G. HYDROLOGY AND WATER QUALITY

1. INTRODUCTION

This section addresses surface hydrology and water quality, as well as groundwater resources in the project area. The analysis presented in this section is based on information contained in a *Hydrology and Water Quality Technical Report* prepared for the proposed project by Fuscoe Engineering, Inc. (Fuscoe) in October 2010, and information provided by various public agencies, including the Federal Emergency Management Agency (FEMA), California Department of Water Resources (DWR), Los Angeles Regional Water Quality Control Board (RWQCB), California Geological Survey (CGS), County of Los Angeles, and City of Long Beach. The *Hydrology and Water Quality Technical Report* is included as Appendix G of this Draft EIR.

2. ENVIRONMENTAL SETTING

a. Regulatory Framework

The following discussions present the regulatory and permitting processes that have been established to control flooding and the quality of water runoff from urban construction sites, and summarize the applicable federal, state, regional, local, and other hydrology/drainage and water quality regulatory requirements.

(1) Hydrology and Drainage

(a) National Flood Insurance Program

The National Flood Insurance Act of 1968 established the National Flood Insurance Program, which is based on the minimal requirements for floodplain management in the Code of Federal Regulations 44, Sections 59-77, and is designed to minimize flood damage within Special Flood Hazard Areas (SFHAs). The Federal Emergency Management Agency (FEMA) is the agency that administrates the National Flood Insurance Program. SFHAs are defined as areas that have a one-percent (1%) chance of flooding within a given year, also referred to as the 100-year flood. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community.

The National Flood Insurance Program applies to the entire United States, and therefore the project site is subject to FEMA requirements.

(b) City of Long Beach

The City of Long Beach refers to the Los Angeles County Department of Public Works (LACDPW) Hydrology and Hydraulic Design Manuals for storm drain planning and design calculations. The LACDPW requires that a storm drain conveyance system is designed for a 25-year storm event and that the combined capacity of the storm drain and street flow is able to convey a 50-year storm event. In areas with a sump condition, the conveyance system shall be designed for a 50-year storm event. All drainage improvements in the project vicinity are subject to review and approval by the City of Long Beach Public Works Department.

The proposed project would utilize on- and off-site storm drainage facilities that are subject to LACDPW requirements, the design of which would be subject to review and approval by the City of Long Beach Public Works Department.

(2) Water Quality

(a) Clean Water Act

Controlling pollution of the nation's receiving water bodies has been a major environmental concern for more than three decades. Growing public awareness of the impacts of water pollution in the United States culminated in the establishment of the federal Clean Water Act (CWA) in 1972, which provided the regulatory framework for surface water quality protection.

The United States Congress amended the CWA in 1987 to specifically regulate discharges to waters of the US from public storm drain systems and storm water flows from industrial facilities, including construction sites, and require such discharges be regulated through permits under the National Pollutant Discharge Elimination System (NPDES). Rather than setting numeric effluent limitations for storm water and urban runoff, CWA regulation calls for the implementation of Best Management Practices (BMPs) to reduce or prevent the discharge of pollutants from these activities to the Maximum Extent Practicable (MEP) for urban runoff and meeting the Best Available Technology Economically achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) standards for construction storm water.

Regulations and permits have been implemented at the federal, state, and local level to form a comprehensive regulatory framework to serve and protect the quality of the nation's surface water resources.

In addition to reducing pollution with the regulations described above, the CWA also seeks to maintain the integrity of clean waters of the United States – in other words, to keep clean waters clean and to prevent undue degradation of others. As part of the CWA, the Federal Anti-degradation Policy [40 CFR Section 131.12] states that each state "shall develop and adopt a statewide anti-degradation policy and identify the methods for implementing such policy…" [40 CFR Section 131.12(a)]. Three levels of protection are defined by the federal regulations:

1. Existing uses must be protected in all of the Nation's receiving waters, prohibiting any degradation that would compromise those existing uses;

2. Where existing uses are better than those needed to support propagation of aquatic wildlife and water recreation, those uses shall be maintained, unless the state finds that degradation is "…necessary to accommodate important economic or social development" [40 CFR Section 131.12(a)(2)]. Degradation, however, is not allowed to fall below the existing use of the receiving water; and

3. States must prohibit the degradation of Outstanding National Resource Waters, such as waters of National and State parks, wildlife refuges, and waters of exceptional recreation or ecological significance.

The proposed project would contribute stormwater to downstream receiving water bodies, and therefore the proposed development would be subject to the requirements of the CWA.

(b) Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969, California Water Code § 13000 et seq., established the principal State program for water quality control and authorizes the State Water Resources Control Board (SWRCB) to implement the provisions of the federal Clean Water Act. The Act divides the State into nine RWQCB areas. The proposed project site is located in Region 4, the Los Angeles RWQCB (LARWQCB) area. Each RWQCB implements and enforces provisions of the Porter-Cologne Act and the Clean Water Act subject to policy guidance and review by the SWRCB.

One of the functions of the RWQCB is to prepare and periodically update a Basin Plan. Each Basin Plan establishes the following: beneficial uses of water designated for each water body to be protected; water quality objectives for surface water and groundwater; and actions necessary to maintain these standards in order to control non-point and point sources of pollution in State waters. The "Water Quality Control Plan, Los Angeles Region," or "Basin Plan" in which the project site is located was approved in June 1994. Permits issued to control pollution (i.e., waste discharge requirements and NPDES permits) must implement Basin Plan requirements.

The proposed project would contribute stormwater to downstream receiving water bodies, and therefore the proposed development would be subject to the requirements of the Act.

(c) California Coastal Act

The California Coastal Commission is responsible for protecting water quality in coastal environments as defined under Sections 30230 and 30231 of the California Coastal Act. These water quality provisions provide a broad basis for protecting coastal waters, habitats and biodiversity associated with new development and redevelopment projects. To meet the objectives of Sections 30230 and 30231, the California Coastal Commission supports a three-pronged approach to water quality management, which includes implementing site design, source control, and treatment control BMPs. New development and redevelopment projects that are within the coastal zone are required to apply for a coastal development permit (CDP) through the California Coastal Commission prior to construction. As part of the CDP process, projects must demonstrate water quality protection with the implementation of site design, source control, and treatment control BMPs.

As the project site is located within the coastal zone, the proposed project would be subject to the water quality requirements of the Coastal Act.

(d) Applicable National Pollutant Discharge Elimination System (NPDES) Permits

Pursuant to the regulatory program set forth above, the LARWQCB has jurisdiction over the following NPDES permits and other regulatory programs as it relates to the project and project site.

(i) Statewide General Construction Storm Water Permit

The General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ/CAS000002) is an NPDES permit that regulates dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Program (SWPPP). The SWPPP is required to list Best Management Practices (BMPs) to protect storm water runoff quality. Additionally, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the project site discharges directly to a water body listed on the Section 303(d) list for sediment.

(ii) Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters (Dewatering Permit)

The Los Angeles RWQCB issued Order No. R4-2008-0032/CAG994004 to regulate the discharge of treated or untreated groundwater generated from permanent, temporary dewatering operations or other applicable wastewater discharges not specifically covered in other general NPDES permits. This permit applies to discharges that do not contain pollutant concentrations that cause violations of any applicable water quality objectives for the receiving waters, including discharge prohibitions. In addition, the discharges shall not exceed the water quality criteria for toxic pollutants. To obtain coverage under this permit, an applicant must submit an NOI and data establishing the chemical characteristics of the dewatering discharge. A standard monitoring and reporting program is included as part of the permit. For dewatering activities that are not covered by the General Permit, WDRs and an individual NPDES permit must be obtained from the applicable RWQCB.

Groundwater was reportedly encountered on site between depths of approximately 10 and 15 feet below ground surface (bgs). Historical data reported groundwater ranging from 6 ½ feet to 10 feet below the ground surface. Based on the proposed depth of excavation up to 14 feet for the underground parking structure, dewatering is expected for both construction and post-construction operations (it should be noted that temporary over-excavation to depths up to 25 feet may be required, followed by soil recompaction to finished depth of 14 feet). For all dewatering activities, the project shall apply for coverage under and adhere to the monitoring and reporting program associated with Order No. R4-2008-0032.(iii) Munic*i*pal Permits and SUSMP Requirements.

As indicated above, in accordance with the Clean Water Act, NPDES permits are also required for storm water discharges from municipal separate storm sewer systems (referred to as MS4 permits or municipal permits). The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The storm water management programs specify what best management practices (BMPs) will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection

and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not.

A municipal storm water NPDES permit has been issued to Los Angeles County and 85 cities within the County including the City of Long Beach. As described below, the City of Long Beach has been issued its own NPDES permit (NPDES Permit No. 99-060; CAS004003/CI 8052) by the LARWQCB. Under more recent regulations adopted by the LARWQCB and set forth in these municipal NPDES permits, the LARWQCB set forth a Standard Urban Storm Water Mitigation Plan (SUSMP) that was developed to address storm water pollution from new development and redevelopment by the private sector. Jurisdictions in Los Angeles County are required to adopt the requirements set forth in the County SUSMP into their own SUSMP. Implementation of a project-specific Water Quality Management Plan (WQMP) that meets SUSMP requirements is required during the operational life of the project to ensure that storm water pollution is addressed by incorporating BMPs in the design phase of development. This requirement provides for water quality design standards to ensure that storm water runoff is managed for water quality concerns in addition to flood protection and that pollutants carried by storm water are retained and not delivered to waterways. Project applicants for specified projects are required to select source control and treatment control BMPs from the list approved by the LARWQCB and included in the SUSMP. In combination, these treatment control BMPs must be sufficiently designed and constructed to treat, infiltrate, or filter the first 0.75-inch of storm water runoff from a storm event. The SUSMP provisions that are applicable to all land use categories include: (1) reducing peak storm water runoff discharge rates; (2) conserving natural areas; (3) minimizing storm water pollutants of concern; (4) protecting slopes and channels; (5) providing storm drain stenciling and signage; (6) properly designing outdoor material storage areas; (7) providing proof of ongoing BMP maintenance; and (8) designing standards for structural or treatment control BMPs.

Given the potential for the proposed project to contribute pollutant loads to stormwater flows during construction and operation of proposed uses, the project is subject to the requirements of the NPDES permits.

(e) City of Long Beach

The LARWQCB has issued the City of Long Beach its own NPDES permit (NPDES Permit No. 99-060; CAS004003/CI 8052). As part of its Report of Waste Discharge (ROWD) submitted for its NPDES permit, the City of Long Beach included among other programs, a storm water management program. In accordance with the objectives of the federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, the Long Beach Storm Water Management Program (LBSWMP) contains several elements, practices and activities aimed at reducing or eliminating pollutants in storm water to the maximum extent practicable (MEP). Among these programs is a development planning and construction program. In accordance with this program as well as the requirements of the SUSMP mandated by the RWQCB, Chapter 18.95 of the Long Beach Municipal Code includes several requirements relating to development planning and construction. Included in these requirements are source control BMPs for projects such as gasoline stations and hillside projects. Additional requirements include treatment control BMPs and requirements regarding erosion control, peak runoff, and BMP maintenance for projects that include ten or more home subdivisions, 100,000-square foot or more square foot commercial developments and projects located adjacent to or directly discharging to environmentally sensitive areas. Post-construction structural or treatment control BMPs designed to mitigate (infiltrate or treat) the volume of runoff produced from a 0.75-inch storm event

prior to its discharge to a storm water conveyance system are also required for these specific projects. In addition, in accordance Chapter 18.95 of the Long Beach Municipal Code, construction projects are required to prepare a SWPPP that will incorporate construction site BMPs.

