4.8 Hydrology and Water Quality

This section identifies, discusses, and analyzes the effects of the Proposed Project on local and regional hydrology, flooding, and water quality. The purpose of this section is to provide (1) a discussion of existing hydrology, flooding, and water quality conditions on the project site and (2) an analysis of how the Project would affect those existing conditions. This analysis considers the effects of the Proposed Project on storm water runoff, and potential on-site and off-site erosion and sedimentation. The current conditions and quality of these water resources are described in the *City of Newport Beach Priority Project Preliminary Water Quality Management Plan (WQMP)* prepared by David Evans and Associates, Inc. (DEA, 2017) which is included as Appendix H to this EIR.

4.8.1 REGULATORY SETTING

Federal

Clean Water Act

The Clean Water Act (33 U.S.C. § 1251 et seq., formerly the Federal Water Pollution Control Act of 1972), was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the "Waters of the United States (U.S.)". In 1972, the Clean Water Act was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to "Waters of the U.S."[1] from any point source.[2] In 1987, the Clean Water Act was further amended to require that the U.S. Environmental Protection Agency (USEPA) establish regulations for permitting municipal and industrial storm water discharges under the NPDES permit program. Final regulations regarding storm water discharges were issued on November 16, 1990, and require that municipal separate storm sewer system (MS4) discharges and industrial (including construction) storm water discharges to surface waters be regulated by an NPDES permit. NPDES permit requirements relevant to the Proposed Project are discussed later in this section.

The Clean Water Act also requires states to adopt water quality standards for receiving water bodies and to have those standards approved by the USEPA. Water quality standards consist of designated beneficial uses for a particular receiving water body (e.g., wildlife habitat, agricultural supply, fishing), along with the water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents (such as lead, suspended sediment, and fecal coliform bacteria) or narrative statements that represent the quality of water that support a particular use. Because the State of California was unable to develop these standards for priority toxic pollutants, the USEPA promulgated the California Toxics Rule in 1992 (40 *Code of Federal Regulations* [CFR] 131.38), which fills this gap. As a separate Rule, the California Toxics Rule is discussed further below under State regulations.

[1] "Waters of the U.S." include all waters that have, are, or may be used in interstate or foreign commerce (including sightseeing or hunting), including all waters subject to the ebb and flow of the tide and all interstate waters including interstate wetlands (33 CFR 328.3).

[2] Point sources are discrete water conveyances such as pipes or man-made ditches.

When water quality issues compromise the designated beneficial uses of a particular receiving water body, Section 303(d) of the Clean Water Act requires the identification and listing of that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (plus a "margin of safety"). Once established, the TMDL allocates the loads among the water body's current and future pollutant sources.

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency's (FEMA) primary missions is to reduce the loss of life and property and protect the nation from all hazards, including flooding. FEMA is responsible for administering the National Flood Insurance Program (NFIP). The NFIP enables property owners in participating communities to purchase insurance as protection against flood losses in exchanges for State and community floodplain management regulations that reduce future flood damages. In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all properties within Zone A, which are communities subject to a 100-year flood event. In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the floodplains of Flood Insurance Rate Maps (FIRM).

State of California

Porter-Cologne Water Quality Control Act

California's Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act) grants the State Water Resource Control Board (SWRCB) and the RWQCBs power to protect surface water and groundwater quality and is the primary vehicle for implementing California's responsibilities under the federal Clean Water Act. The SWRCB is divided into nine regions, each overseen by a RWQCB. The SWRCB is responsible for protecting California's surface waters and groundwater supplies.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The Basin Plan must conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State Water Policy. The Basin Plan establishes beneficial uses for surface and groundwater in the region, and sets forth narrative and numeric water quality standards to protect those beneficial uses. Basin plans are updated every three years and provide the basis of determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Act also states that an RWQCB may include water discharge prohibitions applicable to particular conditions, areas, or types of waste within its regional plan. The Porter-Cologne Act is also responsible for implementing Clean Water Act Sections 401 and 402 and 303(d) to SWRCB and RWQCBs.

Water Quality Orders (SWRCB)

The SWRCB has adopted an NPDES General Permit for construction activities, known as the Construction General Permit (Construction General Permit). The current Construction General Permit (Order No. 2009-0009-DWQ, amended by 2010-0014-DWQ and 2012-006-DWQ) became effective on July 1, 2010. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in conjunction with construction activities. The SWPPP must contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots,

roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list Best Management Practices (BMPs) that the discharger would use to protect storm water runoff and the placement of said BMPs. Additionally, the SWPPP must contain a Construction Site Monitoring Program to demonstrate that the site is in compliance with the Construction General Permit. Depending on the construction site risk level, the CSMP includes varying levels of visual monitoring and water quality sampling and analysis.

