4.7 HYDROLOGY AND WATER QUALITY

The purpose of this section is to describe stormwater drainage impacts associated with construction and operation of the proposed project, including effects on surface water and groundwater quantity and quality, and flooding effects resulting from implementation of the proposed project. For purposes of this discussion, stormwater includes rainwater that is captured into the storm drain system and eventually conveyed to the Pacific Ocean or infiltrates to groundwater. Impacts to the sanitary sewer system, which is the system that collects sewage and conveys it directly to the water reclamation/treatment plants, are addressed in Section 4.14 (Utilities and Service Systems) of this document. In addition, groundwater supplies are also addressed in Section 4.14.

The primary sources of information for the analysis presented in this section include information from the Federal Emergency Management Agency (FEMA); *City of Huntington Beach Wet Utilities Study for The Ripcurl Project* (PBS&J 2008 [WUS]); *Geotechnical Investigation Proposed College Country Mixed-Use Development 7302-7400 Center Avenue Huntington Beach California* (Geocon Inland Empire, Inc. 2006 [Geotech Report]); *Preliminary Hydrology Report* (PBS&J 2008 [PHR]); *Water Quality Management Plan for The Ripcurl Project Site* (Fuscoe Engineering 2008 [PWQMP]): the City of Huntington Beach; the *Water Quality Control Plan, Santa Ana River Basin* (Santa Ana River Regional Water Quality Control Board, 2008 [Basin Plan]); *City of Huntington Beach Citywide Urban Runoff Management Plan* (CHB 2005a [URMP]); *City of Huntington Beach Urban Water Management Plan* (CHB 2005b [UWMP])); *Orange County Water District Groundwater Management Plan* (OCWD 2004 [GMP]); and the *Orange County Drainage Area Management Plan* (OCFCD 2003 [DAMP]).

All comments received in response to the IS/NOP circulated for the proposed project were taken into consideration during preparation of this EIR, and, if relevant, have been addressed in this section or others within this document.

4.7.1 Environmental Setting

The project site is located at 7302–7400 Center Avenue in the northeastern portion of the City of Huntington Beach (City) in western Orange County, California. The project site is a developed 3.8-acre site bordered by Center Avenue to the north; an existing commercial property to the south; Gothard Street to the west; and the Union Pacific Railroad right-of-way, commercial property, and The Village at Bella Terra site to the east. The proposed development site is currently fully developed as a commercial site and is estimated to be 90 percent impervious. Topography within the area is flat (USGS 1981) and in accordance with the UWMP, the site soils are classified as Hydrologic Group C, which means that the pervious area soils have a moderately high runoff rate and somewhat poor infiltration.[12]

The project site is underlain by artificial fill and was encountered in all of the site explorations ranging from 1½ to 7½ feet in depth below the existing ground surface (Geotech Report 2006). The fill, in turn,

[12] Highest infiltration and lowest runoff is associated with Hydrologic Group A, and lowest infiltration and highest runoff is associated with soil Hydrologic Group D.

is underlain by Holocene Age alluvial soils consisting of relatively flat-lying layers of silt, sandy silt, silty sand, and clay. The alluvial soils are primarily fine-grained and soft to firm with some loose to medium dense silty sand layers. The soils consist of flood plain deposits and are anticipated to extend to a depth of approximately 90 feet below the existing ground surface (Geotech Report 2006). The minimum depth to groundwater within the project site is about 5 feet below ground surface (bgs) (Geotech Report 2006). See Section 4.5 (Geology and Soils) of this EIR for more information regarding project site soils and geology.

Climate records for the Newport Beach Harbour station[13] (south of the project site) and Long Beach WSCMO[14] Station[15] (north of the project site) indicate that mean monthly temperatures range from about 55.9 to 57.0 degrees Fahrenheit (°F) during January to about 68.1°F to 75.1°F during August. The mean monthly maximum temperature occurs during August and is about 73.0°F to 84.6°F; mean monthly minimum temperature occurs during December and is about 48.0 to 45.3°F. Annual precipitation at Newport Beach Harbour is about 11.65 inches per year, with about 92 percent occurring from November through April. Annual precipitation at Long Beach WSCMO is about 12.94 inches per year, with about 92 percent occurring from November through April.

Regional Hydrology and Drainage

The City of Huntington Beach (City) is located within the Santa Ana River Basin (SARB), a 2,800-square-mile area located roughly between Los Angeles and San Diego. The SARB is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwestward to the Pacific Ocean. The SARB can be divided into an upper basin and a lower basin. The project site is located within the lower basin drainage and surface flows are dominated by the flood control dam at El Prado. The Santa Ana River canyon, which separates Chino Hills from the Santa Ana Mountains, is the major drainage of Orange County. The lower Santa Ana River has been channelized and modified so that in most years flow does not reach the Pacific Ocean and is used to recharge groundwater.

The project site is located within the Westminster Watershed of the SARB, which covers 74.1 square miles in the southwestern corner of Orange County. Three main tributaries drain this watershed: (1) the Los Alamitos Channel, (2) the Bolsa Chica Channel, and (3) the East Garden Grove-Wintersburg Channel, which drains past the Bolsa Chica Wetlands, into Outer Bolsa Bay, Huntington Harbour, Anaheim Bay, and finally into the Pacific Ocean. The project site is within the East Garden Grove-Wintersburg Channel drainage area of the Westminster Watershed.

The OCFCD is responsible for the design, construction, operation, and maintenance of regional flood control facilities. The County flood channels are maintained annually, and maintenance includes debris and vegetation removal. The existing storm drainage channels were originally designed to accommodate 25-year flood events or less, the standard at the time. However, when the channels were constructed,

[13] Western Regional Climate Center. Historical Climate Data. Newport Beach Harbour, California, NCDC 1971-2000 Normals. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6175 Accessed on May 12, 2007.
[14] WSCO = Weather Service Contract Meteorological Observatory
[15] Western Regional Climate Center. Historical Climate Data. Long Beach WSCMO, California, NCDC 1971-2000 Normals. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5085 Accessed on May 12, 2007.

they were generally built to accommodate only 65 percent of the 25-year flood event. The channels were built with restrictive channel bottoms, which reduce the amount of water the channel could carry, but slow the flow rate of runoff water while still enabling the system to convey runoff. The County now uses 100-year flood event standards for new storm drain construction and drainage improvements, and portions of the channels have been improved to accommodate up to a 100-year storm event.

Local Hydrology and Drainage

Drainage from within the City is conveyed through streets and gutters to a City storm drain system consisting of underground pipes, pump stations, and open channels, as well as several Orange County channels. The City is responsible for its own subregional and local drainage facilities, which ultimately route runoff into Orange County Flood Control District (OCFCD) facilities. The City owns and operates fifteen storm drainage channel pumping stations that are generally located near principal Orange County drainage channels. Runoff water is collected at each pump station through the City's drainage facilities, and then transferred to the nearest OCFCD channel, which ultimately conveys water to the Pacific Ocean. The City's channels, originally designed to accommodate up to 25-year flood events, are generally constructed at ground level (or at-grade). The at-grade channels accelerate flooding potential because the amount of water that may be pumped into an at-grade channel is less than what can be pumped to a below-grade channel. As a result, those areas located adjacent to an at-grade channel can flood in a storm event because the pump stations are unable to pump a sufficient amount of water into the channels without the channels overflowing.

The Drainage Element of the Citywide Urban Runoff Management Plan (CHB 2005) incorporates a city-based Master Plan of Drainage (MPD) that is a comprehensive drainage study of the community, which identifies and creates an inventory of existing storm drain facilities, identifies those areas where system elements do not meet the latest goals established by the City, ranks the severity of the difference between existing capacity and the capacity needed to achieve those goals, prepares planning level cost opinions for system upgrades, and recommends system improvements to initiate the corrections. The City can then initiate the individual drainage projects within its budgetary, political and discretionary restraints. Hydrologic and hydraulic modeling has determined that several areas within the City's drainage system are undersized for the current storm flows and subject to potential flooding (MPD 2005).

On-Site Drainage Patterns

The project site is within the Westminster Watershed. The project site is currently fully developed as a commercial site and is estimated to be 90 percent impervious. Stormwater runoff is drained via street flow in Center Avenue and/or Gothard Street. Drainage from the project site sheet flows to Gothard Street. Flow in Gothard Street flows south along Gothard Street to the intersection of Edinger Avenue and Gothard Street. There, it enters the storm drain system that flows south to the Murdy Channel. A pump station at Heil Avenue lifts water in the Murdy Channel, and flow in Murdy Channel discharges to the East Garden Grove-Wintersburg Channel (OCFCD facility C05) to the south. The East Garden Grove-Wintersburg Channel runs primarily east to west within the project vicinity and discharges to Outer Bolsa Bay, Huntington Harbour, Anaheim Bay, and eventually, the Pacific Ocean.

Flooding and Conveyance Capacity

Approximately 1.3 acre of the eastern portion of the project site is located in a 100-year flood hazard area (Zone A) as mapped by FEMA (FEMA 2004a, 2004b). Flood depths in this area are about 2 feet (Fuscoe Engineering 2007a).

The MPD requires improvements to the existing storm drain system to meet flood control design requirements for street flow along Gothard Street from Center Avenue to Edinger Avenue. The additional required capacity is 8 cubic feet per second (cfs) between Center Avenue and Edinger Avenue to 11 cfs at Edinger Avenue. The MPD also requires additional capacity for the improved section of the storm drain along Edinger Avenue of 52 cfs at Gothard Street to 127 cfs where the storm drain turns south from Edinger Avenue.

However, the Preliminary Hydrology Report (PHR 2008) modeled Gothard Street street flow capacities based on available information and determined that flow capacity for the 10-year storm event is exceeded by about 18 cfs adjacent to the project site and by about 35 cfs at Edinger Avenue. Flow capacity for the 25-year storm event is also exceeded at these locations but is slightly less than the 10-year flow exceedance. Street flow capacities and exceedence are based on the allowable depth of flooding in the street. The requirement for at least one lane free during a 10-year storm event is more stringent than the requirement for depth of flooding to be no higher than the top of the curb during a 25-year storm event. Even though street flow is much higher for the 50- and 100-year storm events, street flow capacities are not exceeded because the allowable flood depths permit substantially higher flow rates. Street flow adjacent to the project site is about 35 cfs for the 50-year storm event and 40 cfs for the 100-year storm event. Street flow in Gothard Street where it joins Edinger Avenue is about 56 cfs for the 50-year storm event and 64 cfs for the 100-year storm event.

Currently, the project site contributes over 23 percent of the Gothard Street street flow capacity for the 10- and 25-year storm events (which is about 25 cfs for the 10-year storm event, which had the highest exceedance capacity based on keeping one lane free in each direction) in the area adjacent to the project site (PHR 2008). As such, project site flows contribute to exceedance of the street capacity when combined with flow from other areas up-gradient and adjacent to Gothard Street. By the time runoff reaches down to Edinger Avenue, the project site contributes about 14 percent of the total street flow in Gothard for the 10- and 25-year storm events, and street flow capacity is still exceeded (PHR 2008).

Surface Water Quality

Storm water discharges from the urbanized areas in Orange County consist mainly of surface runoff from residential, commercial, and industrial developments. In addition, there are storm water discharges from agricultural land uses in the non-urbanized area of Orange County, including farming and animal operations.

Discharges from various areas within the City, drain directly or indirectly into urban streams, city lakes, bays, wetlands, estuaries, and the Pacific Ocean. The City owns, operates, and maintains a storm drainage system for the purpose of conveying storm runoff to reduce or eliminate flooding under peak storm flow

conditions. The storm drainage system begins with the streets and roads, and includes inlets, storm drains, open channels, pump stations, detention basins, and other appurtenances. While the primary purpose of the storm drain system is to reduce or eliminate flood hazards, the system carries both dry- and wet- weather urban runoff and the pollutants associated with runoff from urban land use and activities.

Several major channels owned and maintained by Orange County are also within the City. These channels receive runoff from areas within the City as well as substantial drainage areas in other upstream jurisdictions. It is estimated that runoff from the City makes up about 35-40 percent of the total dry and wet weather flows in these channels.

The discussion of water quality will be within the context of urban runoff because the project site is located within an urbanized area. Urban runoff (both dry and wet weather) discharges into storm drains and, in some cases, flows directly to creeks, rivers, lakes, and the ocean. Polluted runoff can have harmful effects on drinking water, recreational water, and wildlife.

Urban runoff pollutants include a wide array of environmental, chemical, and biological compounds from both point and nonpoint sources. In the urban environment, stormwater characteristics depend on site characteristics (e.g., land use, perviousness, pollution prevention, types and amounts of Best Management Practices [BMPs]), rain events (duration, amount of rainfall, intensity, and time between events), operations and maintenance practices (e.g., street sweeping), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition (EPA). The EPA estimates that short-term runoff from construction sites, without adequate erosion and runoff control measures, can contribute more sediment to receiving waters than that which is deposited by natural processes over a period of several decades. (USEPA 2007)

The quality of urban runoff in the City is typical of most urban areas and includes a variety of common contaminants (URMP 2005). These pollutants consist primarily of suspended sediments, fertilizers and pesticides, animal waste, and contaminants that are commonly associated with automobiles (e.g., petroleum compounds such as oil, grease, and hydrocarbons). In addition, urban stormwater often contains high levels of soluble and particulate heavy metals generated from traffic, industrial facilities, and occasionally, residential sources.

Runoff Quality

For purposes of this report, urban runoff for discussing water quality issues has been divided into two categories summarized as follows:

- Dry weather urban runoff, which occurs when there is no precipitation-generated runoff. Typical sources include landscape irrigation runoff; driveway and sidewalk washing; non-commercial vehicle washing; groundwater seepage; fire flow; potable water line operations and maintenance discharges; and permitted or illegal non storm water discharges. Irrigation runoff and washing processes generally contribute to dry weather urban runoff only during the dry season (typically from April through September.). It can be a significant source of bacteria and other constituents

that can be introduced through day-to-day urban activities as well as illicit discharges, dumping, or spills.

- Wet weather urban runoff refers collectively to non-point source discharges that result from precipitation events. Wet weather discharges includes all stormwater runoff. Stormwater discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events that often contain pollutants in quantities that could adversely affect water quality. Most urban stormwater discharges are considered diffuse sources and are regulated by the Stormwater NPDES Permit or Construction General Permit (see Regulatory Framework of this section).

The URMP has projected the annual dry weather runoff for the City of Huntington Beach at 2,800 acre-feet (AF). Furthermore, this plan estimates that the average annual wet weather runoff is about 8,000 AF. Based on these estimates, dry weather runoff, which is often considered inconsequential nuisance flows, can contribute over one-fourth of the total annual runoff.

Wet- and dry-weather runoff typically contains similar pollutants of concern. However, except for the initial stormwater runoff concentrations (first flush) following a long dry period between rainfall events, the concentrations of pollutants found in wet-weather flows are typically lower than those found in dry-weather flows because the larger wet-weather flows dilute the amount of pollutants in runoff waters. Storm events may dislodge or carry pollutants over different surfaces than the lower dry weather flows. Table 4.7-1 (Major Types of Pollutants in Runoff) lists typical runoff pollutants.