As noted above, given the potential for the proposed project to contribute pollutant loads to stormwater flows during construction and operation of proposed uses, the project is subject to the requirements of the NPDES permits and LBMC requirements.

b. Existing Conditions

(1) Surface Water Resources

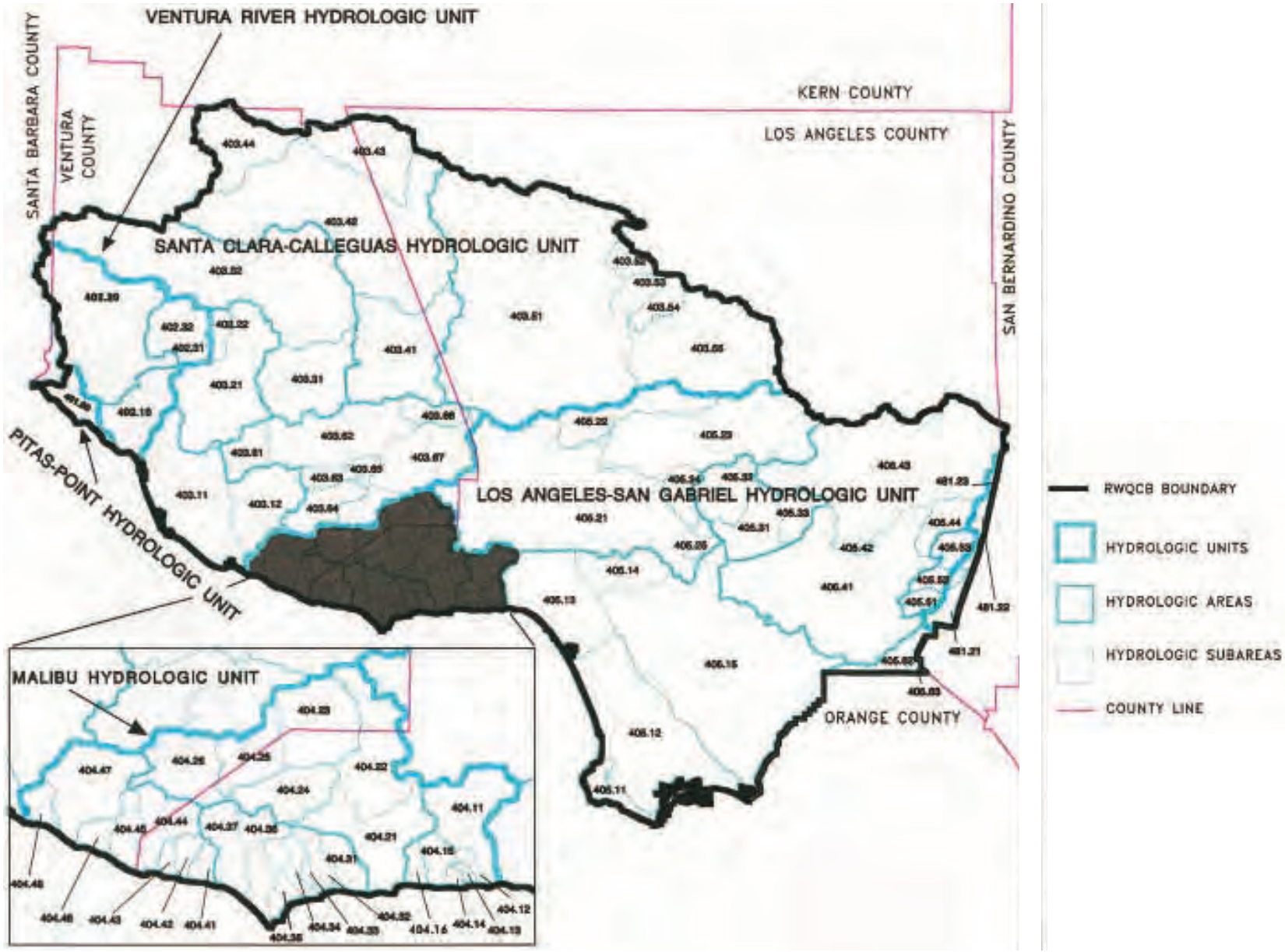
(a) Hydrology and Drainage

The project site is located in an area characterized by flat and gently rolling topography, which generally slopes toward the south to Alamitos Bay. The site is predominantly urbanized with hotel and supporting commercial uses, with impervious surfaces constituting much of the site. Existing impervious surfaces include buildings, internal streets, and parking areas. Pervious surfaces consist of landscaped areas primarily located around the hotel structures and the perimeter of the site. Under existing conditions, the project site is roughly 80% impervious. There are no water bodies located on the project site. The area surrounding the project site contains a mix of commercial uses within the Marina Pacifica, Market Place, and Marina Shores shopping centers, including restaurant, retail, and office uses, and recreational uses within the Alamitos Bay Marina, which consist largely of impervious paved surfaces. Open space associated with the Los Cerritos Wetlands and landscaped medians and greenbelts along local roadways and are the only contiguous areas of predominantly pervious surfaces in the project vicinity.

As illustrated in **Figure IV.G-1**, *Regional Hydrologic Map*, the project site is located within the Los Angeles-San Gabriel Hydrologic Unit, as determined by the California Regional Water Quality Control Board (RWQCB) for planning purposes. This hydrologic unit covers most of Los Angeles County and drains a 1,608-square mile area. The Los Angeles River, San Gabriel River, and Ballona Creek are the major drainage systems in this area. The San Gabriel River is located just to the southeast of the project site, and the Los Angeles River is located approximately six miles west from the project site. Both rivers run in a north-south direction and drain into the Pacific Ocean. There are no surface water bodies or wetlands located on the project site. The primary surface water bodies in the vicinity are Alamitos Bay, the San Gabriel River, as indicated previously, the Los Cerritos Channel, Los Cerritos Wetlands, and the Pacific Ocean. Although several of these surface water bodies have been engineered and dredged substantially, portions of them are included in the U.S. Department of the Interior Fish and Wildlife Service (DOI-FWS) National Wetlands Inventory.

The average annual precipitation on the project site is 12 inches. A 50 year, 24-hour storm event yields approximately 4.8 inches of rainfall and a 10-year, 24-hour storm event yields approximately 3.4 inches.[1] Most of the surface runoff from the project site is generated on-site, with almost no surface flow entering the site from other areas. Runoff from the east and northeastern portions of the site generally flows in an easterly direction, where it is collected by existing City-owned storm drains along Pacific Coast Highway (PCH), designated as Conveyance ID #220010 and #220015 in the City of Long Beach Stormwater Master Plan. These storm drains converge to a 36-inch reinforced concrete pipe (Conveyance ID #220005) that

[1] Los Angeles County Department of Public Works. *Hydrology Manual.* January 2006.



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Regional Hydrologic Map

Second+PCH Development

Source: Los Angeles Regional Water Quality Control Board, 1994.

FIGURE

IV-G-1

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bisects the project site and ultimately discharges to the Alamitos Bay Marina southwest of the project. Runoff from the western portions of the site along Marina Drive is generally conveyed west via sheet flow towards Marina Drive, where it is intercepted by existing catch basins and storm drains that connect to an existing 18-inch City-owned storm drain that discharges to Alamitos Bay at a separate outlet than the 36-inch drain. The location of the storm drainage facilities serving the project area are illustrated in **Figure IV.G-2**, *Existing Hydrology Map*.

Hydrologic calculations to evaluate surface water runoff associated with the 50-year storm frequencies were performed for on-site and off-site drainage areas, utilizing "Tc Calculator" method in accordance with the Los Angeles County 2006 *Hydrology Manual*. Results of the existing condition hydrologic analysis are summarized in **Table IV.G-1**, *Summary of Existing Hydrology Conditions*, below. Detailed calculations are provided in Appendix G of this EIR.

Table IV.G-1

Summary of Existing Hydrology Conditions

Subarea ID	Drainage Area (ac)	50-Year Peak Flow Rate (Q_{50}, cfs)[a]
A-1	2.30	3.55
A-2	1.94	3.13
B-1	3.36	4.73
B-2	0.96	1.62
B-3	1.98	3.20
On-Site Subtotal	**10.54**	**16.23**
C-1	1.09	1.74
C-2	0.47	0.86
C-3	0.47	0.86
C-4	0.32	0.66
D-1	0.62	1.13
D-2	1.21	1.67
E1	3.94	6.06
E2	4.64	7.13
Off-Site Subtotal	**12.76**	**20.11**

[a] *cfs cubic feet per second*

Source: Fuscoe Engineering, Inc., 2010

Based on existing topography, field investigations and the City of Long Beach's Stormwater Master Plan, the capacities of the existing storm drain systems along PCH are summarized in **Table IV.G-2**, *Summary of Existing Drainage Facilities*. Refer to Figure IV.G-2 for locations of the existing storm drain facilities.

Table IV.G-2

Summary of Existing Drainage Facilities

Conveyance ID	Slope	Size (in)	Drainage Area (ac)	Existing Flow Return Period 10-year (Q_{10}, cfs)[a]	25-year (Q_{25}, cfs)	50-year (Q_{50}, cfs)	Full Flow Capacity (cfs)
220015	0.0022	24	7.67	8.85	10.89	12.4	11.5
220010	0.0022	30	12.59	14.09	17.32	19.73	20.9
220005	0.0034	36	16.83	18.86	23.19	26.41	42.2

[a] *cfs cubic feet per second*

Source: Fuscoe Engineering, Inc., 2010

Under existing conditions, all of the on-site runoff ultimately discharges to the existing 36-inch storm drain (Conveyance ID 220005) southwest of the site. As summarized in Table IV.G-2 above, the existing 36-inch storm drain has sufficient capacity to convey runoff from the 50-year event from the project and upstream areas. The 24-inch line upstream of the 36-inch line along PCH (Conveyance ID #220015) is undersized by 0.9 cubic feet per second (cfs) for the 50-year event under existing conditions. However, the pipe size does comply with the 25-year capacity requirements of the Los Angeles County Department of Public Works (LACDWP) Hydrology and Hydraulic Design Manual.