The Construction General Permit also includes the following requirements and evaluation criteria:

- Rainfall Erosivity Waiver: This option allows a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for the site's given location and time frame compute to be less than or equal to 5.
- Technology-Based Numeric Action Levels: The Construction General Permit includes NALs (numeric action levels) for pH and turbidity.
- Risk-Based Permitting Approach: The Construction General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: Project Sediment Risk, and Receiving Water Risk.
- Effluent Monitoring and Reporting: The Construction General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to determine whether NALs and effluent limits for active treatment systems are exceeded.
- Receiving Water Monitoring and Reporting: The Construction General Permit requires some Risk Level 3 dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers.
- Rain Event Action Plan: The Construction General Permit requires certain sites to develop and implement a Rain Event Action Plan that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.
- Annual Reporting: The Construction General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic information.
- Certification/Training Requirements for Key Project Personnel: The Construction General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications in compliance with Construction General Permit requirements.

Regional and Local

Orange County Storm Water Program 2003 Drainage Area Management Plan (DAMP)

Section 402(p) of the Clean Water Act, as amended by the Water Quality Act of 1987, requires that municipal NPDES Permits include requirements (1) to essentially prohibit non-storm water discharges into municipal storm sewers and (2) to control the discharge of pollutants from municipal storm drains to the maximum extent practicable. In response to this requirement, the Orange County Drainage Area Management Plan (DAMP) was developed in 1993, which has been updated several times in response to requirements associated with NPDES permit renewals (County of Orange et al. 2003). The City is a permittee covered by the requirements of this permit.

The main objectives of the Orange County DAMP are to fulfill the Permittees' commitment to present a plan that satisfies NPDES permit requirements and to evaluate the impacts of urban storm water discharges on receiving waters. Orange County DAMP elements include (1) the establishment of public outreach and educational programs, management strategies, and inter-agency coordination; (2) continuing participation in the Regional Research/Monitoring program that is being conducted with the neighboring counties, the Southern California Coastal Waters Research Project (SCCWRP), and three Southern California Regional Boards; (3) the establishment of Best Management Practices (BMPs) aimed at managing project-induced hydrologic effects; and (4) the improvement of water quality throughout the region.

General Waste Discharge Requirements for Discharges to Surface Waters Which Pose an Insignificant (de minimus) Threat to Water Quality (Dewatering Permit)

The Santa Ana RWQCB issued Order No. R8-2003-0061 and Amendments to NPDES Permit No. CAG998001 (Dewatering Permit) to regulate the discharge of dewatering wastes from construction, subterranean seepage, and other similar types of discharges considered to have "de minimus" impacts on water quality within the jurisdictions covered by the County permit. This permit was updated in March 2009 (by Order No. R8-2009-0003, NPDES NP. CAG998001) and applies to projects located within Newport Beach. To obtain coverage under this permit, an applicant must submit a Notice of Intent and data establishing the chemical characteristics of the dewatering discharge. A standard monitoring and reporting program is included as part of the permit. For dewatering activities that are not covered by the Construction General Permit, Waste Discharge Requirements, and an individual NPDES permit must be obtained from the applicable RWQCB.

City of Newport Beach Municipal Code Section 19.28.080

Section 19.28.080 (Storm Drains) of the City's municipal code requires developers to design and construct all drainage facilities necessary for the removal of surface water from the site (e.g., open/closed channels, catch basins, manholes, junction structures), and to protect off-site properties from a project's water runoff. The storm drain system must be designed in accordance with the standards of the Orange County Flood Division. A drainage fee is also charged to fund improvements to the City's drainage facilities.

4.8.2 ENVIRONMENTAL SETTING

The storm water drainage systems in the City of Newport Beach are managed and operated by the City and the Orange County Flood Control District (OCFCD) of the Orange County Public Works Department. The County is responsible for maintaining and repairing regional systems, and the City is responsible for local improvements. Newport Beach has over 95 miles of storm drain pipe, 3,224 catch basins, and 86 tidal valves. The County is responsible for maintaining and repairing regional systems, and the City oversees local improvements, such as clearing blocked drains, removing debris, and cleaning or repairing damaged pipes (City of Newport Beach Municipal Operations, 2017).

Regional Drainage

Orange County encompasses an area of approximately 798 square miles, beginning on the coastal plain and rising to an elevation of over 5,000 feet above mean sea level (msl) in the Puente Hills and Santa Ana Mountains to the north and east. Orange County's climate has hot dry summers and mild winters. Nearly all of the annual precipitation falls between October and April (County of Orange et al. 2003).