Generally, in the City, dry weather pollutants of concern include bacteria, pesticides, petroleum hydrocarbons, metals, and nutrients. Wet weather pollutants of concern include bacteria, trash and debris, suspended solids, metals, nutrients, and hydrocarbons/oil and grease.

Wet Weather

Wet-weather monitoring indicates that acute (1-hour maximum) California Toxics Rule criteria (CTR) (See Regulatory Environment) for copper was regularly exceeded in the East Garden Grove-Wintersburg Channel (45 percent of samples using the freshwater criteria and 100 percent using the salt water criteria) and Huntington Harbour (43 to 80 percent of samples) (CHB 2006a).

Zinc acute CTR was exceeded only occasionally (0 to 6 percent of samples for East Garden Grove-Wintersburg Channel and 0 to 10 percent of samples for Huntington Harbour) and nickel acute criteria was not exceeded (CHB 2006a). Copper chronic (4-day average) CTR criteria was exceeded in 75 to 100 percent of wet weather samples and nickel chronic criteria was exceeded in 0 to 50 percent of wet weather samples from Huntington Bay (CHB 2006a). No exceedance of chronic CTR criteria was measured for zinc (CHB 2006a).

Table 4.7-1 Major Types of Pollutants in Runoff

Pollutant	*Description*	*Wet or Dry Weather*
Bacteria	Sources of fecal contamination to surface waters include wastewater treatment plants, on-site septic systems, domestic and wild animal manure, and urban runoff.	Dry, Wet
Pesticides	These compounds can potentially be found in dry and wet weather runoff as a result of normal use (e.g., vehicle fueling, landscaping) and/or illegal dumping and discharge.	Dry, Wet
Petroleum Hydrocarbons	Elevated levels of oil and grease and petroleum hydrocarbons can be found in wet weather runoff, particularly from streets, roads, and other paved surfaces. They can also be found in dry weather runoff as a result of illegal dumping and discharge; and driveway/parking lot/street washing.	Dry, Wet
Metals	Metals such as copper, lead, zinc, arsenic, chromium and cadmium can potentially be found in dry weather runoff but typically at levels much lower than in wet weather runoff. These metals may be toxic to or bioaccumulate in some aquatic species. Sources of metals in stormwater may include automobiles, paints, preservatives, motor oil, and various urban activities including atmospheric deposition from industrial plants and other operations.	Dry, Wet
Nutrients	Nitrogen and phosphorus are present in dry weather runoff that originate, primarily from irrigation nuisance flows, on-site septic system leakage, and deposits of animal waste or other organic debris. During wet-weather conditions, nutrients can be mobilized in runoff from landscaping, leaks from sanitary sewers and septic systems, and runoff of atmospheric deposits, animal waste, and organic debris deposited on impervious surfaces. Nitrogen and phosphorus concentrations can be 2 to 3 times higher in wet weather runoff compared to dry weather runoff. Nutrient loads to surface waters can lead to heavy algae growth, eutrophication and low dissolved oxygen levels.	Dry, Wet
Trash and debris	Significant loads of trash, debris, and coarse solids can be found in wet weather urban runoff. Plant material can be a substantial component of coarse solids.	Wet
Suspended solids	Erosion and sediment transport contribute to suspended solids in runoff waters. Sediment is associated with effects on surface water quality including increased turbidity, effects on aquatic and benthic habitat, and reduction in capacity of impoundments. In addition, a number of other pollutants are often attached to and are carried by sediment particles.	Wet

Dry Weather

Dry-weather monitoring indicates that acute CTR copper criteria was exceeded 55 to 88 percent of samples in Huntington Harbour (CHB 2006a). No acute CTR criteria were exceeded for either nickel or zinc during dry-weather (CHB 2006a). No summary of dry-weather chronic criteria exceedance was available.

Mass Loading

Mass loading (total amount of pollutants transported in channel waters) within the East Garden Grove-Wintersburg Channel was approximately 4 tons of nitrate, 2 tons of phosphate, 35 tons of copper, 110 tons of zinc, and 21 tons of lead (CHB 2006b).

Natural Treatment System

The Natural Treatment System—East Garden Grove Wintersburg Channel Project for dry weather treatment using Talbert and Huntington Lakes—is a Santa Ana Regional Water Quality Control Board Approved Supplemental Environmental Project (SEP) (Huntington Beach 2007). This proposed project would divert approximately 3 million gallons per day of urban runoff from the large regional channel, the

East Garden Grove-Wintersburg Channel into the Huntington Beach Central Park for natural treatment and restoration of aquatic resources. The project would provide multiple benefits, including: the reduction in polluted runoff entering Bolsa Chica Wetlands, Huntington Harbour and Anaheim Bay; the restoration of aquatic resources in Central Park, including Talbert Lake, Huntington Lake, and Shipley Nature Center; enhancements to groundwater protection by reinforcing the sea-water intrusion barrier; and educational opportunities.

Water Quality Standards and Total Maximum Daily Loads

The project site is located within the Wintersburg Channel Planning Area for water quality. The Wintersburg Channel Planning Area is the portion of the East Garden Grove-Wintersburg Channel drainage area and receives upstream flow from the Slater Channel, as well as East Garden Grove Channel and Ocean View Channel. Within the City itself, these channels join to form the East Garden Grove-Wintersburg Channel. Further downstream, the Slater Channel enters into East Garden Grove-Wintersburg Channel. The channel then discharges into the Outer Bolsa Bay and then into Huntington Harbour, Anaheim Bay, and the Pacific Ocean. The East Garden Grove-Wintersburg Channel has a drainage area of approximately 5.3 square miles. Surface waters in the Outer Bolsa Bay, Huntington Harbour, and Anaheim Bays are all tidally influenced. The predominant land uses for this planning area are a mixture of single and multi-family residential, commercial, and industrial areas.

Designated beneficial uses for Bolsa Bay (no Hydrologic Unit identified) include: water and non-water contact recreation; commercial and sport fishing; preservation of biological habitats of special significance; wildlife habitat; rare, threatened, or endangered species; spawning, reproduction, and/or early development; shellfish harvesting; and marine habitat. Designated beneficial uses for Huntington Harbour (Hydrologic Unit 801.11) include: navigation; water and non-water contact recreation; commercial and sport fishing; wildlife habitat; rare, threatened, or endangered species; spawning, reproduction, and/or early development; and marine habitat. It is also listed as excepted from the municipal and domestic supply beneficial use. Anaheim Bay (Hydrologic Unit 801.11) designated beneficial uses include: navigation (Outer Bay); water and non-water contact recreation; preservation of biological habitats of special significance; wildlife habitat; rare, threatened, or endangered species; spawning, reproduction, and/or early development; and marine habitat. It is also listed as excepted from the municipal and domestic supply beneficial use. There are no site specific water quality objectives for total dissolved solids, hardness, chloride, total inorganic nitrogen, sulfate, or chemical oxygen demand.

Some receiving waters in the vicinity of the Project Area have been listed pursuant to Section 303(d) as not attaining water quality standards established by EPA. Anaheim Bay is listed as impaired (not meeting its designated beneficial uses) by dieldrin, nickel, PCBs, and sediment toxicity from unknown sources (SARWQCB 2006). Huntington Harbour is listed as impaired by chlordane, copper, lead, nickel, PCBs, and sediment toxicity from unknown sources, and by pathogens from urban runoff/storm sewers (SARWQCB 2006). No TMDLs have yet been developed for these impaired water bodies and the proposed completion date is 2019 (SARWQCB 2006).

No water quality objectives are applicable to the Murdy or East Garden Grove-Wintersburg Channels; however, discharges from these channels eventually reach Outer Bolsa Bay, Huntington Harbour, and

Anaheim Bay. At the Heil pump station (Murdy Channel), dry weather total copper and lead concentrations exceeded the 6-month median and daily maximum water quality objective for protection of marine aquatic life.[16] Total and dissolved nickel and zinc exceeded the 6-month median water quality objective, and total zinc exceeded the daily maximum water quality objective.[17] Other measured constituents of concern measured did not exceed water quality objectives.[18]

Groundwater

Orange County Groundwater Basin

The project site overlies the Coastal Plain of Orange County Groundwater Basin, Department of Water Resources Basin Number 8-1 (Orange County Basin) (DWR 2004). The Orange County Basin underlies a coastal alluvial plain in the northwestern portion of Orange County. It covers an area of approximately 350 square miles, bordered by the Coyote and Chino hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates at the Orange County line to the northwest, where the entire aquifer system is contiguous with the Central Basin of Los Angeles County (DWR 2004). Groundwater flow is unrestricted across the county line. The Newport-Inglewood fault zone forms the southwestern boundary of all but the shallow aquifers in the basin. The major surface water drainages overlying this groundwater basin are the San Gabriel and Santa Ana Rivers, as well as San Diego and Santiago Creeks, all of which have headwaters outside of the groundwater basin.

The aquifers comprising the Orange County Basin extend over 2,000 feet deep, and form a complex series of interconnected sand and gravel deposits (DWR 2004). The proportion of fine materials increases from the mountain areas towards the coast, resulting in areas of recharge (forebay area) where materials are coarser and more interconnected, and pressure areas where materials are finer and the aquifer becomes confined. In coastal and central portions of the Orange County Basin, these deposits are separated by extensive lower-permeability clay and silt deposits, known as aquitards. In the inland area, generally northeast of Interstate 5, the clay and silt deposits become thinner and more discontinuous, allowing for larger quantities of groundwater to flow more easily between shallow and deeper aquifers.

Historical groundwater flow was generally toward the ocean in the southwest, but pumping has greatly altered the hydraulic gradient and caused water levels to drop below sea level inland of the Newport-Inglewood fault zone. The present hydraulic gradient is primarily from recharge areas toward withdrawal areas. Salt water intrusion has migrated inland along the coastal regions and some water supplies have been contaminated in this area. A salt-water intrusion barrier in the Alamitos and Talbert Gaps has been successful in blocking this intrusion. Overall, groundwater storage capacity in the Orange County Basin is estimated at 38,000,000 AF.

The Orange County Basin is recharged primarily from local rainfall (greater in wet years), base flow from the Santa Ana River (much of which is actually recycled wastewater from treatment plants in Riverside

[16] URMP Appendix A: Table B: Water Quality Objectives. 2005.
[17] URMP Appendix A: Table B: Water Quality Objectives. 2005.
[18] URMP Appendix A: Table B: Water Quality Objectives. 2005.

and San Bernardino Counties), imported water percolated into the basin, and reclaimed wastewater directly recharged into the basin (UWMP 2005).

The Orange County Basin is not adjudicated, based on the Department of Water Resources' official departmental bulletins, California's Groundwater Bulletin 118 (updated 2003) and Bulletin 160, and the California Water Plan Update (2005); the Orange County groundwater basin is not specifically identified as a basin in an overdraft condition. However, the Orange County Water District (OCWD) considers the Orange County groundwater basin to be in an overdrafted condition. OCWD's Groundwater Management Plan summarizes the accumulated overdraft and water level elevations within the basin. OCWD estimates that the accumulated overdraft in June 2004 was approximately 400,000 AF (GMP 2004).

OCWD manages the City's groundwater basin and conducts a comprehensive water quality monitoring program. OCWD collects over 13,500 groundwater samples each year from over 800 wells. The water quality data collected from these wells are used to assess ambient conditions of the basin, monitor the effects of extraction, monitor the effectiveness of the seawater intrusion barriers, evaluate impacts from historic and current land use, address poor water quality areas, and also provide early warning of emerging contaminants of concern.

The project site is underlain by the SARWQCB's Orange Groundwater Management Zone (hydrologic units 801.13, 801.14, 845.61, and 845.63). This subbasin has the designated beneficial uses of municipal and domestic, agricultural, industrial service, and industrial process supplies (Basin Plan 2008). Specific groundwater quality objectives for the Orange Groundwater Management Zone are only identified for total dissolved solids (TDS $\leq$ 580 mg/L) and nitrate as nitrogen (Nitrate-N $\leq$ 3.4 mg/L). Otherwise, general narrative and numeric water quality objectives listed in the Basin Plan for the designated beneficial uses apply.

OCWD groundwater monitoring has assessed the following potential pollutants (UWMP 2005):

Nitrates. The Orange County groundwater basin has a number of constituents that are water quality concerns. Although nitrates are present throughout the basin, only a small number of areas exceed the drinking water regulatory maximum contaminant level (MCL). The Regional Water Quality Control Board's groundwater subbasin nitrate-nitrogen water quality objective is 3.4 mg/L (the MCL is 10 mg/L).

Total Dissolved Solids (TDS). OCWD has been proactive to combat increased salinity within the basin; however, many wells within OCWD, with the exception of any in the City of Huntington Beach, exceed the SARWQCB's water quality objective of 580 mg/L. TDS concentrations from groundwater pumped from the City of Huntington Beach wells averages about 336 mg/L of TDS.

Volatile Organic Compounds (VOC). OCWD has an aggressive VOC monitoring program. Because of the monitoring program, VOCs have been detected in a number of wells within OCWD. Several drinking water wells have been taken out of service, although not within the City.

Methyl Tertiary-Butyl Ether (MTBE). Drinking water wells within OCWD are tested for methyl tertiary-butyl ether, more commonly known as MTBE. The health effects of MTBE are uncertain; however, the U.S. Environmental Protection Agency currently classifies MTBE as a possible human carcinogen. Two wells within OCWD, but not within the City, have been taken out of service because of MTBE contamination.

N-nitrosodimethylamine (NDMA). Ultraviolet light treatment was added to the process for recycled water treatment and use at the Talbert Barrier to reduce the occurrence of NDMA, a known carcinogen, in injection waters. The City's wells have been tested for NDMA and have not had measured concentrations that exceeded the action level.

Emerging Contaminants. Pharmaceuticals, personal care products, and endocrine disruptors are considered emerging environmental contaminants. There are water quality concerns associated with these emerging contaminants because of their wide spread use among the population and their impact on human health because of exposure to low doses over long periods of time. OCWD is aware of these contaminants and is working with California Department of Health and Safety (DHS) to track and report their concentrations in the groundwater.

Colored Groundwater. The OCWD 2004 Groundwater Management Plan reports nine wells have been drilled in the colored zone. Since 2004, an additional well (Well No. 8) was put online and is used to irrigate Central Park. These 10 operating wells aid in reducing the groundwater level of the colored aquifer and thus minimize the potential for upward vertical migration of colored water into the clear zones.

However, overall, groundwater supplies do not exceed drinking water regulatory requirements (maximum contaminant level or MCL) (CHB 2007).

Water Supply

Water at the proposed project site would be served by the City and derived from a combination of local groundwater and imported water. Historically, the City has used groundwater more than imported water to satisfy water system demands. Actual percentages of groundwater and imported water vary somewhat on an annual basis depending on the extent to which these programs are implemented. Currently, the City receives approximately 64 percent of its water supply from groundwater wells accessing the Orange County Basin and approximately 36 percent of its supply from imported water from MWDOC (WUS 2008). To ensure a lasting supply for the region, the basin is managed by the OCWD, and the City pays a replenishment assessment to the district for each acre-foot of water taken from the groundwater basin. Allowable Basin Pumping Percentage (BPP) for each purveyor is typically set by OCWD on an annual basis.

4.7.2 Regulatory Framework

Federal

Clean Water Act (CWA)

The Clean Water Act (CWA) was designed to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The EPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) Program, to the SWRCB and RWQCB. While the NPDES system is administered by federal and State programs, the local authority provides the specific details with which projects must comply. Thus, the NPDES system is described in detail under the Local regulations.