(b) Floodplains

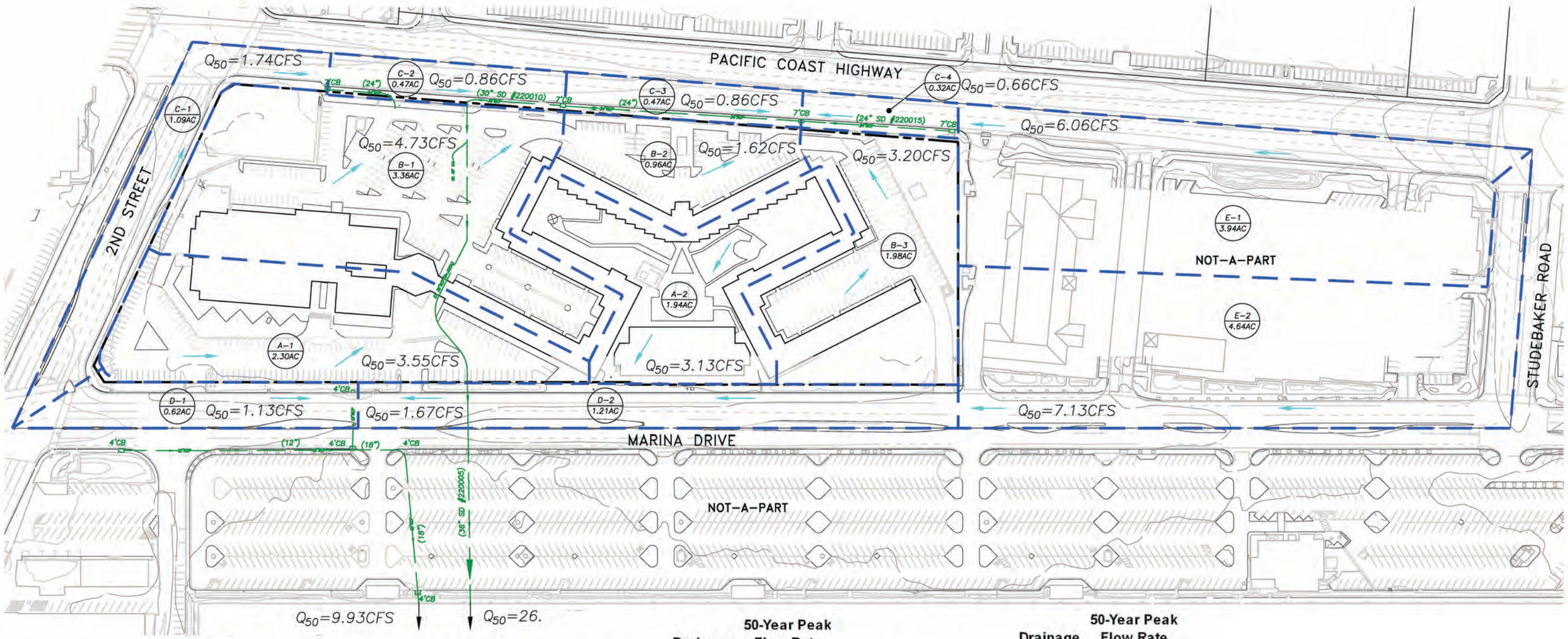
According to the FIRM for the project site (FIRM Map No. 06037C1988F, revised September 26, 2008) issued by FEMA, the project site is located within Zone X, as illustrated in **Figure IV.G-3**, *Flood Insurance Rate Map*. Zone X refers to areas located within a 500-year floodplain (i.e., areas with a 0.2-percent chance of flooding in any given year), areas located within a 100-year floodplain (i.e., areas with a one-percent chance of flooding in any given year) with average depths of less than one foot or less than one square mile in area, and areas located within a 100-year floodplain that are protected from flooding by levees. The project site, as indicated on the FIRM, is within a 100-year floodplain that is protected by "Provisionally Accredited" levees, as determined by the U.S. Army Corps of Engineers (ACOE), which is the agency responsible for operation and maintenance of the levees along the Los Angeles River.[2] A Provisionally Accredited Levee (PAL) is a levee that FEMA has previously accredited with providing one-percent annual chance protection on an effective FIRM and for which FEMA is awaiting data and/or documentation that will demonstrate the levee's compliance with 44 CFR Section 65.10, Mapping of Areas Protected by Levee Systems, of the NFIP regulations.

(c) Surface Water Quality

(i) Regional Drainage

Surface water quality can be affected by a number of variables, which include land use, hydrology, meteorology, geology, and soils. Land uses may affect surface water quality based on the associated

[2] *Federal Emergency Management Agency.* Provisionally Accredited Levees (PAL) Brochure. *April 2008. Located at: http://www.fema.gov/library/viewRecord.do?id=1987. Accessed June 15, 2009.*



LEGEND

- PROJECT BOUNDARY
- DRAINAGE BOUNDARY
- EXISTING STORM DRAIN
- EXISTING CATCH BASIN
- FLOW ARROW

Subarea ID	Drainage Area (ac)	50-Year Peak Flow Rate (Q_{50}, cfs)
A-1	2.3	3.55
A-2	1.94	3.13
B-1	3.36	4.73
B-2	0.96	1.62
B-3	1.98	3.2
Total On-Site	**10.54**	**16.23**

Subarea ID	Drainage Area (ac)	50-Year Peak Flow Rate (Q_{50}, cfs)
C-1	1.09	1.74
C-2	0.47	0.86
C-3	0.47	0.86
C-4	0.32	0.66
D-1	0.62	1.13
D-2	1.21	1.67
E1	3.94	6.06
E2	4.64	7.13
Total Off-Site	**12.76**	**20.11**

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0 150 Feet

Existing Hydrology Map

Second+PCH Development

Source: Fuscoe Engineering, 2010.

FIGURE

IV.G-2

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activities. As an example, office buildings generate small amounts of exterior pollutants, and surface parking lots have deposits of oil, gasoline, and other pollutants. These pollutants could be washed away by runoff. Meteorology may affect surface water quality through the quantity and intensity of storm events, which determine to what extent pollutants are washed away by runoff. Geology and soils may affect surface water quality in that they determine infiltration and runoff velocity. The more infiltration of runoff into the soil, and slower the runoff velocity, the less ability the runoff has to carry sediments and pollutants.

The project site is located within the San Gabriel River Watershed. Since the watershed is highly urbanized, urban runoff and illegal dumping are major contributors to impaired water quality in the San Gabriel River and tributaries. Primary sources of storm water pollution in urban areas typically include automobiles and activities associated with automobile use, housekeeping and landscaping practices, industrial activities, construction, non-storm water connections to the drainage system, and accidental spills. Common pollutant sources and the pollutants that are generated from these sources are listed in **Table IV.G-3**, *Common Sources of Pollutants in Urban Runoff*. Pollutant concentrations in urban runoff are extremely variable, and are dependent on source strength, storm intensity, runoff volume, and elapsed time since the previous storm event.

Table IV.G-3

Common Sources of Pollutants in Urban Runoff

Pollutant	Automobile/ Atmospheric Deposit	Urban Housekeeping/ Landscaping Practices	Industrial Activities	Construction Activities	Non-Storm Water Connections	Accidental Spills
Sediments	X	X	X	X		
Nutrients	X	X	X	X	X	X
Bacteria and Viruses		X		X	X	X
Oxygen Demanding Substances		X	X	X	X	X
Oil and Grease	X	X	X	X	X	X
Anti-Freeze	X	X		X	X	X
Hydraulic Fluids	X	X	X	X	X	X
Cleaners and Solvents	X	X		X	X	X
Heavy Metals	X	X	X	X	X	X
Chromium	X	X	X			
Copper	X	X	X			
Lead	X	X	X			
Zinc	X	X	X			
Iron	X		X			
Cadmium	X		X			
Nickel	X		X			
Manganese	X		X			
Paint		X		X	X	X
Wood Preservatives		X		X	X	X
Fuels	X		X	X	X	X
PCBs	X				X	X
Pesticides	X	X	X	X	X	X
Herbicides	X		X	X	X	X
Floatables [a]		X	X	X		X

[a] *Floatables in storm water are pollutants that contain significant amounts of heavy metals, pesticides, and bacteria.*

Source: Los Angeles Regional Water Quality Control Board, 2009.

(ii) Beneficial Uses

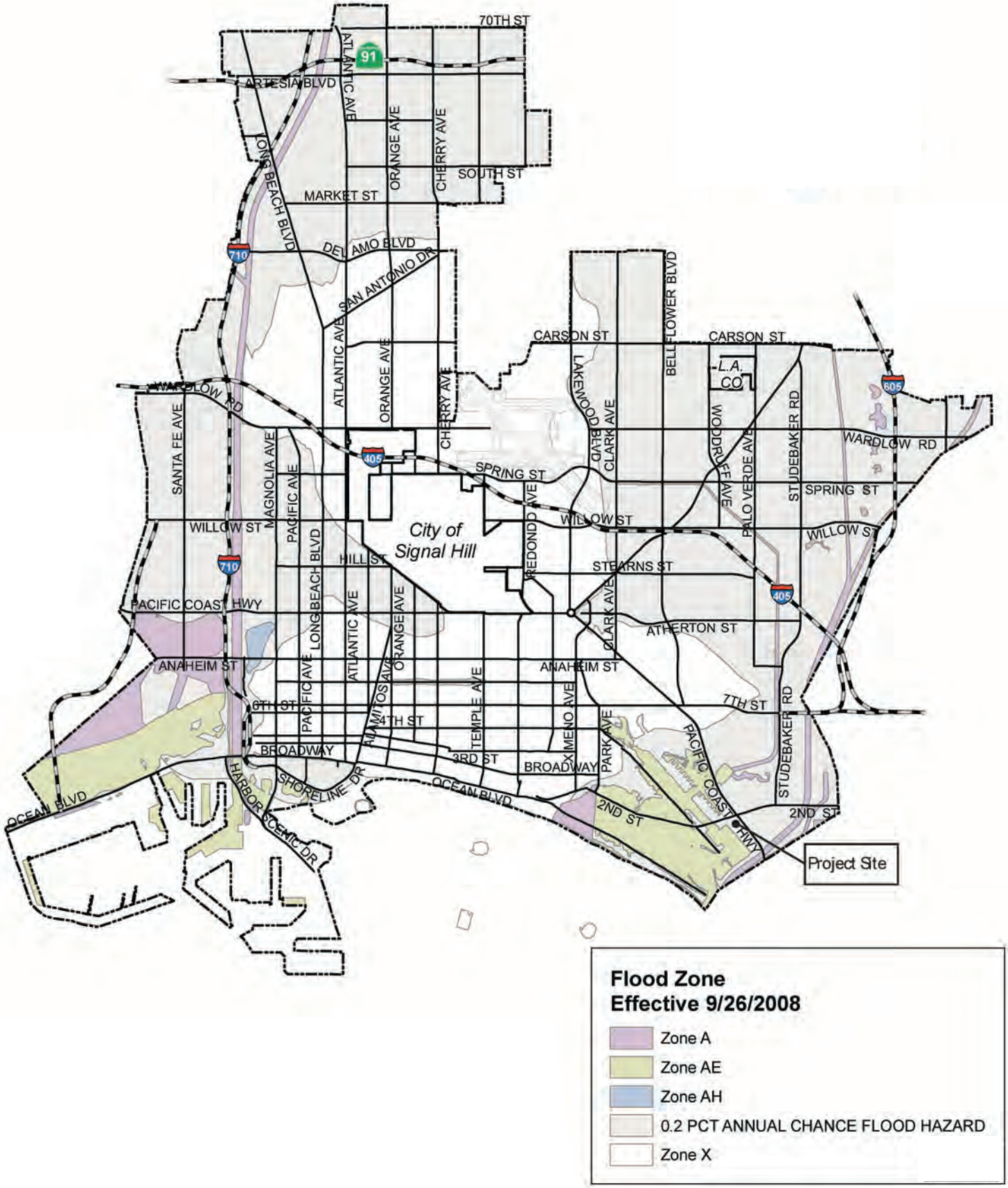
As previously discussed, runoff from the project site ultimately discharges into the Alamitos Bay (Hydrologic Subunit 405.12), which is part of the larger Los Angeles-San Gabriel Hydrologic Unit (Hydrologic Unit 405.15). According to the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) developed by the Los Angeles RWQCB, Alamitos Bay has the following beneficial uses:

- COMM Commercial and Sport Fishing
- EST Estuarine Habitat
- IND Industrial Service Supply
- MAR Marine Habitat
- NAV Navigation
- RARE Rare, Threatened, or Endangered Species
- REC1 Water Contact Recreation
- REC2 Non-Contact Water Recreation
- SHELL Shellfish Harvesting
- WET Wetland Habitat
- WILD Wildlife Habitat

In order to maintain the beneficial uses listed above, surface waters must achieve certain water quality objectives outlined in the Basin Plan. For the Alamitos Bay, qualitative and quantitative general water quality objectives have been set in the Basin Plan for the following constituents:

- Ammonia
- Bacteria, coliform
- Bioaccumulation
- Biochemical Oxygen Demand (BOD5)
- Biostimulatory Substances
- Chemical Constituents
- Chlorine, total residual
- Color
- Exotic Vegetation
- Floating Material
- Methylene Blue Activated Substances (MBAS)
- Mineral Quality
- Nitrogen (Nitrate, Nitrite)
- Oil and Grease
- Oxygen, dissolved (DO)
- Pesticides
- pH
- Polychlorinated Biphenyls (PCBs)
- Radioactive Substances
- Solid, Suspended, or Settleable Materials
- Taste and Odor
- Temperature
- Toxicity
- Turbidity

Under Section 303(d) of the Clean Water Act (CWA), States are required to identify water bodies that do not meet their water quality standards. Once a water body has been listed as impaired, a Total Maximum Daily Load (TMDL) for the constituent of concern (pollutant) must be developed for that water body. A TMDL is an estimate of the daily load of pollutants that a water body may receive from point sources, non-point sources, and natural background conditions (including an appropriate margin of safety), without exceeding its water quality standard. Those facilities and activities that are discharging into the water body, collectively, must not exceed the TMDL.



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Flood Insurance Rate Map

Second+PCH Development

Source: Federal Emergency Management Agency, 2008.

FIGURE

IV.G-3

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Storm water runoff from the site ultimately discharges into existing storm drain lines that outlet to the Alamitos Bay. According to the 2006 303(d) list published by the Los Angeles RWQCB, Alamitos Bay is listed as impaired for indicator bacteria from unknown sources. The proposed TMDL completion date is 2019. There are no additional TMDLs or known impairments for Alamitos Bay as a receiving water body.

(iii) Water Quality Objectives

In order to maintain the beneficial uses listed above, surface waters must achieve certain water quality objectives outlined in the Basin Plan. For the Alamitos Bay, qualitative and quantitative general water quality objectives have been set in the Basin Plan. Brief summaries of the applicable objectives are provided in **Table IV.G-4**, *Water Quality Objectives for Los Angeles Region Surface Waters, Enclosed Bays and Estuaries.*

(iv) Current Surface Water Quality Conditions

As part of the City of Long Beach SWMP, receiving water monitoring is conducted at key discharge points throughout the watershed. The monitoring program includes 1) mass emission monitoring during storm events, 2) monitoring of dry weather discharges, 3) receiving water monitoring, and 4) special studies. As part of the initial receiving water sampling efforts, the City monitored Alamitos Bay for the first two years of the program to document the effects of a dry weather diversion previously installed upstream in the watershed.

In addition, monitoring of the first major storm event of each season was continued to assess water quality and toxicity at locations in the Alamitos Bay and to determine the extent of impact of storm water discharges to the Bay.

Since the initial pilot program in 2002, five storm water plume-tracking studies have been conducted in Alamitos Bay. The results of these studies on plume characteristics found that the Los Cerritos Channel (located northwest of the project site) was the major source of storm water entering Alamitos Bay. The proposed project drains directly into Alamitos Bay and does not drain into the Los Cerritos Channel. In addition, the results found that for the most part, total metal concentrations increased with decreasing salinity (or increasing storm water influence),and with the exception of cadmium, dissolved metals also showed similar patterns of storm water influence. Tests of sea urchin fertilization found no evidence of a toxic response. At the end of the 2007/08 monitoring period, it was recommended that the monitoring of the storm water plume in Alamitos Bay be discontinued.

(2) Groundwater Resources

(a) Groundwater Hydrology

Based on the Geologic Map of California, published by the California Geological Survey (formerly the California Division of Mines and Geology, 1977), the project site is located within the coastal plain of Los Angeles County which consists of alluvium, lake playa, terrace deposits, unconsolidated and semi-consolidated materials. The project site is located in a subsection of the coastal plain designated as the Long Beach Plain.

Table IV.G-4

Water Quality Objectives for Los Angeles Region Surface Waters, Enclosed Bays and Estuaries

Constituent	Water Quality Objective[a]
Fecal Coliform	In waters designated for REC-1, the fecal coliform density shall not exceed a geometric mean limit of 200/100 ml. Single sample density shall not exceed 400/100 ml (Basin Plan Amendment for Bacteria Objectives, October 2001).
E. coli	In waters designated for REC-1, the E. coli density shall not exceed a geometric mean limit of 126/100 ml. Single sample density shall not exceed 235/100 ml.[b]
Chlorine	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.
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Floating Material	Waters shall not contain floating materials in concentrations that causes nuisance or adversely affects beneficial uses.
Nitrogen	Waters shall not exceed 10 mg/L of nitrogen, 45 mg/L as nitrate, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.
Oil and Grease	Waters shall not contain oils and greases in concentrations that result in visible film or coating on the surface of the water, that cause nuisance, or that otherwise adversely affect beneficial uses.
Oxygen, Dissolved (DO)	The mean annual DO level shall be greater that 7 mg/L.
Pesticides	MUN-designated water bodies shall not exceed pesticide concentrations specified in Section 64444 of Title 22 California Code of Regulations.
pH	The pH shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Solid, Suspended, or Settleable Materials	Waters shall not contain solid, suspended, or settleable materials that causes nuisance or adversely affects beneficial uses.
Temperature	Natural receiving water temperature shall not be altered unless it can be demonstrated that such alteration shall not adversely affect beneficial uses.
Turbidity	Waters shall be free of changes in turbidity that causes nuisance or adversely affects beneficial uses.

ml = milliliter
mg/L = milligrams per liter
[a] *Source: Los Angeles Regional Water Quality Control Board (RWQCB). (1994, June). Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.*

Source: Los Angeles Regional Water Quality Control Board (RWQCB). (2001, October). Basin Plan Amendment for Bacteria Objectives.

Based on the State of California Bulletin No. 104 (*Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County*, also known as the "Basin Plan") dated June 1961, the project site is located within the West Coast Basin. The basin consists of recent alluvium that forms the semi-perched aquifer, the Bellflower aquitard, and the Gage aquifer. Regional groundwater beneath the project site is believed to be affected by seawater intrusion. A shallow perched water-bearing zone is encountered from depths of 10 to 20 feet below ground surface (bgs). The first regional occurring aquifer beneath the site is the Gage aquifer, which occurs at an approximate depth of 100 feet bgs in the vicinity. Shallow groundwater flow is generally towards the south with a gradient of 0.02 feet per foot.

Natural recharge of the shallow and semi-perched aquifers by percolation from the ground surface occurs throughout the Los Angeles Coastal Plain and by underflow from the recharge areas. However, such natural recharge has steadily decreased regionally as a result of urbanization and industrialization over the years, as well as channeling of the Los Angeles and San Gabriel Rivers. Artificial recharge programs have been developed to compensate for the loss of natural recharge areas and the heavy use of groundwater.

(b) Groundwater Quality

(i) Beneficial Uses

The Basin Plan identifies the Central Basin of the Los Angeles Coastal Plan as having four beneficial uses. They are:

- MUN – Municipal and Domestic Supply;
- IND – Industrial Service Supply;
- PROC – Industrial Process Supply; and
- AGR – Agricultural Supply

(ii) Water Quality Objectives

Specific water quality objectives have been established for the Central Basin of the Los Angeles Coastal Plan to maintain its beneficial uses, and are summarized below in **Table IV.G-5**, *Water Quality Objectives for the Central Basin of the Los Angeles Coastal Plain.*

Table IV.G-5

Water Quality Objectives for the Central Basin of the Los Angeles Coastal Plain

TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
700	250	150	1.0

TDS = total dissolved solids mg/L = milligrams per liter

Source: Fuscoe Engineering, Inc., 2010

In addition to specific numeric water quality objectives, narrative objectives for all groundwaters in the coastal watersheds of Los Angeles and Ventura Counties also apply to the project area. Narrative objectives

have been established for various constituents, as shown below in **Table IV.G-6**, *General Water Quality Objectives for Groundwaters in the Los Angeles Region*.

Table IV.G-6

General Water Quality Objectives for Groundwaters in the Los Angeles Region

Constituent	Water Quality Objective
Bacteria	Concentration of coliform organisms shall be less than 1.1/100 ml over any seven-day period.
Chemical Constituents & Radioactivity	Groundwaters designated for use as MUN shall cont contain concentrations of chemical constituents and radionuclides in excess of the limits specified in Title 22 of the California Code of Regulations. Groundwaters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.
Nitrogen (Nitrate, Nitrite)	Ground waters shall not exceed 10 mg/L of nitrogen, 45 mg/L as nitrate, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.
Taste & Odor	Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

ml = milliliter mg/L = milligrams per liter

Source: Los Angeles Regional Water Quality Control Board (RWQCB). June 1994. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

(iii) Current Groundwater Quality Conditions

Based on the State of California Bulletin No. 104 (Planned Utilization of the Ground Water Basins of the Coastal Plain of Los Angeles County) dated June 1961, the project site is located within the West Coast Basin. The basin consists of recent alluvium that forms the semi-perched aquifer, the Bellflower aquitard, and the Gage aquifer. Regional groundwater beneath the project site is believed to be affected by seawater intrusion. A shallow perched water-bearing zone is encountered from depths of 10 to 20 feet below ground surface (bgs).

The first regional occurring aquifer beneath the site is the Gage aquifer, which occurs at an approximate depth of 100 feet bgs in the vicinity. Shallow groundwater flow is generally towards the south with a gradient of 0.02 feet per foot.

The general quality of groundwater within the Los Angeles Coastal Plain has been substantially degraded from background levels. The groundwater in the surrounding area has experienced seawater intrusion, which is currently under control in most areas. Groundwater in the lower aquifers of this basin is generally of good quality. However, the quality of groundwater in parts of the upper aquifers is degraded by seawater

intrusion and organic pollutants from a variety of sources, such as leaking tanks and leaking crude oil pipelines.[3] As discussed in detail in Section IV.F, *Hazards and Hazardous Materials*, of this EIR, groundwater beneath the site has been affected by hydrocarbons (petroleum products) resulting from past releases from leaking underground storage tanks associated with current and former gasoline stations on-site and in the project vicinity. Remediation of soil and groundwater on-site is currently ongoing under oversight by the Los Angeles Regional Water Quality Control Board.