The project site is in the Newport Bay Watershed in the central portion of Orange County. The watershed is defined by the foothills of the Santa Ana Mountains to the east and the San Joaquin Hills to the west and southwest. The total area of the watershed is approximately 154 square miles. There are four sub-watersheds that make up the Greater Newport Bay Watershed: Peters Canyon Wash, Upper San Diego Creek, Lower San Diego Creek, and Newport Bay. The project site is in the Lower San Diego Creek sub-watershed (EPA, 2017).

Existing Site Drainage

The project site is currently developed with surface parking and landscaping in the parking lot planter islands. The site is 27 percent pervious and 73 percent impervious. The site currently drains in two directions, with approximately 60 percent of surface runoff draining to Von Karman Avenue and 40 percent to Birch Street. The site is relatively flat at 1 to 2 percent to provide sheet flow within the existing parking lot (DEA, 2016a).

The parking lot drainage is collected in concrete swales which are collected by storm drain lines. From the southerly side of the existing ridge line, the flows collected by the on-site storm drain system connect to the existing storm drain line in Von Karman Avenue. The drainage area northerly of the existing ridge line is tributary to an existing 60-inch storm drain line located on the east side of the 5000 Birch Street building which ultimately drains to the collection ponds within Koll Center. Receiving waters for the project site include San Diego Creek (Reach 1), Lower Newport Bay, Upper Newport Bay, and Pacific Ocean (DEA, 2016a).

Existing drainage volumes and peak flow rates for the 2-year, 24-hour storm event are shown in *Table 4.8-1*. The project site is divided into three major drainage areas, designated as "A", "B", and "C".

Table 4.8-1. Runoff Volume Summary, Existing Conditions			
Drainage Area	**Area (acre)**	**Volume (acre-feet)**	**Flow Rate (cubic feet per second)**
A	5.0	0.5947	7.93
B	0.8	0.1230	1.59
C	5.3	0.3591	8.47
Total	11.1[a]	1.3768	17.99

a. The drainage area of 11.1 acres is less than the 13.16-acre project site because there is no development on the west side of the project site.

Source: DEA, 2017.

1. Drainage Area "A" collects the building roof and street runoff in catch basins which is conveyed through an on-site storm drain system which connects to the public storm drain in Von Karman.
2. Drainage Area "B" collects the parking lot runoff in catch basins which is conveyed through an on-site storm drain system of which low flows would drain to a drywell system. Storm flows exceeding low flows would continue to flow over the driveway to Birch Street.
3. Drainage Area "C" collects the parking lot and street runoff in catch basins which is conveyed through an on-site storm drain system which connects to the public storm drain located on the east side of 5000 Birch Street.

Flood Hazards

Flood zones are geographic areas that FEMA defines, based on studies of flood risk. The zone boundaries are shown on flood hazard maps, also called Flood Insurance Rate Maps (FIRM). High Risk Zones or Special Flood Hazard Areas (Zone A) are high-risk flood areas where special flood, mudflow, or flood-related erosion hazards exist and flood insurance is mandatory. Low-to-Moderate Risk Zones or Non-Special Flood Hazard Areas (Zones B, C, and X) are areas that are not in any immediate danger from flooding caused by overflowing rivers or hard rains. Insurance purchase is not required in these zones. The applicable FIRM (Number 06059C0286Js) shows that the project site is located within flood Zone X (FEMA, 2017).

Surface Water Quality

Water quality impairments for Reach 1 of the San Diego Creek, Upper Newport Bay, and Lower Newport Bay are shown in *Table 4.8-2*.

Table 4.8-2. Water Quality Impairments

Water Body	Contaminant	Total Maximum Daily Load (TMDL) Status; Completion Date for Proposed TMDLs
San Diego Creek Reach 1	Benthic Community Effects	Still Required; 2027
	DDT (Dichlorodiphenyltrichloroethane	USEPA approved TMDL: 2013
	Malathion	Still Required; 2027
	Toxicity	Still Required; 2025
	Nutrients	USEPA approved TMDL: 1999
	Indicator Bacteria	Still Required; 2019
	Sedimentation/Siltation	USEPA approved TMDL: 1999
	Selenium	Still Required; 2007
	Toxphene	Required, 2019
Upper Newport Bay	Chlordane	USEPA approved TMDL: 2013
	Copper	Still Required, 2019
	DDT (Dichlorodiphenyltrichloroethane)	USEPA approved TMDL: 2013
	Indicator Bacteria	USEPA approved TMDL: 2013
	Malathion	Still Required; 2027
	Nutrients	USEPA approved TMDL: 1999
	PCBs (Polychlorinated biphenyls)	USEPA approved TMDL: 2013
	Pesticides	USEPA approved TMDL: 1999
	Toxicity	Still Required, 2027
	Sedimentation/Siltation	Approved
Lower Newport Bay	Chlordane	USEPA approved TMDL: 2013
	Copper	Still Required, 2019
	DDT (Dichlorodiphenyltrichloroethane)	USEPA approved TMDL: 2013
	Indicator Bacteria	USEPA approved TMDL: 2000
	Nutrients	USEPA approved TMDL: 1999
	PCBs (Polychlorinated biphenyls)	USEPA approved TMDL: 2013
	Pesticides	Approved
	Toxicity	Still Required; 2019