Total Maximum Daily Loads (TMDLs)

The CWA Section 303(d) established the Total Maximum Daily Load (TMDL) Program. The purpose of the TMDL program is for states to identify streams, lakes, and coastal waters that do not meet certain water quality standards and are not expected to meet standards solely through technology-based controls of point source discharges. For such watersheds, a TMDL for the constituent(s) for which the water body is impaired must be determined.

The TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still achieve the target water quality objective. All sources of the constituent(s) must be identified and loads quantified. Load reductions are determined and then allocated among the sources. Finally, an implementation plan is prepared to achieve the load reductions.

Anaheim Bay and Huntington Harbour are water bodies in the City listed on the 2006 California 303(d) list (see Environmental Settings Section). To date, no TMDLs have been established for receiving water bodies in the City but the expected completion date is 2019 for all listed constituents.

Floodplain Development

The Federal Emergency Management Agency (FEMA) is responsible for determining flood elevations and floodplain boundaries based on Army Corps of Engineers (Corps) studies and other FEMA approved floodplain studies associated with a Letter of Map Revision (LOMR). FEMA is also responsible for distributing the Flood Insurance Rate Maps (FIRMs), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas, including the 100-year floodplain.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within the flood hazard areas depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR) which enables FEMA to require municipalities that participate in the National Flood Insurance Program (NFIP) to adopt certain flood hazard reduction standards for construction and development in 100-year flood plains.

Section 60.3(c)(2) of the NFIP regulations requires that the lowest occupied floor of a residential structure be elevated to, or above, the 100-year flood elevation (the base flood elevation). Section 60.3(c)(3) adds that nonresidential or commercial structures can be either elevated or dry flood-proofed to, or above, the 100 year flood elevation.

State

Responsibility for the protection of water quality in California resides with the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The Santa Ana Regional Water Quality Control Board (SARWQCB) implements a number of federal and State laws, the most important of which are the *State Porter-Cologne Water Quality Control Act* and the *Federal Clean Water Act*.

All projects resulting in discharges, including the proposed project, whether to land or water, are required to obtain approval of Waste Discharge Requirements (WDRs) by the RWQCBs. Land and groundwater-related WDRs (i.e., non-NPDES WDRs) regulate discharges of privately or publicly treated domestic wastewater and process and wash-down wastewater. WDRs for discharges to surface waters also serve as NPDES permits, which are further described below.

Porter-Cologne Water Quality Control Act

The State of California's *Porter-Cologne Water Quality Control Act* (Division 7 of the California Water Code) provides the basis for water quality regulation within California, including the California Toxics Rule (CTR), Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP), Inland Surface Water Quality Standards, California Urban Water Management Act, and NPDES permits. The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the RWQCBs conduct planning, permitting, and enforcement activities. The *Porter-Cologne Water Quality Control Act* authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface and groundwater) and directs the RWQCBs to develop regional Basin Plans. Section 13170 of the California Water Code also authorizes the SWRCB to adopt water quality control plans on its own initiative.

Waste Discharge Requirements

The water quality objectives are achieved primarily through the establishment and enforcement of waste discharge requirements. All dischargers of waste to waters of the State are subject to regulation under the *Porter-Cologne Act*. This includes both point and diffuse source dischargers. All current and proposed discharges to land must be regulated under Waste Discharge Requirements (WDRs), waivers of WDRs, a basin plan prohibition, or some combination of these administrative tools. Discharges of waste directly to State waters would be subject to an individual NPDES permit, which also serves as a WDR.

The RWQCBs have primary responsibility for issuing WDRs. The RWQCBs may issue individual WDRs to cover individual discharges or general WDRs to cover a category of discharges. WDRs may include effluent limitations or other requirements that are designed to implement applicable water quality control plans, including designated beneficial uses and the water quality objectives established to protect those uses and prevent the creation of nuisance conditions.

National Pollutant Discharge Elimination System (NPDES)

The SWRCB and RWQCBs also implement, monitor, and enforce the NPDES storm water permitting and waste discharge requirements within their jurisdiction. In general, the regulations require all communities with populations over 50,000 to develop programs for reducing pollutants carried by stormwater runoff into waters of the United States. The SWRCB and RWQCBs also develop and implement state or regional general permits regulating certain types of discharges. These permits serve as the mechanism for enforcement of the program.

NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit)

The SWRCB permits all regulated construction activities under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 98-08-DWQ (1999) (NPDES No. CAS000002). In accordance with NPDES Phase I regulations, to minimize the potential effects of construction runoff on receiving water quality, California requires that any construction activity affecting 5 acres or more must obtain coverage under the Construction General Permit. Implementation of NPDES Phase II expanded this requirement to include construction activities disturbing 1 acre or more.

The Construction General Permit requires projects that disturb 1 or more acres obtain coverage under the Construction General Permit. This includes submittal of a Notice of Intent (NOI) to comply with permit conditions and the preparation and implementation of a storm water pollution prevention plan (SWPPP), which must be prepared before construction and coverage under the Construction General Permit begins. Components of SWPPPs typically include specifications for BMPs to be implemented during project construction for the purpose of minimizing the discharge of pollutants in storm water from the construction area. In addition, a SWPPP includes measures to minimize erosion from and stabilization of disturbed surfaces, which is also incorporated into a Water Quality Management Plan (WQMP) in accordance with the Orange County Municipal Stormwater NPDES Permit, after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities during construction. Because the proposed project would disturb more than 1 acre, construction would be subject to the Construction General Permit.

Local/ Regional

Santa Ana River Basin Water Quality Control Plan (Basin Plan)

The Santa Ana RWQCB (Region 8) has jurisdiction over the Santa Ana River Basin. The Santa Ana RWQCB (SARWQCB) is required by law to develop, adopt, and implement a Water Quality Control

Plan for the entire region. The principal elements of the Water Quality Control Plan are a statement of beneficial water uses that the SARWQCB will protect; water quality objectives needed to protect the designated beneficial water uses; and strategies and time schedules for achieving the water quality objectives. The water quality objectives are achieved primarily through the establishment and enforcement of waste discharge requirements (WDRs). Both beneficial uses and water quality objectives comprise the relevant water quality standards.

The Santa Ana Water Quality Control Plan (Basin Plan) specifically: (1) designates beneficial uses for surface and ground waters; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy; and (3) describes implementation programs to protect all waters in the region. In cases where the Basin Plan does not contain a criteria for a particular pollutant, other criteria are used to establish a water quality objective. These may be applied from SWRCB documents (e.g., the Inland Surface Waters Plan and the Pollutant Policy Document) or from water quality criteria developed under Section 304(a) of the Clean Water Act (e.g., California Toxics Rule).

The SARWQCB has set water quality objectives for all surface waters in the region. Chemical constituents are regulated depending upon the beneficial use of the water body. Water quality objectives are also set for groundwater and enclosed bays and estuaries. The proposed project would be subject to the requirements of the Basin Plan.

General Waste Discharge Requirements for Discharges to Surface Waters That Pose An Insignificant (De Minimus) Threat to Water Quality (De Minimus Threat General Permit)

Low threat discharges are regulated under Order No. R8-2006-0004 Amending Order No. R8-2003-0061, NPDES No. CAG998001 as amended by Order No. R8-2005-0041, General Waste Discharge Requirements for Discharges to Surface Waters That Pose An Insignificant (De Minimus) Threat to Water Quality. De minimus threat discharges are not expected to cause toxicity, therefore, no toxicity limits are specified in this general permit. Construction dewatering wastes (except stormwater) are regulated as de minimus threat discharges to surface waters that are subject to the terms and conditions of this Order and all dischargers must comply with the effluent limitations specified in the Revised Discharge Specifications A.1.a and A.1.b and monitoring and reporting program of this Order. Development of the proposed project would require groundwater dewatering during construction and/or operation because the excavation depth would be more than 14 feet below the existing ground surface where groundwater was encountered in a test bore at 8.5 feet below the existing ground surface. Therefore, it would be subject to the requirements of this DeMinimus Threat General Permit for construction and either an individual WDR/NPDES permit for operation or this DeMinimus Threat General Permit.

Orange County Municipal Stormwater NPDES Permit (Stormwater NPDES Permit)

Stormwater discharges from the City are regulated under the California Regional Water Quality Control Board Santa Ana Region Waste Discharge Requirements for the County of Orange, Orange County

Flood Control District and The Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County (Order No. R8-2002-0010, NPDES No. CAS618030) (Stormwater *NPDES* Permit).

The co-permittees of this Stormwater NPDES Permit are responsible for the management of storm drain systems within their jurisdictions and required to: implement management programs, monitoring programs, implementation plans and all BMPs outlined in the Drainage Area Master Plan (DAMP) within each respective jurisdiction, and take any other actions as may be necessary to meet the MEP (Maximum Extent Practicable) standard.

Receiving water limitations are identified in the Stormwater NPDES Permit and include requirements that:

- Discharges from the MS4s shall not cause or contribute to exceedances of receiving water quality standards (designated beneficial uses and water quality objectives) for surface waters or groundwaters, and
- The DAMP and its components shall be designed to achieve compliance with receiving water limitations.

Provisions for compliance inspection are incorporated in the Stormwater NPDES Permit and include requirements for construction site inspections, including review of erosion control and BMP implementation plans and effectiveness. Each co-permittee is also required to enforce its ordinances and permits at all construction sites.

Requirements for new development and significant re-development include the establishment of a mechanism to ensure (prior to issuance of any local permits or other approvals) that all construction sites that are required to obtain coverage under the State's Construction General Permit have filed with the State Board a NOI to be covered by the relevant general permit and prepare and implement a SWPPP.

The Stormwater NPDES Permit also requires preparation and implementation of a water quality management plan (WQMP) for urban runoff for new development and significant redevelopment that defines how short and long-term impacts on receiving water quality from new developments and re-developments are minimized. The permittees are required to prepare and implement a WQMP for urban runoff for priority projects. The proposed project would be considered a priority project requiring a WQMP because it would include more than ten units of residential use.

Minimum treatment control BMPs must either be sized to comply with either the volume-based or flow-based numeric sizing criteria or be deemed by the Principal Permittee to provide equivalent or superior treatment, either on a site basis or a watershed basis. Any structural infiltration BMPs must also meet the minimum requirement to not cause or contribute to an exceedance of groundwater water quality objectives or cause nuisance pollution and shall be implemented to protect groundwater quality.

This Stormwater NPDES Permit also includes a Monitoring and Reporting Program for the County of Orange, Orange County Flood Control District, and Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff area (Order No. R8-2002-0010 NPDES No. CAS618030).

The current Stormwater NPDES Permit is currently under review for renewal. Therefore, the proposed project could be subject to new requirements included in the reissued Stormwater NPDES Permit. The current draft includes similar requirements for control of pollutants in stormwater runoff as the existing Stormwater NPDES Permit; however, enforcement provisions are stronger.

Orange County Drainage Area Management Plan (DAMP)

The purpose of the DAMP was to satisfy NPDES permit conditions for creating and implementing an Urban Runoff Management Program (URMP) to reduce pollutant discharges to the maximum extent practicable (MEP) for protection of receiving waterbody water quality and support of designated beneficial uses. The DAMP contains guidance on both structural and nonstructural BMPs for meeting these goals.

City of Huntington Beach Local Implementation Plan (LIP)

The current specific water pollution control program elements are documented in the DAMP and corresponding City of Huntington Beach Stormwater NPDES Permit Local Implementation Plan of 2003 (City of Huntington Beach LIP). The City has developed the City of Huntington Beach LIP using the DAMP as its basis. The City of Huntington Beach LIP provides a written account of activities that the City has undertaken, or is undertaking, to meet the requirements of the Third Term NPDES Permit and a means of displaying a meaningful improvement in water quality. As with the DAMP, the City of Huntington Beach LIP proposes a wide range of continuing and enhanced BMPs and control techniques that will be implemented and reported on as part of the Third Term Permit reports.

The City of Huntington Beach LIP has also incorporated the model construction program described in the DAMP. The construction program includes requirements, guidelines, and methods that construction site owners, developers, contractors and other responsible parties must use for pollution prevention to protect water quality from construction discharges. Regardless of size or priority, all construction projects are required to implement BMPs to prevent runoff and discharges into the storm drain system or water bodies. At a minimum, all construction projects must include erosion and sediment controls, as well as waste and materials management controls. The City of Huntington Beach LIP designates the construction-specific BMPs that the City has determined acceptable for use within the City's jurisdiction.

Citywide Urban Runoff Management Plan (URMP)

The Citywide Urban Runoff Management Plan (URMP) provides a broad framework for managing the quantity and quality of all urban runoff that reaches receiving waters from the land surfaces and through the storm drain system within the City. The Water Quality Element of the URMP focuses primarily on managing runoff quality, while the Drainage Element addresses flood hazards and inconveniences. The URMP identifies potential common solutions that can address both water quality and quantity concerns.

Section 3: Water Quality Element

The Water Quality Element provides a basis for implementing a comprehensive program for improving water quality through a combination of methods to reduce the level of urban runoff and pollutants

emanating from private as well as public property and thus enhancing the quality of water discharged from the municipal storm drain system within the City.

Water Quality Management Plan

During the project review, approval and permitting process, the City requires all new development and significant redevelopment to address the quantity and quality of storm water runoff from the completed development. A project-specific Water Quality Management Plan (WQMP) describing how the project will address runoff is required for all projects listed under the City's "Priority Project Category".

The WQMP describes how the project will meet the following requirements:

- Incorporate and implement all applicable Source Control BMPs
- Consider the implementation of Site Design BMPs (e.g., pervious pavement, bioretention), and document those BMPs included and those not included; and
- Either implement Treatment Control BMPs or participate in or contribute to an acceptable regional or watershed management program.

The City has general/standard conditions of approval to protect receiving water quality from short- and long-term impacts of new development and significant redevelopment. Prior to issuance of any grading or building permit for projects that disturb soil of one or more acres, the Applicant shall demonstrate, by providing a copy of the Notice of Intent submitted to the SWRCB and a copy of the subsequent issuance of a Waste Discharge Identification number, that coverage has been obtained under the Construction General Permit. Projects subject to this requirement shall also prepare, submit, and implement a Stormwater Pollution Prevention Plan, including erosion control measures. This also includes the requirement that the Applicant demonstrate that all structural and non-structural BMPs described in the WQMP have been installed and implemented in accordance with approved plans and specifications prior to close-out of a grading or building permit and/or issuance of a Certificate of Use or Occupancy.

Section 4: Drainage Element

The Drainage Element of the URMP incorporates a city-based Master Plan of Drainage (MPD) that is a comprehensive drainage study of the community, which identifies and creates an inventory of existing storm drain facilities, identifies those areas where system elements do not meet the latest goals established by the City, ranks the severity of the difference between existing capacity and the capacity needed to achieve those goals, prepares planning level cost opinions for system upgrades, and recommends system improvements to initiate the corrections.

City of Huntington Beach Municipal Code

In order to comply with NPDES permit requirements, the City of Huntington Beach has codified requirements in their municipal code. The following sections of the City's municipal code would be applicable to the proposed project:

- Chapter 14.25 (Storm Water and Urban Runoff Management)
- Chapter 14.48 (Drainage)

- Chapter 14.52 (Water Efficient Landscape Requirement)
- Chapter 17.05 (Grading and Excavation Code)

City of Huntington Beach General Plan

The following goals, objectives, and policies within the Huntington Beach General Plan are applicable to hydrology and water quality.

