table 4.7.F summarizes each component and its potential to negatively impact water quality. Impacts as a result of the culvert cleaning, channel construction, and dredging are discussed in more detail below.

During construction, activities such as grading, excavation, and backfilling would result in the disturbance of soil. During storm events, storm water runoff could carry sediments and other substances from construction activities, resulting in erosion and storm water pollution discharges to the Lagoon and Marine Stadium.

Since the project site would disturb more than 1 ac of soil, an SWPPP is required. During construction, the City will adhere to the General Construction Permit and will utilize typical BMPs (Table 4.7.D) specifically identified in the SWPPP for the project in order to prevent construction pollutants from contacting storm water and to keep all products of erosion from moving off site into receiving waters. Under NPDES Permit 99-060, issued to the City, the project proponent must submit a NOI to the SWRCB prior to commencement of construction activities. In addition, a SWPPP must be prepared and implemented at the project site and revised as necessary if administrative or physical conditions change. The SWPPP would include BMPs in accordance with the SUSMP for Los Angeles County that address source reduction and provide measures and controls necessary to mitigate potential pollutant sources. Required elements of the SWPPP include the following:

- A site description addressing the elements and characteristics specific to the site
- Descriptions of BMPs for erosion and sediment controls
- BMPs for construction waste handling and disposal
- Implementation of approved local plans

Table 4.7.F: Construction Effects on Water Quality

Sequence of Improvement	Project Component	Construction Action	Potential Water Quality Impact	Excavation/ Demolition Debris	Approximate Duration of Effect	Probable Months of Duration
Phase 1: Lagoon Improvements						
1	Clean culvert and remove impedances	Tidal flows through the culvert would be stopped during the culvert work, which would temporarily impair water quality in the Colorado Lagoon (Lagoon). In order to access the culvert, soils overlying the culvert would be excavated and stockpiled on Marina Vista Park.	Stagnant water in the Lagoon; erosion potential	900 cy of culvert debris; 130 tons of culvert rock	10 weeks	July–August
2	Storm drain upgrades, diversion system, and bioswales	This component would require excavation of vegetative and soil material from the north shore.	Negative grading/erosion impact potential	2,500 cy for bioswales; 900 cy for wet well	5 months	April–June; August–September
3	Dredge Lagoon areas	Construction could result in the west arm of the Lagoon being diked off and dewatered to allow for sediment dredging. The west arm of the Lagoon and/or the central Lagoon may be wet dredged by clamshell buckets from land-based equipment.	Wet dredge turbidity impacts; negative excavation/ erosion impact potential	21,500 cy of sediment dredge (west arm and central Lagoon combined)	6 months	June–November
4	Remove north parking lot, East 6th Street access road, and north shore restroom	The north parking lot, access road, and north shore restroom would be demolished and replaced with native vegetation habitat.	Demolition debris contamination and negative grading/erosion impact potential	1,840 tons of asphalt debris from parking lot and access road; 10 tons of concrete debris from restroom demolition	3 months	October–December
5	Recontour Lagoon slopes, develop Bird Island, and revegetate	Construction would include existing vegetation removal, grading/excavation, and installation of native habitat.	Negative grading/erosion impact potential	5,100 cy of grading for side slope recontouring; 6,600 cy from Bird Island creation	4 months	September–December
6	Develop walking trail and viewing platform at the Lagoon	Construction would include minor grading and structure development.	Negative grading/erosion impact potential	N/A	1 month	January

Table 4.7.F: Construction Effects on Water Quality

Sequence of Improvement	Project Component	Construction Action	Potential Water Quality Impact	Excavation/ Demolition Debris	Approximate Duration of Effect	Probable Months of Duration
Phase 2: Marina Vista Park Improvements						
1	Build open channel, construct bridges, demolish and replace Marina Vista Park and Marine Stadium restrooms	Demolition, excavation, and grading would occur to construct the bridge structures. Tidal flows through the culvert would be stopped during the channel construction, which would temporarily impair Lagoon water quality. Channel would be constructed in phases over a 16-month period.	Stagnant water in the Lagoon; demolition debris contamination and negative grading/erosion impact potential	25,500 cy excavated for channel; 1,800 tons concrete debris from East Eliot Street and East Colorado Street for bridges; 20 tons debris from demolished restroom structures	16 months	All
2	Reconfigure sports fields and develop walking trail in Marina Vista Park	A large portion of Marina Vista Park, including the sports fields, would be fenced off to the public. Construction would include regrading the entire site.	Negative grading/erosion impact potential	N/A	6 months	Spring and Summer

cy = cubic yards

- Proposed postconstruction controls, including a description of local postconstruction erosion and sediment control requirements
- Non-storm water management

The site is subject to inspection by the RWQCB during construction (General Construction Activity Permit). The General Construction Activity Permit requires the discharger (the City) to inspect the site prior to an anticipated storm, during extended storm events, and after actual storm events to ensure that BMPs are functioning properly. Corrective measures are to be implemented immediately, and the RWQCB must be notified within 48 hours. Construction BMPs act as physical barriers to prevent sediment and other construction-related pollutants from leaving a construction site. By adopting this permit, the SWRCB has determined that adherence to the provisions of the General Construction Activity Permit will prevent significant impacts to water quality during project construction. As stated in Section 4.7.2, water quality monitoring is required at construction sites that directly discharge into an impaired water body or if BMPs were observed not to be effective. In this manner, the SWRCB and the RWQCB can ensure that any immediate impacts due to a failure of a BMP will not yield significant impacts to a receiving water.

During construction, the City is required to adhere to the General Construction Permit and utilize typical BMPs (Table 4.7.D) specifically identified in the SWPPP for the project in order to prevent construction pollutants from contacting storm water and to keep all products of erosion from moving off site into receiving waters (Mitigation Measures WQ-1 and WQ-2). Compliance with the General Construction Permit has been determined by the SWRCB to ensure that water quality standards (protection of beneficial uses and adherence to water quality objectives) are adequately protected during the construction period. Therefore, Mitigation Measures WQ-1 and WQ-2 will reduce potential waste discharge and water quality violations related to runoff during construction of the storm drain upgrade component to less than significant levels.

Culvert Cleaning and Open Channel Construction. Cleaning the existing culvert and removing impedances to flow is a short-term component of the proposed project. To implement this component, the culvert would have to be plugged to prevent flow through it. This would be accomplished by removing the trash racks and installing “stop logs” (sheet pile or timber panels) within the vertical slots found on both ends of the culvert. The remaining water would be pumped out to the nearest water body. The culvert design includes removable access panels on the top to allow for a small track-loader and cleaning equipment to be lowered into the culvert by crane. The track-loader and hydroblasting equipment would scrape the bottom, sides, and ceiling to remove sediments and marine growth. The sediment collected by the track-loader would be removed via excavator (or a crane with a bucket) through an access opening and hauled off site. All of the impedances would be removed from in and around the culvert, and the tide gates would be removed to provide a maximum culvert opening size. It is estimated that up to 900 cubic yards (cy) of sediment and trash and 130 tons of rock would be removed and hauled off site.

Because the culvert cleaning activity will temporarily eliminate the tidal connection from Marine Stadium to the Lagoon, the cleaning could lead to stagnation and water quality problems if a tidal connection from Marine Stadium to the Lagoon is not periodically reestablished. Due to the tidal restriction during culvert cleaning, the low circulation areas of the Lagoon may develop algae buildup, foul odors, and weeds and create an ideal environment for mosquito breeding. In order to

provide a tidal connection during the construction period, the culvert cleaning will be conducted over a longer period of time that would allow the tides to flush in and out of the Lagoon from Marine Stadium. To maintain water quality in the Lagoon during the cleaning, the culvert will be opened once every two weeks during the period of the greatest tidal fluctuations for two to three days to allow for maximum tidal exchange. Culvert cleaning is expected to take place during summer months, a time when storm water runoff flows through the culvert are minimal. In addition to coordination with the tidal regime, two subsurface aeration systems will be installed and utilized in the Lagoon during the culvert cleaning. Aeration systems help control algae, organic sludge, and growth of aquatic weeds; accelerate the natural breakdown of decaying vegetation; and effectively inhibit mosquito breeding. Use of two subsurface aeration systems will help maintain the health of the Lagoon and reduce the buildup of algae, organic sludge, aquatic weeds, and mosquito breeding environments. Because water quality could be temporarily degraded during construction activities associated with culvert cleaning and open channel construction, swimming in the Lagoon shall be restricted during construction activities associated with culvert cleaning and open channel construction.

Implementation of Mitigation Measure WQ-3 requires that the culvert tidal connection is established every 2 weeks for 2 to 3 days during culvert cleaning and requires the use of two subsurface aeration systems, which would reduce the temporary water quality impacts associated with the culvert cleaning to less than significant levels. In addition, the use of a silt screen around each end of the culvert shall be implemented to minimize sediment/turbidity impacts to the receiving waters when the culvert is periodically opened to flush out the potentially stagnant Lagoon waters. Mitigation Measure WQ-4 requires that daily bacteria testing shall be conducted during construction activities associated with culvert cleaning in order to ensure conditions are acceptable to maintain swimming within the Lagoon. Implementation of these water quality protection features would result in less than significant impacts to water quality in the Lagoon during the culvert cleaning.

Construction of the open channel would result in similar impacts to water quality as cleaning of the culvert. However, impacts would occur over a longer period of time. The first step of construction of the open channel will be to excavate the soil above and along the sides of the concrete culvert. The culvert would remain operational during this period. Approximately 25,500 cy of soil would be excavated. Implementation of construction BMPs listed in Table 4.7.D would reduce impacts associated with soil erosion. Following soil excavation, the culvert would be plugged to prevent flow through it, similar to the culvert cleaning, and water would be removed from inside the culvert via a pump. After the water was drained from the culvert, culvert demolition would begin in the center of the culvert. The culvert would be demolished, debris removed, and the underlying soil would be excavated. That particular section of the channel would be fully built (with erosion control blankets and riprap to prevent erosion). After one section of the proposed channel is complete, construction of the channel would move outward towards each end, demolishing the culvert and building the channel until both ends were reached. During the construction period, the ends of the culvert will be opened periodically during spring tides to convey flows from/to the Lagoon through the remaining culvert sections and newly constructed open channel stretch to maintain water quality in the Lagoon. Following this flushing, the culvert ends would be closed again, water pumped out to the nearest water body, and culvert demolition/open channel construction would continue along a new section. This process would

repeat until both ends are reached. Once the remaining culvert end sections were complete, the channel ends would be breached (at low tide), and the new tidal connection would be established.

Similar to the cleaning of the culvert, demolition of the existing concrete culvert and construction of the open channel will eliminate the tidal connection during those activities. This may lead to stagnation and water quality problems. In order to provide a tidal connection during the construction period, demolition and open channel construction will be conducted in sections/stages along their lengths between the Lagoon and Marine Stadium. Periodic opening of the culvert during construction is needed to ensure tidal exchange and to limit stagnation of the water in the Lagoon. To maintain water quality in the Lagoon during construction, the culvert will be opened once every 2 weeks of construction during the period of the greatest tidal fluctuations for 2 to 3 days to allow for maximum exchange. Construction of the open channel may take place during wet months, which may require the channel to be opened more frequently. In addition to coordination with the tidal regime, two subsurface aeration systems will be installed and utilized during construction that closes off the culvert. Implementation of these water quality features would help reduce impacts to water quality in the Lagoon.

Implementation of Mitigation Measure WQ-3 requires that the culvert tidal connection is established every 2 weeks for 2 to 3 days during channel construction and requires the use of two subsurface aeration systems that would reduce the temporary water quality impacts associated with the channel construction. In addition, the use of a silt screen around each end of the culvert/open channel shall be implemented to minimize sediment/turbidity impacts to the receiving waters when the culvert/channel is periodically opened to flush out the potentially stagnant Lagoon waters. Mitigation Measure WQ-4 requires that daily bacteria testing shall be conducted during construction activities associated with open channel construction in order to ensure conditions are acceptable for maintaining swimming within the Lagoon. Implementation of these water quality protection features would result in less than significant impacts to water quality in the Lagoon during the channel construction.

Opening the culvert periodically during culvert demolition and channel construction could result in significant erosion of soils if the channel banks are not properly stabilized. Implementation of bank stabilization techniques and the use of erosion control blankets and riprap during construction will be necessary to minimize erosion of sediments into the Lagoon and Marine Stadium. In addition, demolition of the two restroom structures would create approximately 20 tons of concrete debris. Construction activities associated with these improvements have the potential to impact water quality in the Lagoon and Marine Stadium if construction debris and soils are not properly contained on site. During construction activities, the City is required to adhere to the General Construction Permit and utilize typical BMPs (Table 4.7.D) specifically identified in the SWPPP for the project in order to prevent construction pollutants from contacting water bodies and to keep all products of erosion from moving into receiving waters (Mitigation Measures WQ-1 and WQ-2). Mitigation Measures WQ-1 through WQ-4 will reduce potential waste discharge and water quality violations related to runoff during construction of the proposed open channel to less than significant levels.

Bridge Construction. Two vehicular bridges with pedestrian/bicycle facilities would be built over the existing culvert at East Colorado Street and East Eliot Street in order to maintain existing

traffic circulation. The two bridges would both be at-grade and would be approximately 160 ft in length (due to the angle of the street/bridge and the proposed channel alignment) and approximately 45 ft in width. Each bridge would include two 12 ft lanes and two 5 ft sidewalks, and may include an 8 ft wide bike path on one side. Piles would be constructed to allow the bridges to span the open channel. The space between the piles would be approximately 35 ft. Construction of each bridge would occur at different times to provide for adequate circulation during construction. Construction is anticipated to take approximately 6 months for each bridge. The channel construction schedule would overlap the bridge construction schedule for 3 to 4 months. The bridges would be built "in the dry" (i.e., construct the bridge prior to final excavation of the open channel under the bridge), which would allow the existing culvert to remain operational during construction of the bridges. Spacing of the bridge piles would be such that they would straddle the existing culvert.

The bridge construction over the existing culvert and the adjacent two water bodies that will be near-grade will require special consideration to prevent adverse direct impacts to water quality, specifically measures to block pollutants from entering the Lagoon and Marine Stadium. Construction of each bridge would require demolition of the existing asphalt street; therefore, there is a potential for pollutants to enter the water bodies from construction work. The soil excavation required for bridge construction would be the same as that required for channel construction. Bridge construction would require the use of the construction BMPs listed in Table 4.7.D. If construction BMPs are properly designed, implemented, and maintained as presented in Mitigation Measure WQ-2, adverse water quality impacts would not occur.

Remove Contaminated Sediment in the Western Arm. It is estimated that the layer of contaminated sediment reaches 4–5 ft deep. Removal of sediment to a depth of 6 ft provides a safeguard that only clean sediment remains. Hence, the excavation design is based on removing 6 ft of sediment at the uppermost portion of the western arm, with the excavation depth gradually decreasing toward the footbridge, where the contamination is less. The sediment assessments concluded that the existing pedestrian footbridge provides a reasonable and conservative boundary for removal of the contaminated sediment. The width of the excavation footprint is intended to be as wide as possible to remove the maximum quantity of sediment while still providing for stable side slopes around the Lagoon perimeter. Slopes are to be dredged to create a smooth transition from the Lagoon floor up the side slopes. Approximately 16,000 cy of sediment would be removed from the western arm of the Lagoon. Dredging in the Lagoon would remove sediments, known to contain lead and the three groups of organochlorine pesticides (DDT compounds, chlordane, and dieldrin), PCBs, and a number of metals, including cadmium, copper, mercury, silver, and zinc.