3. ENVIRONMENTAL IMPACTS

a. Methodology

(1) Hydrology

The evaluation of hydrology and drainage impacts is qualitative and based on the assumption that, given the developed nature of the project area, the redevelopment of the site contemplated in the proposed project will not substantially change the rate or volume of stormwater flows coming off the site. The adequacy of stormwater drainage facilities in the project area is based on information provided in the City of Long Beach Stormwater Master Plan.

(2) Water Quality

For purposes of the water quality analysis, impacts were assessed by evaluating the types of pollutants and/or effects on water quality likely to be associated with construction and operation of the project. Project consistency with relevant regulatory permits/requirements, including BMPs and applicable plans, is evaluated to demonstrate how compliance would ensure that the project would not significantly degrade existing water quality.

b. Thresholds of Significance

A project may have a significant impact on hydrology and water quality if it would exceed the significance thresholds included in Section IX, Hydrology and Water Quality, and Section XVII, Utilities and Service Systems, in Appendix G of the CEQA *Guidelines*. As such, the proposed project would result in a significant impact to hydrology and water quality if it would:

1. Violate any water quality standards or waste discharge requirements;

2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

3. 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;

[3] *Leighton and Associates, Inc.* Phase I Environmental Assessment Report, 6280 East 2nd Street and 6400 East Pacific Coast Highway, City of Long Beach, Los Angeles County California. *August 4, 2004.*

4. 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;

5. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

6. Otherwise substantially degrade water quality;

7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

9. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam;

10. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or

11. Inundation by seiche, tsunami, or mudflow.

All of these significance thresholds were preliminarily evaluated in the proposed project's Initial Study, which is included as Appendix A of this EIR. The Initial Study determined that the proposed project would have a less than significant impact with respect to threshold No. 11 and therefore no further study of that threshold was required in the EIR. Below, the remaining thresholds (i.e., Nos. 1-10) are used to further analyze the severity of the proposed project's potential impacts on hydrology and water quality.

c. Project Design Features

The proposed project involves the redevelopment of the existing site into a mixed use development with retail, residential, hotel, restaurant, and entertainment uses. Specifically, the development would include up to 191,475 square feet of retail uses, 325 residential units, a 100-room hotel with 3,510 square feet of meeting space and 4,368 square feet of restaurant space, 21,092 square feet of non-hotel restaurant space, a 99-seat theater, a 4,175-square-foot marine/science learning center, and associated landscaping and open space. The new buildings would range generally from two to six stories in height, with one residential tower reaching up to 12 stories. In addition, a new roadway would be constructed in the southern portion of the site. Parking would be provided both in underground structures and at the ground level of the site. Additional infrastructure and landscaping improvements are also proposed.

The following identifies project features that are proposed as part of the project, as discussed in the Project Description presented in Chapter II of this EIR. Current stormwater regulations require development projects to obtain permits for both construction and operation of proposed uses. The conditions associated with these permits include various requirements for controlling the amount or rate of stormwater discharged from the project site, as well as the generation and release of pollutants into stormwater flows. These requirements for stormwater management, which will be employed as part of the proposed project, are discussed in detail below.

(a) Stormwater Management Features for Construction Activities

As part of the conditions of approval and prior to the issuance of grading permits, the project developer must provide evidence that the project will comply with the most current General Construction Permit (GCP) and associated local National Pollutant Discharge Elimination System (NPDES) regulations to ensure that the potential for soil erosion is minimized on a project-by-project basis. In accordance with the updated GCP (Order No. 2009-0009-DWQ), the following Permit Registration Documents (PRDs) are required to be submitted to the State Water Resources Control Board (SWRCB) prior to commencement of construction activities:

- Notice of Intent (NOI)
- Risk Assessment (Standard or Site-Specific)
- Particle Size Analysis (if site-specific risk assessment is performed)
- Site Map
- Stormwater Pollution Prevention Plan (SWPPP)
- Post-Construction Water Balance Calculator (not required for the proposed project, as it is covered under the Long Beach Municipal Separate Storm Sewer System [MS4] permit Order No. R9-2009-0030)
- Active Treatment System (ATS) Design Documentation (if ATS is determined necessary)
- Annual Fee & Certification

In accordance with the existing and updated GCP, a construction SWPPP must be prepared and implemented at the project site, and revised as necessary, as administrative or physical conditions change. The SWPPP must be made available for review by the RWQCB, upon request, must describe construction Best Management Practices (BMPs) that address pollutant source reduction and provide measures/controls necessary to mitigate potential pollutant sources. These include, but are not limited to: erosion controls, sediment controls, tracking controls, non-storm water management, materials & waste management, and good housekeeping practices. The above-mentioned BMPs for construction activities are briefly discussed below.

- Erosion control BMPs, such as hydraulic mulch, soil binders, and geotextiles and mats, protect the soil surface by covering and/or binding the soil particles. Temporary earth dikes or drainage swales may also be employed to divert runoff away from exposed areas and into more suitable locations. If implemented correctly, erosion controls can effectively reduce the sediment loads entrained in storm water runoff from construction sites.
- Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water. All storm drain inlets on the project site or within the project vicinity (i.e., along streets immediately adjacent to the project boundary) should be adequately protected with an impoundment (e.g., gravel bags) around the inlet and equipped with a sediment filter (e.g., fiber roll). They should also be placed around areas of soil disturbing activities, such as grading or clearing.
- Stabilize all construction entrance/exit points to reduce the tracking of sediments onto adjacent streets and roadways. Wind erosion controls should be employed in conjunction with tracking controls.

- Non-storm water management BMPs prohibit the discharge of materials other than storm water, as well as reduce the potential for pollutants from discharging at their source. Examples include avoiding paving and grinding operations during the wet season where feasible, and performing any vehicle equipment cleaning, fueling and maintenance in designated areas that are adequately protected and contained.
- Waste management consists of implementing procedural and structural BMPs for collecting, handling, storing and disposing of wastes generated by a construction project to prevent the release of waste materials into storm water discharges.

Prior to commencement of construction activities, the project-specific SWPPP will be prepared in accordance with the site-specific sediment risk analyses based on the final rough grading plans and erosion and sediment controls proposed for each phase of construction for the project. The first major phase of construction includes the demolition of the existing hotel and related site improvements. During this phase, sediment controls and waste management best practices will be the primary form of BMPs. During the excavation phase, stockpile management BMPs will be the primary form of BMPs. The excavation process is expected to take approximately 90 days with export occurring each day. Long-term stockpiles are not expected as the export will be hauled away each day to prevent the build of large stockpiles that have a higher risk of erosion from wind or rain.

(b) Stormwater Management Features for Post-Construction Activities

Based on the requirements of the City of Long Beach Stormwater Management Plan (SWMP), the proposed project is designated as a "Priority Project" since the proposed redevelopment project includes the redevelopment of more than 5,000 square feet, development of 10 or more residential units, and more than 100,000 square feet of commercial development. As a result, the project is required to incorporate and implement, where applicable, source control and treatment control BMPs that address post-construction management of storm water runoff quality.

Selection of treatment control BMPs is based on the pollutants of concern for the project site and the BMP's ability to treat those pollutants, in consideration of site conditions and constraints. In addition, the treatment control BMPs must be designed to treat potential pollutants and runoff produced from a 0.75-inch storm event, prior to its discharge into a storm water conveyance system.

Careful consideration of site design is a critical first step in storm water pollution prevention from both new development and redevelopment projects. In general, site design objectives include a combination of factors that may include: minimization of impervious surfaces including roads and parking lots; preservation of native vegetation and root systems; minimization of erosion and sedimentation from susceptible areas such as slopes; incorporation of water quality wetlands, biofiltration swales, etc., where such measures are likely to be effective and technically and economically feasible; and minimization of impacts from storm water and urban runoff on the biological integrity of natural drainage systems and water bodies.

The second phase of water quality management includes source control BMPs. Source control BMPs effectively minimize the potential for typical urban pollutants to come into contact with runoff, thereby limiting water quality impacts downstream. This includes both non-structural measures, such as activity restrictions, maintenance, and training practices, and structural measures, such as material storage area and loading dock design features. The third component to sound water quality management is incorporating treatment control BMPs designed to reduce the impacts of urban development on downstream water bodies to the maximum extent practicable (MEP). The purpose of treatment control BMPs is to remove the

pollutants typically associated with each type of urban land use, including the designated residential and commercial land uses, prior to discharging into receiving waters. In keeping consistent with local water quality treatment requirements and the requirements of the Los Angeles RWQCB, treatment control BMPs shall be designed to infiltrate, filter, and/or treat runoff from a 0.75-inch storm event.

In accordance with the Standard Urban Storm Water Mitigation Plan (SUSMP) requirements described above, the proposed project will include the following site design and source control BMPs:

- All drainage improvements, such as catch basins, roof drains, and surface parking drains will be designed in accordance with standard engineering practices.
- Common area landscape management that includes use of drought-tolerant, native landscaping, minimizing fertilizer and pesticide application, use of slow-release fertilizers, maintenance activities, providing education to homeowners/tenants (via project owner, HOA and/or POA), and providing education and training for employees on management of landscape materials and storm water management.
- Installing and maintaining efficient irrigation systems designed to minimize water by eliminating overspray to hardscape areas, and setting irrigation timing and cycle lengths in accordance with water demands, given time of year, weather, and day and night temperatures.
- The phrase "No Dumping – Only Rain In Drain" or equally effective phrase will be stenciled on catch basins and/or area drains to alert the public as to the destination of pollutants discharged into the storm water.
- The project will comply with SUSMP design requirements for outdoor trash and storage areas, loading docks, and storm drain stenciling.

In addition to site design and source control BMPs, the project will include the following treatment control BMPs:

- Media Filtration

In accordance with SUSMP requirements, three media filtration units will be implemented to treat on-site flows and a portion of the off-site flows prior to discharging into the existing 36-inch storm drain line. Four media roof drain filter BMPs will also be implemented (e.g., Filterra Roof Drain) to provide treatment of flows from the rooftops for the three proposed laterals that will connect directly into the proposed storm drain line in Marina Drive. The remainder of off-site flows originating from the property east of the project (approximately 8.6 acres) will be routed around the property without treatment and all on-site flows will be treated before co-mingling with these off-site flows.

Media filter inserts typically come as contained pre-cast vault or manhole structures that use passive, siphon-activated media-filled cartridges or chambers that trap and adsorb particulates and pollutants. These units are noted to have high to medium removal efficiencies for sediments including soil-bound pesticides, metals, organics, trash/debris, oxygen demanding substances, bacteria, and oil & grease. They are moderately efficient at removing nutrients. Removal efficiencies for these constituents vary depending on the filter media selected, (such as perlite, zeolites, fabric, sand, etc) and for the type of unit installed. Media filtration system include both proprietary and design-build systems.