Utilities Element

Goal U2 Provide a wastewater collection and treatment system which is able to support permitted land uses; upgrade existing deficient systems; and pursue funding sources to reduce costs of wastewater service provisions in the City.

Objective U 2.1 Ensure the city provides and maintains a wastewater collection and treatment facilities system which adequately conveys and treats wastewater generated by existing and planned development at maximized cost efficiency.

Policy U 2.1.6 Require that sewer capacity is available before building permits are issued for new development.

Goal U3 Provide a flood control system which is able to support the permitted land uses while preserving the public safety; upgrade existing deficient systems; and pursue funding sources to reduce the costs of flood control provisions in the City.

Objective U3.1 Ensure that adequate storm drain and flood control facilities are provided and properly maintained in order to protect life and property from flood hazards.

Policy U 3.1.6 During development review, determine if any structures meant for human habitation are constructed within the 100-year flood plain. If necessary, evaluate the structures' flood safety, and require remedial actions.

Objective U 3.2 Ensure the costs of infrastructure improvements to the storm drain and control system are borne by those who benefit.

Policy U 3.2.1 Require improvements to the existing storm drain and flood control facilities necessitated by new development be borne by the new development benefiting from the improvements; either through the payment of fees; or by the actual construction of the improvements in accordance with State Nexus Legislation.

Objective U 3.3 Ensure that storm drain facilities (channels and outputs) do not generate significant adverse impacts on the environment in which the facilities traverse or empty.

Policy U 3.3.1 Evaluate any existing environmental degradation or potential degradation from current or planned storm drain and flood control facilities in wetlands or other sensitive environments.

Policy U 3.3.2 Where feasible, utilize natural overland flows, open channels, and swale routings as preferred alignments for components of drainage systems.

Policy U 3.3.3 Require that new developments employ the most efficient drainage technology to control drainage and minimize damage to environmentally sensitive areas.

4.7.3 Project Impacts and Mitigation

Analytic Method

The proposed project is a mixed-use residential and commercial development that would consist of four levels of housing/retail establishments over three levels of parking (two levels of parking below grade and one level of parking above grade). The probable depth of the subterranean parking level is anticipated to be between approximately 14 and 25 feet below the existing ground surface, including footing depth. The retail component would be located on the ground level adjacent to the one level of above grade parking and the residential component would be above the retail and parking. A mezzanine level would also be located on the roof. Overall, the project would be six stories in height and consist of approximately 440 residential units and up to 10,000 square feet (sf) of retail uses. As a condition of project approval, the proposed project would be required, at a minimum, to construct the portion of the MPD-required new storm drain pipeline along the east side of Gothard Street from Center Avenue to Edinger Avenue.

Storm Flow

Actual existing street flow capacity and area runoff is not provided for in the MPD, therefore, the Orange County Flood Control District-approved AES program[19] was used to estimate potential project site peak flow rates and street flow design capacity in the Preliminary Hydrology Report (PBS&J 2008). Table 4.7-2 (Street Flow Design Capacity for Design Storm Events) lists the estimated Gothard Street street flow capacity for the design storm events summarized from the PHR and WUS. These values are estimates based on typical road design characteristics used for the MPD model, as specified in the MPD,

[19] Engineering Hydrologic Software Solutions. Advanced Engineering Softwater (AES) RATSCx 2006 v. 13.0 for Orange County. (approved for use in Orange County; based on the Orange County Hydrology Manual, 1986)

and estimated slopes as describe in the Preliminary Hydrology Report using Digital Elevation Models, as-built drawings, and the Preliminary Grading Plan dated June 4, 2008.

Table 4.7-2 Street Flow Design Capacity for Design Storm Events

Gothard Street Location	*Slope[c] (ft/ft)*	*10-year[a] (cfs)*	*25-year[a] (cfs)*	*50-year[b] (ft depth)*	*100-year[b] (ft depth)*
McFadden to Center Ave	0.00158	5.47	15.40	0.87	1.17
Southwest Corner of the Project Site	0.0017	5.70	16.04	0.87	1.17
Between the Southwest Corner of the Project Site and Edinger Ave	0.0030	7.57	21.31	0.87	1.17
At Edinger Avenue	0.0016	5.53	15.56	0.87	1.17

SOURCE: PHR PBS&J, 2008a, WUS PBS&J 2008b

a Determined using AES program calculator based on slope, cross-section, and hydraulic coefficients. Street flow design flow is based on best available information for Gothard Street configurations within the study area and does not include as-built slope information for the majority of the study area. A typical secondary arterial highway cross-section was used to describe Gothard Street (80-foot width, including parkway).

b Cannot be determined using AES program calculator based on slope, cross-section, and hydraulic coefficients; actual exceedance evaluated based on flow depth in detailed model output. The 10-year storm event must leave one lane (about 12 feet) free of flooding; the 25-year runoff cannot exceed a flow depth higher than the curb height; the 50-year flow depth cannot exceed a depth 0.2 feet above the curb height; the 100-year flow depth cannot exceed 0.5 feet above the curb.

c Slope based on best available information as noted in the Preliminary Hydrology Report. Higher slope for section 55 to 60 results in higher capacity.

For the PHR, in accordance with the MPD, the project area soils, including the project site, are classified as Hydrologic Group C, which means that the pervious area soils have a moderately high runoff rate and somewhat poor infiltration.[20] The existing and proposed project impervious area on the project site was assumed to be about 90 percent. For the analysis, the proposed project was not expected to alter the amount of impervious surfaces on the project site, but the onsite flow path length and slope increased, based on the Preliminary Grading Plan dated June 4, 2008.

Two scenarios, existing conditions and build out of the General Plan, were evaluated in the PHR in order to adequately size pipes and improvements and to determine maximum capacity criteria. This is because parcels to the north of the project site are currently vacant but could be developed for residential, commercial, or industrial land uses; the future increase in runoff rates from these properties when developed could contribute to greater storm drain system capacity exceedance for the proposed project. These results are listed in the PHR and WUS, however, in accordance with CEQA requirements, only the existing conditions scenario is used in this environmental review impacts analysis.

Table 4.7-3 (Estimated Peak Flow Rates in Gothard Street) lists the PHR modeled peak flow rates in Gothard Street near the project site for the design storm events and the project site contributions to peak flow rates, as summarized from the PHR and WUS.

[20] Highest infiltration and lowest runoff is associated with Hydrologic Group A, and lowest infiltration and highest runoff is associated with soil Hydrologic Group D

Table 4.7-3 Estimated Peak Flow Rates in Gothard Street

Location	10-year		25-year		50-year		100-year	
	Existing Site (cfs)	Proposed Project (cfs)	Existing Site (cfs)	Proposed Project (cfs)	Existing Site (cfs)	Proposed ProjecT (cfs)	Existing Site (cfs)	Proposed Project (cfs)
Southwest Corner of Project Site	24.9	24.9	30.9	30.9	35.4	35.4	40.5	40.5
Project Site Contribution[a]	*5.7*	*5.7*	*7.0*	*7.0*	*7.9*	*7.9*	*8.6*	*8.6*
Between the Project Site and Edinger Ave	30.4	30.8	37.2	37.6	42.6	42.8	48.5	48.5
At Edinger Avenue	40.6	40.6	48.9	50.0	56.0	57.1	63.8	65.2

SOURCE: PHR PBS&J, 2008a, WUS PBS&J 2008b,

a Project contribution is based on the proportion of peak street flow contributed by the project site to determine the proportion of exceedance that the project site contributes to.

Water Quality

Potential water quality impacts are qualitatively assessed based on the Preliminary Water Quality Management Plan dated June 6, 2008 for the proposed project and estimated changes in runoff and project site characteristics.

Thresholds of Significance

The following thresholds of significance are based on Appendix G of the 2008 CEQA Guidelines. For purposes of this EIR, implementation of the proposed project may have a significant adverse impact if it would do any of the following:

- Violate any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater 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)
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Utilities)

The Stormwater NPDES Permit also requires that the following potential impacts shall be considered during CEQA review:

1. Potential impact of project construction on storm water runoff;
2. Potential impact of project's post-construction activity on storm water runoff;
3. Potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas;
4. Potential for discharge of storm water to affect the beneficial uses of the receiving waters;
5. Potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm; and,
6. Potential for significant increases in erosion of the project site or surrounding areas.
7. Under the Utilities Service Systems section: would the project include a new or retrofitted storm water treatment control Best Management Practice (BMP), (e.g. water quality treatment basin, constructed treatment wetlands), the operation of which could result in significant environmental effects (e.g. increased vectors and odors)?

Effects Not Found to Be Significant

Threshold	Would the project 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 dams?

The project site is not located in any dam inundation area as identified in the City of Huntington Beach General Plan, Hazards Element or the Prado Dam Inundation Area, as identified in the Orange County General Plan, Figure 2-19 (County of Orange 1987). Consequently people and structures would not be subject to dam inundation failure risks. Therefore, ***no impact*** would occur as a result of dam failure, and no further analysis is required in this EIR.

The nearest large watercourse is the Santa Ana River, located over 3 miles from the project site. Levees constructed along the Santa Ana River also minimize the flood risks to areas within the project site. In 1997 and through 2002, FEMA revised the flood maps for areas within the City of Huntington Beach, in recognition of the improvements made to the Santa Ana River Channel. These revisions reduced the anticipated flood level in the City. Additionally, the channelization of the Santa Ana River from Weir Canyon Road to the Pacific Ocean has improved the capacity of the channel sufficiently such that the channel can convey the water volume associated with a 190-year flood event. Therefore, there would be

no impact associated with failure of the Santa Ana River levee system and no further analysis of this system is required in this EIR.

The nearest channelized water course within the project vicinity is the Murdy Channel. This channel is below-grade (not confined in a levee system) up-gradient and adjacent to the project site. Therefore, there would be ***no impact*** from levee failure of the Murdy Channel.

The East Garden Grove-Wintersburg Channel is located down gradient of the project site but is an at-grade structure (confined within levees). The East Garden Grove-Wintersburg Channel levees have not been certified by FEMA, and therefore, must be considered subject to levee failure. Revised FEMA maps (February 18, 2004) show the area that would be inundated during a 100-year flood event (1 percent chance of occurring in any given year) including levee failure. Therefore, the potential flood hazards associated with failure of the East Garden Grove-Wintersburg Channel levee system is addressed in the impacts discussion, below, for thresholds concerning the 100-year flood hazard areas.

Flooding may also occur as a result of an exceedence in Gothard Street design flow capacity. Exceedance of Gothard Street design flow capacity is addressed in the impact discussion, below, for thresholds related to storm drainage system capacity exceedance.

Threshold	Would the project 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)?

According to the City's 2005 Urban Water Management Plan, groundwater wells currently supply 64 percent of the City's water, while the remaining 36 percent is imported (WUS 2008). The project site largely consists of impervious surfaces at this time, and the amount of impervious surfaces would not change substantially with implementation of the proposed project. The project site is neither a designated groundwater recharge area nor does the project site serve as a primary source of groundwater recharge. The City of Huntington Beach has two recharge facilities, the Talbert and Alamitos Barriers; neither of which will be impacted by the proposed project. Therefore, the potential for a reduction in groundwater recharge would be negligible and would not affect City groundwater wells. ***No impact*** would result, and no further analysis is necessary in the EIR.

The proposed project would not implement any new water supply wells or permanent groundwater dewatering system. Therefore, operation of the proposed project would not affect the local groundwater table such that there would be a reduction in groundwater levels or production rates for pre-existing nearby wells and there would be ***no impact*** from operation of the proposed project on the local groundwater table and no further analysis is necessary in the EIR.

Construction of the proposed project would, however, require dewatering for development of below-grade parking structures and underground utilities in the eastern portion of the project site and

potentially in other areas. Potential impacts are addressed in the impacts discussion, below, for construction dewatering. Additionally, although it is not currently planned, the proposed project could implement a permanent groundwater dewatering system instead of dry flood-proofing all underground structures. Potential impacts of a permanent groundwater dewatering system are addressed in the impacts discussion below.

Threshold	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, in a manner that would result in substantial erosion or siltation on or off site? (Including additional NPDES criteria 1, 2, 5, and 6)

The proposed project would not result in off-site erosion hazards. Discharge from the project site is to a lined drainage system including the City streets, underground storm drain systems, and the lined Murdy and East Garden Grove-Wintersburg Channels. Therefore, there would be ***no impact*** of the project site on off-site erosion and no further analysis is necessary in this EIR.

Impacts associated with on-site erosion and siltation hazards are addressed in the Impacts and Mitigation Measures discussion below.

Threshold	Would the project otherwise substantially degrade water quality?

Infiltration BMPs are not proposed or included as Mitigation Measures for the proposed project and the amount of pervious surfaces available for infiltration of stormwater runoff would not be substantially altered; therefore, groundwater quality would not be affected by implementation of the proposed project. Furthermore, the proposed project land use is similar to existing conditions and there would not be substantial additional sources of pollutants that could infiltrate to groundwater. Consequently, implementation of the proposed project would not otherwise degrade water quality and there would be ***no impact***.

All other potential water quality degradation impacts are discussed under the pertinent thresholds and evaluated, as appropriate, under the appropriate threshold discussion either in this section or in the impacts discussion below.

Threshold	Would the project expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?

Tsunamis are large sea waves generated by submarine earthquakes, or similar large-scale, short-duration phenomena, such as volcanic eruptions, that can cause considerable damage to low-lying coastal areas. Seiches are waves, also caused by large-scale, short-duration phenomena, that result from the oscillation of confined bodies of water (such as reservoirs and lakes) that also may damage low-lying adjacent areas, although not as severely as a tsunami. The project site is not located within a moderate Tsunami Run-up Area as delineated on Figure EH-8 in the City of Huntington General Plan, Hazards Element. Therefore, there would be no risk associated with tsunamis.

The closest enclosed bodies of water that could result in earthquake-induced seiches are Huntington Lake, Talbert Lake, and Sully Miller Lake. All of these lakes are more than one mile from and topographically down-gradient of the project site. Therefore, potential seiche activity in these lakes would not be expected to reach the project site and there would be no risk from seiches.

Mudflow hazards typically occur where unstable hillslopes are located above gradient or where site soils are unstable and subject to liquefaction, and when substantial rainfall saturates soils causing failure. The project site is not located near steep unstable hillslopes susceptible to mudslide. Except for adjacent berms, the area is relatively flat and the adjacent berms are engineered fill material. There would be no substantial mass earth movement during saturated soil conditions. Therefore, the proposed project would not result in a significant loss, injury, or death by mudflow.

In summary, there would be ***no impact*** that would expose people or structures at the project site to a significant risk of loss, injury, or death involving inundation by a seiche or tsunami, and no further analysis of these is required in this EIR.