There are two potential methods related to dredging and disposing of the contaminated sediment within the western arm of the Lagoon. The first and proposed method would install a temporary cofferdam just west of the footbridge to isolate the west arm of the Lagoon. The dredge area would be drained of water, and the bottom sediment would be dewatered. Groundwater may be encountered, in which case, dewatered groundwater may be discharged back into the Central Lagoon. An excavator would be used to remove the dry sediment, which would be temporarily stockpiled in the parking lot along the Lagoon's north shore. Plastic tarps and containment structures would be placed under and around the stockpile area to minimize runoff back into the

Lagoon and surrounding areas. Due to the contamination levels within the western arm of the Lagoon, the dredge materials from this Lagoon location would be hauled to a Class 1 hazardous waste disposal facility or an approved Port of Long Beach site via haul trucks. Approximately 16,000 cy of sediment would be removed from the western arm of the Lagoon and approximately 5,500 cy of sediment would be removed from the central Lagoon.

The alternate dredge method consists of land-based wet dredging. The second method would not dewater portions of the Lagoon prior to dredging. The dredge areas would be isolated by a silt curtain to maintain water quality. Clamshell/bucket-type dredging equipment would be used and temporary shore-perpendicular berms or piers would be built into the Lagoon to allow the dredger to access depths not within reach from the Lagoon's shores. Similar to the first method, the dredged material would be temporarily stockpiled in the parking lot along the northern shore until it was drained and loaded onto trucks. Water from the dredged material would be allowed to sheetflow back into the Lagoon if analysis indicates that the contaminants will not leach into the runoff; otherwise, the runoff will be treated by either filtering or binding with Portland cement for removal to a landfill. Plastic tarps and containment structures would be placed under and around the stockpile areas to minimize runoff back into the Lagoon and surrounding areas. Approximately 16,000 cy of sediment would be removed from the western arm of the Lagoon and approximately 5,500 cy of sediment would be removed from the central Lagoon.

Dredged Material Disposal. The RWQCB and EPA are responsible for determining appropriate dredged material testing and discharge standards and for ensuring that dredging and the disposal of dredged materials are consistent with the maintenance of water quality. Criteria for determining the appropriate disposal method and a list of permits required for proper disposal of material are described in Section 4.6, Hazards and Hazardous Materials. As described in that section, material that is classified as a hazardous waste would require proper disposal as a hazardous waste. Final determination of a suitable disposal method is specified in the permit issued for the dredging project by the United States Army Corps of Engineers.

West Arm Dry Dredge Impacts. Impacts to water quality would be minimal under this scenario and limited to dewatered groundwater discharged back to the central Lagoon. The groundwater on site is variable and has been recorded at depths ranging from 5 to 7 ft below ground surface (bgs). Groundwater is anticipated to be encountered during dredging activities associated with the dry dredge of the west arm. Therefore, groundwater may need to be discharged back into the central Lagoon during construction. Discharge of groundwater into the Lagoon has the potential to significantly impact water quality since the overlying sediments in the west arm of the Lagoon are hazardous or contaminated. Construction dewatering on the proposed project site also may be required if water has been standing on site and needs to be removed for construction, vector control, or other reasons. Dewatered groundwater from the site may need to be filtered prior to discharge into the Lagoon to ensure that surface water quality is protected.

Any dewatering or construction-related, non-storm water discharges would be controlled in compliance with the Los Angeles RWQCB groundwater dewatering permit (Order No. R4-

2003-0111, NPDES No. CAG994004). This permit requires permittees to conduct monitoring of dewatering discharges and adhere to effluent and receiving water limitations contained within the permit so that water quality of surface waters is ensured protection. If the groundwater is found to contain contaminates, the discharge permit would require the dewatered groundwater to be treated prior to discharge into the storm drain system or surface waters. Compliance with the applicable dewatering permit would further assure that the impacts of these discharges are appropriately addressed. Therefore, with implementation of Mitigation Measure WQ-5, which requires compliance with the groundwater dewatering permit, potential violations of water quality standards related to discharge of groundwater during dewatering activities would be reduced to less than significant levels.

The dry dredged material would be stockpiled on the north beach parking lot prior to trucking to a landfill or Port of Long Beach. The stockpiled material would be placed on a tarp or moisture barrier to prevent contamination/leaching from the material back to the Lagoon waters. Once the material is sufficiently dried, it will be hauled off by trucks. With implementation of a SWPPP, as outlined in Mitigation Measure WQ-2, impacts to water quality from stockpiled dredge material would be less than significant.

West Arm Wet Dredge Impacts. Construction dredging and disposal of wet dredged materials could affect water quality if water quality protection measures were not implemented. Proposed dredging activities in the Lagoon would result in short-term disturbance of localized Lagoon sediments, which contain elevated concentrations of lead and organochlorine pesticides. As is typical for dredging projects, construction dredging of Lagoon sediments could adversely affect water quality by temporarily resuspending sediments, thereby increasing turbidity. In addition, chemicals such as lead and organochlorine pesticides that are present in the sediments could be released into the water column during resuspension, which could temporarily degrade water quality. Dredging could also expose deeper sediments with higher concentrations of lead and organochlorine pesticides to the water column, which could result in long-term degradation of water quality. Impacts related to resuspended sediments (turbidity) and resuspended metals and chemicals are described in more detail below.

Turbidity Effects due to Resuspension of Sediments and Water Quality Effects Related to Contaminants in the Dredged Sediments. Suspended sediments in the water column can lower levels of dissolved oxygen, increase salinity, increase concentrations of suspended solids, and possibly release chemicals present in sediments into the water. The degree of turbidity resulting from the suspended sediments would vary with the quantity and duration of the construction activity and would also depend on the methods used, the quality of equipment, and the care of the operator. In all cases, increased turbidity levels would be relatively short-lived and generally confined to within a few hundred yards of the activity. After initially high turbidity levels, sediments would disperse and background levels would be restored within hours of disturbance. Substantially depressed oxygen levels (i.e., below 5 mg/L) can cause respiratory stress to aquatic life, and levels below 3 mg/L can cause mortality. However, oxygen levels resulting from project construction activities are not expected to remain low for long periods. Also, tidal

flushing would improve depressed oxygen levels by introducing oxygenated water into the project area, and releases of anoxic (oxygen-poor) sediments would occur for relatively short time periods. Normal circulation and tidal effects in the Lagoon would generally disperse and dilute the water temporarily affected by construction activities. Therefore, only temporary water quality impacts related to suspended solids in the water column would be expected during dredging activities.

As discussed above, sediments would be resuspended during construction wet dredging. Because these sediments contain lead and organochlorine pesticides, water quality in the Lagoon could be temporarily degraded during construction dredging, resulting in a potentially significant, but temporary, impact to water quality. To reduce potentially significant water quality impacts to a less than significant level, Mitigation Measures WQ-6 and WQ-7 are recommended. Mitigation Measure WQ-6 would control the dispersion of sediments during construction activities and would limit the area subject to these temporary effects. Equipment used for dredging would be modified or specifically designed to control the dispersion of sediments and achieve precise control over the depth and area of sediment removal. In addition, dredge operators could use automatic rather than manual monitoring of the dredging operations, which would allow continuous data logging with automatic interpretation and automatic adjustments to the dredging operations for real-time feedback for the dredge operator. Automatic systems could also be used to monitor turbidity and other water quality conditions in the vicinity of the dredging operations and allow real-time adjustments by the dredging operators to control temporary water quality effects. Mitigation Measure WQ-7 includes the use of silt curtains to reduce sediment dispersal beyond the dredge site. With implementation of the recommended mitigation measures, water quality impacts related to the dredging of sediments containing lead and organochlorine pesticides would be less than significant.

Stockpiled Material. Water from the dredged material would be allowed to sheet flow back into the Lagoon if the analysis indicates that the contaminants will not leach into the runoff, or the runoff water from the dredged material will be treated by either filtering or by binding with Portland cement for removal to a landfill. Once the material is sufficiently dried, it will be hauled off by trucks. With implementation of an SWPPP as outlined in Mitigation Measure WQ-2, impacts to water quality from stockpiled dredge material would be less than significant.

Remove Sediment in the Central Lagoon. The sediments in the central region of the Lagoon contain levels of lead, mercury, silver, DDT, and chlordane that are not hazardous per State standards. This project component would remove sediment and sand that has eroded and been deposited into the Lagoon waters over the years and create a larger subtidal area. Approximately 5,500 cy of sediment would be removed from the central Lagoon utilizing the wet dredge method discussed previously. Because the sediment from the central Lagoon is not considered hazardous, it could be reused on site for landscaping at the Lagoon.

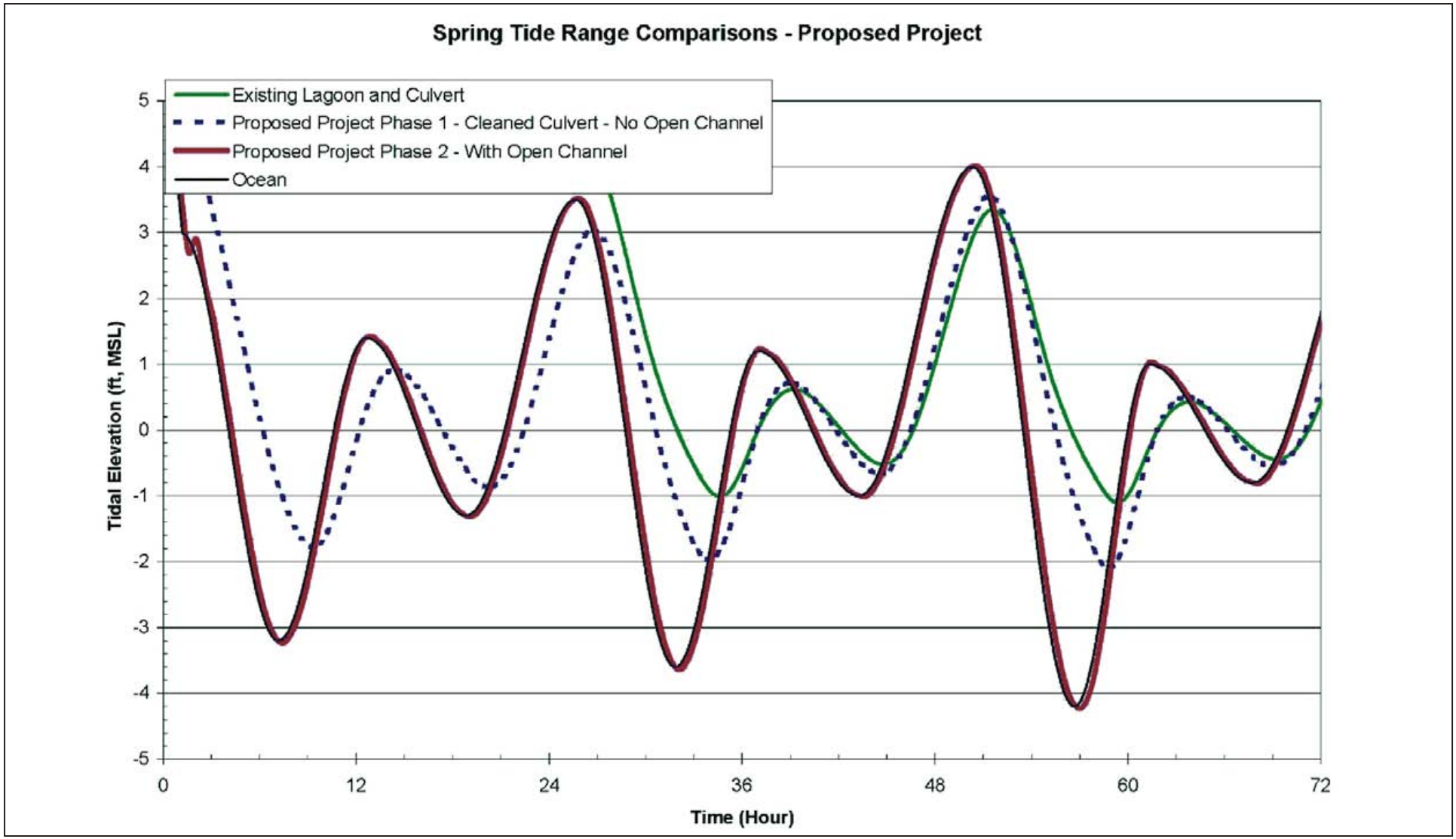
Impacts in regard to dredging the central arm would be similar to but slightly less than the impacts discussed above for the west arm wet dredge method. Impacts would be less because

there is less contamination in the central area compared to the west arm and less material is being removed. Implementation of Mitigation Measures WQ-2, WQ-6, and WQ-7 would reduce temporary dredging impacts to the central area to less than significant levels.

Recontour Lagoon Slopes, Develop Bird Island, and Revegetate. Recontouring the Lagoon side slopes, developing Bird Island, and revegating the Lagoon would potentially result in impacts to water quality. Recontouring the Lagoon side slopes and developing Bird Island requires excavation and grading of approximately 10,700 cy of soil material. Given that the excavation occurs directly adjacent to or within the Lagoon shore water, there is potential for sediment/turbidity impacts to water quality. In addition, erosion of soil material into the Lagoon could occur prior to revegetation of the site. During construction, the City is required to adhere to the General Construction Permit and utilize typical BMPs (Table 4.7.D) specifically identified in the SWPPP for the project in order to prevent construction pollutants from contacting storm water and to keep all products of erosion from moving off site into receiving waters (Mitigation Measures WQ-1 and WQ-2). In addition, Mitigation Measure WQ-8 is proposed, which requires the use of a silt curtain in the area directly adjacent to the graded slopes. Implementation of a silt curtain during recontouring of the Lagoon side slopes and development of Bird Island would limit the area of potential sediment/turbidity impacts to water quality. With implementation of Mitigation Measures WQ-1, WQ-2, and WQ-8, impacts would be reduced to less than significant levels.

Operational Impacts. The proposed project would result in improved water quality for the Lagoon. The existing uses at the Lagoon and Marina Vista Park would not change substantially from existing conditions. Operationally, water quality would improve due to implementation of the following project components: culvert cleaning, open channel, and storm drain upgrades. Implementation and operation of Bird Island has the potential to negatively impact water quality if bird feces introduction into the Lagoon increases as a result of the creation of the island. Each component is described in more detail below.

Culvert Cleaning. Cleaning the culvert of sediment, biofouling debris, and structural impedances will increase the opening of the culvert and improve tidal exchange through the culvert. The effect of cleaning the culvert will be to increase the tide range and tidal prism. Increasing the tide range and tidal prism will enable more rapid tidal flushing and more frequent turnover of Lagoon water over existing conditions. The spring tide range will increase by 27 percent, to 5.6 ft from 4.4 ft for existing conditions, compared to nearly 8.2 ft at Marine Stadium. As a result of the culvert cleaning, the seawater residence time in the Lagoon would be shortened to 8.0 days, compared to 8.5 days for existing conditions. However, the residence time would still be more than the Marine Stadium residence time of 6.9 days for open ocean conditions. Tidal range and tidal prism information for existing conditions compared to the culvert cleaning is shown on Figure 4.7.4. This information is also summarized in Table 4.7.G along with residence time. As shown, the culvert cleaning would result in Lagoon waters being turned over more frequently,



LSA

FIGURE 4.7.4

Colorado Lagoon Restoration Project

Existing and Proposed Spring Tidal Range

SOURCE: Moffatt & Nichol, 2007

I:\CLB0702\G\E&PSTidal Range.cdr (2/29/08)

Table 4.7.G: Tidal Conditions Comparison – Proposed Project Phase 1

	Existing Conditions	Cleaned Culvert
Spring Tidal Range (feet)	4.4	5.6
Spring Tidal Prism (acre-feet)	64	73
Residence Time from Ocean (days)	8.5	8.0

Source: Tidal Hydraulics Study for Colorado Lagoon Restoration Project EIR, Moffatt and Nichol, April 14, 2008.

which would result in incremental improvements to water quality over existing conditions.[1] Therefore, impacts to water quality as a result of implementation of culvert cleaning would result in incremental improvements to water quality. Therefore, no mitigation measures are necessary, as the impacts of the proposed project are beneficial to the project site.