There are several design variations for sand filters, including Austin Sand Filters, Delaware Sand Filters, and underground filters. In general, sand filters feature a pre-treatment basin or chamber to allow large particulates to settle out, and a filtration chamber where storm water runoff is filtered through a layer of sand (typically 18 inches deep at a minimum). Other variations include utilizing a mixture of organic compost or peat within the sand layer (Organic filter) and combining the sand filter layer within the pre-treatment basin (Pocket Sand Filter). Examples of proprietary media filter units include the StormFilter® (Contech Construction Products, Inc.), Up-FloTM Filter (Kristar Enterprises, Inc), Smart Sponge® media filtration vaults (Abtech Industries), and JellyfishTM filter systems (Imbrium Systems, Inc).

In accordance with the City's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements, the media filtration units will be sized to treat the first 0.75-inch of storm water runoff from a storm event for its contributing drainage area. Since off-site runoff will not comingle with on-site runoff, treatment of off-site flows is not required. Accordingly, the media filtration devices including the roof drain filters will be sized to treat, at a minimum, 2.24 cfs or 30,168 cubic feet of combined on-site runoff. Further details on sizing, design, and maintenance responsibilities for the media filtration unit will be documented in the project-specific SUSMP, prepared during later phases of the project.

d. Analysis of Project Impacts

(1) Would the project 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?

or

Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

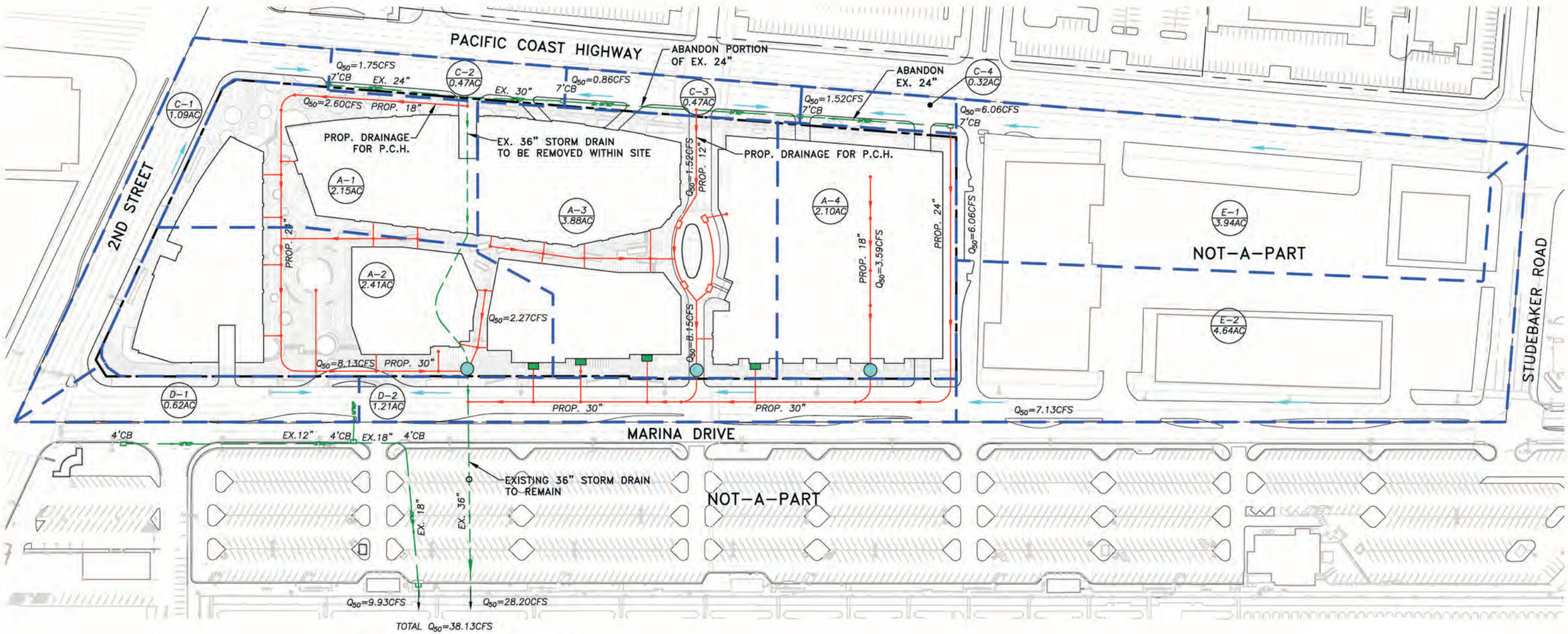
or

Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

(a) Proposed Hydrology and Drainage Conditions

Under post-development conditions, storm water runoff will be conveyed similar to existing conditions, continuing to flow generally west and southwest, discharging to the existing 36-inch City storm drain line southwest of the site. Proposed roof drains and area drains will collect roof runoff from the new buildings and connect to a new on-site storm drain system. Within the project site between Marina Drive and PCH, the existing 36-inch line will be removed and relocated to the north to accommodate the new buildings. Additional new storm drain lines will collect flows throughout the site, and will converge with the relocated 36-inch line. Along PCH, the existing storm drains will remain and connect to the relocated line, and the storm drain line at Marina Drive will remain as under existing conditions. **Figure IV.G-4**, *Proposed Hydrology Map*, identifies the proposed storm drain facilities.

Due to the proposed land use conversion from existing hotel uses to mixed residential and commercial uses, it is anticipated the project will increase impervious surfaces by approximately 10 percent compared to existing conditions. Similarly, it is expected that the peak flow runoff rates will increase accordingly. Runoff from the proposed project will drain similar to existing conditions, and will continue to discharge all on-site



LEGEND

- PROJECT BOUNDARY
- DRAINAGE BOUNDARY
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED MEDIA FILTRATION DEVICE
- PROPOSED ROOF DRAIN FILTERS
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- DIRECTION OF FLOW

0 150 Feet

Proposed Hydrology Map

Second+PCH Development

Source: Fuscoe Engineering, 2010.

FIGURE

IV.G-4

PCR

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runoff into the proposed 36-inch line that traverses the site. All other off-site drainage areas would remain as under existing conditions (see Table IV.G-1). **Table IV.G-7**, *Summary of Proposed Hydrology Conditions*, below, summarizes the proposed on-site hydrology conditions based on the estimated increases in imperviousness on-site, and **Table IV.G-8**, *Summary of Proposed Storm Drain Conditions*, summarizes the anticipated changes capacities of the existing storm drain facilities. Site-specific hydrology and hydraulic conditions will be evaluated during the conceptual grading and engineering phases of the project to determine appropriate storm drain sizes and slopes.

Table IV.G-7

Summary of Proposed Hydrology Conditions

Subarea ID	Drainage Area (ac)	50-Year Peak Flow Rate (Q_{50}, cfs)[a,b]
A-1	2.15	3.68
A-2	2.41	4.12
A-3	3.88	6.63
A-4	2.10	3.59
On-Site Subtotal	10.54 (0)	18.02 (+1.79)
Off-Site Subtotal	12.76 (0)	20.11 (0)
Total Discharging to 36-Inch Storm Drain	**16.83**	**28.20 (+1.79)**

[a] *Numbers in parentheses represent change as compared to existing conditions*
[b] *cfs = cubic feet per second*

Source: Fuscoe Engineering, Inc., 2010

Table IV.G-8

Summary of Proposed Storm Drain Conditions

Conveyance ID	Slope	Size (in)	Drainage Area (ac)[a]	Proposed Flow Return Period: 10-year (Q_{10}, cfs)[a,b]	25-year (Q_{25}, cfs)[a,b]	50-year (Q_{50}, cfs)[a,b]	Full Flow Capacity (cfs)[a,b]
220015	0.0022	24	0.79 (-6.88)	1.09 (-7.76)	1.33 (-9.56)	1.52 (-10.88)	11.5
220010	0.0022	30	1.56 (-11.03)	1.85 (-12.24)	2.28 (-15.04)	2.60 (-17.13)	20.9
220005	0.0034	36	16.83 (0)	20.13 (+1.27)	24.76 (+1.57)	28.2 (+1.79)	42.2

[a] *Numbers in parentheses represent change as compared to existing conditions*
[b] *cfs = cubic feet per second*

Source: Fuscoe Engineering, Inc., 2010

Based on the proposed hydrology conditions, the project will result in an increase of approximately 1.8 cfs as compared to existing conditions during the 50-year event. In order to reduce the peak flows discharging to

the undersized 24-inch storm drain in PCH (ID Conveyance #220015) and reduce the required sizes of storm drains crossing the site within the parking structure, a new on-site 24-inch storm drain line will collect off-site flows and direct the runoff south along the eastern boundary of the proposed site. The off-site flows will then tie into the new on-site system proposed for Marina Drive before discharging into the existing 36-inch line. The increase in runoff due to the increase in impervious surfaces is considered less than significant based on the available capacity within the existing 36-inch line. In addition, increases in discharges to tidal waters such as the marina are not subject to hydromodification (generally defined as the alteration of natural flow characteristics of a site) impacts and therefore, potential impacts to increased erosion or downstream habitats are less than significant.

(b) Surface Hydrology and Flooding Impacts

All on-site drainage systems, including curb-and-gutters, area drains, and storm drains will be designed per City of Long Beach standards, thereby minimizing potential impacts of on-site flooding. In addition, the majority of the proposed improvements are the replacement of one impervious surface for another while recognizing the existing utilities, edge conditions and drainage facilities. Proposed on-site storm drain systems will continue to discharge into the existing 36-inch line that will be relocated on-site to accommodate the site prior to reconnecting to the downstream existing facility. Off-site drainage areas that also drain to this line will continue to do so under proposed conditions. As shown above in Table IV.G-8, the capacity of the existing 36-inch line is sufficient to convey the proposed estimated peak flows for the 50-year storm from the project site as well as upstream areas. With the implementation of the proposed storm drain improvements, impacts relating to downstream flooding are considered less than significant.

Removal of the existing on-site storm drain system will be required for the project to better accommodate the proposed building footprints. These alterations will be designed to provide necessary capacity for on-site collection and conveyance of storm water runoff. However, the larger drainage areas will remain the same for the overall project site, and runoff will continue to drain generally from northeast to southwest, discharging at the existing discharge point to the existing 36-inch storm drain line and outletting to Alamitos Bay.

As discussed above, all on-site drainage systems will be designed per City of Long Beach standards to minimize impacts to on-site flooding. The existing 36-inch storm drain that receives all on-site drainage and outlets to Alamitos Bay has sufficient capacity to convey both on-site and off-site flows for the proposed condition. The proposed peak flow of 28.2 cfs will not impact the existing 36-inch storm drain that has a capacity of 42.2 cfs. Potential impacts to the planned storm water drainage systems are considered less than significant.

Overall, based on the above discussion, the proposed project would not substantially alter the existing drainage pattern of the site or area, create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems, require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. As such, impacts related to surface hydrology and drainage would be less than significant.

(2) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

or

Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

or

Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

As previously discussed, the FIRM prepared by FEMA currently indicates that the entire project site is located within areas defined as being within the 0.2-percent chance flood area (500-year floodplain). This includes areas located within a 100-year floodplain that are protected by levees, as in the case of the project site, which is protected by "Provisionally Accredited" levees (i.e., San Gabriel River channel), as determined by the ACOE in accordance with National Flood Insurance Act regulations. Given the ongoing inspection and maintenance of the San Gabriel River levees by the ACOE, the potential for failure of the levees is considered minimal. Therefore, no significant impacts associated with the placement of housing or structures within a 100-year flood hazard or flooding as a result of the failure of a levee or dam will occur. No mitigation measures are required.