Impacts and Mitigation Measures

Threshold	Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality? (Including additional NPDES criteria 1 through 4 and 6)

Impact 4.7-1 **Construction and operation of the proposed project could increase stormwater pollutant loads or concentrations, which could result in a violation of waste discharge requirements or water quality standards. This is a *potentially significant* impact.**

Pollutants in urban runoff can impact the beneficial uses of the receiving waters and cause or threaten to cause a condition of pollution or nuisance. While the proposed project would not result in any point-source discharge subject to an individual permit (WDR), it would be subject to the Construction General Permit, Stormwater NPDES Permit, and potentially the De Minimus Threat General Permit for construction dewatering. Additionally, sanitary waste discharges would be subject to the individual NPDES permits for the Orange County Sanitary District Reclamation Plant No. 1 and Treatment Plant No. 2.

Construction Phase

The proposed project would include construction activities, such as clearing and grubbing, pavement removal and replacement, excavation and trenching for foundations and utilities, soil compaction, cut and fill activities, and grading, all of which would temporarily disturb soils. Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in sediment transport from the site. Erosion and sedimentation affects water quality through interference with photosynthesis, oxygen exchange, and the respiration, growth, and reproduction of aquatic species. Additionally, other pollutants, such as nutrients,

trace metals, and hydrocarbons, can attach to sediment and be transported downstream, which could contribute to degradation of water quality.

The delivery, handling, and storage of construction materials and wastes, as well as the use of construction equipment, could also introduce a risk for stormwater contamination that could impact water quality. Spills or leaks from heavy equipment and machinery can result in oil and grease contamination, and some hydrocarbon compound pollution associated with oil and grease can be toxic to aquatic organisms at low concentrations. Staging areas or building sites can also be the source of pollution due to the use of paints, solvents, cleaning agents, and metals during construction. Impacts associated with metals in stormwater include toxicity to aquatic organisms, such as bioaccumulation, and the potential contamination of drinking supplies. Pesticide use (including herbicides, fungicides) associated with site preparation work (as opposed to pesticide use for landscaping) is another potential source of stormwater contamination. Pesticide impacts to water quality include toxicity to aquatic species and bioaccumulation in larger species. Larger pollutants, such as trash, debris, and organic matter, are additional pollutants that could be associated with construction activities. Impacts include health hazards and aquatic ecosystem damage associated with bacteria, viruses, and vectors. Construction impacts on water quality are potentially significant and could lead to exceedance of standards or criteria.

All construction activities, including the adjacent storm drain system improvement, and installation and realignment of utilities, would all be subject to existing regulatory requirements:

> As required by the Stormwater NPDES Permit and associated DAMP, Construction General Permit, and codified in Municipal Code 14.25.040 (New Development and Significant Redevelopment), prior to the issuance of a grading or building permit, the project Applicant shall file a NOI with the State of California to comply with the requirements of the General Construction Permit. This will include the preparation of a SWPPP incorporating BMPs for construction-related control of erosion and sedimentation contained in stormwater runoff. The SWPPP is updated as needed during the course of construction to satisfy the requirements of each phase of development. A copy of the current SWPPP shall be kept at the project site and submitted to the City. The applicant must demonstrate that coverage has been obtained under the Construction General Permit by providing a copy of the NOI submitted to the SWRCB and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number. The SWPPP may include, but would not necessarily be limited to, the following applicable measures (DAMP, 2005):
>
> - Erosion and Sediment Control BMPs, which may include the following:
>   - Construction scheduling, such as phasing and season avoidance, to minimize erosion and sediment
>   - Perimeter protection, such as straw wattles or silt fences
>   - Check dam to prevent gulley erosion and/or slow water down to allow sediment to settle out
>   - Gravel bag berm/barriers to prevent runoff or run-on of surface water flows
>   - Street sweeping and vacuuming to remove vehicle- tracked soil and sediment
>   - Storm Drain Inlet Protection such as filter bags and perimeter protection
>   - Stabilized Construction Entrances/Exits, Stabilized Construction Roads, Tire Washing to prevent vehicle tracking of sediment and debris on roadways
>   - Wind Erosion Control BMP such as soil stabilizers (would require more water quality modeling), wetting down of dry sediment, or covering exposed surfaces

- > Covering exposed surfaces as soon as possible (e.g., hydroseeding, hydraulic mulch, soil binders, and others)
- > Velocity dissipation devices
- > Water Conservation Practices BMP
- > Storm drain inlet protection

- Vehicle and Equipment Operation BMPs (vehicle and equipment cleaning/maintenance, potable water/irrigation controls)
- Equipment staging areas to localize and establish BMPs for control of pollutants associated with equipment re-fueling, operation, and maintenance which may include the following:
  - > Construction equipment shall be brought to the site no sooner than it is needed and shall be removed from the site as soon as practical. Major equipment overhaul will take place off site
  - > Vehicle and equipment maintenance facilities will be prepared and used to prevent discharges of fuel and other vehicle fluids.
  - > Vehicle and equipment fueling will take place in a contained staging area to prevent discharges of fuel and other vehicle fluids
- Waste Management and Materials Management BMPs. Waste management and material pollution BMPs for control of pollutants associated with the storage of construction materials and construction activities may include the following:
  - > Material Delivery and Storage—materials will be stored either off site or under cover. Hazardous materials will be stored in contained areas
  - > Material Use—selection of less environmentally detrimental materials will be used, where feasible and practical
  - > Stockpile Management—stockpiles will be minimized and covered to prevent leaching of potential chemicals and sediment
  - > Spill Prevention and Control will be implemented to prevent contamination of soil or water with construction and equipment operations chemicals
  - > Solid Waste Management
  - > Sanitary/Septic Waste Management
  - > Hazardous Waste Management—hazardous chemicals used in construction will be disposed of in accordance with hazardous waste materials management regulations, including Municipal Code: Title VII, Chapter 8.7823(i), which states that "[A]ll hazardous substances and hazardous materials shall be stored in such a manner as to prevent such substances or materials from coming into contact with stormwater or other runoff which discharges into the storm drain system. It is unlawful for any person to dispose of any hazardous waste in any trash container used for municipal trash disposal."
  - > Contaminated Soil Management—soil found to exhibit signs of pre-existing contamination will be tested and disposed of as required based on level of contamination. No contaminated soil will be brought on site and used as fill material
  - > Concrete Waste Management, such as contained concrete washout areas
- Water conservation
- Dewatering operations BMPs
- Slope drains

For dewatering during construction activities, the following regulatory requirement is also applicable:

- The discharger or project Applicant, must comply with the De Minimus Threat General Permit. This general permit includes discharges associated with construction dewatering. The discharger must:
  - Meet effluent limitations criteria listed in the order
  - Comply with the monitoring and reporting requirements

Furthermore, the City of Huntington Beach LIP requires that all construction projects, regardless of size or priority, are required to implement stormwater BMPs that shall include, at a minimum, erosion and sediment controls. This LIP has incorporated the model construction program described in the DAMP and includes requirements, guidelines, and methods that must be used for pollution prevention to protect water quality from construction discharges.

The development of a construction SWPPP has been identified by the SWRCB as protective of water quality during construction activities. Incorporation of required BMPs for materials and waste storage and handling, equipment and vehicle maintenance and fueling, as well as for outdoor work areas, would reduce potential discharge of stormwater pollutants from these sources. The City has codified this requirement and others pertaining to erosion and sediment controls into part of the Municipal Code prior to allowing a project to obtain a grading or building permit. Prior to receiving a grading or building permit, the project applicant must obtain approval of their SWPPP by the City Department of Public Works.

The proposed project would be considered a Significant Redevelopment Project under City Municipal Code and a Priority Project under the DAMP (Table 7.11-1 Priority Projects Categories, Exhibit 7.11 Model Water Quality Management Plan) because it would involve construction of more than 10 residential units and pavement in excess of 3,000 sf, requiring both a grading permit and a building permit. The URMP also incorporates provisions for construction site inspection to ensure that construction BMPs are implemented and operating effectively. Consequently, there would be no violation of the General Construction Permit WDR with implementation of the proposed project.

Grading permit regulations are included in Municipal Code Section 17.05.310 (Erosion control and water quality requirement systems) including the prohibition of grading more than 200 cubic feet between October 1 and April 30 on any single grading site under permit unless an erosion control system has been approved or waived by the Director of Public Works (Director); a civil engineer shall be responsible for the design of all erosion control improvements and initial approval of the installation of permanent and semi-permanent erosion control devices during each rainy season; desilting facilities shall be provided and maintained by the owner at drainage outlets from the graded site; equipment and workers for emergency work shall be made available at all times during the rainy season; and any violation of an applicable federal or state-issued stormwater permit, or failure to conform to the City's water quality requirements prepared pursuant to such a permit is also a violation of this Chapter. Section 17.05.320 (Erosion control plans) requires preparation of erosion control plans prepared by the engineer of record and in accordance with provisions of the Grading Manual shall be submitted to the Director for approval by September 15 of each year for projects under grading permit. Section 17.05.330 (Erosion control maintenance) specifies required maintenance of erosion control BMPs and Section 17.05.340 (Inspection

authority) specifies that grading operations for which a permit is required shall be subject to inspection by the Director.

Construction dewatering for development of the proposed project would be subject to the De Minimus Threat General Permit WDR, including both discharge and effluent limitations. Compliance with this general discharge permit is considered by the RWQCB to be protective of water quality. The active monitoring of construction sites for compliance with regulations would also ensure compliance with this general permit.

Consequently, the potential violation of either WDR would be less than significant. Furthermore, these existing regulations are considered protective of water quality and would therefore prevent violation of water quality standards. Existing regulations would ensure that the potential of discharges of polluted stormwater from construction to affect beneficial uses of receiving waters would be not be substantial. Implementation of existing project requirements would ensure that any violation of WDRs or water quality standards during construction would be ***less than significant***.

Operation

Wastewater Generation

Details on the potential proposed project impacts on sanitary sewer systems are discussed in the Utilities and Service Systems of this EIR (Section 4.14). The remaining capacity at Reclamation Plant No. 1 is 98 million gallons per day (MGD) and the remaining capacity at Treatment Plant No. 2 is approximately 24 MGD (WUS 2008). As such, it is assumed there would be more than adequate capacity to treat the net increase of 35,794 gallons per day (0.036 MGD) of wastewater that would be generated by the proposed project (WUS 2008). The OCSD has run a 2030 wet weather peak flow model and determined that there is about 0.6 MGD capacity on the 15 inch sewer at Goldenwest Avenue and Heil Avenue and 4 MGD in the 69-inch trunk line in Edinger Avenue.[21] The individual NPDES permits are issued by the RWQCB to include effluent limitations based on the design capacity and including monitoring programs protective of water quality. Consequently, the proposed project would not exceed treatment system capacities. Therefore, the proposed project would not violate the WDRs and there would be no violation of water quality standards associated with wastewater from the proposed project.

Stormwater

Operation of the proposed project would not result in a significant change in land use with the potential for increased site runoff. The project site would not be greatly altered compared to existing conditions; existing commercial land would be converted to mixed-use residential and commercial land.

During the operational phase of the proposed project, the major source of pollution in stormwater runoff would be contaminants that have accumulated on rooftops and other impervious surfaces, such as driveways and pedestrian walkways. Pollutants associated with the operational phase of the proposed

[21] OCSD. Email dated June 23, 2008 from Adam Nazaroff (OCSD) to Steve Bogart (City of Huntington Beach). Capacity Reviews for New Development Project in City of Huntington Beach.

project include nutrients, oil and grease, metals, organics, pesticides, and gross pollutants (including trash, debris, and bacteria).

Nutrients that may be present in post-construction stormwater include nitrogen and phosphorous resulting from fertilizers applied to landscaping and atmospheric deposition. Excess nutrients can impact water quality by promoting excessive and/or a rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Pesticides can also enter stormwater after application on landscaping areas of the proposed project, which are toxic to aquatic organisms and can bioaccumulate in larger species, such as birds and fish. Oil and grease can enter stormwater from vehicle leaks, traffic, and maintenance activities. Metals may enter stormwater as surfaces corrode, decay, or leach. Potential gross pollutants associated with operational activities include clippings associated with landscape maintenance, street litter, and pathogens (bacteria). Pathogens (from sanitary sewer overflows, spills and leaks from portable toilets, pets, wildlife, and human activities) can impact water contact recreation, non-contact water recreation and shellfish harvesting. Microbial contamination of the beaches from urban runoff and other sources has resulted in a number of health advisories issued by the Orange County Health Officer.

Operation of the proposed project would not include vehicle or equipment maintenance or fueling. However, it would include vehicle storage in underground parking lots. The proposed project would not be expected to result in an increase in runoff (Table 4.7-3 Estimated Peak Flow Rates in Gothard Street) and discharge is to a lined or underground storm drain system, therefore, there would be no potential for off-site erosion. The proposed project would include use of hazardous materials on-site (pool and spa cleaning materials). Furthermore, the addition of residential and retail uses could contribute more gross pollutants (e.g., trash, debris, pet waste) to stormwater runoff. Oil and grease, sediment, and metals may decrease because the associated parking would be covered as opposed to the existing surface parking. Pesticides and nutrients used for landscaping would be expected to be similar to existing conditions because the amount of landscaping would remain about the same. Aerially deposited metals, nutrients, and other constituents, would also be expected to remain the same because of the same amount of impervious surfaces compared to existing conditions.

Some structures (e.g., basements and underground parking) would be below the local groundwater table. The Geotechnical report encountered groundwater at 8.5 feet below the existing ground surface (begs) within the eastern portion of the project site. The proposed project would place 6 to 10 feet of fill in this area and have a basement floor about 24 feet below the final grade. Therefore, the basement level would be about 14 to 16 feet begs. If the project proponent elects to use a permanent dewatering system instead of dry flood-proofing the structures, dewatering during operational activities would be subject to the following regulatory requirement:

- The discharger or project Applicant, must comply with the De Minimus Threat General Permit. This general permit includes discharges associated with construction and certain types of operational groundwater dewatering. The discharger must:
  - Meet effluent limitations criteria listed in the order
  - Comply with the monitoring and reporting requirements
  - Or:

- The discharger or project Applicant, would have to apply for an individual WDR/NPDES permit for dewatering discharges to the storm drain system. The RWQCB may waive requirements for a WDR if dewatering discharges would not pose a threat to surface waters. The RWQCB may also issue an individual WDR including discharge quantity limitation and effluent quality limitations, along with a monitoring and reporting requirements:

The DAMP requires design review of public agency projects (Section A-7: New Development and Significant Redevelopment) and for the County of Orange to ensure that the construction plans for its public works projects reflect the structural BMPs described in the project's approved WQMP.