Open Channel. Replacing the existing culvert with an open channel would significantly improve the tidal range in the Lagoon (Figure 4.7.4), which would result in improved circulation and water quality. Under the existing conditions, tidal flow, tidal prism, and low tides are muted by the effects of the culvert and tide gates. Tidal prism is the volume of water exchanged between the Lagoon and Marine Stadium during one tidal period. Measured low tides during average tide conditions in the Lagoon are approximately 2 ft less than those in Marine Stadium The existing spring tidal prism (64.4 af) and spring tidal range (4.4 ft) is much less than what the open channel would provide (114.3 af and 8.2 ft, respectively). This results in less than optimal tidal circulation and flushing. The residence time of the Lagoon water is approximately 8.5 days, while Marine Stadium water residence is approximately 6.9 days under similar conditions. The existing rates of circulation and flushing cause water in the Lagoon to gradually build up nutrients, bacteria, and other pollutants.

Increased tidal flow and tidal prism would result in lowering the lower low tide in the Lagoon and may result in a smaller subtidal area and expanded intertidal habitat. Because the mudflat areas would be exposed more often, the Lagoon waters will not experience eutrophication (excessive nutrient concentrations), and odors should not increase. This component will result in a conversion of some areas from Lagoon habitat (areas composed of subtidal waters) to intertidal habitat (areas that are submerged at high tide and exposed at low tide) by increasing tidal range.

An open channel connection between the Lagoon and Marine Stadium is more effective at transferring water between the Lagoon and Marine Stadium than the existing culvert and a cleaned culvert. Creating an open channel will increase the tide range and the tidal prism at the Lagoon. Increasing the tide range together with an increase in tidal prism will cause more rapid tidal flushing and more frequent turnover of Lagoon water. The average spring tidal range will increase by 86 percent, to 8.2 ft from 4.4 ft for existing conditions, which is the same as Marine Stadium and for the open ocean conditions. Refer to Figure 4.7.5 for the existing and proposed

[1] Development and Evaluation of Restoration Alternatives – Colorado Lagoon Restoration Feasibility Report, Moffatt & Nichol, November 11, 2004.

inundation at spring low tide. In addition, the tidal prism for the proposed channel increases to 114.3 af from 64.4 af, for an increase of nearly 77 percent.

Table 4.7.H details the difference between existing conditions and those expected after implementation of the cleaned culvert and open-channel components. Cleaning the culvert would increase the tidal range and tidal prism, but only 30 percent and 17 percent, respectively, of what the proposed open channel would create. Therefore, the open channel would be significantly more effective at transferring water between the Lagoon and Marine Stadium than the cleaned culvert. Therefore, impacts to water quality as a result of implementation of the open channel would result in significant improvements to water quality. Therefore, no mitigation measures are necessary, as the impacts of the proposed project are beneficial.

Table 4.7.H: Tidal Conditions Comparison – Proposed Project Phase 2

	Existing Conditions	Cleaned Culvert	Open Channel (with no culvert)
Spring Tidal Range (feet)	4.4	5.6	8.2
Spring Tidal Prism (acre-feet)	64	73	114
Residence Time from Ocean (days)	8.5	8.0	7.3

Source: Tidal Hydraulics Study for Colorado Lagoon Restoration Project EIR, Moffatt and Nichol, April 14, 2008.

Storm Drain Upgrades. The existing TAD has the highest flood flow and the Project 452 storm drain has the second-highest flood flow entering the Lagoon. The third-largest storm drain (Line I) discharges into the northeast portion of the Lagoon, where the sediment quality was better compared to the northwest portion. Implementation of the proposed project and the TADP would not alter the pollutant load, but would redistribute the flows between the Lagoon and the wet well or between the Lagoon and Marine Stadium (TADP). The wet well would collect dry weather flow in a storage chamber that would discharge to the sewer system for treatment instead of discharging into the Lagoon. As a result, flow from the remaining three major storm drain systems entering the Lagoon (after implementation of the TADP) would result in treatment of the dry weather flow for all the major storm drains entering the Lagoon. The 2005 storm drain contaminant survey concluded that most COC occurred in highest concentrations at a site sampled in the TAD line. Therefore, implementation of the TADP would result in a large percentage of contaminants entering the Lagoon to be redirected into Marine Stadium. As a result, TADP would result in a significant improvement to water quality in the Lagoon. The proposed project would contribute to the improvement in water quality by treating dry weather flows in the sanitary sewer system rather than discharging directly to the Lagoon. Therefore, the drains contributing the largest amount of dry weather flow and pollutants into the Lagoon would be redirected and/or treated.

LSA

LEGEND

- Project Boundary
- Proposed Open Channel (Top of Channel 100')
- Existing Culvert
- Proposed Condition Tidal Inundation Level at Low Tide
- Existing Condition Tidal Inundation Level at Low Tide
- Proposed Bird Island

0 100 200 Feet

FIGURE 4.7.5

Colorado Lagoon Restoration Project

Existing and Proposed Tidal Inundation at Low Tide

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

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Implementation of the bioswales would provide treatment to the remaining four local storm drains and golf course runoff discharging into the Lagoon; therefore, all dry weather runoff entering the Lagoon would be either diverted for sewer treatment (three major storm drains) or treated by the bioswale (four local storm drains) prior to discharge into the Lagoon. The four local storm drains proposed for treatment by the bioswales provide a small amount of flow compared to the major system outfalls proposed for diversion. However, these local storm drains are currently discharging into the Lagoon without any form of treatment. A large amount of this flow is from the golf course and residential areas of the watershed. Pollutants in runoff typically produced by these land uses include bacteria and viruses; nutrients; trash; oxygen-demanding substances; oil and grease; sediment; and pesticides. Table 4.7.I shows the effectiveness of standard Treatment Control BMPs to remove these pollutants of concern. As shown, the bioswales will help to reduce some of the pollutants generated by the surrounding land uses entering the Lagoon. Therefore, the proposed wet well and bioswale components will have a positive impact on water quality entering the Lagoon. As a result of implementation of the proposed project, impacts to water quality would be beneficial, and no mitigation is required.

Bird Island. The proposed project includes development of Bird Island. Bird Island will be constructed by excavating approximately 6,600 cy of soil material from the eastern shore of the west arm. Bird Island is anticipated to provide a safe refuge for roosting birds. Due to the habitat improvements throughout the Lagoon, bird species may be more attracted to the Lagoon area than previously, given the increased marsh habitat. As a result of increased foraging and roosting activities of birds, bacterial levels of the Lagoon waters could potentially increase. Increased bacterial levels in the water would have a potentially significant negative impact on the water contact recreational beneficial use as designated by the RWQCB. As a result of implementation of Bird Island, the Lagoon may have increased advisory warnings or closures. Therefore, implementation of Mitigation Measure WQ-9 is proposed to mitigate potential impacts of the Bird Island component by requiring the City of Long Beach to continue weekly monitoring of the Lagoon for bacteria and further requires an annual reevaluation of the water contact recreational beneficial use of the Lagoon. Implementation of WQ-9 would reduce impacts of the Bird Island component to less than significant levels.

Mitigation Measures

The following mitigation measures have been identified to reduce or eliminate the identified potential impacts resulting from the proposed project:

WQ-1 During demolition, grading, and construction, the construction contractor shall ensure that the project complies with the requirements of the State General Construction Activity National Pollution Discharge Elimination System (NPDES) Permit. Prior to issuance of demolition and grading permits, the construction contractor shall demonstrate to the City that coverage has been obtained under the State General Construction Activity NPDES Permit by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board (SWRCB) and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) number or other proof of filing to the City Building Official.

Table 4.7.I: Treatment Control BMPs Selection Matrix[1]

Pollutant of Concern	Treatment Control BMP Categories							
	Water Quality Inlets	**Drain Insert[2]**	**Biofilters**	**Detention Basins[3]**	**Infiltration Basins[4]**	**Wet Ponds or Wetlands**	**Filtration**	**Hydrodynamic Separator Systems[(5)]**
Sediment (commercial use)	L	V	H/M	M	H/M	H/M	H/M	H/M
Nutrients (commercial use and impairment)	L	V	L	M	H/M	H/M	LM	L
Organic Compounds (commercial use)	L	V	U	U	U	U	H/M	L
Trash (commercial use and impairment)	M	V	L	M	U	U	H/M	H/M
Oxygen-Demanding Substances (commercial use)	U	U	L	M	H/M	H/M	H/M	L
Bacteria and Viruses (commercial use and impairment)	L	V	U	U	H/M	U	H/M	L
Oil and Grease (commercial use)	M	V	H/M	M	U	U	H/M	L
Metals (commercial use and impairment)	L	V						
Pesticides (nonsoil bound)	U	U	U	U	U	U	U	L

[1] Cooperative periodic performance assessment may be necessary.
[2] Removal efficiency depends on type of product. Few products have performance data collected under field conditions.
[3] For detention basins with minimum 36- to 48-hour drawdown time.
[4] Including trenches and porous pavement.
[5] Also known as hydrodynamic devices and baffle boxes.

L: Low removal efficiency
H/M: High or medium removal efficiency
U: Unknown removal efficiency
V = Variable removal efficiency

Biofilters include:
• Grass swales
• Grass strips
• Wetland vegetation swales
• Bioretention

Detention Basins include:
• Extended/dry detention basins with grass lining
• Extended/dry detention basins with impervious lining

Wet Ponds and Wetlands include:
• Wet ponds (permanent pool)
• Constructed wetlands

Filtration Systems include:
• Media filtration
• Sand filtration

Infiltration Basins include:
• Infiltration basins
• Infiltration trenches

Hydrodynamic Separation Systems include:
• Swirl Concentrators
• Cyclone Separators

Source: *California Stormwater BMP Handbook—New Development and Redevelopment* (2003).
BMPs = best management practices

WQ-2 Prior to issuance of a grading permit, the City of Long Beach Building Official shall ensure that construction plans for the project include features meeting the applicable construction activity best management practices (BMPs) and erosion and sediment control BMPs published in the *California Storm water BMP Handbook–Construction Activity* or equivalent. The construction contractor shall submit a Storm Water Pollution Prevention Plan (SWPPP) to the City that includes the BMP types listed in the handbook or equivalent. The SWPPP shall be prepared by a civil or environmental engineer and will be reviewed and approved by the City Building Official prior to the issuance of any grading or building permits. The SWPPP shall reduce the discharge of pollutants to the maximum extent practicable using BMPs, control techniques and systems, design and engineering methods, and such other provisions as appropriate. A copy of the SWPPP shall be kept at the project site.

The construction contractor shall be responsible for performing and documenting the application of BMPs identified in the SWPPP. The construction contractor shall inspect BMP facilities before and after every rainfall event predicted to produce observable runoff and at 24-hour intervals during extended rainfall events, except on days when no ongoing site activity takes place. Prestorm activities will include inspection of the major storm drain grate inlets and examination of other on-site surface flow channels and swales, including the removal of any debris that blocks the flow path. Poststorm activities will include inspection of the grate inlets for evidence of unpermitted discharges. The construction contractor shall implement corrective actions specified by the City Building Official, as necessary, at the direction of the City Director of Public Works. Inspection records and compliance certification reports shall be submitted to the City Director of Public Works on a monthly basis and shall be maintained for a period of three years. Inspections shall be scheduled monthly during the dry season and weekly during the wet season for the duration of project construction or until all areas are revegetated.

WQ-3 The Construction Contractor shall ensure, and the Director of Development Services shall verify, that during cleaning/clearing of the culvert, the culvert shall be opened once every 2 weeks during the period of the greatest tidal fluctuations for 2 to 3 consecutive days to allow for maximum tidal exchange between Marine Stadium and Colorado Lagoon. The tidal exchange will occur during spring tides, if feasible, to allow for exchange during the period of greatest tidal fluctuation to achieve maximum water quality benefit. If, for erosion, flooding, or other engineering reasons, the Project Engineer determines that tidal exchange during spring tides is not feasible, an alternative tidal exchange regime will be implemented subject to approval by the Directors of Development Services and Parks, Recreation, and Marine Services. In addition to coordination with the tidal regime, two subsurface aeration systems shall be installed and utilized during construction activities that close off the tidal flow of the culvert. The use of silt screen around each end of the culvert shall be implemented during culvert flushing to minimize sediment/turbidity impacts to the adjacent receiving waters.

WQ-4 The Director of Director of Health and Human Services shall continue to monitor bacteria levels in the Colorado Lagoon on a daily basis during cleaning of the culvert and during construction of the open channel in order to ensure the integrity of the water is maintained for swimming in Colorado Lagoon during construction activities associated

with the culvert and open channel. If water quality exceeds the water contact recreational beneficial use water quality standards, the Directors of the Health and Human Services, Recreation and Marine Services, shall post the site and close the beach, if necessary.

WQ-5 Prior to commencement of grading activities, the construction contractor shall determine, and report to the Director of Development Services and Public Works, whether dewatering of groundwater will be necessary during project construction and whether dewatering activities will require discharge to the storm drain system or surface waters. Discharge of dewatered groundwater to the storm drain system or surface waters will require compliance with the *Waste Discharge Requirement for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties* (Order No. R4-2003-0111, NPDES No. CAG994004), or subsequent permit. This will include submission of a Report of Waste Discharge (ROWD) and an application for coverage under the permit to the Los Angeles Regional Water Quality Control Board at least 45 days prior to the start of dewatering and compliance with all applicable provisions in the permit, including water sampling, analysis, and reporting of dewatering-related discharges.

WQ-6 During dredging, the City Director of Development Services shall require that the contractor employs measures to control dispersion of contaminated sediments. Equipment used for dredging shall be modified or specifically designed to control the dispersion of sediments. In addition, the City shall require that contractor to implement specific measures as required by the United States Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), and other regulatory agencies during the permitting process. The operations could include the use automatic rather than manual monitoring of the dredging operations, which would allow continuous data logging with automatic interpretation and automatic adjustments to the dredging operations for real-time feedback for the dredge operator. Automatic systems could also be used to monitor turbidity and other water quality conditions in the vicinity of the dredging operations and allow real-time adjustments by the dredging operators to control temporary water quality effects. The specific measures to be implemented would be subject to approval by the Corps, RWQCB, and other regulatory agencies during the permitting process.

WQ-7 Prior to the issuance of any construction permits, the City Director of Development Services shall verify that Best Management Practices (BMPs) for all dredging activities, such as a silt curtain, have been incorporated into project plans in order to reduce impacts to water quality to the maximum extent practicable. The construction contractor shall be responsible for performing and documenting the application of the BMPs.

WQ-8 Prior to the issuance of any construction permits, the Director of Development Services shall demonstrate in the record that silt curtains for all construction activities involving excavation and grading directly adjacent to or within the Lagoon waters, have been incorporated into project plans in order to reduce impacts to water quality to the maximum extent practicable. The construction contractor shall be responsible for performing and documenting the application of BMPs, such as the silt curtain, identified in this document.

WQ-9 The Director of Health and Human Services shall continue to monitor bacteria levels in the Colorado Lagoon on a weekly basis. If water quality exceeds the water contact recreational beneficial use water quality standards, the Directors of the Health and Human Services, and Parks, Recreation and Marine Services, shall post the site and close the beach, if necessary. In addition, the Directors of the Department of Health and Parks, Recreation and Marine Services, and Development Services shall review the monitoring data on an annual basis and evaluate the water contact recreational beneficial use of the Lagoon.