(3) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Within the project site, groundwater is relatively close to the ground surface (within 10 feet bgs) and subject to rainfall and tidal influence due to the proximity of the site to the Alamitos Bay and the Pacific Ocean. The project site is not located in an aquifer recharge area, and there are no groundwater wells or pumping activities proposed for the project site. Temporary dewatering is expected during the construction of the sub-surface structures and a permanent dewatering system is expected to maintain the structural integrity of the subterranean parking structure for long-term operations. All dewatering required for construction activities and post-construction operation will be performed in accordance with Los Angeles RWQCB and SWRCB General Construction Permit requirements. Therefore, impacts to groundwater recharge and groundwater supplies from the proposed project are considered less than significant.

(4) Would the project violate any water quality standards or waste discharge requirements?

or

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

Otherwise substantially degrade water quality?

(a) Construction-Related Water Quality

(i) Construction Surface Water Quality

Clearing, grading, excavation and construction activities associated with the project may affect water quality due to sheet erosion of exposed soils and subsequent deposition of particulates in local drainages. Grading activities, in particular, lead to exposed areas of loose soil, as well as sediment stockpiles, that are susceptible to uncontrolled sheet flow. Although erosion occurs naturally in the environment primarily from weathering by water and wind action, improperly managed construction activities can lead to substantially accelerated rates of erosion that are considered detrimental to the environment. In addition, due to on-site watering activities utilized to reduce airborne dust (please refer to Section IV.B., *Air Quality*, of this EIR), construction could contribute marginally to increased sediment loading of surface runoff during dry weather conditions. As noted above under Project Design Features, as part of the conditions of approval and prior to the issuance of grading permits, the developer must provide evidence that the project will comply with the most current General Construction Permit (GCP) and associated local NPDES regulations to ensure that the potential for soil erosion is minimized on a project-by-project basis. Specifically, under the Statewide General Construction Permit (Order 2009-0009-DWQ), the project proponents are required to submit a Notice of Intent (NOI) and associated Permit Registration Documents (PRDs) to the SWRCB prior to commencement of construction activities. In addition, a SWPPP will be prepared and implemented at the project site, and revised as necessary as administrative or physical conditions change. The SWPPP will describe construction BMPs meeting the BAT/BCT standards required by the GCP and that addresses pollutant source reduction, and will ensure that water quality standards are not exceeded in downstream receiving waters due to construction activities. These include, but are not limited to erosion controls, sediment controls, tracking controls, non-storm water management, materials & waste management, and good housekeeping practices. The SWPPP will be developed in accordance with the construction plans. The SWPPP will provide construction BMPs that are to be maintained for the duration of the construction as well as measures that are specific to each phase of construction. With implementation of NPDES and local regulations, proposed construction activities will not result in substantial erosion or sedimentation, degrade surface water quality of receiving waters to levels below standards considered acceptable by the LARWQCB or other regulatory agencies, or impair the beneficial uses of the receiving waters. In addition, construction of the project will not result in a violation of any water quality standards or waste discharge requirements, will not result in substantial erosion or siltation on- or off-site, and will not otherwise substantially degrade water quality. Therefore, construction-related impacts to surface water quality will be less than significant given compliance with applicable regulations.

(ii) Construction Groundwater Quality

Construction activities on the project site could require excavation of up to 14 feet below ground surface during removal of existing foundations and construction of the subterranean parking level (it should be noted that temporary over-excavation to depths up to 25 feet may be required, followed by soil recompaction to finished depth of 14 feet). Implementation of these construction activities would likely involve dewatering, given the historic groundwater levels measured on-site. Although it is known that groundwater contamination exists beneath the northern portion of the project site, a short-term NDPES permit would be obtained to ensure that all needed groundwater treatment will be completed prior to discharging the groundwater to the storm drain system, in compliance with storm water regulations. Therefore, construction activities associated with the project will not degrade the groundwater quality to levels below standards considered acceptable by the LARWQCB or other regulatory agencies. In addition, as

noted above, these short-term activities will not substantially deplete groundwater supplies or interfere with groundwater recharge. As such, groundwater impacts during construction of the project will be less than significant given compliance with applicable regulations.

(b) Operational Water Quality

(i) Operational Water Quality Conditions

With the proposed land use changes, redevelopment of the project site may result in long-term impacts to the quality of storm water and urban runoff, subsequently impacting downstream water quality. Redevelopment projects similar to the proposed project can potentially create new sources for runoff contamination through changing land uses. As a consequence, the uses associated with the proposed project have the potential to increase the post-construction pollutant loadings of certain constituent pollutants associated with the proposed land uses and their associated features, such as landscaping.

In accordance with the requirements of the City of Long Beach Stormwater Management Program and MS4 permit, new development and significant redevelopment projects must incorporate site design and source control BMPs to address post-construction storm water runoff management. In addition, new developments and redevelopment projects meeting one of the three categories (designated as "Priority Projects") must implement applicable source control BMPs and treatment control BMPs on-site: 1) ten (10) or more home subdivisions; 2) 100,000 or more square foot commercial developments; and 3) projects located adjacent to or directly discharging to environmentally sensitive areas. Selection of treatment control BMPs is based on the pollutants of concern for the specific project site and the BMP's ability to effectively treat those pollutants, in consideration of site conditions and constraints. Further, new development and redevelopment projects must develop a project-specific Standard Urban Stormwater Mitigation Plans (SUSMPs) that describes the menu of BMPs chosen for the project site, as well as include operation and maintenance requirements for all structural and treatment control BMPs.

The pollutants of concern for water quality are those pollutants that are anticipated or potentially could be generated by the project, based on past and proposed land uses, along with those pollutants that have been identified by regulatory agencies as potentially impairing beneficial uses in receiving water bodies. Based on the various land uses for the proposed project, the pollutants of concern can be divided up into anticipated pollutants and potential pollutants. **Table IV.G-9**, *Anticipated and Potential Pollutants Generated by Land Use Type*, derived from the California Stormwater Quality Association, summarizes typical pollutants of concern for major land uses and project categories, including those that are proposed for the project.

- **Bacteria/Pathogens.** Elevated pathogens are typically caused by the transport of human or animal fecal wastes from the watershed. Runoff that flows over land such as urban runoff can mobilize pathogens, including bacteria and viruses. Even runoff from natural areas can contain pathogens (e.g., from wildlife, plant matter and soils). Other sources of pathogens in urban areas include pets and leaky sanitary sewer pipes. The presence of pathogens in runoff can impair receiving waters. Total and fecal coliform, enterococcus bacteria, and E. coli bacteria are commonly used as indicators for pathogens due to the difficulty of monitoring pathogens directly.
- **Trace Metals.** The primary sources of trace metals in storm water are metals typically used in transportation, buildings and infrastructure and also paints, fuels, adhesives and coatings. Copper, lead, and zinc are the most prevalent metals typically found in urban runoff. Other trace metals, such

Table IV.G-9

Anticipated and Potential Pollutants Generated by Land Use Type

Project Categories and/or Project Features	Bacteria/ Virus	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediment	Trash & Debris	Oxygen Demanding Substances	Oil & Grease
Detached Residential	X		X	X		X	X	X	X
Attached Residential	P		X	X		X	X	P [a]	P [b]
Commercial/ Industrial	P[c]	P	P [a]	P [a]	P [e]	P [a]	X	P [a]	X
Automotive Repair Shops		P			X [(4,5)]		X		X
Restaurants	X						X	X	X
Hillside Development >10,000ft^2	X		X	X		X	X	X	X
Parking Lots	P [f]	X	P [a]	P [a]	X [d]	P [a]	X	P [a]	X
Streets, Highways & Freeways	P [f]	X	P [a]	P [a]	X [d]	X	X	P [a]	X

X = Anticipated
P = Potential

[a] *A potential pollutant if landscaping or open area exist on-site.*
[b] *A potential pollutant if the project includes uncovered parking areas.*
[c] *A potential pollutant if land use involves food or animal waste products.*
[d] *Including petroleum hydrocarbons.*
[e] *Including solvents.*
[f] *Analyses of pavement runoff routinely exhibit bacterial indicators.*

Source: County of Orange Flood Control District, 2003 Drainage Area Master Plan, Table 7-1.3, July 1, 2003.

as cadmium, chromium, mercury are typically not detected in urban runoff or are detected at very low levels. Trace metals have the potential to cause toxic effects on aquatic life and are a potential source of groundwater contamination.

- **Nutrients.** Nutrients are inorganic forms of phosphorous and nitrogen. The main sources of nutrients in urban areas include fertilizers in lawns, pet wastes, failing septic systems, and atmospheric deposition from automobiles and industrial operations. The most common impact of excessive nutrient input is eutrophication of the receiving water body, resulting in excessive algal production, hypoxia or anoxia, fish kills and potential releases of toxins from sediment due to changes in water chemistry profiles.
- **Pesticides.** Pesticides (including herbicides) are chemical compounds commonly used to control insects, rodents, plant diseases, and weeds. Excessive application of a pesticide or impractical application of pesticides (i.e., right before rain events) may result in runoff containing toxic levels to receiving water bodies and the microorganisms.

- **Organic Compounds.** Organic compounds are carbon-based, and are typically found in pesticides, solvents, and hydrocarbons. Dirt, grease, and other particulates can also adsorb organic compounds in rinse water from cleaning objects, and can be harmful or hazardous to aquatic life either indirectly or directly.
- **Sediment.** Sheet erosion and the transport and deposition of sediment in surface waters can be a significant form of pollution that may result in water quality problems. Increases in runoff velocities and volumes can cause excessive stream erosion and sediment transport altering the sediment equilibrium of a stream or channel. Alternatively, unstable tributaries can result in excess sediment loading into the main channels thereby increasing the amount of sediment moving downstream during storm events, such as the Southern Arroyo. Excessive fine sediment, such as total suspended solids, can impair aquatic life through changes to the physical characteristics of the stream (light reduction, temperature changes, etc.).
- **Trash and Debris.** Improperly disposed or handled trash such as paper, plastics and debris including biodegradable organic matter such as leaves, grass cuttings, and food waste can accumulate on the ground surface where it can be entrained in urban runoff. Large amounts of trash and debris can have significant negative impacts on the recreational value of water bodies. Excessive organic matter can create a high biochemical oxygen demand in a stream and lower its water quality.
- **Oxygen Demanding Substances.** Oxygen-demanding substances include biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds, such as proteins, carbohydrates and fats, as well as ammonia and hydrogen sulfide. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions, resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds.
- **Petroleum Hydrocarbons/Oil and Grease.** The most common sources of oil and grease in urban runoff stem from spilled fuels and lubricants, discharge of domestic and industrial wastes, atmospheric deposition and runoff. Runoff can contain leachate from roads, breakdown of tires/rubber and deposition of automobile exhaust. Some petroleum hydrocarbons, such as polycyclic aromatic hydrocarbons (PAHs), can bio-accumulate in aquatic organisms and are toxic at low concentrations. Hydrocarbons can be measured in a variety of ways including petroleum hydrocarbons (TPH), oil and grease, or as individual groups such as PAHs. Hydrocarbons can persist in sediment for long periods of time in the environment and can result in adverse impacts on the diversity and abundance of benthic communities.