In accordance with the DAMP, Municipal Code, and City of Huntington Beach LIP, all new development and significant redevelopment projects requiring a grading and/or building permit are required to develop and implement a project WQMP that includes BMPs, depending upon the project size and characteristics. The proposed project, which is a DAMP-identified priority project and City of Huntington Beach-identified significant redevelopment project, would be required to prepare and implement a project-specific WQMP that would be reviewed and approved by the City and must include the following:

- Site Design BMPs
  - > The development plan shall minimize directly connected impervious areas (DCIA).
  - > Runoff reduction areas may be implemented where groundwater protection and vector control is ensured.
  - > The development plan shall also minimize impervious area, maximize permeability, and reduce the C-factor (runoff coefficient) of the project site.
- Routine Non-Structural Source Control BMPs (see WUS 2008 or DAMP for BMP details)
  - > Education for Property Owners, Tenants and Occupants
  - > Activity Restrictions—Conditions, covenants and restrictions (CCRs) shall be prepared by the Applicant for the purpose of surface water quality protection. Use restrictions may be developed by a building operator through lease terms, and others.
  - > Common Area Landscape Management—on-going maintenance, consistent with County Water Conservation Resolution and the City of Huntington Beach Water Ordinance, and per the City Arboricultural and Landscape Standards and Specifications, and fertilizer and/or pesticide usage consistent with Management Guidelines for Use of Fertilizers (DAMP Section 5.5) is required.
  - > BMP Maintenance.
  - > Title 22 California Code of Regulations Compliance and relevant sections of the California Health & Safety Code regarding hazardous waste management.
  - > Spill Contingency Plan
  - > Hazardous Materials Disclosure Compliance
  - > Uniform Fire Code Implementation
  - > Common Area Litter Control
  - > Employee Training
  - > Housekeeping of Loading Docks.
  - > Common Area Catch Basin Inspection

- > Street Sweeping Private Streets and Parking Lots - Streets and parking lots are required to be swept in late summer or early fall prior to the start of the rainy season

- Routine Structural Source Control BMPs
  - > Provide Storm Drain System Stenciling and Signage
  - > Design Outdoor Hazardous Material Storage Areas To Reduce Pollutant Introduction
  - > Design Trash Storage Areas To Reduce Pollutant Introduction
  - > Use Efficient Irrigation Systems and Landscape Design
  - > Protect Slopes and Channels
  - > Loading Dock Areas—cover loading dock areas, or design drainage to preclude urban run-on and runoff; direct connections to the municipal storm drain system from below grade loading docks (truck wells) or similar structures are prohibited.
  - > Community Car Wash Racks—in complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for common usage.
- Project-based Treatment Control BMPs; and/or participation in an approved regional or watershed management program as defined in Section 7-II.3.3.3 of the DAMP in the affected watershed.

Acceptable structural and non-structural BMPs are listed in the DAMP and California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment (2003) in compliance with the Stormwater NPDES Permit. Treatment flow rate or volume design requirements for structural BMPs are specified in the Stormwater NPDES Permit. In accordance with the Stormwater NDPES Permit and DAMP requirements, the treatment BMP design water quality flow rate would be about 0.53 cfs (PWQMP 2008). Water efficient irrigation practices (Municipal Code 14.52 Water Efficient Landscape; water efficient guidelines and Conceptual Landscape Plan). The project WQMP shall incorporate water efficient landscaping using drought tolerant, native plants in accordance with a City-approved Conceptual Landscape Plan

A Preliminary WQMP, dated June 6, 2008 (PWQMP) has been prepared for the proposed project. This PWQMP includes Site Design, Source Control and Treatment Control BMPs, along with Operations and Maintenance BMPs. In accordance with the PWQMP, the proposed project would incorporate landscaping to reduce the amount of impervious area and directly connected impervious area and a StormFilter™ system to treat the proposed project runoff prior to discharge into the City storm drain system. A properly sized and maintained StormFilter™ system can remove about 80 percent of suspended solids, 62 percent of phosphorous, 40 to 60 percent of dissolved metals, and 50 to 75 percent of pathogen indicators, along with oil and grease and sediment associated pollutants (PWQMP 2008). This PWQMP would be effective in reducing potential proposed project pollutants in stormwater runoff.

A Final WQMP would be required prior to issuance of a precise grading permit. Additionally, discharge of the treated stormwater to City streets/parkway is not allowed by the City. In order to address these issues, the City has identified the following Code Requirements and Conditions of Approval:

Code Requirements

CR4.7-1 *A Final WQMP shall be prepared, maintained, and updated as necessary to satisfy the requirements of the adopted Stormwater NPDES Permit, DAMP, and LIP. The Final WQMP shall incorporate water quality BMPs for all improved phases of the proposed project. All Structural BMPs shall be sized to filter and/or treat the 85th percentile 24-hour storm event or the maximum flow rate of runoff produced by a rainfall intensity of 0.2 inch per hour. Prior to receiving a precise grading permit and upon City approval of the Final WQMP, three signed copies and an electronic copy on CD (.pdf or .doc format) shall be submitted to the Department of Public Works. The Project WQMP shall also:*

- *Discuss regional or watershed programs (if applicable)*
- *Address site design stormwater quality BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or "zero discharge" areas, and conserving natural areas.*
- *Include Routine Source Control BMPs as defined in the DAMP and WUS*
- *Incorporate Treatment Control BMPs as defined in the DAMP and WUS; StormFilter^{TM} media shall be specified and documented for removal of Primary Pollutants of Concern*
- *Generally describe the long-term operations and maintenance requirements of the Treatment Control BMPs*
- *Describe the mechanism for funding the long-term operation and maintenance of the Treatment Control BMPs*
- *Include an Operations and Maintenance (O&M) Plan for all structural BMPs.*
- *In accordance with DAMP requirements, the project Applicant shall also properly design and implement a residential car wash facility. No residential car wash facility has yet been identified in the proposed project. The DAMP requires on-site vehicle wash areas for residential areas with more than 100 units where identified. This wash area must incorporate appropriate BMPs to prevent discharge of contaminated wash water from entering the sanitary sewer or storm drain systems*
- *A minimum of 10-feet separation between the bottom of any infiltration BMPs and the seasonal high water table is required. Infiltration BMPs are prohibited on fill material unless fill is documented at suitably prepared and stable for use with infiltration BMPs*
- *Treatment BMPs shall be selected such that standing water drains within 24 hours or as required by the City's vector control agency.*
- *If a permanent groundwater dewatering system is implemented, the requirements of the applicable NPDES permit (De Minimus Threat General Permit or Individual WDR/NPDES Permit) shall be incorporated into the Final WQMP.*
- *Amend deficiencies and incorporate additional requirements per City review of the Final WQMP including, but not limited to:*
  - *Common area catch basin inspections For industrial/commercial developments and for developments with privately maintained drainage systems, the owner is required to have at least 80 percent of drainage facilities inspected, cleaned and maintained on an annual basis with 100 percent of the facilities included in a two-year period. Cleaning should take place in the late summer/early fall prior to the start of the rainy season. Drainage facilities include*

catch basins (storm drain inlets) detention basins, retention basins, sediment basins, open drainage channels and lift stations.

- *Provide storm drain stenciling and signage; there would be a new, on-site storm drain system with inlets*
- *Protect slopes and channels and provide energy dissipation for the fill slopes and two swales identified on the WQMP figure in the PWQMP*
- *Community car wash racks. Include and describe how this BMP will be implemented or include prohibition of car washing in Activity Restrictions BMPs. Per the DAMP, in complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for common usage.*
- *No discharge of building or parking lot wash water shall enter the storm drain system unless treated and approved by the City of Huntington Beach.*
- *All trees shall be trimmed by or under the direct observation/direction of a licensed/certified Arborist, for the entire The Ripcurl improvement area. Minimum standards for maintenance for the total community shall be established and enforced for the total community. The responsible party shall be identified and shall rectify problems arising from incorrect tree trimming, chemical applications and other maintenance within the total community.*
- *Landscape irrigation shall be performed in accordance with an Irrigation Management Plan to minimize excess irrigation contributing to dry- and wet-weather runoff. If automated sprinklers are used, they shall be inspected at least quarterly and adjusted yearly to minimize potential excess irrigation flows. Landscape irrigation maintenance shall be performed in accordance with the approved irrigation plans, the City Water Ordinance and per the City Aboricultural and Landscape Standards and Specifications.*
- *Nutrient and pesticide management of landscaped areas shall be in accordance with the Orange County Guideline for the Use of Fertilizers and Pesticides.*

CoA4.7-1 *The project developer shall construct an underground storm drain pipe along the east side of Gothard Street from Center Avenue to Edinger Avenue to connect to the existing, underground Edinger Avenue storm drain pipe. Based on a Final Hydrology and Hydraulics Report, the Gothard Street new, underground storm drain facility sizing and design shall be targeted to convey the highest storm event exceedence flow rates along Gothard Street at full build-out of the General Plan, including contributions from any permanent groundwater dewatering system. The proposed project onsite storm drainage system shall be designed to convey all water quality treated flow directly into the new underground storm drain pipe along Gothard Street.*

Construction of the new pipeline for compliance with project conditions of approval **CoA4.7-1** would be subject to the same regulatory requirements as development of the proposed project, including preparation an implementation of a SWPPP. Therefore, potential impacts associated with implementation of project conditions of approval **CoA4.7-1** would be less than significant.

Implementation of the existing regulations along with code requirement **CR4.7-1** and project conditions of approval **CoA4.7-1** would reduce potential pollutant loads and ensure that appropriate BMPs are used (e.g., constraints on infiltration-type BMPs and documented effectiveness), that regulatory requirements

are met, and that any post-construction violation of WDRs or water quality standards would be ***less than significant***.

Furthermore, the potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas would be ***less than significant***.

Threshold	Would the project create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? (Including additional NPDES criteria 1, 2, 4, and 6)

Impact 4.7-2 **Implementation of the proposed project could contribute additional sources of polluted runoff. This is considered a *less than significant* impact.**

Construction Phase

Please refer to the discussion for Impact 4.7-1

The proposed project would include construction activities that could contribute additional sources of polluted runoff to the storm drain system. Existing regulations require preparation and implementation of a SWPPP and a City grading permit would be required. Any potential construction dewatering would be subject to the De Minimus Threat General Permit conditions. The City of Huntington Beach LIP also requires that all construction projects, regardless of size or priority, implement stormwater BMPs that shall include, at a minimum, erosion and sediment controls. Therefore, existing regulatory requirements would ensure that construction of the proposed project would not result in substantial additional sources of polluted runoff and impacts from construction would be ***less than significant***.

Operation

Please refer to the discussion for Impact 4.7-1

Operation of the proposed project would not substantially alter site drainage and land use characteristics such that there would be substantial additional sources of polluted runoff. The project site is currently about 90 percent impervious and would continue to remain so with implementation of the proposed project. The project site is currently developed with commercial land uses and the proposed project would include commercial and residential uses. No new surface parking would be created with implementation of the proposed project; surface parking would be eliminated and covered, underground parking would be implemented. Even though the proposed project would not be expected to provide a substantial additional source of polluted runoff, existing regulations require implementation of a WQMP that would reduce pollutants in stormwater runoff, likely to less than existing conditions. Implementation of code requirements **CR4.7-1** would also ensure that pollutants in stormwater runoff are reduced to the maximum extent practicable. Therefore, implementation of code requirements **CR4.7-1** and existing

regulatory requirements would ensure that operation of the proposed project would not contribute additional sources of polluted runoff and impacts would be ***less than significant***.

Impact 4.7-3 **Implementation of the proposed project would exceed the capacity of the existing storm drain system. This is considered a *potentially significant* impact.**

The City MPD and project PHR have both identified design street flow capacity exceedances within Gothard Street. Table 4.7-2 (Street Flow Design Capacity for Design Storm Events) lists the street flow capacities and Table 4.7-3 (Estimated Peak Flow Rates in Gothard Street) lists the existing and proposed project peak flow rates in Gothard Street as determined in the PHR. As noted in the PHR, design capacities would not be exceeded for the 50- and 100-year storm events; however, they would be exceeded for the 10- and 25-year storm events, for both existing conditions and with implementation of the proposed project. Based on results identified in the PHR and WUS, Table 4.7-2 and Table 4.7-3, Table 4.7-4 (Conveyance Capacity Exceedance) lists the peak flow rate exceedances in Gothard Street for the 10 and 25-year storm events, which is the difference between peak flow rates and the design flow capacity.

Table 4.7-4 Conveyance Capacity Exceedence

	10-year Storm Event			*25-year Storm Event*		
Gothard Street Location	*Design Flow[a] (cfs)*	*Street Flow[b] (cfs)*	*Exceedance[c] (cfs)*	*Design Flow[a] (cfs)*	*Street Flow[b] (cfs)*	*Exceedance[c] (cfs)*
Existing Conditions						
At Center Ave	5.47	23.4	17.9	15.40	29.0	13.6
Project Site Contribution[d]		*5.7*	*4.4*		*7.0*	*3.2*
Southwest Corner of the Project Site	5.7	24.9	19.2	16.04	30.9	14.9
Between the Project Site and Edinger Ave	7.57	30.4	22.8	21.31	37.2	15.9
At Edinger Avenue	5.53	40.6	35.1	15.56	48.9	33.3
Proposed Project						
At Center Ave	5.47	23.4	17.9	15.40	29.0	13.6
Project Site Contribution[d]		*5.7*	*4.4*		*7.0*	*3.2*
Southwest Corner of the Project Site	5.7	24.9	19.2	16.04	30.9	14.9
Between the Project Site and Edinger Ave	7.57	30.8	23.2	21.31	37.6	16.3
At Edinger Avenue	5.53	40.6	35.1	15.56	50.0	34.4

SOURCE: PHR PBS&J, 2008a, WUS PBS&J 2008b,

a Street flow design flow is based on best available information for Gothard Street configurations within the study area and does not include as-built slope information for the majority of the study area, as described in Section 2.2.2. A typical secondary arterial highway cross-section was used to describe Gothard Street (80-foot width, including parkway). Model output is provided in Appendix D.

b Street flow model output value.

c Exceedance is the difference between modeled street flow and the design flow.

d Project site contribution is the proportion of peak streetflow contributed by the project site. This is representative of the proportion of exceedance that the project site contributes to.

The PHR identified that system capacity is already exceeded by 17.9 cfs at the project site to 35.1 cfs at Edinger Avenue, for the 10-year storm event, and because the 10-year storm event exceedance flow rate was higher than the 25-year storm event exceedance flow rate, the 10-year exceedance would be the defining flow rate for designing improvements. The MPD identified deficiencies of 8 to 11 cfs. Therefore, both the existing project site and proposed project would exceed the capacity of the existing and planned storm drain system. However, final system and pipe sizing to mitigate exceedences, per project conditions of approval **CoA4.7-1**, shall be determined based on a Final Hydrology and Hydraulics Report prior to the issuance of a precise grading permit.

As evaluated in the PHR (2008), the proposed project would not cause or contribute to substantial increase in the exceedance of street flow design capacities of Gothard Street; however, a detailed project site Hydrology and Hydraulic Report has not yet been prepared and alterations in project site drainage characteristics could, therefore increase peak flow rates from the project site and even incrementally small increases in peak flows would be potentially significant. As noted in the WUS, the proposed project would reduce the amount of impervious surfaces on the project site by about 9.4 percent, place 6 to 10 feet of fill in the eastern portion of the project site, grade all drainage to local streets/driveways and the emergency vehicle access lane, and implement a local underground storm drain system to carry storm flows to Gothard Street (PGP 2008), which would all alter project site drainage conditions.

Stormwater detention possibilities are limited for the proposed project because the project site is currently mostly impervious surfaces and will remain mostly impervious surfaces, the soils are not suitable for infiltration (Hydrologic Group C and slowly percolating pervious surfaces), and the groundwater table may be within five feet of the ground surface within this area (Geotechnical Report 2006). Some storage could be provided by maximizing use of green roofs, storage in oversized underground pipes, and/or rooftop runoff to underground cisterns to store runoff. Because most of the parking for the area would be below-grade, use of microswales within the parking lots to store runoff would not be feasible.