4.7.7 CUMULATIVE IMPACTS

Cumulative impact analysis considers the impacts of all hydrology and water quality factors in the Lagoon watershed. Implementation of the proposed project will result in the enhancement of the Lagoon. The project would significantly improve the water quality for swimming and add additional recreation amenities while maintaining all the existing uses on site.

The planned future projects, as listed in Table 4.7.J, are generally improvements to existing developments or facilities, residential projects, or commercial development within the Lagoon watershed or the larger San Gabriel River watershed. Many of the nearby projects are outside the area that contributes to the Lagoon watershed. Only two projects contribute runoff directly to the Lagoon watershed, the TAD Project and the 4200 East Anaheim 29 Unit Condominium Project. There are no known incompatibilities between the proposed project and planned future projects that would result in adverse cumulative hydrology and water quality impacts to the Lagoon.

Table 4.7.J: Planned Future Projects

Project	Size	Description
2080 Obispo[1]	106 units (single-family homes)	Residential development project
4200 East Anaheim Street	29 units (condominiums)	Residential development project
5116 Anaheim Road[1]	64 units (attached townhomes)	Residential development project
2930 East 4th Street[1]	6,200 square feet	Commercial expansion project (Ralph's Supermarket)
Alamitos Bay Marina Rehabilitation Project[1]	N/A	Marina reconstruction project
Termino Avenue Drain	N/A	Storm drain expansion project
Home Depot, 400 Studebaker Road[1]	175,000 square feet	Commercial development

[1] Projects that are outside the Colorado Lagoon watershed and subbasins.
N/A = not applicable

As discussed throughout this section, the TAD is a major system outfall structure entering the Lagoon that is currently proposed by the County of Los Angeles to be modified to no longer discharge into the Lagoon. Instead, the drain would bypass the Lagoon and discharge storm water flows into Marine Stadium and dry weather flows into the sanitary sewer system. The TAD project would also pick up flows from three other storm drains located on the south shore of the Lagoon that currently discharge into the Lagoon. The purpose of the TAD project is to construct a storm drain that would alleviate flooding problems in the area and accommodate a 50-year storm event.

Implementation of the County TADP cumulatively affects the proposed Colorado Lagoon Restoration project because it would divert approximately 50 percent of the storm flow, and thus COC, from the Lagoon to Marine Stadium. In addition, the project diverts a large percentage of dry weather flow from the Lagoon to the sanitary sewer. The TADP EIR concluded that the TADP would not contribute to long-term cumulative impacts due its limited maintenance and operational requirements in conjunction with the Colorado Lagoon Restoration project. The hydrology model evaluated the TAD project's impacts to the entire Alamitos Bay system, and it was determined that it would not contribute to cumulative hydrology and water quality impacts outside of the 1-mile radius.

In addition to the future planned projects listed in Table 4.7.J, the RWQCB is currently conducting a TMDL study to further characterize the condition of the Lagoon and to provide effluent limitations on the discharge of pollutants of concern into the Lagoon for future development projects. The establishment of TMDLs would result in an improved quality of runoff water entering the Lagoon.

The proposed project in conjunction with TADP and TMDL study would improve storm water runoff quality and flooding conditions in the project area, thereby improving the existing water quality and hydrologic conditions in the Lagoon. Other projects in the watershed would be required to comply with water quality and waste discharge requirements to ensure that no impacts to groundwater or surface water quality would occur. No cumulative hydrology impacts would occur as a result of the proposed project. Therefore, the related projects, when considered together with the proposed project, would reduce impacts to hydrology and water quality.

Therefore, no adverse cumulative impacts related to hydrology and water quality would result from the proposed project when it is combined with other foreseeable projects that are planned or expected to occur in the Lagoon watershed or the San Gabriel watershed.

4.7.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of Mitigation Measures WQ-1 through WQ-8 would reduce potentially significant hydrology and water quality impacts that may result from the proposed project to a less than significant level. Therefore, no significant adverse impacts related to hydrology and water quality would result from the proposed project.

4.8 LAND USE

INTRODUCTION

The Colorado Lagoon (Lagoon) (proposed project site) is located in the southeastern portion of the City of Long Beach (City). The project site lies northwest of the mouth of the San Gabriel River and is north of Marine Stadium and Alamitos Bay. The project area is primarily accessible from East Appian Way and East Colorado Street via Park Avenue from East 7th Street.

The 48.61-acre (ac) project site includes the Lagoon water body, adjacent park land areas, Marina Vista Park, and a small area at Marine Stadium as shown on Figure 4.8.1. The Colorado Lagoon is an approximately 11.7 ac tidal water body[1] that is connected to Alamitos Bay and the Pacific Ocean through an underground tidal culvert to Marine Stadium. The Lagoon serves three main functions: hosting estuarine habitat, providing public recreation (including swimming), and retaining and conveying storm water drainage.

As detailed in the project description (Section 3.0), the deteriorated ecological health of the Lagoon has been established for the past several decades. The proposed project consists of various habitat, storm water drainage, and recreational improvements to the existing project area. The purpose of the proposed project is to restore the site's ecosystem, improve the estuarine habitat, provide enhanced recreation facilities, improve water and sediment quality, and manage storm water. The types and intensity of land uses on the project site will generally remain the same. However, the proposed project requires a Local Coastal Program (LCP) amendment to update information regarding the existing and proposed conditions at the Lagoon and a Zoning Code amendment to refine the code definition of passive park. This section of the Environmental Impact Report (EIR) addresses the consistency of the proposed project with existing and planned land uses and adopted plans.

4.8.1 EXISTING ENVIRONMENTAL SETTING

On-Site Land Uses

The Lagoon is an 11.7 ac water body that is located in a park setting owned and maintained as a City park by the City Department of Parks, Recreation, and Marine. On-site facilities include the Colorado Lagoon Playgroup Preschool; Colorado Lagoon Marine Science Center that is staffed by the City and the Friends of the Colorado Lagoon (FOCL); a model boat shop; two restrooms; picnic areas; parking; a pedestrian bridge; a lifeguard station; sandy shoreline areas; play equipment; and grassy open space areas.

[1] Lagoon water body acreage was estimated by LSA GIS based on a 2006 aerial photo and varies with tides.

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LEGEND

	PROJECT BOUNDARY
1	SINGLE FAMILY HOMES
2	MIXED STYLE HOMES
3A	TOWN HOMES
3B	MODERATE DENSITY RESIDENTIAL
4	HIGH DENSITY RESIDENTIAL
7	MIXED USE
8N	SHOPPING NODES
8P	PEDESTRIAN RETAIL
8R	MIX RETAIL RESIDENTIAL
10	INSTITUTIONAL
11	OPEN SPACE/PARKS

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FIGURE 4.8.1

Colorado Lagoon Restoration Project

Land Uses in the Project Vicinity

SOURCE: City of Long Beach Dept. of Planning & Building and Dept. of Technology Services

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The project area also includes Marina Vista Park, which is located to the southeast of the Lagoon on the south side of East Colorado Street. Marina Vista Park overlooks the water of Marine Stadium to the south and provides the following amenities: two soccer fields, tennis courts, a baseball diamond, play equipment, and picnic areas. Additionally, Marina Vista Park is the site of municipal band concerts in the summer.

The project area also includes a small triangle-shaped area (0.282 ac) at Marine Stadium that is a water body and park area on the south side of East Eliot Street. The Marine Stadium amenities include Mothers Beach, an activity center, boating facilities, coastal viewing, a rowing center, green open space, benches, and picnic tables. The entire project area is owned and operated by the City Department of Parks, Recreation, and Marine.

Adjacent Land Uses

The area surrounding the proposed project is composed primarily of park and recreational land, residential development, and small areas of commercial and industrial land uses, as detailed below. The project site and adjacent land uses are shown on Figure 4.8.1.

North: Recreation Park, which is a City park, is adjacent to the Lagoon on the north and includes 9-hole and 18-hole golf courses, a baseball stadium, a softball stadium, a casting pond, picnic areas, a dog park, tennis courts, a community center, lawn bowling, a bandshell, and a playground.

South: Developed neighborhoods, which are largely composed of residential land uses, are located to the south. Small areas of commercial and institutional development are located to the south of the Lagoon and to the west of Marina Vista Park. In addition, Marine Stadium, which is a recreational water body, is located to the south of the project site.

East: Developed residential land uses are located to the east of the project site.

West: Developed residential land uses are located to the west of the project site.

4.8.2 REGULATORY SETTING

State Sovereign Lands

The State of California (State) acquired ownership of all previously ungranted tidelands, submerged lands, and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space purposes. Tidelands are those lands that lie between the lines of the high tide and the mean low tide; submerged lands lie below the line of mean low water. The State Lands Commission (SLC) has the review responsibility for tidal and submerged lands legislatively granted in trust to local jurisdictions. All tidelands and submerged lands, granted or ungranted, are subject to the Common Law Public Trust, which is a sovereign public property right held by the State-delegated trustee for the benefit of all people. The tidelands at the Lagoon and Marine Stadium are held in trust by the City of Long Beach in accordance with the State Tidelands Grant.

California Coastal Act/Local Coastal Program/Coastal Development Permit

The California Coastal Act of 1976 (Coastal Act) was created to: (1) protect, maintain, and, where feasible, enhance and restore the overall quality of the Coastal Zone environment and its natural and man-made resources; (2) ensure orderly, balanced utilization and conservation of Coastal Zone resources that take into account social and economic needs; (3) maximize public access to and along the coast and public recreational opportunities in the Coastal Zone consistent with sound resource conservation principles and constitutionally protected rights of private property owners; (4) ensure priority for coastal-dependent development over other development on the coast; and (5) encourage State and local cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses in the Coastal Zone. The Coastal Act requires all cities located within the Coastal Zone to adopt a LCP. The LCP is used by cities to regulate local land uses and development in a manner that is consistent with the goals of the Coastal Act. Specifically, LCPs identify the location, type, densities, and other land use policies for future development within the Coastal Zone of a jurisdiction.

The project site is located entirely within the Coastal Zone, as shown on Figure 4.8.2, and is under the land use planning and regulatory jurisdiction of the City of Long Beach and the California Coastal Commission (CCC). The Lagoon is addressed in the certified City of Long Beach LCP. The LCP was adopted by the Long Beach City Council on February 12, 1980, and certified by the CCC on July 22, 1980. After the CCC has certified an LCP, the primary responsibility for issuing coastal development permits is transferred from the CCC to the local government. However, the CCC retains permanent coastal permit authority over areas on the immediate shoreline, including tidelands and submerged lands, such as the Lagoon and Marine Stadium. The proposed project includes an LCP amendment to update information pertaining to the existing and proposed conditions at the Lagoon. Because of the CCC's jurisdiction over the Lagoon area and the City's LCP, the CCC will have certification authority over the LCP amendment.

The Coastal Development Permit (CDP) process regulates improvements in the Coastal Zone. Projects proposed within the Coastal Zone are required to obtain a CDP prior to commencement. Because the proposed project area includes tidal and submerged lands, the CCC would issue the CDP for this project.

Southern California Association of Governments (SCAG) Regional Comprehensive Plan

SCAG's Regional Comprehensive Plan (RCP) is a regional policy document that responds to Southern California's housing, traffic, water, air quality, and other regional challenges. The plan is a collaborative effort to address the region's challenges and set a path forward. The RCP ties together SCAG's role in transportation, land use, and air quality planning and further promotes environmental policies. Second, it recommends key roles and responsibilities for the public and private sectors and requests that reasonable policies be implemented.

The RCP's objective is to balance resource conservation, economic vitality, and quality of life. The plan lays out a long-term planning framework that responds to growth and infrastructure challenges in a comprehensive way. Local governments are asked to consider the plan's recommendations in General Plan updates, municipal code amendments, design guidelines, incentive programs, and other actions.

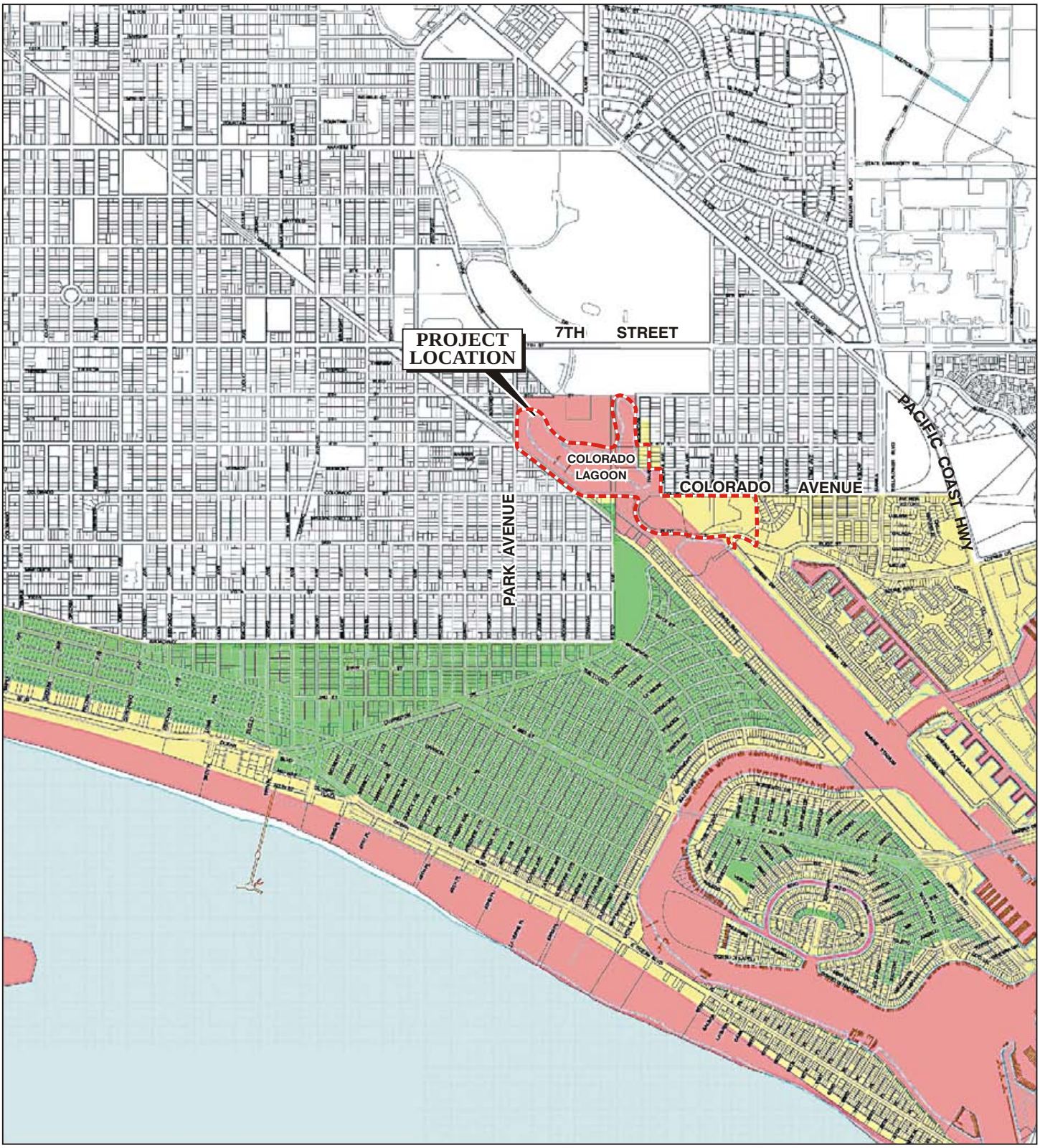

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FIGURE 4.8.2

COASTAL ZONE SUBAREAS

- PROJECT BOUNDARY
- CITY PERMIT JURISDICTION
- APPEALABLE AREA
- STATE PERMIT JURISTICTION

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SOURCE: City of Long Beach, CA.