Source: Santa Ana RWQCB, 2017.

Groundwater and Groundwater Quality

There are no designated groundwater recharge areas in the City (Newport Beach 2006). The Orange County Water District (OCWD) notes that the principal groundwater aquifer at the project site has ranged from approximately 50 to 110 feet below the ground surface (bgs) over the past 10 years. At the time of subsurface exploration of the project site, a zone of heavy seepage was encountered at depths ranging from 20 to 25 feet bgs. The groundwater encountered represented intermittent seepage and perched zones throughout the site. Perched groundwater is defined as an accumulation of groundwater above the water table in an unsaturated zone, usually trapped above an impermeable soil layer such as clay or controlled by fractures in the rock. The cone penetration test soundings indicated that groundwater was

present at 23 feet bgs at the time of testing. Variations in groundwater may result from fluctuation in ground surface topography, subsurface stratifications, rainfall, and other factors. In general, groundwater is expected to follow the direction of surface topography; therefore, local groundwater flow is expected to be in a general westerly direction. A review of the California Department of Water Resources Water Data Library indicated that no public water wells are located on the project site.

According to the Irvine Ranch Water District's (IRWD) Urban Water Master Plan, the IRWD has not experienced and does not foresee any constraints to its water supplies or water supply capacities resulting from water quality impacts (see Section 4.15, *Utilities and Service Systems*). Replenishment supplies for the Orange County Basin include increased capture of Santa Ana River flows, purified recycled water, purchases of replenishment water from MWD, and expansion of local supplies. OCWD's Groundwater Replenishment System is OCWD's recycled water purification system that has been in operation since 2008. Wastewater is purified using a three-step process to produce high-quality water used to recharge the Basin and for injection into the seawater intrusion barrier. Groundwater quality in the basin is not expected to constrain water supplies for the City of Newport Beach (IRWD, 2016).

4.8.3 THRESHOLDS OF SIGNIFICANCE

The following significance criteria are from the City of Newport Beach Environmental Checklist. The project would result in a significant impact related to hydrology and water quality if it would:

Threshold 4.8-1 Violate any water quality standards or waste discharge requirements.

Threshold 4.8-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a new 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.

Threshold 4.8-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on- or off-site.

Threshold 4.8-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

Threshold 4.8-5 Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Threshold 4.8-6 Otherwise substantially degrade water quality.

As addressed in Section 1.4, *Summary of Effects with No Impact*, the City has determined that the Proposed Project would not have a significant impact on the following threshold for the reasons stated below, and that no further analysis was required:

- 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 which 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.

The FIRM applicable to the project site (FIRM Number 06059C0286J) shows that the site is located within flood Zone X. FEMA defines Zone X as areas of minimal flood hazard and is outside of the 100-year and 500-year flood zones (EEI, 2016a). Therefore, no impact would occur.

- Be subject to inundation by seiche, tsunami, or mudflow

The project site is located approximately 5.5 miles from the Pacific Ocean and is between approximately 46 to 52 feet above msl (EEI, 2016a). The California Geological Survey notes that the project site is not located within an area at risk of tsunami inundation (CGS, 2009). Therefore, no impact would occur. It is also unlikely that the site could be affected by a seiche, which occur in large bodies of water such as a lake, because there are no large water bodies proximate to the site. San Joaquin Freshwater Marsh is approximately 1 mile east of the site and is at a lower elevation by approximately 35 feet. Lastly, the project site is flat and in a developed area, thus no inundation by mudflow would be expected. Therefore, no impacts would occur.

4.8.4 ENVIRONMENTAL IMPACTS

This section describes the methodology used in conducting the impact analysis for hydrology and water quality, the thresholds of significance used in assessing impacts to hydrology and water quality, and the assessment of impacts related to hydrology and water quality, including relevant mitigation measures.