In accordance with **CoA4.7-1**, the proposed project would have to implement an off-site underground storm drain system to convey water quality treated flows from the project site to the storm drain system in Edinger Avenue; water quality treated storm flows would not be allowed to discharge into Gothard Street. The Gothard Street new, underground storm drain facility sizing and design would also be targeted to convey the highest storm event exceedance flow rates along Gothard Street at full build-out of the General Plan. However, because the PHR was not a detailed Hydrology and Hydraulic Report, the potential for the proposed project to increase the project site peak flow rate contribution to exceedance of street flow capacities remains potentially significant, even with implementation of project conditions of approval **CoA4.7-1**.

Additionally, if a permanent dewatering system is implemented, this could add additional sources of water to the storm drain system that could cause or contribute to street flow and flow capacity exceedances during storm events, even with implementation of the new storm drain pipe as required by project condition of approval **CoA4.7-1**.

Implementation of the following mitigation measures could reduce proposed project peak runoff rates such that storm drain system capacity is not exceeded and ensure that any permanent groundwater dewatering system would not contribute to storm drain capacity exceedance.

Mitigation Measure

MM4.7-1 *The Applicant shall prepare a Hydrology and Hydraulics Report and Drainage Plan that incorporates stormwater attenuation to reduce project site runoff to meet City design standards for stormflow in Gothard Street.*

Prior to receiving a precise grading permit, the Applicant shall prepare an Hydrology and Hydraulics Report detailing proposed project peak runoff rates for the 10-, 25-, 50-, and 100-year design storm events to Gothard Street, including contributions from any permanent groundwater dewatering that may be implemented by the proposed project. This Hydrology and Hydraulics Report shall also identify the existing available capacity for flow in Gothard Street for the design storms and evaluate the existing capacity in and potential impacts to the Edinger Avenue system, Murdy Channel, and East Garden Grove-Wintersburg Channel.

Based on the Hydrology and Hydraulics Report, the Applicant shall prepare a Drainage Plan that shall incorporate sufficient stormwater attenuation such that the City design standards for flow in Gothard Street are not exceeded. It is expected that this may require underground detention facilities. However, detention in underground parking structures shall not be allowed and surface ponding shall be limited to a maximum depth of 8 inches. Attenuation shall be designed for back to back 24-hour storm design storm events that development of the proposed project would increase peak runoff rates for.

If either above-ground or below-ground detention facilities are proposed, the Applicant shall consult with the Department of Public Works and vector control agency to develop a design that will be sufficient for stormwater detention but will not present a human health or environmental hazard.

A qualified engineer of the Public Works Department shall approve this Hydrology and Hydraulics Report and Drainage Plan prior to issuance of a precise grading permit. It is recommended that the site Drainage Plan be coordinated with the WQMP to maximize efficiency of stormwater runoff detention/retention and water quality treatment.

The Building and Safety Department shall evaluate any proposed permanent groundwater dewatering system to ensure that it would function as required. Following construction, the Building and Safety Department shall verify that any groundwater dewatering system has been implemented as required.

Implementation of mitigation measure **MM4.7-1** would ensure that storm drain system capacity is not exceeded and there would be no human health or environmental hazards associated with implementation of stormwater detention and dewatering and impacts on storm drain system capacity would be ***less-than-significant***.

Threshold	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, in a manner that would result in substantial erosion or siltation on or off site? (Including additional NPDES criteria 1, 2, 5, and 6)

Impact 4.7-4 **Implementation of the proposed project would alter the project site runoff characteristics that could result in more on-site erosion and off-site siltation. This is considered a *less-than-significant* impact.**

Construction Phase

Please refer to the discussion for Impact 4.7-1

The proposed project would include construction activities, such as excavation and trenching for foundations and utilities, soil compaction, cut and fill activities, and grading, all of which would temporarily disturb soils. Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in sediment transport from the site. Construction of the proposed project would require a City Grading Permit (Municipal Code Section 7.05.060) including Erosion control and water quality requirement systems (Municipal Code Section 17.05.310) and grading operations inspections (Municipal Code Section 17.05.340). Additionally, because the proposed project would disturb more than one-acre of surface area, it would be subject to the Construction General Permit requirements, including preparation of a SWPPP. The City of Huntington Beach LIP also requires that all construction projects, regardless of size or priority, implement stormwater BMPs that shall include, at a minimum, erosion and sediment controls. The City of Huntington Beach LIP has incorporated the model construction program described in the DAMP and includes requirements, guidelines, and methods that must be used for pollution prevention to protect water quality from construction discharges. Therefore, existing regulatory requirements would ensure that construction of the proposed project would not result in substantial on-site erosion or off-site siltation and impacts would be ***less than significant***.

Operation

Please refer to the discussion for Impact 4.7-2

During operation of the proposed project, exposed surfaces, including the filled slopes in the eastern portion of the project site, would be required to be stabilized in accordance with Municipal Code, the City of Huntington Beach LIP, and DAMP. The proposed project would also be required to develop and implement an approved project WQMP including post-construction structural and non-structural BMPs for erosion and sediment controls. Implementation of code requirements **CR4.7-1** would also include surface stabilization to prevent increased on-site erosion and off-site siltation following implementation of the proposed project. Additionally, the proposed project site would not discharge to an off-site system susceptible to erosion; stormwater runoff is discharged to streets, underground storm pipes, or the lined Murdy and East Garden Grove-Wintersburg Channels. Implementation of code requirements **CR4.7-1** and existing regulatory requirements would ensure that operational erosion and off-site siltation would

not be substantial and potential impacts associated with on-site erosion or off-site siltation would be reduced to ***less-than-significant*** levels.

Threshold	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 that would result in flooding on or off site? (Including additional NPDES criteria 1, 2, and 5)

Impact 4.7-5 **Implementation of the proposed project would substantially alter the project site runoff characteristics that could result in more flooding on- or off-site. This is considered a *potentially significant* impact.**

Please refer to the discussion for Impact 4.7-2

The project site is currently flat and about 90 percent impervious surfaces that drain as sheet flow to local streets and Gothard Street. The proposed project would substantially alter the project site runoff characteristics. However, with implementation of mitigation measure **MM4.7-1** and implementation of project conditions of approval **CoA4.7-1** the potential for increased site runoff for both peak runoff rates and total storm flow volumes would not be substantial and the potential for off-site flooding impacts would be ***less than significant***.

The proposed project would alter the on-site drainage patterns, include below grade parking structures, and raise the eastern portion of the project site by 6 to 10 feet with fill material. Mitigation measure **MM4.7-1** prevents use of underground parking structure for storm or flood detention and raising the eastern portion of the project site would remove the above ground developed area from on-site flooding impacts. However, structures on the project site could inadvertently be susceptible to flooding if runoff of 100-year flood event water is not prevented from draining to the underground parking.

Because development would occur within a FEMA-defined flood hazard area Zone A and City Floodplain Overlay F2 designated area, the following minimum development requirements, per existing Zoning Code, would apply that would help prevent potential impacts associated with on-site flooding.

The City has identified code requirements for floodplain development that would also serve to minimize potential effects of on-site flooding.

Code Requirements

CR4.7-2 *The Applicant shall design and implement the proposed project in accordance with the Zoning Code 222.14 Development Standards and Standards for Construction Section A-F2 Standards of Construction.*

- *Anchoring. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. All manufactured homes shall comply with the anchoring standards of Section 222.14A5.*

- *Construction Materials and Methods. All new construction and substantial improvements shall use construction methods and practices that minimize flood damage, and shall utilize materials and utility equipment resistant to flood damage. Adequate drainage paths around structures on slopes shall be provided to guide flood waters around and away from proposed structures.*
- *Elevation and Floodproofing.*
  - > *New residential construction and substantial improvement of any residential structure shall have the lowest floor including basement elevated one foot above the base flood elevation except: (3285-7/95, 3334-6/97)*

    2. In an A zone, the lowest floor including basement shall be elevated one foot above the base flood elevation as determined by the City. (3285-7/95, 3334-6/97)

    Upon completion of the structure, the elevation of the lowest floor including basement shall be certified by a California-registered architect, engineer, or surveyor. The elevation certificate shall be submitted to the Director. (11/97)
  - > *Nonresidential construction shall be either elevated to comply with subsection 3a or together with attendant utility and sanitary facilities be floodproofed below the level stated in subsection 3a so that the structure is watertight with walls substantially impermeable to the passage of water and be capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A floodproofing certificate shall be completed and certified by a California registered engineer or architect and submitted to the Director. (11/97)*
  - > *Space Below the Lowest Floor. All new construction and substantial improvement with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwater. All proposals for using space below the lowest floor shall exceed the following requirements:*

    (1) Be certified by a California registered engineer or architect; or

    (2) Be certified to comply with a local floodproofing standard approved by the Federal Insurance Administration, Federal Emergency Management Agency, or (3285-7/95, 3334-6/97)

    (3) Have a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves or other coverings or devices provided they permit the automatic entry and exit of floodwaters. (3285-7/95)
  - > *All preliminary development proposals shall identify the flood hazard area, the elevation of the base flood, and be consistent with the need to minimize flood damage. All developments shall provide adequate drainage to reduce exposure to flood hazards.*
  - > *All final subdivision plans shall provide the elevation of proposed structures and pads. The lowest floor and pads shall be certified by a California registered engineer or surveyor and submitted to the Director. (3285-7/95, 3334-6/97)*

- *Standards for Utilities and Mechanical Equipment.*
  - > *All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into flood waters.*
  - > *On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.*
  - > *All new construction and substantial improvements shall be constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.*
  - > *All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed in a floodproof manner.*

Additionally, implementation of the following mitigation measures would reduce potential on-site flood impacts to the less-than-significant level.

Mitigation Measure

MM4.7-2 *The Applicant shall design and implement project site drainage features to minimize stormwater runoff and flood waters from entering into underground parking structures or otherwise contribute to flood hazards and shall incorporate flood-proofing and hydrostatic pressure measures for all below-ground structures.*

Prior to receiving a precise grading permit, the Applicant shall prepare a site Grading and Drainage Plan identifying design elements to minimize underground structure flooding. The Grading and Drainage plan shall implement design features to minimize flooding of under ground structures such as, but not limited to:

- *Grade areas to drain away from the structure entryways*
- *Implement overflow prevention (e.g., berms or dikes, grated inlets, or a combination, thereof) to direct project site runoff and flood flows away from underground structure entryways*
- *Elevate underground structure entryways to two-feet above the existing grade (approximate depth of potential flooding from the East Garden Grove-Wintersburg Channel)*
- *Implement sumps and pumps within the underground structures to remove any runoff entering the underground structures (this measure shall also be subject to WQMP and DAMP BMP requirements for discharge treatment and disposal)*

Additionally, the Applicant shall incorporate flood-proofing measures to prevent seepage flooding. Underground structures materials and design shall be in accordance with FEMA floodplain development requirements and the 2007 California Building Code for structures subject to flooding and hydrostatic pressures.

- *The geotechnical engineer and/or waterproofing specialist shall prepare design requirements for flood-proofing the underground structures and ensuring that structures are build to withstand hydrostatic pressures.*

- *Any utilities located in below grade structures shall be protected from ponding water and seepage in accordance with the geotechnical engineer recommendations and 2007 California Building Code.*

The Applicant shall also design on-site runoff to drain away from building foundations and shall not allow for more than 8 inches of ponding at any location on-site.

Implementation of existing code requirements **CR4.7-2** and mitigation measures **MM4.7-1** and **MM4.7-2,** along with project conditions of approval **CoA4.7-1,** would reduce the potential for on-site flooding of underground structures and other areas and on-site flood impacts would be ***less than significant***.

Threshold	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?

Impact 4.7-6 **Implementation of the proposed project would place housing within a 100-year flood hazard area. This is considered a *less-than-significant* impact.**

About 1.3 acres of the eastern portion of the project site is located within a 100-year flood hazard area from failure of the East Garden Grove-Wintersberg Channel as mapped by FEMA. This area is identified as a flood Zone A; subject to flooding during a 100-year flood event but no Base Flood Elevation (BFE) has been determined. FEMA allows development of residential uses within a flood hazard area if the lowest occupied flood is elevated to, or above, the 100-year flood elevation. Nonresidential or commercial structures can be either elevated or dry flood-proofed to, or above, the 100 year flood elevation. The City of Huntington Beach requires that building pads shall be constructed one foot above the BFE in Special Flood Hazard Areas (e.g., FEMA Zone A). Although the base flood elevation is not identified by FEMA, the West Consultants study of flooding from the East Garden Grove-Wintersburg Channel (Fuscoe Engineering 2007) indicates that the project site would experience a 2-foot flood depth. A letter from the County of Orange (Floodplain Administrator) to the City of Huntington Beach indicated that the information submitted from the West Consultant's study is the best available information at this time and can be used for establishing building pad elevation for developments (Fuscoe Engineering 2007).

Furthermore, the residential component of the proposed project would be on top of the retail and parking structures and 6 to 10 feet of fill would be placed within the SFHA to raise the ground surface elevation to above the flood depth. Therefore, the lowest occupied level would be several feet above the flood depth and in compliance with floodplain development requirements for residential uses. Additionally, code requirements for development within flood hazard areas, **CR4.7-2**, would apply. Consequently, with implementation of existing regulations, the proposed project impacts associated with housing within a flood hazard area would be ***less than significant***.

Threshold	Would the project place within a 100--year flood hazard area structures that would impede or redirect flood flows?

Impact 4.7-7 **Implementation of the proposed project would place structures within a 100-year flood hazard area that could impede or redirect flood flows. This is considered a *less-than-significant* impact.**

As mentioned above, the proposed project would place structures within a flood hazard area as mapped by FEMA. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount. FEMA has mandated that projects can cause no rise in the regulatory floodway and no more than a one-foot cumulative rise in the BFE for all projects in the base (100-year) floodplain. The BFE and floodway zone for this flood hazard area has not yet been defined by FEMA. Although the proposed project would place 6 to 10 feet of fill in this area, the project site is located at the very edge of the flood hazard area. This would also not result in substantially more fill compared to existing conditions because existing structure essentially act as fill in this area. Therefore, the proposed project not cause or contribute to substantial impedance or redirection of flood flows and potential impacts of proposed project structures on flood flows would be ***less than significant***.

Threshold	Would the project result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Impact 4.7-8 **Implementation of the proposed project would result in the construction of new stormwater drainage facilities. However, incorporation of mitigation measures and existing regulations would reduce potential environmental impacts to *less-than-significant* levels.**

Please refer to the discussion for Impact 4.7-1 through Impact 4.7-5 for construction of on-site stormwater drainage facilities.

The construction of the new, off-site storm drain pipe along Gothard Street, as required by project conditions of approval **CoA4.7-1**, would include construction activities that could contribute additional sources of polluted runoff to the storm drain system. Construction of this new underground pipe would be subject to the same regulatory requirements identified for the proposed project. Existing regulations require preparation and implementation of a SWPPP and a City precise grading permit would have to be obtained. Any potential construction dewatering would be subject to the De Minimus Threat General Permit conditions. The City of Huntington Beach LIP also requires that all construction projects, regardless of size or priority, implement stormwater BMPs that shall include, at a minimum, erosion and sediment controls. Therefore, existing regulatory requirements would ensure that construction of this new, off-site stormwater drainage facility would not result in substantial environmental effects and potential impacts would be ***less than significant***.

Threshold	Would the project 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)?