Colorado Lagoon Restoration Project

Coastal Zone

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SCAG Compass Growth Vision

This report, completed in June 2004, presents the comprehensive Growth Vision for the six-county SCAG region. The Growth Vision is driven by four key principles:

- Mobility: Getting where we want to go
- Livability: Creating positive communities
- Prosperity: Long-term health for the region
- Sustainability: Preserving natural surroundings

City of Long Beach Citywide Strategic Plan

The City has adopted a citywide Strategic Plan, "Long Beach 2010." The Strategic Plan includes goals and actions to achieve the long-range vision of the General Plan. The Strategic Plan focuses on goals in five areas: neighborhoods, youth and education, safety, economic opportunity, and the environment. The following Strategic Plan goals, under the heading "A Healthy Environment, A Sustainable City," are applicable to the proposed project:

- Goal 1: Become a sustainable city.
- Goal 2: Enhance open space.
- Goal 3: Improve management of water resources and restore wetlands and riparian habitat.

City of Long Beach General Plan

The City of Long Beach General Plan provides goals, objectives, and policies that guide City decision-makers in directing future growth and development. The General Plan must contain at least seven elements: Land Use, Transportation, Housing, Conservation, Noise, Open Space and Recreation, and Safety. The City's Seismic Safety and Air Quality elements are optional components of the General Plan. Each element discusses in detail official policies and programs the City has adopted regarding each topic.

Table 4.8.A: City of Long Beach General Plan Elements

City of Long Beach General Plan Element	Year of Adoption
Open Space and Recreation	2002
Housing	2001
Air Quality	1996
Transportation	1991
Land Use	1989
Seismic Safety	1988
Local Coastal Program (LCP)	1980
Noise	1975
Public Safety	1975
Conservation	1973

Land Use Element. The Land Use Element of the General Plan was adopted in 1989 and was revised in April 1997. The Land Use Element regulates the types of use and land use intensity within the City of Long Beach. Figure 4.8.1 illustrates the General Plan land use designations for the project site and adjacent areas. The General Plan land use designation for the project site is "Open Space and Parks" Land Use District (LUD) No. 11 by the Land Use Element of the General Plan. The Open Space and Park District is intended to provide for "preserving natural habitat areas, and promoting the mental and physical health of the community through recreational, cultural, and relaxation pursuits. Parks are characterized by open spaces devoted to leisure activities including the enjoyment of nature, wildlife, cultural heritage, sports, and similar activities."

The Land Use Element includes various Neighborhood Plans for different areas of Long Beach. The project area is included in the Alamitos Heights neighborhood. As stated in the Land Use Element, "Alamitos Heights has very distinctive neighborhood boundaries. The park areas of Marine Stadium and Recreation Park together with Colorado Lagoon form the western edge." This neighborhood is predominantly developed with residential uses. Alamitos Heights has ample recreation opportunities due to the location of Recreation Park, Colorado Lagoon, and Marine Stadium. The Land Use Element states that "These amenities have increased the overall value of the neighborhood and their continued successful operation should be supported."

Open Space and Recreation Element. The Long Beach City Council adopted the most recent Open Space and Recreation Element of the General Plan on October 15, 2002. The project site is currently designated as a "Special Use Park" because of the Lagoon's swimming amenity. There are several Goals/Objectives, Policies, and Programs in the Element that are applicable to the proposed project, as listed below:

- Develop well-managed, viable ecosystems that support the preservation and enhancement of natural and wildlife habitats. (Goals/Objectives 1.1)
- Preserve, keep clean and upgrade beaches, bluffs, water bodies and natural habitats. (Goals/Objectives 1.2)
- Design and manage natural habitats to achieve environmental sustainability. (Goals/Objectives 1.4)
- Promote the creation of new and reestablished natural habitats and ecological preserves including wetlands, woodlands, native plant communities and artificial reefs. (Policy 1.1)
- Protect and improve the community's natural resources, amenities and scenic values including nature centers, beaches, bluffs, wetlands, and water bodies. (Policy 1.2)
- Promote and assist with the remediation of contaminated sites. (Policy 1.4)
- Restore Colorado Lagoon to serve as both a productive wetland habitat and recreational resource by reducing pollutant discharges into the water, increasing water circulation with Alamitos Bay and/or restocking or planting appropriate biological species. (Program 1.6)
- Maintain a sufficient quantity and quality of open space in Long Beach to produce and manage natural resources. (Goals/Objectives 2.1)
- Preserve, enhance and manage open areas to sustain and support marine life habitats. (Policy 2.4)

- Make all recreation resources environmentally friendly and socially and economically sustainable. (Goals/Objectives 4.5)
- Create additional recreation open space and pursue all appropriate available funding to enhance recreation opportunities. (Open Space and Recreation Element, Policy 4.1)
- Protect public parkland from intrusive, non-recreational uses. (Open Space and Recreation Element, Policy 4.2)
- Keep parklands open and green by limiting the amount of parking lot and building coverage areas within parks. (Open Space and Recreation Element, Policy 4.3)
- Give special consideration to handicapped and disadvantaged residents in accessing public recreation resources. (Open Space and Recreation Element, Policy 4.13)

City of Long Beach Parks, Recreation, and Marine Strategic Plan

The City Department of Parks, Recreation and Marine developed a Departmental Strategic Plan in February 2003. The Departmental Strategic Plan assessed recreation needs and objectives citywide. There are several strategies in the Plan that apply to the proposed project, as listed below:

- Establish lifetime use opportunities. Recreation programs and facilities will be designed to develop and serve a lifetime user through active, passive, and educational experiences. (Strategy 9, page 62)
- The Department of Parks, Recreation, and Marine should be a steward for preserving the environmental, cultural, and historical resources in Long Beach. (Strategy 11, page 63)
- Support efforts to improve the water quality and cleanliness of City beach areas. (Strategy 13, page 66)

City of Long Beach Zoning Code

Zoning is the division of a city into districts and the application of development regulations specific to each district. It is the intent of the City to have the General Plan Land Use Element and the Zoning Ordinance be consistent in order to ensure that long-term goals and objectives are implemented through land use regulations and other tools. The zoning ordinance and zoning designations of the land are primary tools implementing the City's General Plan. Figure 4.8.3 illustrates the existing zoning designations for the project site and surrounding areas. The Lagoon is zoned Park (P) and is designated as a Special Use Park in the zoning code.

The Lagoon is also considered to be as a passive park, which under the existing zoning code (Chapter 21.15.2007) is defined as the following:

> "Passive park" means a plot of land that is landscaped, maintained as open space, serves a neighborhood, and is used as an informal gathering place for relaxation and play. Passive park includes, but is not limited to, parquets, urban oases, and small space sites. Accessory buildings and or structures such as, but not limited to, play

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FIGURE 4.8.3

Colorado Lagoon Restoration Project

Zoning Designations in the Project Vicinity

SOURCE: City of Long Beach Dept. of Planning & Building and Dept. of Technology Services

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equipment, tables, fire pits, barbecues, concession stands and public restrooms are not permitted. Permitted improvements include walking paths and sitting areas with bench and chairs only."

Marina Vista Park is in the Planned Development 1 (PD-1) zoning district. PD-1 is also known as the Southeast Area Development and Improvement Plan (SEADIP) area. Within SEADIP, Marina Vista Park is located within Subarea 32. Subarea 32 is designated for use as a public park and is consistent with LUD No. 11 (park).

PD-1 (SEADIP). SEADIP was originally developed as a Specific Plan for a Planned Development District in the City of Long Beach. It was the first segment of the Long Beach Coastal Zone to be systematically planned and zoned according to policies and concerns later enunciated by the Coastal Act. Having been approved just before the commencement of work on the City's LCP, it was later incorporated as a part of the LCP for the City of Long Beach.

Implementation of the SEADIP Specific Plan occurred through the establishment of a Planned Development (PD) Ordinance. Planned Development Districts in the City of Long Beach were established to allow flexible development plans to be prepared for areas of the city that may benefit from the formal recognition of unique or special land uses and the definition of special design policies and standards not otherwise possible under conventional zoning district regulations. Purposes of the Planned Development District include permitting a compatible mix of land uses, allowing for planned commercial areas and business parks, and encouraging a variety of housing styles and densities (City of Long Beach Zoning Code, Chapter 21.37). The SEADIP Specific Plan is therefore implemented through the PD-1 zoning district.

As a zoning district, PD-1 provides for a mixed-use community of residential, business, and light industrial uses integrated by an extensive system of parks, open space, and trails. Provisions found in PD-1 are related to development standards, such as setbacks, buffers, open space requirements, and parking standards. There are no provisions or requirements in PD-1 that are specifically related to the proposed project.

4.8.3 METHODOLOGY

Land use impacts are assessed based upon the physical effects related to land use compatibility (e.g., air quality, aesthetics, and circulation) and consistency with adopted plans and regulations. Specifically, this section of the EIR addresses the potential environmental impacts related to:

- **Land Use**
  - On-site land uses
  - Adjacent land uses
- **Plans and Regulations**
  - California Coastal Act
  - City of Long Beach Local Coastal Plan

- Citywide Strategic Plan
- City of Long Beach General Plan
- City of Long Beach Parks, Recreation, and Marine Strategic Plan
- City of Long Beach Zoning Code

Evaluation of the proposed project for consistency with applicable adopted plans and regulations includes analysis of the Coastal Act, City of Long Beach Local Coastal Plan, the General Plan for the City of Long Beach, and the Zoning Code for the City of Long Beach. The Local Coastal Program of the City of Long Beach identifies the location, type, and intensity of land uses, and policies regarding open space, infrastructure, recreation, and public service needs for the Coastal Zone of the city. As previously stated, a Local Coastal Program Amendment and a Zoning Code Amendment are part of the proposed project.

4.8.4 THRESHOLDS OF SIGNIFICANCE

The proposed project may have a significant impact on the environment if any of the following occur:

- Physically divide an established community
- 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
- Substantially conflict with existing on-site or adjacent land uses
- Conflict with any applicable habitat conservation plan or natural community conservation plan

4.8.5 PROPOSED PROJECT

The Lagoon is an approximately 11.7 ac tidal water body that is connected to Alamitos Bay and the Pacific Ocean through an underground tidal culvert to Marine Stadium. The Lagoon serves three main functions: hosting estuarine habitat, providing public recreation (including swimming), and retaining and conveying storm water drainage.

The deteriorated ecological health of the Lagoon has been established for the past several decades. The purpose of the proposed project is to restore the site's ecosystem, improve the estuarine habitat, provide enhanced recreation facilities, improve water and sediment quality, and manage storm water. The proposed project consists of the following components, which would improve the water and sediment quality within the Lagoon and provide habitat and recreational improvements.

- **Improvements Benefiting Water and Sediment Quality**
  - Clean culvert and remove tidal gates, sill, and other structural impedances.
  - Build an open channel between the Lagoon and Marine Stadium.
  - Remove contaminated sediment in the western arm of the Lagoon.

- Remove sediment in the central Lagoon area.
- Upgrade the storm drains with trash separation devices, a diversion system, and bioswales.

- **Habitat Improvements**
  - Remove the north parking lot and access road.
  - Recontour the Lagoon side slopes.
  - Revegetate the Lagoon areas with various native plant species.
  - Import and plant eelgrass in the Lagoon and open channel.
  - Develop Bird Island.

- **Recreation Improvements**
  - Construct a walking trail along the Lagoon and open channel.
  - Reconfigure the baseball and youth overlay soccer fields in Marina Vista Park.

- **Operational Components**
  - Implement trash management protocols.
  - Implement bird management protocols.
  - Modify sand nourishment practices.

- **Planning Components**
  - LCP Amendment
  - Zoning Code Amendment

The existing uses on the project site are a combination of passive and active recreation uses, and the proposed project would implement improvements to the existing recreation and open space uses on the project site. No new buildings are proposed as part of the project, with the exception of replacing the two existing restroom structures that will be demolished as a result of construction of the open channel. An existing active recreation swimming beach on the north shore of the Lagoon is being removed as part of the project and replaced with passive open space habitat and a trail. The proposed open channel is an additional passive recreation feature in Marina Vista Park; however, it is within an area that is already devoted to park use. There is no change to the number or type of existing sports fields in Marina Vista Park. The proposed project would not convert any existing park use to a use other than park, and no net increase in active recreation facilities would occur.

4.8.6 IMPACTS AND MITIGATION MEASURES

Less Than Significant Impacts

The following impacts that could result from implementation of the proposed project were evaluated and considered less than significant.

Physically Divide an Established Community. The project site is presently used for park and recreation activities. The proposed project would implement water and sediment quality improvements, habitat improvements, and recreation improvements to the project area. The proposed project would not change the existing uses within or adjacent to the project site. The Lagoon and Marina Vista Park are existing neighborhood parkland/open space uses, which would continue with implementation of the proposed project. Therefore, the proposed project would not divide an established community or disrupt the existing physical arrangement of the surrounding area. Hence, impacts related to this issue would not occur.

Conflict with Existing Land Uses at Colorado Lagoon. The Lagoon portion of the project area is owned and operated by the City of Long Beach Department of Parks, Recreation, and Marine. Existing on-site facilities include the Colorado Lagoon Marine Science Center (which is staffed by the City and FOCL), restrooms, parking, a pedestrian bridge, a lifeguard station, sandy shoreline areas, play equipment, picnic areas, grassy open space areas, a preschool, and a model boat shop.

Implementation of the proposed project would provide improvements to enhance the existing uses within and adjacent to the Lagoon. None of the proposed improvements conflict with the existing recreation, open space, and natural resource uses at the Lagoon. The primary goals of the proposed project are to: (1) create habitat at the Lagoon that can successfully establish and support native plant and animal communities in the long-term, (2) implement long-term water quality control measures, and (3) enhance the Lagoon's value as a recreational resource.

As detailed in Section 4.11, Recreation, the proposed project would result in improved water quality within the Lagoon that will provide more opportunities for swimming. The project would also develop a walking trail along portions of the perimeter of the Lagoon and the eastern side of the proposed open channel that extends through areas that currently provide no public access. In addition, the project would provide habitat improvements at the Lagoon that will enhance the existing open space areas by creating upland, marsh, and intertidal habitat areas. As a part of the habitat improvements, the north parking lot (which contains 73 parking spaces) and the access road to East 6th Street would be removed to provide more space for native vegetation planting and habitat restoration. As detailed in Section 4.12, Traffic and Circulation, in addition to the north shore parking lot, parking for Lagoon use is also provided by: a parking lot on the south shore that includes 56 parking spaces; the parking lot bounded by East Colorado Street, East Appian Way, and Nieto Avenue; and on-street parking on East Colorado Street and East 6th Street. The maximum parking demand of Lagoon use is approximately 38 spaces, which can be accommodated by the parking lot on the south shore, while providing 18 surplus parking spaces. In addition, parking will remain available on East Colorado and East 6th Streets and at the Nieto Avenue parking lot. Therefore, the removal of the north parking lot would not result in a parking deficiency that would conflict with the existing recreational uses at the Lagoon.

All of the project components, as fully detailed in Section 3.0, Project Description, or Section 4.11, Recreation, are consistent with the existing park, open space, and natural resource uses at the Lagoon. As described, the proposed project would make long-term improvements to the existing land uses at the Lagoon; however, these improvements would enhance the value of the site's existing uses, and no

conflict would occur. Therefore, impacts related to land uses at the Lagoon would not occur, and no mitigation is necessary.