Threshold 4.8-1:	**Would the Project violate any water quality standards or waste discharge requirements?**
Threshold 4.8-6:	**Would the Project otherwise substantially degrade water quality?**

The Proposed Project would create new types of pollutant sources associated with mixed-use residential development that could alter the types of constituents or levels of pollutants contained in post-developed site runoff. In order to reduce the amount of pollutants in storm water runoff from the Proposed Project and to minimize associated hydrologic and water quality impacts, best management practices (BMPs) are required to be implemented in accordance with City, State, and RWQCB standards.

Pollutants of Concern are those pollutants that are expected to be generated by the Proposed Project that could impact water quality. Expected pollutants are described in *Table 4.8-3*.

Table 4.8-3. Pollutants of Concern	
Pollutant	**Sources in Proposed Project**
Suspended-Solid/Sediment	Attached Residential, Retail, Parking, and Street project components
Nutrients	Attached Residential, Retail, Parking, and Street project components
Heavy Metals	Retail, Parking and Street project components
Pathogens (Bacteria/Virus)	Attached Residential, Retail, Parking, and Street project components
Pesticides	Attached Residential, Retail, Parking, and Street project components
Oil and Grease	Attached Residential, Retail, Parking, and Street project components
Toxic Organic Compounds	Retail, Parking, and Street project components
Trash and Debris	Attached Residential, Retail, Parking, and Street parking components
Source: DEA, 2017.	

Construction

Clearing, grading, excavation, and construction activities associated with the Proposed Project may impact water quality by induced sheet erosion of exposed soils and the subsequent deposition of particulates in local drainages. Grading activities and sediment stockpiles can lead to exposed areas of loose soil that are susceptible to uncontrolled sheet flow and wind erosion. Impacts can also occur from sediment laden runoff and mobilization of pollutants associated with vehicle staging and operation.

In compliance with NPDES regulations, the State of California requires that any construction activity disturbing one acre or more of soil comply with the General Construction Activity Storm Water Permit (Construction General Permit). The permit requires development and implementation of a SWPPP and monitoring plan, which must include erosion-control and sediment-control BMPs that would meet or exceed measures required by the Construction General Permit to control potential construction-related pollutants (SC 4.8-1). Categories of BMPs that are included in SWPPPs include:

- Erosion controls: cover and/or bind soil surface, to prevent soil particles from being detached and transported by water or wind. Erosion control BMPs include mulch, soil binders, and mats.
- Sediment controls: filer out soil particles that have been detached and transported in water. Sediment control BMPs include barriers, and cleaning measures such as street sweeping.
- Wind erosion controls: the aims and methods of wind erosion are similar to those of erosion control described above.
- Tracking controls: tracking control BMPs minimize the tracking of soil offsite by vehicles; for instance, stabilizing construction roadways and entrances/exits.
- Non-storm water management: prohibit the discharge of materials other than storm water, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Non-storm water management BMPs also prescribe conducting various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-storm water discharges and contamination of any such discharges.

- Waste and materials management: management of materials and wastes to avoid contamination of storm water. Waste and materials management BMPs include spill prevention and control, stockpile management, and management of solid wastes and hazardous wastes.

Through compliance with Standard Condition (SC) 4.8-1, construction activities associated with the Proposed Project would have a less than significant impact on surface water quality and would not significantly impact the beneficial uses of receiving waters.

Based on the depths to groundwater within the proposed development areas, construction dewatering may be required. Should groundwater be unexpectedly encountered that would require dewatering, the Project would apply for coverage and adhere to the monitoring and reporting program under Order No. R8-2009-0003 (SC 4.8-3).

Operation

The preliminary WQMP prepared for the Project specifies four categories of BMPs to be implemented by the project: site design BMPs, low-impact development (LID) BMPs, structural source control BMPs, and non-structural source control BMPs. The City requires that all new development prepare and submit a WQMP to the City for review and approval prior to the issuance of grading permits.

Site design BMPs are intended to reduce or eliminate post-project runoff. The project WQMP includes the following site design BMPs:

- **Minimize Impervious Area:** 1.) Roadway widths are proposed at the minimum required to satisfy City ordinance and Fire access requirement; 2.) Proposed building types include podium construction and 13-story residential buildings. Building vertically rather than horizontally contributes to a minimized building/impervious footprint; 3.) Primary parking is proposed below ground, covered parking beneath the residential units, minimizing the impervious area required for parking; and 4.) Pervious surface area would be increased by approximately 0.83-acre (or approximately 7 percent) from the existing conditions as a result of Project implementation.
- **Maximize Natural Infiltration Capacity:** The project site is already developed within an area designated with a soil classification of "B"[3]. Natural infiltration is possible on the site, except in areas of geological concern due to close proximity to building structures. As discussed above, the impervious area on site is minimized by a variety of techniques, thereby increasing the potential for natural infiltration to occur.
- **Disconnect Impervious Areas:** Pervious landscaped areas are located throughout the project site. Roof drainage shall be directed to landscaped podium gardens. Overflow from the podium gardens would be directed into the landscaped marsh areas at ground level. Wherever site grading allows, walkways and paved areas would surface flow into adjacent landscaped areas, rather than directly discharging to an inlet.