In accordance with the City's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements, as noted above under Project Design Features, the media filtration units will be sized to treat the first 0.75-inch of storm water runoff from a storm event for its contributing drainage area. Since off-site runoff will not comingle with on-site runoff, treatment of off-site flows is not required. Accordingly, as shown below in **Table IV.G-10**, *Minimum Flow Rates and Volumes for Water Quality Treatment*, the media filtration devices including the roof drain filters will be sized to treat, at a minimum, 2.24 cfs or 30,168 cubic feet of combined on-site runoff. Further details on sizing, design, and maintenance responsibilities for the media filtration unit will be documented in the project-specific SUSMP, prepared during later phases of the project.

In addition to media filtration units, bioretention tree filters are also recommended for use in mixed use and higher-density developments to provide pre-treatment of runoff closer to the source areas, as well as to reduce treatment requirements downstream. Tree box filters are structural, vegetated planters that receive

Table IV.G-10

Minimum Flow Rates and Volumes for Water Quality Treatment

Site Location	Drainage Area	% Impervious	Minimum Treatment Flow Rate (QBMP)	Minimum Treatment Volume (VBMP)
Device # 1	6.12 acres	95%	1.06 cfs	14,320 ft^3
Device # 2	4.35 acres	95%	0.75 cfs	10,179 ft^3
Device # 3	2.40 acres	95%	0.36 cfs	5,668 ft^3
Total Treatment	12.89	95%	2.24 cfs	30,168 ft^3

cfs = cubic feet per second

Source: Fuscoe Engineering, Inc., 2010

storm water runoff and allow pollutants to filter and settle out prior to discharging off-site. The filter receive runoff from roof downspouts or sheet flow, and allow it to filter through a minimum of 18 inches of soil where vegetation will uptake nutrients, microbial contaminants, oil and grease, and pesticides, and sediments and fine particulates can settle out. These systems may be constructed above-ground in elevated structures, such as a concrete planter box, or below the paved surface grade. They can contain a variety of vegetation, including trees, shrubs, perennials and wetland vegetation, and can be proprietary structures or design-build. An example of a proprietary tree-box filter is Filterra® by Americast. Filterra units feature a specially designed media filter mixture within a below-grade concrete box. One tree or large shrub is planted within the media to provide additional pollutant removal, and function similar to bioretention cells.

(ii) Operational Surface Water Quality

Operation of the proposed project will produce pollutants typically associated with urban uses, such as oil and grease, metals, fertilizers, pesticides, dirt from landscaped areas, and litter. Pollutants in this runoff have the potential to be carried off-site and increase pollutant levels in affected receiving waters such as Alamitos Bay, Long Beach Harbor, and Pacific Ocean. Although the proposed project will include landscaped areas, as previously discussed, it will not substantially change the amount of pervious surface area on the project site relative to existing conditions. As such, the minor change in overall imperviousness of the site and associated runoff will not notably increase or reduce the proposed project's contribution of surface water runoff discharge to existing or planned storm water drainage systems or of additional sources of polluted runoff.

In addition, as previously discussed, the applicant and subsequent property owners will be required to comply with SUSMP requirements during the operational life of the project. Such requirements will include source control BMPs, treatment control BMPs, requirements regarding erosion control peak runoff, and BMP maintenance. As part of these requirements, post-construction structural or treatment control BMPs designed to mitigate (infiltrate or treat) the volume of runoff produced from a 0.75-inch storm event prior to its discharge to a storm water conveyance system will also be implemented. Given that the proposed project will replace existing buildings that currently provide no water quality treatment measures with new buildings that include water quality treatment measures, additional sources of polluted runoff are not anticipated, as noted above. In addition, source controls and treatment control BMPs will be implemented in accordance with the City of Long Beach SWMP requirements to provide treatment of pollutants expected

from the proposed land use including sediments, trash & debris, oil & grease, bacteria & pathogens, nutrients, heavy metals and pesticides. With the implementation of site design, source control, and treatment control BMPs, the proposed project will treat runoff prior to exiting the project site. As a result of the runoff controls, water quality exceedances are not anticipated, and pollutants are not expected in project runoff that would adversely affect beneficial uses in downstream receiving waters.

Therefore, overall, runoff contaminants generated by the operation of the proposed project will not violate any water quality standards or waste discharge requirements, impair the quality of receiving surface waters, impair the beneficial uses of the receiving waters, or otherwise substantially degrade water quality. Thus, impacts to surface water quality associated with operation of the project will be less than significant given compliance with applicable regulations.

(iii) Operational Groundwater Quality

As indicated above, the proposed project is not expected to notably increase polluted runoff in the area given a lack of proposed uses with the potential to generate large amounts of pollutants as well as the introduction of a storm water treatment system that will incorporate SUSMP requirements. This negligible change in pollutants will also not increase the associated potential from groundwater contamination through percolation. Additionally, as discussed in Section IV.F, *Hazards and Hazardous Materials*, of this EIR, a groundwater remediation program is currently being implemented on the project site under the oversight of the RWQCB to address existing contamination associated with historic gas station operations both on- and off-site. Upon completion of remedial activities, to the satisfaction of the RWQCB, such contamination will no longer be considered a threat to groundwater quality and no further impacts to local groundwater resources would occur. As such, operation of the proposed project will not degrade the groundwater quality to levels below standards considered acceptable by the LARWQCB or other regulatory agencies or impair the quality of receiving surface waters or groundwater. Impacts would be less than significant in this regard and no mitigation measures are required.

3. CUMULATIVE IMPACTS

Development of the proposed project and other related projects could result in flooding, groundwater hydrology, erosion and sedimentation, and overall water quality impacts.

a. Hydrology and Drainage

Cumulative development within the project area could incrementally increase the net impervious surface area of watershed, which could increase stormwater flows entering flood control facilities. Although a net increase in stormwater flows from increased development could occur, it is not anticipated that such development will substantially increase the stormwater flow volumes currently conveyed by existing infrastructure. Furthermore, implementation of flood control improvements, as necessary and anticipated by applicable drainage master plans of affected jurisdictions, would serve to minimize the potential for adverse flooding impacts resulting from cumulative development. With implementation of planned stormwater improvements in anticipation of development projects, cumulative flooding impacts would be less than significant, and the project's contribution to overall impacts would not be cumulatively considerable.

Temporary dewatering is may be required during construction of related cumulative developments, as is the case with the proposed project, and also may require permanent dewatering systems for long-term operations depending on project design and groundwater conditions. Nonetheless, all dewatering required for construction activities and post-construction operation would be performed in accordance with Los Angeles RWQCB and SWRCB General Construction Permit requirements. Additionally, the project site and other related projects in the area are located at relatively low elevations near the coastline, and therefore have relatively shallow groundwater levels and generally pervious soils. Further development within the area, the majority of which would occur on already urbanized land, could increase overall impervious surface area and incrementally reduce percolation of stormwater into local groundwater units. However, such incremental changes in the context of an urban environment, and the fact that shallow coastal aquifers are typically not utilized for drinking water due to seawater intrusion, cumulative development in conjunction with the proposed project would not have a measurable effect on groundwater recharge or groundwater supplies. Therefore, cumulative impacts to groundwater recharge and groundwater supplies resulting from the proposed project and other related development would be less than significant and the project's contribution to such impacts would not be cumulatively considerable.

With regard to the placement of housing or other structures within a 100-year floodplain, it is not anticipated that any of the related projects propose development within or near designated flood zones. While unlikely, should cumulative development be located within a 100-year flood zone, the project's design and construction would be required to remove the area from the flood-prone area through flood protection structures (e.g., levees) or raising the base elevation to a level above the 100-year flood elevation. Furthermore, a Letter of Map Revision, issued by FEMA, would also be required to certify that the development is no longer susceptible to 100-year floods. Compliance with FEMA requirements through the National Flood Insurance Program (NFIP) for each respective city would minimize risks associated with the placement of structures within designated 100-year flood zones. As such, cumulative floodplain impacts would be less than significant, and the project's contribution to these impacts would not be cumulatively considerable.

b. Water Quality

Impacts to surface water quality during construction and operation, as is the case with the proposed project, would be minimized through compliance with the NPDES permit requirements. Development and implementation of an approved SWPPP for each cumulative project would address project-specific water quality impacts during construction, and likewise each approved project-specific SUSMP would address water quality impacts during project operation. Proper implementation of recommended source-control, volume-based, and treatment BMPs pursuant to each project's SWPPP and SUSMP would serve to preclude significant cumulative water quality impacts. Additionally, the proposed project's contribution to these impacts would not be cumulatively considerable.

The proposed project, in conjunction with related cumulative development, is not expected to notably increase polluted runoff in the area given a lack of proposed uses with the potential to generate large amounts of pollutants as well as RWQCB requirements for a storm water treatment system that will incorporate SUSMP requirements. This minor change in pollutants will also not increase the associated potential from groundwater contamination through percolation. Additionally, as is the case with the proposed project, any of the cumulative development project sites with known groundwater contamination would be required to implement a groundwater remediation program under the oversight of the RWQCB to

address such contamination. Upon completion of remedial activities, to the satisfaction of the RWQCB, such contamination would no longer be considered a threat to groundwater quality and no further impacts to local groundwater resources would occur. As such, operation of the proposed project, in conjunction with cumulative development, would not degrade the groundwater quality to levels below standards considered acceptable by the LARWQCB or other regulatory agencies or impair the quality of receiving surface waters or groundwater. Cumulative groundwater quality impacts would be less than significant and the project's contribution to such impacts would not be cumulatively considerable.

Given compliance with applicable regulations and requirements of affected public agencies, it is anticipated that the proposed project and related projects would not result in adverse cumulative effects related to flooding, hydrology, drainage, erosion and sedimentation, or water quality. Cumulative hydrology and water quality impacts would be less than significant, and the proposed project's contribution to these impacts would not be cumulatively considerable.

4. MITIGATION MEASURES

a. Hydrology/Drainage

Based on the analysis provided above, development of the proposed project will not result in significant hydrology impacts. Thus, no mitigation measures are required.

b. Water Quality

As is the case with hydrology and drainage-related impacts, development of the proposed project will not result in significant water quality impacts. Thus, no mitigation measures are required.

5. SIGNIFICANCE AFTER MITIGATION

a. Hydrology/Drainage

As discussed above, the proposed project would not appreciably increase the volume or rate of stormwater flows generated on-site, and the existing storm drains serving the project site are adequate to convey project-related flows. Furthermore, the proposed project would not result in adverse flooding impacts relative to floodplains. Therefore, a less than significant impact relative to hydrology and drainage will occur.

b. Water Quality

As previously indicated, the project will not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the LARWQCB or other regulatory agencies, impair the beneficial uses of the receiving waters, violate any water quality standards or waste discharge requirements, degrade the groundwater quality to levels below standards considered acceptable by the LARWQCB or other regulatory agencies or substantially depletes groundwater supplies, or interfere substantially with groundwater recharge.