Conflict with Existing Land Uses within Marina Vista Park. The Marina Vista Park portion of the project area is 19.41 ac[1] and is located southeast of the Lagoon, on the south side of East Colorado Street. Marina Vista Park overlooks the water of Marine Stadium to the south and provides the following amenities: two soccer fields (one adult, one youth overlay), tennis courts, a baseball/softball field, play equipment, picnic areas, and a restroom. Additionally, Marina Vista Park is the site of municipal band concerts in the summer. Marina Vista Park is owned and operated by the City of Long Beach Department of Parks, Recreation, and Marine.

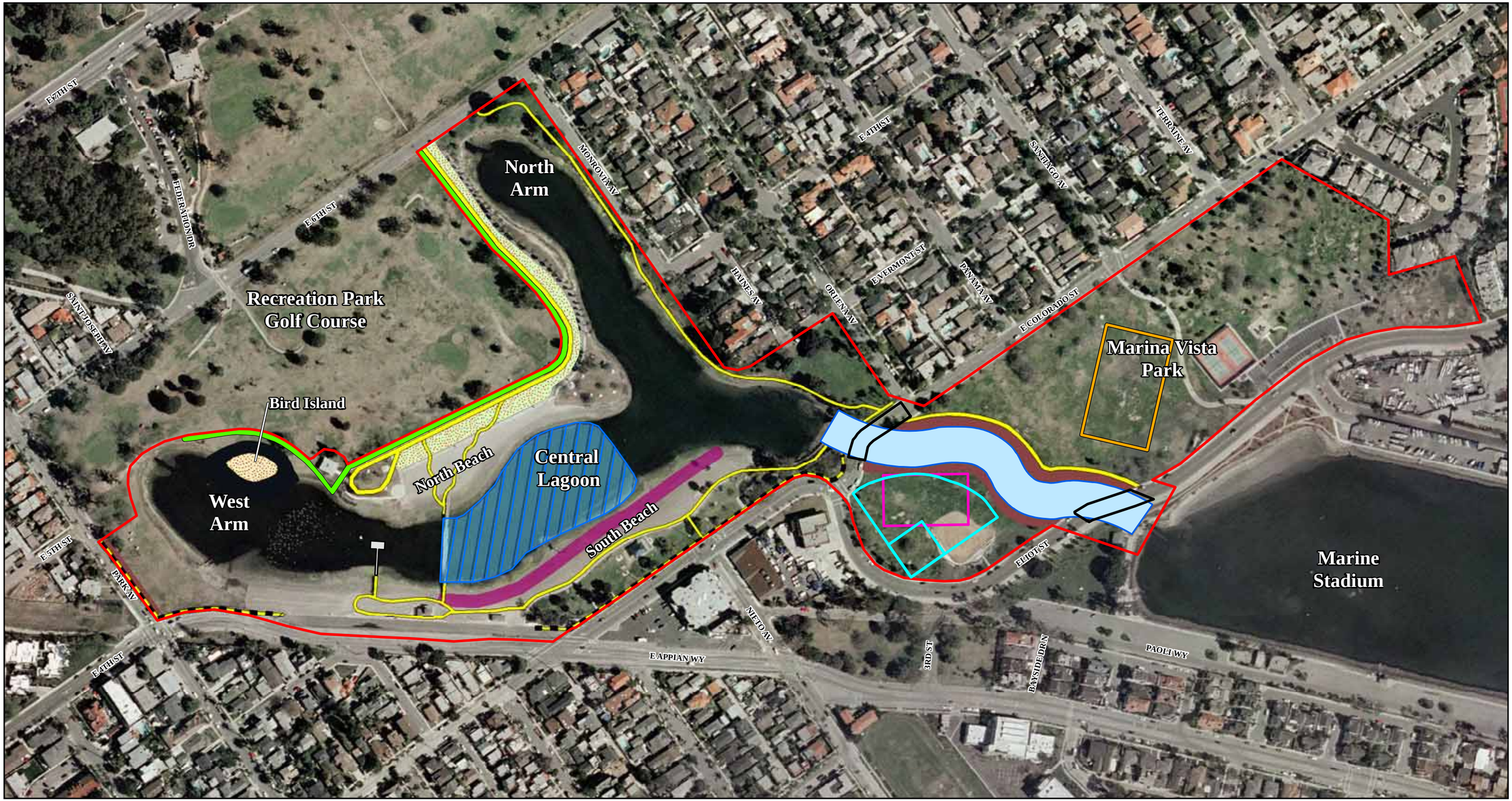
Implementation of the proposed project will result in improvements and recreational land use changes within Marina Vista Park. This includes development of an open channel with vegetated buffers and a walking trail through the park from the Lagoon to Marine Stadium. In addition, the existing baseball and youth overlay soccer fields would be leveled and reconfigured. These proposed improvements do not conflict with the existing recreation and open space uses within the park.

As described in Section 4.11, Recreation, the proposed open channel would run a meandering course from the Lagoon to Marine Stadium. The open channel would be 14 feet (ft) deep, have 3:1 side slopes, and be approximately 100 ft across at the top. The open channel would convert 2.02 ac of parkland from an active recreation use to a passive recreation use, both of which are consistent with the park, recreation, and open space land uses within Marina Vista Park. The channel design would provide an aesthetically pleasing natural looking water feature and also provide for biological enhancements such as marsh areas and eelgrass beds. The open channel and its features are consistent with the existing open space uses of the project site.

A landscaped buffer would be installed along the sides of the channel and a meandering 8 ft wide walking trail constructed of decomposed granite would be installed on the eastern side of the channel. In addition, two existing public restrooms near the Marine Stadium end of the proposed open channel (one in Marina Vista Park and one south of East Eliot Street) will be demolished and replaced with new facilities. Due to the location of the proposed open channel, the baseball field in Marina Vista Park would be moved slightly north. The new location would provide an area large enough to maintain functionality for league sports and to provide a youth soccer field overlay (as currently provided). The adult-sized soccer field will remain in its current location, as shown in Figure 4.8.4. The new field locations would continue to provide the same number of fields and functionality currently provided in the park. All of these project components are consistent with the existing recreation uses in Marina Vista Park.

As described in Section 3.0, Project Description, and 4.11, Recreation, the proposed project would make long-term land use changes within Marina Vista Park. These proposed changes are consistent with the existing park and open space land uses within Marina Vista Park, and no on-site land use conflicts would occur. Therefore, land use impacts within Marina Vista Park would be less than significant, and no mitigation is necessary.

[1] Acreage was estimated by LSA Associates, Inc. (LSA) using geographic information systems (GIS) data based on a 2006 aerial photo.



LSA

0 125 250 Feet

- Project Boundary
- Swimming Area
- Sand Nourishment Area
- Existing Sidewalk
- Proposed Bioswale
- Bird Island
- Proposed Trail (Decomposed Granite)
- Vegetated Buffer/Berm
- Proposed Bridge
- Proposed Open Channel (Top of Channel 100')
- Proposed Viewing Platform
- Baseball Field (New Location)
- Adult Soccer Field (Existing Location)
- Youth Soccer Field (New Location)
- Access Road and Parking Lot to be removed with proposed project

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

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FIGURE 4.8.4

Colorado Lagoon Restoration Project

Proposed Recreation Components

Conflict with Existing Land Uses within the Recreation Park 9-Hole Golf Course. The Recreation Park 9-hole golf course is adjacent to the west and north shores of the Lagoon. An existing fence separates the Lagoon and the golf course from 6th street along the north shore to the existing restroom. West of the restroom, there is no fence or other physical separation between the Lagoon and the golf course. Development of Bird Island, which would be located on the north shore of the western arm of the Lagoon (where no fence exists), would utilize some of the land area that is currently golf course. Additionally, the storm drain diversion system would involve the installation of an underground wet well and pump station on the golf course at the corner of East 6th Street and Park Avenue. These improvements will result in the use of a small portion of the existing golf course. The locations of Bird Island and the pump station would not conflict with or impede existing use of the golf course, specifically the long and short tees of the 7th hole. Therefore, no on-site land use conflicts would occur.

Conflict with Existing Land Uses at Marine Stadium. Marine Stadium is a water body and park area adjacent to Marina Vista Park to the south of East Eliot Street. The park amenities include Mothers Beach, an activity center, boating facilities, coastal viewing, a rowing center, green open space, benches, and picnic tables.

The project area includes a 0.28 ac triangle-shaped area that is adjacent to the north end of Marine Stadium waters, just south of East Eliot Street. This area consists of open space, nonnative trees (several palms), and a restroom building. Development of the open channel component of the proposed project (as detailed previously) would relocate the existing restroom, and this area would become a part of the open channel, which would end at the waters of Marine Stadium. Therefore, the proposed open channel component would make long-term changes within the 0.28 ac area at Marine Stadium. The construction of the open channel over a portion of the 0.28 triangle will not preclude the continued use of the remaining land area for passive and active recreation uses. These proposed changes are consistent with the existing park and open space land uses within this area of Marine Stadium, and no on-site land use conflicts would occur. Therefore, land use impacts would be less than significant, and no mitigation is necessary.

Land Use Effects/Adjacent Properties. Land use compatibility and operational conflicts are considered significant if they lead to physical impacts on persons living or working in the area. Such incompatibilities and conflicts are characterized by substantial nuisances, such as significant unmitigated increases in traffic, noise, odor, activity level, or substantial incongruity and conflict (physical and visual) with adjacent land uses.

As described previously, the proposed project consists of various water quality, habitat, and recreational improvements to the project area. The land uses and intensity of uses on the project site will generally remain the same after development of the proposed project improvements.

As described in Section 4.12, Traffic and Circulation, and previously within this section, the proposed project would remove the north parking lot, which contains 73 parking spaces. Parking would continue to be provided by: the parking lot on the south shore that has 56 parking spaces; on-street parking on East Colorado and East 6th Streets; and the parking lot bounded by East Colorado Street, East Appian Way, and Nieto Avenue. After implementation of the proposed project, the maximum

parking demand of Lagoon use would be approximately 38 spaces. The parking lot on the south shore can accommodate this demand while providing 18 surplus parking spaces. In addition, parking will remain available on East Colorado and East 6th Streets and at the Nieto Avenue parking lot. The parking locations provided along the southern shore of the Lagoon are appropriate, as a large portion of the existing recreational use of the Lagoon is on the south shore, which is also the location of the swimming area. Therefore, removal of the north parking lot will not cause a parking deficiency that would result in traffic or parking impacts to adjacent properties.

The proposed project would develop a walking trail along portions of the perimeter of the Lagoon and the eastern side of the proposed open channel that extends through areas that currently provide no public access, as shown on Figure 4.8.4. The trail would be generally 8 ft wide, except along the north shore where the access trail from East 6th Street would be 12 ft wide so as to provide emergency access along the western shore of the northern arm of the Lagoon. The trail would provide access to areas on the eastern side of the north arm, which is near the residences to the east of the Lagoon. The location of the trail is not anticipated to adversely affect these residences because: (1) the trail is not directly adjacent to the residential properties; it is centrally aligned between the Lagoon water body and the project boundary and bounded by native vegetation that would encourage pedestrians to remain on the trail; and (2) Monrovia Street provides an additional buffer between the Lagoon and many of the homes adjacent to the north arm of the Lagoon. Therefore, land use impacts of the trail on adjacent properties are considered less than significant.

The proposed project would also remove the nonnative vegetation and install native vegetation at various areas around the Lagoon. The native vegetation would consist of various different types of habitat communities including: low marsh, mid marsh, high marsh, upland, shrubs, and vegetated buffers. The proposed native vegetation planting is shown on Figure 4.8.5. These vegetated native habitats would consist of aesthetically appealing plants that would be selected and located in the appropriate elevations. The native vegetation would enhance the existing habitat at the Lagoon and is expected to increase the abundance and diversity of native birds using the Lagoon area for foraging and resting. The native landscaping will result in a change to the existing visual quality of the Lagoon area, as described in Section 4.1, Aesthetics; however, the new landscaping will be attractive, and it would not adversely affect views of users and from properties adjacent to the project area. The native landscaping is an enhancement to the existing habitat and is anticipated to provide enhanced views of the Lagoon. This off-site aesthetic benefit resulting from the proposed project is detailed in Section 4.1, Aesthetics.

The project also includes implementation of trash and bird management protocols, which are designed to keep the Lagoon area free of litter and reduce the number of nonnative birds that are attracted to the area due to being fed by humans. These project components are expected to result in enhanced cleanliness and enjoyment of the recreational opportunities that the Lagoon provides to the adjacent properties. These operational components are not anticipated to result in any adverse impacts to adjacent properties; hence, impacts are considered less than significant.

In summary, the proposed project would not result in any adverse impacts to adjacent properties. Conversely, the proposed project is anticipated to benefit the surrounding area as the recreation and open space environment of the project site would be improved and enhanced in the numerous ways detailed above. Therefore, land use impacts to adjacent properties would be less than significant and no mitigation is necessary.

LSA

0 100 200 Feet

LEGEND

- Project Boundary
- Low Marsh (Coastal Salt Marsh, Cordgrass, Unvegetated Mud Flats)
- Mid Marsh
- High Marsh/Upland
- Native Upland CSS Vegetation
- Park
- Parking/Road
- Sand
- Shrubs
- Trail (Decomposed Granite)
- Vegetated Buffer/Berm
- Proposed Bioswale
- Existing Sidewalk
- Proposed Bridge
- Proposed Open Channel (Top of Channel 100')
- Proposed Viewing Platform

SOURCE: Air Photo USA (2007), Moffat & Nichol (2007), Thomas Bros. (2007).

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FIGURE 4.8.5

Colorado Lagoon Restoration Project

Proposed Habitat Improvements

Planning Effects

California Coastal Act Consistency. As indicated previously, the certified Long Beach LCP includes the project area. However, the CCC retains jurisdiction because the project area includes tidal and submerged lands and because the project includes an LCP amendment. The appropriate standard for review is the project's consistency with the Coastal Act. The Coastal Act identifies Coastal Resources Planning and Management Policies (Chapter 3, Sections 30200 et al.) that address the following issue areas:

- Public Access
- Recreation
- Marine Environment
- Land Resources
- Development
- Industrial Development

Table 4.8.B outlines the Coastal Act policy that is applicable to the proposed project and discusses the project's consistency with each applicable policy. Several policies are not included in Table 4.8.B because they address issues that are not relevant to the proposed Colorado Lagoon Restoration project. Policies not included in the discussion are related to the following: new development projects, boating, fishing, and agricultural lands.

As detailed in Table 4.8.B, the proposed project is consistent with, or furthers the intent of, all applicable Coastal Act policies. Therefore, the proposed project would not result in an impact related to this issue, and no mitigation is required.

SCAG's Regional Policies. As detailed previously, SCAG's RCP is a regional policy document that responds to Southern California's housing, traffic, water, air quality, and other regional challenges. The RCP's objective is to balance resource conservation, economic vitality, and quality of life. In addition, the SCAG Compass Growth Vision provides policies to direct growth related to mobility, livability, prosperity, and sustainability.

These plans include various policies that are applicable to the proposed project. Table 4.8.C outlines the applicable policies and discusses the project's consistency with each applicable policy. Many SCAG policies are not included in Table 4.8.C because they address issues that are not relevant to the proposed project.

As detailed in Table 4.8.C, the proposed project is consistent with, or furthers the intent of, all applicable SCAG regional policies. Therefore, the proposed project would not result in an impact related to this issue and no mitigation is required.