[3] Type B soil is cohesive and has often been cracked or disturbed. They have medium unconfined compressive strength between 0.5 and 1.5 tons per square foot. https://www.osha.gov/dts/vtools/construction/soil_testing_fnl_eng_web_transcript.html; accessed August 16, 2017.

- **Revegetate Disturbed Areas:** The post-developed condition would increase the amount of pervious surface by approximately 0.83 acre (7 percent). These pervious surfaces are targeted to be vegetated. In addition, parkway areas along roadways would include street trees that provide canopy coverage. Native plant species shall be used to the maximum extent practicable while accomplishing the overall landscape goals of the project.
- **Firescaping:** Landscaping shall be provided in accordance with all applicable Fire Code requirements.
- **Xeriscape Landscaping:** Landscaping shall apply the principles of xeriscaping by the inclusion of water use reduction, decrease in energy use, reduction in heating and cooling costs (to adjacent building), minimize runoff from both irrigation and adjacent rooftops, reduce maintenance waste, habitat creation, and lower labor and maintenance costs.
- **Slope and Channel Buffers:** There are no slopes or channels that exist on, or adjacent to, the project site. Any slopes resulting from development of the project shall be stabilized as quickly as possible, and shall be planted with native and drought tolerant plants, or as indicated on an approved Landscape Architect plan.

LID BMPs are required in addition to site design measures and source control to reduce pollutants in storm water discharges. LID BMPs are engineered facilities that are designed to retain or biotreat runoff on the project site. The following LID BMPs are proposed:

- Hydrologic Source Controls BMPs
    - Localized on-lot infiltration
    - Impervious area dispersion (e.g., roof top disconnection)
    - Street trees (canopy interception)
    - Impervious area reduction (e.g., permeable pavers, site design)
- Infiltration BMPs
    - Drywells
    - Vegetated Swale
- Biotreatment BMPs
    - Bioretention with underdrains
    - Storm water planter boxes with underdrains
    - Vegetated swales
    - Proprietary vegetated biotreatment systems

Source control BMPs reduce the potential for pollutants to enter runoff. The Project proposes the following structural source control BMPs:

- Providing storm drain system stenciling and signage
- Design and construct trash and waste storage areas to reduce pollution introduction

- Use efficient irrigation systems and landscape design, water conservation, smart controllers, and source control
- Protect slopes and channels and provide energy dissipation

The Preliminary WQMP includes the following non-structural source control BMPs:

- Education for property owners, tenants and occupants
- Activity restrictions
- Common area landscape management
- BMP maintenance
- Title 22 CCR compliance
- Hazardous materials disclosure compliance
- Uniform Fire Code implementation
- Common area litter control
- Employee training
- Common area catch basin inspection
- Street sweeping private streets and parking lots

Implementation of appropriate BMPs and compliance with the requirements of the NPDES program, City of Newport Beach Municipal Code, and all other applicable federal, State, and local regulations prior to project approval would result in a less than significant impact.

Impact Summary: ***Less Than Significant.*** Construction and operation of the Project would have the potential to adversely impact water quality in downstream receiving waters through discharge of runoff that contains various pollutants of concern. However, the Project incorporates detailed LID features into internal site design and transitional areas for sediment, source, and treatment control. Additional site-design, structural, source-control, and treatment-control BMPs would be incorporated into the Project to supplement LID features, ensuring compliance with the WQMP and NPDES permit. Additionally, the implementation of BMPs would provide for the protection of surface water quality by avoiding and/or minimizing pollutant runoff into surface waters and provide for protection of groundwater quality by minimizing the introduction of pollutants into the groundwater table.

Should groundwater be unexpectedly encountered that would require dewatering, the Project would apply for coverage and adhere to the monitoring and reporting program under Order No. R8-2009-0003. Therefore, the Project would not violate any water quality standards or waste discharge requirements nor would the Project otherwise substantially degrade water quality. Impacts would be less than significant with no mitigation required.