Impact 4.7-9 Construction of the proposed project would require groundwater dewatering. This impact would be *less than significant*.

As noted in Impact 4.7-1, the historical high groundwater levels occur at 5 feet below ground surface at the project site. Consequently, construction dewatering for utilities, foundation excavation and fill, and below-grade parking would be required. As noted in the Section 4.5 (Geology and Soils) of this EIR, the soils are very fine grained and do not tend to allow free flow of water. Therefore, it is unlikely that substantial dewatering would be required during construction. Additionally, coverage under the De Minimus Threat General Permit would include discharge quantity limitations. Furthermore, any potential construction dewatering impacts would be temporary.

As noted above, in Impact 4.7-1, 4.7-5, and 4.7-6, some permanent structures (e.g., basements and underground parking) would be below the local groundwater table. If the project proponent elects to use a permanent groundwater dewatering system instead of dry flood-proofing and full-hydrostatic pressure load construction to protect these structures, the proposed project could permanently lower the localized groundwater table by up to 6 to 8 feet, depending upon the type of dewatering system used and underlying soil/geologic characteristics. The extent of this effect on the local groundwater table will depend upon the lateral transmissivity of project site and neighboring subsurface materials. However, the soils underlying the project site are very fine grained and not conducive to high permeability or allowing free flow of water through the alluvial mass (Geotech Report 2006). It is expected that the majority of groundwater seepage would be from the sand beds embedded within the alluvial mass (Geotech Report 2006). Therefore, the amount of dewatering and extent of this effect on the local groundwater table would depend, in large part, upon the connectivity of the embedded sand layers.

Permanent dewatering activities would require coverage under the De Minimus Threat General Permit or an individual WDR/NPDES Permit, and consequently, it would be subject to discharge quantity limitations. The actual amount of required dewatering is currently unknown but not expected to be substantial based on the large amount of underlying alluvial materials with low permeabilities. Additionally, in portions of the project site, the groundwater table may be below the lowest floor level during construction, but above this level during the wet weather season, requiring dewatering only during certain conditions or not at all.

The City has identified project conditions of approval for groundwater dewatering and surface drainage that would also serve to minimize potential effects of temporary or permanent groundwater dewatering.

Project Conditions of Approval

CoA4.7-2 *Prior to receiving a precise grading or building permit, the Applicant shall prepare a site Grading and Drainage Plan containing the recommendations of the final Soils and Geotechnical Reports analysis for temporary and permanent groundwater dewatering as well as for surface drainage.*

Consequently, it is not expected that a substantial amount of groundwater dewatering would be required and the effect of groundwater dewatering during construction would be temporary. Therefore, proposed project impacts on the local groundwater table and water supplies would be ***less than significant*** with implementation of existing regulations and project conditions of approval **CoA4.7-2**.

4.7.4 Cumulative Impacts

A cumulative impact analysis is only provided for those thresholds that result in a less-than-significant, potentially significant, or significant and unavoidable impact. A cumulative impact analysis is not provided for Effects Found Not to Be Significant, which result in no project-related impacts.

The geographic context for surface water hydrology and water quality cumulative impact analysis is the Westminster Watershed and the limits of the Orange County Groundwater Basin with regard to groundwater impacts. The surface area above the Orange County Groundwater Basin largely built-out (County of Orange 2005). However, there are still some open space and open space and rural residential areas within the groundwater basin surface area. Major areas of vacant lands within Westminster Watershed include the Seal Beach Naval Area and coastal wetland areas (County of Orange n.d.a). The Court of Appeals has determined that residential development is not permitted in these lowland wetlands and they are currently designated as Open Space Reserves.

The cumulative analysis includes those projects in the cumulative projects list (Table 3-4 in Chapter 3 [Project Description]), as well as full buildout of the Westminster Watershed, which includes portions of the cities of Anaheim, Cypress, Fountain Valley, Garden Grove, Huntington Beach, Los Alamitos, Santa Ana, Seal Beach, Stanton, and Westminster. The Westminster Watershed covers 74.1 square miles in the southwestern corner of Orange County. Three main tributaries drain this watershed. The Los Alamitos Channel drains into the San Gabriel River while the Bolsa Chica Channel empties into Huntington Harbour and then to Anaheim Bay. The East Garden Grove-Wintersburg Channel drains past the Bolsa Chica Wetlands and then into Huntington Harbour. Land use within the Westminster Watershed is primarily single and multi-family residential, commercial, and industrial with some parkland (URMP 2005). This analysis also includes implementation of TMDLs for 2006 303(d) listed water quality limited segments (Huntington Harbour and Anaheim Bays) and addresses potential effects of global climate change.

Some receiving waters in the Westminster Watershed have been listed pursuant to Section 303(d) as not attaining water quality standards established by EPA. Anaheim Bay is listed as impaired (not meeting its

designated beneficial uses) by dieldrin, nickel, PCBs, and sediment toxicity from unknown sources. Huntington Harbour is listed as impaired by chlordane, copper, lead, nickel, PCBs, and sediment toxicity from unknown sources, and by pathogens from urban runoff/storm sewers. Dry and wet-weather discharge within the watershed have exceeded chronic and acute California Toxics Rule (CTR) criteria for certain pollutants. Consequently, even reducing the proposed project discharges of pollutants to existing conditions levels could contribute to cumulative violations of water quality standards if existing project site runoff concentrations exceed the CTR criteria.

Continued development and redevelopment within the Westminster Watershed area would be subject to the Stormwater NPDES Permit, Construction General Permit, De Minimus Threat General Permit, and DAMP regulatory requirements, along with any specific municipal codes and Local Implementation Plans. The DAMP requires local agency/municipality construction site inspection, Local Implementation Plans, and Water Quality Monitoring Programs. Furthermore, all construction activities that disturb more than 1 acre of land surface would be required to prepare and implement a construction SWPPP, which would minimize potential pollutant transport during construction and potential violation of water quality standards. The Stormwater NPDES Permit requires incorporation of both the Construction General Permit and Stormwater NPDES Permit requirements into local regulatory ordinances and codes. Additionally, construction site inspection is required by the DAMP, the SWPPP requires water quality monitoring, and the De Minimus Threat General Permit includes monitoring requirements, and Reports of Waste Discharge to the RWQCB for individual WDR that may be required would ensure that the WDRs are not violated. These permits have been identified as protective of water quality.

Each co-permittee must also develop a WQMP that must be approved by Orange County as protective of water quality. Furthermore, all priority projects in the area would be required by the DAMP to develop a project WQMP. Other, non-priority projects would also be required to implement minimal BMPs, including erosion and sediment controls. Implementation of required water conservation measures would minimize potential dry-weather runoff and therefore, potential pollutant transport to surface waters. These conditions would ensure that potential pollutants in stormwater and dry-weather runoff are minimized and that violation of the Stormwater NPDES Permit or water quality standards would not be considerable.

Additionally, although no TMDLs have yet been developed for these impaired water bodies, they are scheduled for completion by 2019. Implementation of these TMDLs and continued monitoring in the watershed would provide potential mitigation for both existing pollutants and new pollutants found to be contributing to degradation of water quality and further ensure that water quality standards are not violated.

Individual dischargers are subject to individual NPDES permits or WDRs and are regulated by the RWQCB, which issues cease and desist orders for dischargers in violation of their permits/WDRs. The Orange County Sanitary District (OCSD), an individually permitted discharger, was originally considered a potential major contributor to degradation of coastal water quality by bacteria contamination. In 2002, the Orange County Sanitary District (OCSD) began chlorination of wastewater effluent. Since then, fecal coliform counts within the OCSD discharge have been minimal to below detection limits and not correlated with bacterial contamination of Huntington Beach. These results suggest that tidal flow out of

the Santa Ana River may be a source of high bacteria concentration, potentially impacting the beach; particularly for total coliform and that the OCSD does not violate its WDRs or contribute to cumulative violation of water quality standards.

The Federal Clean Vessel Act prohibits the discharge of sewage into No Discharge Zone (NDZ) waters. Huntington Harbour was designated a NDZ by the U.S. EPA in 1976. In 1994, Huntington Harbour was listed on the 303(d) list of impaired water bodies due to bacterial contamination. No bacteria TMDL has yet been established for Huntington Harbour. Once established, the TMDL is expected to include a zero waste load allocation for vessel waste discharges, in light of the NDZ status of Huntington Harbour. However, existing facilities did not have the capacity to handle vessel sewage. Consequently, the Santa Ana Regional Board developed a comprehensive Vessel Sewage Disposal Program under the SWRCB General Order Requiring Owners and Operators of Specified Vessel Terminals Located in Newport Bay and Huntington Harbour to Install, Maintain, and Operate Pumpout Facilities and Dump Stations where Necessary to Protect Water Quality (SWRCB Water Quality Order No. 2004-0017-DWQ)). The Vessel Sewage Disposal Program requires the installation of pumpout facilities and dump stations in compliance with existing mandates of the Harbours and Navigation Code and applicable State Board regulations. The Santa Ana Regional Board's program is consistent with the State Board's minimum standards for the design, construction, operation, and maintenance of pumpout facilities. This program will help reduce potential cumulative bacteria contamination of Huntington Harbour.

Therefore, potential violation of water quality standards or waste discharge requirements would not be cumulatively considerable with implementation of existing requirements and future TMDLs. Furthermore, the proposed project impacts on water quality standards and waste discharge requirements are less than significant; code requirements **CR4.7-1** would be implemented to reduce potential stormwater pollutant loads to existing conditions levels or lower. Therefore, the proposed project would not contribute considerably to cumulative impacts and cumulative impacts would be ***less than significant***.

Development of the proposed project in the Westminster Watershed could alter the watershed drainage patterns that could contribute to increases in erosion and siltation. However, most of the area is already built out and existing regulations would be applicable to any new or re-development, which would minimize potential effects. Additionally, the storm drain system within the Westminster watershed is lined or piped and would not be subject to erosion from increased storm flows. Therefore, cumulative effects on erosion and siltation would not be considerable. Compliance with existing regulations, including the grading permit, City of Huntington Beach LIP, and DAMP and incorporation of code requirements **CR4.7-1** would ensure that the potential proposed project contributions to cumulative erosion and siltation are less than significant and cumulative impacts would therefore be ***less than significant***.

Continued development of the Westminster Watershed could alter the watershed drainage patterns that could increase stormwater runoff. Many stormwater conveyance facilities within areas of Huntington Beach are currently inadequate for conveying stormflows and flood during storm events. Planned storm drain system improvements would be subject to existing regulatory requirements, including the

Construction General Permit, Stormwater NPDES Permit, and DAMP, which would minimize impacts associated with development of new or planned stormwater drainage systems within the watershed. Furthermore, most of the area is already built out (County of Orange n.d.b) and existing regulations would be applicable to any new or re-development, which would minimize potential impacts. Furthermore, local agencies and the Army Corps of Engineers have or are remediating existing flooding conditions through channel and stormwater infrastructure improvements. Therefore, cumulative effects on stormwater runoff would not be considerable. Incorporation of proposed project conditions of approval **CoA4.7-1** and mitigation measures **MM4.7-1** would ensure that the potential proposed project contributions to cumulative storm drain conveyance capacity exceedance and flooding are less than significant and cumulative impacts would therefore be ***less than significant***.

Global climate change could, however, alter the existing drainage conditions to exacerbate the existing and potentially future flood conditions in the watershed. Global climate change could affect regional surface water hydrology and sea level rise, both of which could contribute to increased flooding. Warming in western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows (IPCC 2007). Because of uncertainties in the climate sensitivity, it is not clear how rapidly sea levels will rise, even under the highest emission scenarios (CCC 2006). Therefore, cumulative impacts of flooding could be potentially significant and unavoidable but is speculative. Incorporation of proposed project mitigation measures **MM4.7-1** would ensure that the potential proposed project contributions to cumulative stormwater flows are not considerable and cumulative impacts would therefore be ***less than significant***.

Portions of the Westminster watershed are subject to flooding from the East Garden Grove-Wintersberg Channel during a 100-year storm event. The Base Flood Elevation for much of the area is not identified on the FEMA flood hazard maps. However, during the review process for updating the MPD, the City of Huntington Beach, in cooperation with OCFCD and FEMA, reviews existing Hydrology and Hydraulics Studies, Floodplain Encroachment Studies, and applications for Letters of Map Amendments (LOMA) and Map Revisions (LOMR) to determine the standards for development within the Westminster watershed Zone A in order to minimize impacts to flood flows and conveyance capacities. Additionally, FEMA periodically audits the City floodplain management practices and identifies required improvements. Until a new LOMR is approved by FEMA, in agreement with OCFCD and FEMA, the West Consultants Flood Elevation Study is used to determine building pad elevations for flood-proofing and floodplain development requirements within the applicable Westminster watershed area. Therefore, cumulative impacts associated with floodplain development are ***less than significant***.

Implementation of the proposed project would elevate residences to above the retail and parking structures, and therefore, the flood depth within the area and effects on residences would be less than significant. Additionally, the project site is located at the floodplain fringe and structural fill associated with the proposed project would not significantly affect flood flows. Therefore, the proposed project would not contribute considerably to cumulative impacts and cumulative impacts would be ***less than significant***.

Global climate change could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of sea water as the oceans warm, and the melting of ice over land. A rise in sea levels could result in coastal flooding and erosion. In particular, saltwater intrusion would threaten the quality and reliability of the state's major fresh water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Under AB 32, the California Air Resources Board (CARB) has the primary responsibility for reducing greenhouse gas emissions. However, as discussed in Section 4.2 Air Quality, the 2006 Climate Action Team (CAT) Report contains strategies that many other California agencies can implement. The CAT published a public review draft of *Proposed Early Actions to Mitigate Climate Change in California* in 2007.[22] Most of the strategies contained in the 2007 Report were also in the 2006 CAT Report or are similar to the 2006 CAT strategies. As the 2007 report is only a draft and is not yet final, this analysis will assess project compliance with the 2006 CAT Report strategies. The 2006 CAT Report strategies that apply to the project are contained in Table 4.2-9 in Section 4.2 of this EIR, as well as several additional strategies as identified by the State Attorney General's Office in its memo regarding global warming measures dated March 11, 2008.

Based on project-related greenhouse gas emissions estimates, it is not anticipated that the project emissions alone will substantially add to the global inventory of greenhouse gas emissions. In addition, the project would comply with all applicable policies, ordinances, and regulations that would reduce greenhouse gas emissions. Measures that would reduce air quality impacts of the project would also reduce the cumulative contribution of the project to greenhouse gas emissions. Further, the proposed project is an example of a project that was designed from the outset to minimize its greenhouse gas emissions and thereby reduce the City's contribution to global warming. From a geographic standpoint, the project is situated in close proximity of the urban core of Downtown Huntington Beach, as well as its target Golden West College. It will provide residents of the City with the opportunity to live close to their jobs and close to public transportation lines. The Ripcurl project is in line with the type of smart growth project the City wants to encourage. Because the project's contribution to greenhouse gas emissions in California would be low by comparison to a comparable level of development elsewhere, because the project would represent the type of growth that will help the State achieve consistency with AB 32, and because the project would incorporate all feasible greenhouse gas reduction measures (as documented in Section 4.2 of this EIR), cumulative impacts related to greenhouse gas emissions and its effect on hydrologic conditions would be considered ***less than significant***.

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