Table 4.8.B: Consistency with California Coastal Act Policies

California Coastal Act Policies	Conformity with the California Coastal Act
Section 30210: Access; recreational opportunities; posting: In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs, and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.	The Colorado Lagoon (Lagoon) is both a recreation and natural resource that would be enhanced by the proposed project. The proposed project would provide additional native habitat areas and additional recreational amenities through development of a walking trail and viewing platform. The project area would not be enclosed by a fence and will be kept open to the public. Removing the north parking lot and access road would provide additional area for native upland and intertidal habitat and the walking trail, which will enhance the uses of the Lagoon. Adequate access to the Lagoon will be maintained through use of the parking lot on the south shore, the parking lot on Nieto Avenue, and parking along East Colorado Street and East 6th Street (see Section 4.12, Traffic and Circulation). Internally, access to some areas will be enhanced by the development of the walking trail along the Lagoon and open channel. Therefore, the proposed project is consistent with Coastal Act Section 30210.
Section 30211: Development not to interfere with access: Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.	The project will not interfere with the public's right of access. The project will enhance the existing habitat and recreation facilities and will provide additional access through development of a walking trail along a large portion of the Lagoon and eastern side of the proposed open channel. The recreational uses of the project area will continue to serve local and regional visitors. Therefore, the proposed project is consistent with Coastal Act Section 30211.
Section 30212.5: Public facilities; distribution: Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.	The proposed project would remove the Lagoon's north parking lot and access road to provide additional area for development and protection of native intertidal and upland habitat. A parking survey (see Section 4.12, Traffic and Circulation) supports the conclusion that the north parking lot is not needed to meet the parking demand associated with use and activity levels at the Lagoon. After removal of the access road and parking lot, access to the north shore of the Lagoon would be either via parking on East 6th Street and walking on the trail or parking on the south shore and crossing the footbridge. This design would mitigate potential human impacts to native intertidal and upland habitat areas on the north shore. Parking areas provided on the south shore and adjacent streets are distributed as appropriate, as a large portion of the existing recreational use of the Lagoon is on the south shore. In addition, parking on the south shore is beneficial because it allows restoration and protection of native habitat areas on the north shore. For these reasons, the proposed project is consistent with Coastal Act Section 30212.5.
Section 30213: Lower cost visitor and recreational facilities; encouragement and provision; overnight room rentals: Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. The commission shall not: (1) require that overnight room rentals be fixed at an amount certain for any privately owned and operated hotel, motel, or other similar visitor-serving facility located on either public or private lands; or (2) establish or approve any method for the identification of low or moderate income persons for the purpose of	Both the Lagoon area and Marina Vista Park are City-owned public parks and free to the public (with the exception of adult league sports). This would not change as a result of the proposed project. The proposed project would enhance the existing habitat and the free recreational uses within the project area. At the Lagoon, the proposed project would improve the water quality in the swimming area and provide additional recreation through development of the walking trail and enhanced native habitat. Within Marina Vista Park, the recreational uses, including use of the sports fields, will be maintained. In addition, recreation amenities will be enhanced through development of the walking trail adjacent to the proposed

Table 4.8.B: Consistency with California Coastal Act Policies

California Coastal Act Policies	Conformity with the California Coastal Act
determining eligibility for overnight room rentals in any such facilities.	open channel. Implementation of the proposed project would continue the provision of public access to low cost, in this case free, recreational facilities. There is no overnight room rentals included in the project. Therefore, the proposed project is consistent with Coastal Act Section 30213.
Section 30214: Implementation of public access policies; legislative intent: (a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following: (1) Topographic and geologic site characteristics. (2) The capacity of the site to sustain use and at what level of intensity. (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses. (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter. (b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution. (c) In carrying out the public access policies of this article, the commission and any other responsible public agency shall consider and encourage the utilization of innovative access management techniques, including, but not limited to, agreements with private organizations which would minimize management costs and encourage the use of volunteer programs.	The proposed project would remove the Lagoon's north parking lot and access road to provide additional area for development and protection of native intertidal and upland habitat. After removal of the access road and parking lot, access to the north shore of the Lagoon would be either via parking on East 6th Street and walking on the trail or parking on the south shore and crossing the footbridge. This design would mitigate potential human impacts to native intertidal and upland habitat areas on the north shore by focusing pedestrians on the walking trail to protect adjacent habitat areas. In addition, the walking trail would protect the privacy of neighboring residences, as people would tend to stay on the trail and away from residential units. Native landscaping along the proposed trails in both parks will be designed to discourage pedestrians from walking off of the trail. The proposed project also includes trash management protocols that would provide for the collection and containment of litter. All improvements are to public park lands with no use of private land. The proposed project reflects the City of Long Beach's ongoing collaboration with Friends of the Colorado Lagoon (FOCL), which is a citizen's group that was formed to promote enhancement of the environment and recreational facilities of the Lagoon and which provides educational outreach programs to the community at the Lagoon. For all of the reasons listed above, the proposed project is consistent with Coastal Act Section 30213.
Section 30220: Protection of certain water-oriented activities: Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.	The proposed project would enhance the existing habitat and water-oriented recreational uses at the Lagoon. The proposed project would improve the water, sediment, and habitat quality in the Lagoon. This will result in fewer days with the swimming area closed due to high bacteria levels and more days of swimming, thereby continuing and protecting the existing water-oriented uses.
Section 30223: Upland areas: Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.	The proposed project would develop additional habitat areas, which will be adjacent to and support coastal recreational uses such as the Lagoon waters and walking trail. Specifically, the parking lot and access road on the north shore of the Lagoon will be removed to provide for additional native upland habitat area within the existing coastal recreational land use.
Section 30230: Marine resources; maintenance: Marine resources shall be maintained, enhanced, and where feasible restored. Special protection shall be given to areas and species of special biological or economic	The proposed project would enhance the existing habitat and overall marine environment within the Lagoon. The proposed project would improve and restore the Lagoon's water, sediment, and habitat quality, thereby restoring and enhancing the existing

Table 4.8.B: Consistency with California Coastal Act Policies

California Coastal Act Policies	Conformity with the California Coastal Act
significance. Use of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.	marine resources.
Section 30231: Biological productivity; water quality: The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.	The proposed project would enhance the water quality and biological productivity of the Lagoon. The proposed project would improve and restore the Lagoon's water, sediment, and habitat quality, thereby restoring and enhancing biological productivity. Specifically, the proposed project would improve water quality by enhancing tidal flows between the Lagoon and Marine Stadium. Also, the quality of storm water that enters the Lagoon would be improved through the use of storm drain treatments, diversions to the sewer system, and the use of bioswales. The project also includes planting eelgrass beds in the Lagoon, which would increase the biological productivity and quality of the Lagoon and assist in maintaining optimum populations of marine organisms. In addition, natural vegetation buffer areas will be utilized to protect the Lagoon from blowing trash, and the addition of bioswales will treat runoff from the adjacent golf course.
Section 30232: Oil and hazardous substance spills: Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.	The proposed project includes dredging and transporting contaminated sediment from the western arm of the Lagoon. The removal of this sediment is to improve the quality of the Lagoon's environment. Appropriate National Pollutant Discharge Elimination System (NPDES) and other regulatory measures will be applied during excavation and transportation to ensure against any impacts resulting from accidental spills. Additional detail regarding this issue is provided in Section 4.6, Hazards and Hazardous Materials.
Section 30233: Diking, filling or dredging; continued movement of sediment and nutrients: The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects.	The proposed project includes dredging and recontouring activities within the Lagoon water body. These activities are being planned to enhance and restore the Lagoon's natural marine and intertidal environments. These activities would result in increased water, sediment, and habitat quality. In addition, these activities will be conducted in accordance with mitigation measures (as detailed in Section 4.3, Biological Resources, and Section 4.6, Hazards and Hazardous Materials) to minimize adverse environmental effects.
Section 30235: Construction altering natural shoreline: Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.	The existing Lagoon shoreline was developed through extensive dredging. Therefore, naturally created shoreline areas do not exist within the project site. The proposed project includes development of Bird Island and recontouring areas of the Lagoon's shoreline, which will protect the shoreline from erosion and develop additional areas for intertidal habitat. The proposed project would also dredge the Lagoon floor, develop an open channel, and upgrade storm drains. These improvements would enhance the existing habitat and improve tidal flows between the Lagoon and Marine Stadium. The recontouring of the Lagoon shorelines will be designed to ensure that the increased tidal flows resulting from the project would not cause substantial erosion or otherwise alter the natural shoreline

Table 4.8.B: Consistency with California Coastal Act Policies

California Coastal Act Policies	Conformity with the California Coastal Act
	processes. Therefore, the proposed project is consistent with Coastal Act Section 30235.
Section 30236: Water supply and flood control: Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (l) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.	The proposed project includes: upgrading the existing tidal culvert; developing an open tidal channel; upgrading the existing storm drains that discharge into the Lagoon; and dredging the Lagoon floor, which would add volume to the water body. The project does not involve alteration of a river or stream. This project would provide flood control protection through enhanced flood and tidal flow facilities. Also, the project objective is to improve the natural environment of the Lagoon, which supports various fish and wildlife species. As detailed throughout this Environmental Impact Report (EIR), mitigation measures are incorporated into the proposed project, as appropriate, to avoid or reduce adverse environmental impacts. Therefore, the proposed project is consistent with Coastal Act Section 30236.
Section 30240: Environmentally sensitive habitat areas; adjacent developments: (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.	The objective of the proposed project is to restore, enhance, and protect the environment of the Lagoon water body and adjacent land areas. The proposed improvements are designed to improve the site's existing habitat and water quality and provide enhanced continuance of recreation uses within the project site. The proposed project is furthering the objective of Coastal Act Section 30240.
Section 30244: Archaeological or paleontological resources: Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.	As detailed in Section 4.4, Cultural and Paleontological Resources, the project area has been extensively dredged and filled. The proposed project is not anticipated to adversely impact archaeological and paleontological resources as identified by the State Historic Preservation Officer. However, reasonable mitigation measures have been included to ensure that potential impacts remain less than significant. Therefore, the proposed project is consistent with Coastal Act Section 30244.
Section 30251: Scenic and Visual Qualities: The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.	Through the water quality, habitat, and recreational improvements, the proposed project would result in enhanced views of various native habitats from both on site (from the walking trail, viewing platform, and across the Lagoon water) and off site (residences and adjacent streets). In addition, the proposed walking trail and viewing platform provide enhanced access and noninvasive opportunities to enjoy the various areas of the Lagoon, including marsh areas, sand areas, upland areas, and Bird Island.

Table 4.8.C: Consistency with SCAG Regional Policies

Policy Number	Policy Text	Consistency with RCP Policies
RCP Growth Management Chapter		
3.01	The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and polices, shall be used by SCAG in all phases of implementation and review.	The proposed project would implement water and sediment quality improvements, habitat improvements, and recreation improvements to the project site. The project would not change the existing uses on site, would not develop residential uses, and would not create new jobs. Also, the project does not involve infrastructure improvements that could induce population growth. Therefore, the proposed project does not conflict with adopted forecasts or this SCAG policy.
3.20	Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.	The objective of the proposed project is to protect and enhance the habitat resources, including the wetlands, on the project site. Specifically, the proposed project would improve and restore Colorado Lagoon (Lagoon) water, sediment, and habitat quality. Water quality would be improved by enhancing tidal flows between the Lagoon and Marine Stadium. The quality of storm water that enters the Lagoon would be improved through the use of storm drain treatments, diversions to the sewer system, and the use of bioswales. The project also includes planting eelgrass beds in the Lagoon, which would increase the biological productivity and quality of the Lagoon and assist in maintaining optimum populations of marine organisms. In addition, natural vegetation buffer areas will be utilized to protect the Lagoon from blowing trash and runoff from the adjacent golf course. Therefore, the proposed project would support the protection of vital resources on the project site and is furthering the objective of this policy.
3.21	Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.	As detailed in Section 4.4, Cultural Resources, the proposed project involves areas that have been extensively dredged and filled. The proposed project is not anticipated to adversely impact archaeological and paleontological resources. However, reasonable mitigation measures have been included to ensure the protection of unrecorded cultural resources and archaeological sites. Therefore, the proposed project is consistent with Policy 3.21.
3.23	Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.	The proposed project includes mitigation measures to reduce all adverse impacts to the extent feasible. Within this EIR, Section 4.9 includes construction noise mitigation measures; Section 4.3 includes construction mitigation measures to reduce biological impacts; and Section 4.5 includes mitigation measures to reduce exposure to seismic hazards and reduce earthquake damage. Therefore, the proposed project is consistent with Policy 3.23.
RCP Air Quality Chapter		
5.11	Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional, and local) consider air quality, land use, transportation, and economic relationships to ensure consistency and minimize conflicts.	The proposed project is consistent with Policy 5.11. The proposed project does not change the existing uses on the project site. The purpose of the project is to enhance the existing water, sediment, habitat and recreational qualities of the project area. Therefore, as the site uses would not change, the project would not create an inconsistency between air quality, land use, transportation, and economic relationships. This EIR details the project's potential effects on these topics, and mitigation measures are included as necessary to reduce any adverse effects. Sections applicable to this policy include: Section 4.8, Land Use; Section 4.2, Air Quality; and Section 4.12, Traffic and Circulation.

Table 4.8.C: Consistency with SCAG Regional Policies

Policy Number	Policy Text	Consistency with RCP Policies
RCP Open Space and Conservation Chapter		
9.1	Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region	The project area is an existing outdoor recreation area. The proposed project would enhance the natural resources and existing recreational uses on site. At the Lagoon, the proposed project would improve the water quality in the swimming areas and provide additional recreation through development of the walking trail and enhanced native habitat. Within Marina Vista Park, the recreational uses, including use of the sports fields, will be maintained. In addition, recreation amenities will be enhanced through development of the walking trail adjacent to the proposed open channel. Therefore, the proposed project is consistent with Policy 9.1.
9.2	Increase the accessibility to open space lands for outdoor recreation	The proposed project would maintain the existing accessibility to the project site's open space lands that are used for outdoor recreation. The project area would not be enclosed by a fence and will be kept open to the public. Adequate access to the Lagoon will be maintained through use of the parking lot on the south shore and parking along East 6th Street on the north shore. Also, the project will provide additional access through development of a walking trail along a large portion of the Lagoon and eastern side of the proposed open channel. The open space recreational uses of the project area will continue to serve local and regional visitors; therefore, the proposed project is consistent with Policy 9.2.
9.3	Promote self-sustaining regional recreation resources and facilities	The objective of the proposed project is to improve the existing project site, which provides recreation resources. The project would enhance the existing native self-sustaining recreation resources. At the Lagoon, the proposed project would improve the water quality in the swimming areas and provide additional recreation through development of the walking trail and enhanced native habitat. Within Marina Vista Park, the recreational uses, including use of the sports fields, will be maintained. In addition, recreation amenities will be enhanced through development of the walking trail adjacent to the proposed open channel. Therefore, the proposed project is consistent with Policy 9.3.
9.4	Maintain open space for adequate protection to lives and properties against natural and manmade hazards	The proposed project is consistent with Policy 9.4 because the project would maintain the site's existing open space. To reduce any project-related risk related to natural and man-made hazards, appropriate mitigation measures have been included. Potential risks and mitigation measures are detailed in Section 4.5, Geology and Soils, and Section 4.6, Hazards and Hazardous Materials.
9.8	Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.	The objective of the proposed project is to protect and enhance habitat resources, including the wetlands, on the project site. Specifically, the proposed project would improve and restore the Lagoon's water, sediment, and habitat quality. Water quality would be improved by enhancing tidal flows between the Lagoon and Marine Stadium. The quality of storm water that enters the Lagoon would be improved through the use of storm drain treatments, diversions to the sewer system, and the use of bioswales. The project also includes planting eelgrass beds in the Lagoon, which would increase the biological productivity and quality of the Lagoon and assist in maintaining optimum populations of marine organisms. In addition, various native land-based habitats at different tidal elevations will be developed within the project area, and natural vegetation buffer areas will be utilized to protect the resources from blowing trash and runoff from the adjacent golf course. Therefore, the proposed project is furthering the objective of this policy.