Threshold 4.8-2:	**Would the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a new 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?**

With the implementation of the Proposed Project, the amount of pervious surface would increase by 28 percent. The increase in pervious surfaces would increase the groundwater recharge at the project site. The site is located within the Pressure Area of the Orange County Groundwater Basin. The Pressure Area is generally defined as the area of the basin where large quantities of surface water and near-surface groundwater is impeded from percolating into the major producible aquifers by clay and silt layers at shallow depths (upper 50 feet). The Principal and Deep Aquifers in this area are under "confined" conditions (under hydrostatic pressure); the water levels of wells penetrating these aquifers exhibit large seasonal variations. Most of the central and coastal portions of the Groundwater Basin fall within the Pressure Area (OCWD Groundwater Management Plan 2015). Additionally, there are no public water wells located on the project site. Potable and non-potable water service is provided by IRWD. Groundwater is not drawn from the project area. The site does not support surface recharge of groundwater and would have no effect on existing groundwater recharge.

As addressed in Section 4.15, *Utilities and Service Systems*, IRWD obtains its water from several sources including groundwater. The *Preliminary Sub-Area Master Plan Addendum for the Koll Center* (*SAMP Addendum)* calculated the Proposed Project's potable water demand to be 33,665 gpd (37.7 AFY). The Project's water demand of 37.7 AFY would represent less than one percent of IRWD's anticipated water surplus for 2020 during a normal year, single dry-year, and multiple dry-year. Therefore, the Proposed Project would not deplete groundwater supplies or interfere substantially with groundwater recharge. Impacts would be less than significant.

Impact Summary: ***Less Than Significant.*** Although groundwater recharge does occur at the project site, it would nominally increase under Project conditions due to an increase in pervious surface area. The Proposed Project's potable water demand would represent less than one percent of IRWD's anticipated water surplus for 2020. The Project would not deplete groundwater supplies or interfere with groundwater recharge. Project impacts would be less than significant.

Threshold 4.8-3:	**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 which would result in a substantial erosion or siltation on- or off-site?**
Threshold 4.8-4:	**Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**
Threshold 4.8-5:	**Would the Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?**

As previously addressed, implementation of the Proposed Project would increase the amount of pervious surfaces. Approximately 3.8 acres of the project site would be landscaped or have a pervious surface, which includes 0.99-acre of pervious area from the park site. The impervious surface includes walkway areas in the podium area, marsh walkways, roads and parking areas that allow for vehicular traffic, which are anticipated to be paved with asphalt. The balance of the site would consist of building footprints, sidewalks, and other hardscape features.

The preliminary WQMP prepared for the Project incorporates site design BMPs that are intended to reduce or eliminate post-project runoff. In addition to the site design BMPs discussed in *Threshold 4.8-1* above, the Project would preserve existing drainage patterns and time of concentration. The existing site is 73 percent impervious surface, and uses an underground storm drain system. Under the post-developed conditions, drainage patterns would be consistent with the existing condition. Points of connection to the downstream storm drain systems would also be consistent with the existing condition. Post-developed grading and storm drain design results in a decrease in peak flows and storm drain volumes. Time of concentration is the time it takes for initial rainfall to travel from the upland areas of a site to the discharge point. Because the existing site and post-developed site are both majority impervious, the calculations assume a conservative time of concentration of five minutes for both conditions.

Water sources downstream of the project site are potentially susceptible to hydromodification impacts. However, because the post-developed time of concentration remains constant and the peak flows decrease, no hydrologic conditions of concern (HCOC) are anticipated as a result of developing the Project.

Table 4.8-4, provides a summary of pre-development and post-developed runoff volumes for the project site. Approximately 1.30 acre-feet (AF) of runoff volume would be produced by 2-year, 24-hour storm event under the Proposed Project. The same frequency and duration storm produces approximately 1.38 AF in the existing condition. This represents an approximately 6 percent decrease in runoff volume with the Project. As a result, there would be less storm water volumes and peak flow rate than existing conditions. In addition, the proposed parking structure would impact the existing 66-inch diameter reinforced concrete pipe storm drain. This storm drain would be rerouted around the parking structure. The realignment of the proposed storm drain would be adequate to convey the 100-year storm event. Therefore, downstream street and storm drain capacity is not expected to be exceeded and on-site detention would help capture flows.

Table 4.8-4. Runoff Volume Summary (2-year, 24-hour storm event)

Drainage Area	Existing Condition			Proposed Condition		
	Area (acre)	Volume (acre-feet)	Flow Rate (cubic feet per second)	Area (acre)	Volume (acre-feet)	Flow Rate (cubic feet per second)
A	5.0	0.5947	7.93	5.0	0.5678	7.87
B	0.8	0.1230	1.59	0.8	0.1096	1.56
C	5.3	0.3591	8.47	5.3	0.6232	8.39
Total	11.1[a]	1.3768	17.99	11.1	1.3006	17.82

a. The drainage area of 11.1 acres is less than the 13.16-acre project site because no development on the west side of the project site.

Source: DEA, 2017.

The proposed storm drain system would largely maintain the same existing drainage patterns, and connectivity. The construction of the Proposed Project would not increase the overall drainage areas from existing to the proposed condition for the three drainage areas (Table 4.8-4). However, these individual drainage areas would be slightly altered for the Project. The intent is to remodel the storm drain system which currently exists on-site and modify the system to pick up drainage from the Project. The connections to the existing public storm drain systems would remain intact.

Overall, the Proposed Project would result in the conveyance of less water to the storm drain system, since the new development would reduce the impervious area at the project site. Consequently, hydromodification measures would not be required, but BMPs would be required to treat the drainage associated with the proposed impervious areas of the project. Implementation of the project would not cause flooding on- or off-site, and impacts on storm drainage capacity would be less than significant.

Impact Summary: ***Less Than Significant.*** The Project's decrease in impervious surfaces would result in a slight decrease in peak flow runoff and runoff volumes from the site. In addition, the Project would incorporate BMPs to treat the storm water runoff associated with the proposed impervious areas. Therefore, impacts would be considered less than significant.

4.8.5 CUMULATIVE IMPACTS

The area over which cumulative impacts to hydrology and water quality are considered is the Newport Bay Watershed. The Newport Bay Watershed spans most of the cities of Irvine, Tustin, Santa Ana, Lake Forest, and Newport Beach; portions of several other cities; and portions of unincorporated Orange County. Substantial growth is anticipated within the Newport Bay Watershed in the next few decades; as parts of the watershed are already urbanized, growth is expected to be a mix of development and redevelopment. New development and redevelopment projects would result in some increases in impervious surfaces, and thus could generate increased runoff from the affect project sites. Future development in the Newport Bay Watershed would prepare and implement WQMPs specifying BMPs, including LID BMPs, that would minimize runoff from those sites and reduce contamination of runoff with pollutants. Therefore, related projects are not expected to cause substantial increases in runoff and are not expected to require construction of substantial new or expanded municipal storm drain systems.

Future development disturbing one or more acres of soil would be required to prepare and implement SWPPPs identifying BMPs to be used for the construction phases of projects to minimize runoff, erosion, and storm water pollution. Therefore, related projects are not expected to cause substantial increases in storm water pollution. With compliance with SC 4.8-1, 4.8-2, and 4.8-3, cumulative impacts would be less than significant, and project impacts would not be cumulatively considerable.

4.8.6 MITIGATION PROGRAM

Project Design Features

PDF 2 **Utilize Best Management Practices to Capture and Treat Storm Water.**

a. *Podium.* The Project will use a biotreatment or bioretention strategies for treating the design capture volume. Roof drainage shall be directed, as appropriate, into landscape areas in the podium gardens. Roof areas will be 100 percent treated in the podium gardens and then discharge directly onto the adjacent landscaped marsh areas that include bioretention strategies with an underdrain.

b. *Street.* The bio-treatment strategy includes the use of proprietary biotreatment devices such as a Modular Wetland System, or an approved equivalent, in streets and parking. Tributary drainage areas and resulting design capture volumes will be treated within the treatment capacities of each biotreatment device.

c. *Park.* Vegetated swales will be used in the park to treat the design capture volume. Vegetated swales will provide pollutant removal through settling and filtration in the vegetation lining the channels. Volume reduction can be incorporated by adding a gravel drainage layer underneath the swale allowing additional flows to be retained and infiltrated. If additional support is needed to detain the entire design capture volume, infiltration drywell systems will be incorporated.

Standard Conditions

SC 4.8-1 Prior to the issuance of rough grading permits, an SWPPP and Notice of Intent (NOI) to comply with the General Permit for Construction Activities shall be prepared, submitted to the State Water Resources Control Board (SWRCB), and made part of the construction program. This SWPPP shall detail measures and practices that would be in effect during construction to minimize the Project's impact on water quality and storm water runoff volumes.

SC 4.8-2 Prior to issuance of precise grading permits, the Applicant shall prepare and submit a Water Quality Management Plan (WQMP) for the project, subject to the approval of the Community Development Department, Building Division and Code and Water Quality Enforcement Division. The WQMP shall include appropriate BMPs to ensure project runoff is adequately treated.

SC 4.8-3 During construction, if groundwater is unexpectedly encountered, the Applicant would apply for dewatering coverage and adhere to the monitoring and reporting program under the Santa Ana Regional Water Quality Control Board National Pollutant Discharge Elimination System (NPDES) Order No. R8-2009-0003.

Mitigation Measures

No mitigation is required.

4.8.7 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the Mitigation Program set forth in this section, significant impacts to hydrology and water quality would not occur.