Table 4.8.C: Consistency with SCAG Regional Policies

Policy Number	Policy Text	Consistency with RCP Policies
RCP Water Quality Chapter		
11.05	Support regional efforts to identify and cooperatively plan for wetlands to facilitate both sustaining the amount and quality of wetlands in the region and expediting the process for obtaining wetlands permits.	The City of Long Beach and the Los Angeles RWQCB are working cooperatively on the proposed project, which has the objectives of improving the quality of the existing wetlands within the project area. As detailed previously, the proposed project would improve and restore the Lagoon's water, sediment, and habitat quality. Water quality would be improved by enhancing tidal flows between the Lagoon and Marine Stadium. The quality of storm water that enters the Lagoon would be improved through the use of storm drain treatments, diversions to the sewer system, and the use of bioswales. In addition, various native intertidal habitats will be developed within the project area and natural vegetation buffer areas will be utilized to protect the wetlands from blowing trash and runoff from the adjacent golf course. Therefore, the proposed project is furthering the objective of this policy.
11.07	Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.	The proposed project area is currently using reclaimed water for irrigation purposes. After implementation of the proposed project, the area would continue to utilize reclaimed water to irrigate the newly developed native vegetation. Therefore, the proposed project would be consistent with Policy 11.07.
Compass Growth Visioning Principals		
GV P4.1	Preserve rural, agricultural, recreational, and environ-mentally sensitive areas	As detailed previously, the objectives of the proposed project are to preserve and enhance the existing recreational and environmentally sensitive areas within the project area. The proposed project would enhance recreation by increasing water quality in the swimming area and providing additional walking trails, native vegetation, and a viewing platform. Also, the project would level and reconfigure the existing sports fields within Marina Vista Park. Water quality would be improved by enhancing tidal flows between the Lagoon and Marine Stadium. The quality of storm water that enters the Lagoon would be improved through the use of storm drain treatments, diversions to the sewer system, and the use of bioswales. The project also includes planting eelgrass beds in the Lagoon, which would increase the biological productivity and quality of the Lagoon and assist in maintaining optimum populations of marine organisms. In addition, various native land-based habitats at different tidal elevations will be developed within the project area, and natural vegetation buffer areas will be utilized to protect the resources from blowing trash and runoff from the adjacent golf course. Therefore, the proposed project is furthering the objective of this policy.

RCP = Regional Comprehensive Plan
RWQCB = Regional Water Quality Control Board
SCAG = Southern California Association of Governments

Local Coastal Program. As stated previously, the proposed project includes an LCP amendment to update the existing and proposed conditions at the Lagoon. The existing LCP text was adopted by the City and certified by the CCC in 1980. Since that time, water quality and habitat conditions at the Lagoon have not improved, and the City has developed an extensive program to restore the habitat and water quality and enhance recreation uses at the Lagoon. The proposed LCP amendment (included as Appendix B) provides an update to the existing text to ensure it accurately describes the existing conditions at the Lagoon and appropriate improvements. The LCP amendment does not change the uses of the Lagoon, create an inconsistency with the Coastal Act or other City General Plan Elements, or change the LCP's objectives for the Lagoon, which is to provide natural native self-sustaining habitat and coastal recreational opportunities.

Therefore, the proposed LCP amendment component of the proposed project does not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, no impacts would result, and no mitigation is necessary.

Citywide Strategic Plan. The citywide Strategic Plan, "Long Beach 2010," includes several goals that are applicable to the proposed project. These include becoming a sustainable city, enhancing open space, and improving management of water resources and restoration of wetland and riparian habitat. The proposed project is consistent with and furthers these goals. For example, consistent objectives of the proposed project include:

- Treating storm and dry weather runoff to minimize contamination of water and sediment in the Lagoon.
- Improving water quality by increasing the Lagoon's circulation and enhancing the tidal connection with Marine Stadium.
- Improving sediment and habitat quality by removing contaminated sediments within the Lagoon.
- Restoring and maintaining the estuarine habitat of the Lagoon.
- Balancing flood control, water quality, and the recreation demands of the Lagoon.
- Improving and enhancing the existing recreation open space.
- Development of sustainable native habitats.

Under the Strategic Plan heading "A Healthy Environment/A Sustainable City," Goal 3 states, "Improve management of water resources and restore wetlands and riparian habitat." This goal recognizes that open space dedicated to wildlife, especially wetlands, provides a break from urban living. The proposed project furthers this objective through restoration of the Lagoon wetlands and various intertidal and upland habitats.

In addition, this Goal's Action Steps include: (1) "Develop collaboration between the City, the Aquarium of the Pacific, environmental groups, agencies, and upstream cities to eliminate pollution at its source, restore wetlands, and coordinate recreational opportunities along the rivers;" and (2) "As sources of pollution are eliminated, start phased cleanup of contaminated sediments." The proposed project is consistent with and implements these Action Steps, as the City has been collaborating with FOCL and the Los Angeles Regional Water Quality Control Board (RWQCB) to reduce storm water

pollutants from entering the Lagoon, improve the water quality and wetland habitat at the Lagoon, remove contaminated sediments, and to provide enhanced recreation on the project site.

Therefore, the proposed project is consistent with and furthers several specific objectives of the citywide Strategic Plan. Hence, no impacts related to conflicts with the citywide Strategic Plan would occur and no mitigation is necessary.

General Plan Land Use Element. The General Plan land use designation for the project site is "Open Space and Parks" LUD No. 11 by the Land Use Element of the General Plan. The Open Space and Park District is intended to provide for "preserving natural habitat areas, and promoting the mental and physical health of the community through recreational, cultural, and relaxation pursuits. Parks are characterized by open spaces devoted to leisure activities including the enjoyment of nature, wildlife, cultural heritage, sports, and similar activities."

The project area is addressed in the Alamitos Heights neighborhood of the Land Use Element, which is predominantly developed with residential uses. Alamitos Heights has ample recreation opportunities, including Recreation Park, Colorado Lagoon, and Marine Stadium. The Land Use Element states that "These amenities have increased the overall value of the neighborhood and their continued successful operation should be supported."

The proposed project would continue and enhance the existing park and recreation uses on the project site and is consistent with the existing land use designation. In addition, the proposed project is consistent with the desired character of the Alamitos Heights neighborhood and would further the intent of the neighborhood objective of supporting the existing recreation land uses. The proposed project would result in: improved water quality in the swimming areas; improved native habitat surrounding the Lagoon; additional walking trails; and improved and reconfigured sports fields. All of these components would increase the overall value of the project site as a recreation, habitat, and open space resource that is consistent with the area's designations within the General Plan Land Use Element.

General Plan Open Space and Recreation Element. The City's Open Space and Recreation Element defines Marina Vista Park as a Neighborhood Park and the Lagoon as a Special Use Park because of the Lagoon's swimming amenity. As listed previously in Section 4.8.2, there are several objectives and policies in the Open Space and Recreation Element that are specific to the Lagoon and/or related to the proposed project. The proposed project is consistent with the Element's objectives and policies for the project area because the project would continue and enhance the existing recreation and open space uses within the project site.

The policies in the Open Space and Recreation Element are divided into four categories. The proposed project is consistent with and/or furthers the intent of the policies in all four categories as described below:

- **Open Space for the Preservation of Natural Resources.** The Element states that the areas of Long Beach that retain natural resources are quite limited and that 90 to 95 percent of the region's wetlands have been lost to development. Wetlands serve as a critical wildlife habitat, marine life

nursery, and stopping/feeding grounds for migratory birds. The overall policy objective for this policy category is to preserve land areas of natural resources. The proposed project is consistent with the policies within this portion of the Element because the project would retain the existing open space within the project area and the objectives include restoration and enhancement of the existing natural resources, including the wetlands, within the project area.

- **Open Space for the Managed Protection of Resources.** The objectives of the proposed project include development of native sustainable habitats within the project area. The project provides for the enhancement of natural resources to support a variety of habitats, including marine, intertidal, and upland habitats. The proposed project would also provide long-term solutions to increase the water quality within the Lagoon. These project components and the retention of the open space on the project site would provide for the managed protection of resources. Therefore, the proposed project is consistent with this category of policies within the Open Space and Recreation Element.
- **Open Space for Public Health and Safety.** The proposed project is consistent with the policy of maintaining open space buffers to protect property and life from natural disasters such as earthquakes. The proposed project is not in an area identified as being of particular significant risk for earthquakes; however, the area would be maintained as open space and would continue to provide recreational opportunities that the community desires. Therefore, the proposed project is consistent with this category of policies within the Open Space and Recreation Element.
- **Open Space for Outdoor Recreation and Recreation Facilities.** The proposed project would enhance the recreation opportunities on the project site, make the project site (which is a recreation area) environmentally friendly and sustainable, and protect the existing recreation resource. The proposed project furthers the intent of the Outdoor Recreation policies by providing additional recreational opportunities (i.e., development of the walking trail at the Lagoon and Marina Vista Park) and enhancing the existing recreational activities (i.e., improving water quality for swimming, increasing the area of native vegetation, and reconfiguring and leveling the sports fields within Marina Vista Park). In addition, the project utilizes a funding combination of City resources and grant funds (Policy 4.1), the recreation facilities within the project area will continue to be free. and all proposed improvements will be in compliance with the Americans with Disabilities Act (ADA) (Policy 4.13). Therefore, the proposed project is consistent with and furthers the intent of this category of policies within the Open Space and Recreation Element.

As detailed above, the proposed project does not conflict with the City's Open Space and Recreation Element. Hence, no adverse impacts would result, and mitigation measures are not necessary.

City of Long Beach Parks, Recreation, and Marine Strategic Plan. The City Department of Parks, Recreation, and Marine developed a Departmental Strategic Plan in February 2003. The Departmental Strategic Plan assessed recreation needs and objectives citywide and identified strategies to provide recreation opportunities and improve water quality and City beach areas. Specific strategies that are applicable to the proposed project are listed in Subsection 4.8.1. The proposed project is consistent with and furthers the intent of the Departmental Strategic Plan. Specifically, the proposed project would provide active, passive, and educational recreational opportunities that are consistent with Strategy 9. Also, the proposed project would improve the water quality and beach areas at the Lagoon, which is consistent with Strategy 13. Therefore, the proposed project would not conflict with the Departmental Strategic Plan, and no adverse impacts related to this topic would occur.

City of Long Beach Zoning Code. The Lagoon is zoned Park (P) and is designated in the zoning code as a Special Use Park. Marina Vista Park is located within Subarea 32 of PD-1 (SEADIP), which is designated for park uses. Figure 4.8.2 illustrates the existing zoning designations for the project site and surrounding areas.

SEADIP was adopted by the Long Beach City Council in 1977 as a specific plan and an amendment to the then-current General Plan. It was later incorporated into the LCP for the City of Long Beach. As a PD zoning district, SEADIP provides development standards for property in the 1,470 ac planning area. As previously stated, the overall intent of the PD-1 (SEADIP) zoning district is to provide a community of residential, business, and light industrial uses integrated with a system of parks, open space, and trails.

The project is consistent with the designated park use of Subarea 32 of PD-1. The proposed project would continue and enhance the existing park and recreation uses on the project site. The proposed project would result in the addition of a walking trail along the eastern side of the open channel and improved and reconfigured sports fields within Marina Vista Park, which are uses consistent with the park designation. The improvements to the existing open space habitat and integration of additional park amenities demonstrate that the project serves to further the intent of SEADIP.

The proposed project includes a zoning code amendment to refine the code definition of passive park. The Lagoon is considered a passive park, which under the existing zoning code (Chapter 21.15.2007) is defined as the following:

> "Passive park" means a plot of land that is landscaped, maintained as open space, serves a neighborhood, and is used as an informal gathering place for relaxation and play. Passive park includes, but is not limited to, parquets, urban oases, and small space sites. Accessory buildings and or structures such as, but not limited to, play equipment, tables, fire pits, barbecues, concession stands and public restrooms are not permitted. Permitted improvements include walking paths and sitting areas with bench and chairs only."

The zoning code amendment would refine the definition of passive park to more accurately describe the Long Beach areas, including water bodies such as the Lagoon, that are designated as passive park. The proposed zoning amendment is as follows:

> "Passive Park" means a plot of land that is landscaped, maintained as open space, serves a neighborhood, and is used as an informal gathering place for relaxation and play. Passive Park includes, but is not limited to, parquets, urban oases, and small space sites. ~~Accessory buildings and or structures such as, but not limited to, play equipment, tables, fire pits, barbecues, concession stands and public restrooms are not permitted.~~ Permitted improvements and features include, but are not limited to, walking paths, ~~and~~ sitting areas, ~~with bench and chairs only~~, play equipment, tables, fire pits, barbecues, public restrooms, landscaped and natural open spaces, habitat reserves, beaches, lakes, streams, lagoons, bays, and Marine Stadium.

The existing P zoning of the project area is consistent with the recreational uses on site. The proposed project would not change uses within or adjacent to the project area. Therefore, no impacts related to zoning consistency would occur with implementation of the proposed project. In addition, the zoning code amendment would result in a more clear definition of the amenities and features that are allowable within areas defined as passive park. The zoning code amendment would not result in a conflict related to any code that was adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, impacts related to this topic would not occur.

Conflict with Any Applicable Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP). There are no adopted HCPs or NCCPs applicable to the project site. Therefore, the proposed project would not result in effects to an adopted HCP or NCCP.

Potentially Significant Impacts

No potentially significant impacts related to land use would result from the proposed project have been identified.

4.8.7 CUMULATIVE IMPACTS

As defined in Section 15130 of the State CEQA Guidelines, cumulative impacts are the incremental effects of an individual project when viewed in connection with the effects of past, current, and probable future projects within the cumulative impact area for land use. Long Beach is a heavily urbanized area with a wide variety of established land uses. The land use patterns around the project site have been established with park, open space, residential, and small areas of commercial and industrial development.

The proposed project would not change the existing uses on the project site or result in off-site land use changes. Likewise, the project is consistent with all applicable plans and policies related to land uses and the quality of uses on site. The proposed project would involve an LCP amendment, which would update the existing LCP text to more accurately describe the conditions at the Lagoon and various improvement objectives for the resource. The project would also involve a Zoning Code Amendment that would result in more clearly defined allowable amenities and features within areas defined as passive park.

The proposed project would not have a significant cumulative impact on land use. The proposed project would result in an enhancement of the existing features and uses within the project area, which are consistent with the surrounding area. The planned future land use projects, as listed in Table 4.8.D and shown on Figure 4.8.6, are generally improvements to existing facilities, infill residential projects, or new commercial development. There are no incompatibilities between the proposed project and planned future land use projects. Therefore, the contribution of the proposed project to potential cumulative land use compatibility impacts in the project area is considered less than significant.

Table 4.8.D: Planned Future Projects

Project	Size	Description
2080 Obispo Avenue	106 units (single-family homes)	Residential development project
4200 East Anaheim Street	29 units (condominiums)	Residential development project
5116 Anaheim Road	64 units (attached townhomes)	Residential development project
2930 East 4th Street	6,200 square feet	Commercial expansion project (Ralph's Supermarket)
Alamitos Bay Marina Rehabilitation Project	N/A	Marina reconstruction project
Termino Avenue Drain	N/A	Storm drain expansion project
Home Depot, 400 Studebaker Road	175,000 square feet	Commercial development

N/A = not applicable

LSA

0 750 1,500 Feet

Project Boundary

Planned Future Projects

Termino Avenue Storm Drain Alignment

Alamitos Bay Marina Rehabilitation Project

1 - 2080 Obispo Avenue
2 - 4200 E. Anaheim Street
3 - 5116 Anaheim Road
4 - 2930 E. 4th Street
5 - Home Depot - 400 Studebaker Road

SOURCE: Air Photo USA (2007).

FIGURE 4.8.6

Colorado Lagoon Restoration Project
Planned Future Projects

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