5.8 Hydrology and Water Quality

The analysis in this section of the EIR addresses the potential impacts associated with hydrology and water quality that may occur due to implementation of the proposed Collier Park Renovations Project. Hydrology is addressed in terms of changes to the existing runoff volume from the site due to implementation of the project. Water quality is addressed in terms of pollutants that would be generated from project construction and operation which could result in the degradation of downstream receiving waters.

5.8.1 Regulatory Framework

5.8.1.1 Federal

Clean Water Act

The federal Clean Water Act (CWA) is the primary federal law that protects our nation's waters, including lakes, rivers, aquifers, and coastal areas. Section 401 of the CWA requires that any applicant for a federal permit to conduct any activity, including the construction or operation of a facility, which may result in the discharge of any pollutant, must obtain certification from the state. Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate both point source and nonpoint source discharges of pollutants to surface waters of the U.S. Section 404 of the CWA established a permit program to regulate the discharge of dredged material into waters of the U.S. Section 303 of the CWA requires states to identify surface waters that have been impaired. Under Section 303(d), states, territories, and authorized tribes are required to develop a list of water quality segments that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology.

National Flood Insurance Program

The National Flood Insurance Act of 1968 established the National Flood Insurance Program in order to provide flood insurance within communities that were willing to adopt floodplain management programs to mitigate future flood losses. This Act also required the identification of all floodplain areas and the establishment of flood-risk zones within those areas. The Flood Disaster Protection Act of 1973 expanded the National Flood Insurance Program by substantially increasing limits of coverage authorized under the program, and by requiring known flood-prone communities to participate in the program and to adopt adequate flood plan ordinances. This Act also made the purchase of flood insurance mandatory for property owners who are being assisted by federal programs, agencies, or institutions in the acquisition or improvement of land or facilities located in identified areas having special flood hazards. The National Flood Insurance Program has been further amended by subsequent reform acts. The Federal Emergency Management Agency (FEMA) is the primary agency responsible for administering programs and coordinating with communities to establish effective floodplain management standards. FEMA is responsible for preparing Flood Insurance Rate Maps, which delineate both the special flood hazard areas and the risk premium zones applicable to the community.

National Pollutant Discharge Elimination System Program

The NPDES program was established by the CWA to regulate both point source (discharge at a specific location or pipe) and nonpoint source (diffuse runoff) discharges to surface waters of the U.S. For point source discharges, each NPDES permit contains limits on allowable concentrations and mass emission of pollutants contained in the discharge. For nonpoint source discharges, the NPDES program establishes a comprehensive storm water quality program to manage urban storm water and minimize pollution of the environment to the maximum extent practicable. The NPDES program consists of characterizing receiving water quality, identifying harmful constituents, targeting potential sources of pollutants, and implementing a comprehensive storm water management program. In California, the NPDES program is administered by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs).

5.8.1.2 State

NPDES Construction General Permit

Construction activities that result in a land disturbance of equal to or greater than one acre (and projects that meet other specific criteria) must comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), which is governed by the SWRCB under Order No. 2009-0009-DWQ as modified by 2010-0014-DWQ, NPDES No. CAS000002. Each RWQCB enforces the Construction General Permit for projects within their region. It is the responsibility of the landowner to obtain coverage under the Construction General Permit prior to commencement of construction activities. To obtain coverage, the owner must file a Notice of Intention (NOI) with a vicinity map and the appropriate fee to the RWQCB.

The Construction General Permit outlines the requirements for preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP has two major objectives: 1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and 2) to describe and ensure the implementation of construction best management practices (BMPs) to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The Construction General Permit also outlines post-construction standards for runoff reduction requirements, which includes the use of non-structural and/or structural measures to preserve pre-construction runoff volumes and drainage densities from the site, as well as post-construction BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site.

NPDES Municipal Permit

Discharges of urban runoff from the municipal separate storm sewer systems (MS4s) draining the watersheds of the County of San Diego, the 18 incorporated cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (the co-permittees) must comply the NPDES Municipal Storm Water Permit for San Diego County (Municipal Permit), which is governed by the San Diego RWQCB under Order No. R9-2007-0001, NPDES No. CAS0108758. The Municipal Permit specifies the requirements necessary to reduce the discharge of pollutants in urban runoff to the maximum extent practicable, and outlines the individual responsibilities of the co-permittees including (but not limited to) the implementation of: 1) management programs; 2) best management practices (BMPs); and 3) monitoring programs.

Each co-permittee is responsible for implementing the requirements of the Municipal Permit to prevent the water quality impacts of urbanization within their jurisdiction and watershed(s). The Municipal Permit reflects these two broad levels of responsibility by requiring comprehensive urban runoff management programs at both jurisdictional and watershed levels. The City of La Mesa has complied with the jurisdictional program requirement of the Municipal Permit by developing the City of La Mesa Storm Water BMP Manual – Part I (City of La Mesa 2010), which documents the City's Jurisdictional Urban Runoff Management Program (JURMP) (described below). In addition, the City of La Mesa, along with the County of San Diego, San Diego Unified Port District, San Diego County Regional Airport Authority, and six other incorporated cities of San Diego County, has complied with the watershed program requirement of the Municipal Permit by jointly developing the San Diego Bay Watershed Urban Runoff Management Program (WURMP) (described below). These programs are designed to identify and prioritize local water quality problems that can be attributed to urban runoff and provide solutions to mitigate these problems.

The Municipal Permit also requires the implementation of a program addressing urban runoff pollution issues in development planning for public and private projects. The City of La Mesa has complied with this condition by developing the City of La Mesa Storm Water BMP Manual – Part II (City of La Mesa 2011), which documents the City's Local Standard Urban Storm Water Mitigation Plan (SUSMP) (described below).

Porter-Cologne Water Quality Control Act

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. The Water Quality Control Plan for the San Diego Basin (RWQCB 1994) is designed to preserve and enhance the quality of water resources in the San Diego Region for the benefit of present and future generations. The purpose of the plan is to designate beneficial uses of the region's surface and groundwaters, designate water quality objectives for the reasonable protection of those uses, and establish an implementation plan to achieve the objectives.

All projects resulting in discharges, whether to land or water, are subject to Section 13263 of the California Water Code and are required to obtain approval of Waste Discharge Requirements (WDRs) from the RWQCBs. Land and groundwater related WDRs (i.e., non-NPDES WDRs) regulate discharges of process and wash-down wastewater and privately or publicly treated domestic wastewater. WDRs for discharges to surface waters also serve as NPDES permits.

5.8.1.3 Regional

San Diego Basin Plan

The Water Quality Control Plan for the San Diego Basin (San Diego RWQCB 1994), known as the San Diego Basin Plan, is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the San Diego Basin Plan: 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; 3) describes implementation programs to protect the beneficial uses of all waters in the region; and 4) describes

surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan. The beneficial uses designated within the San Diego region are listed in Table 5.8-1. The San Diego Basin Plan incorporates by reference all applicable SWRCB and RWQCB plans and policies.

Table 5.8-1 San Diego Basin Plan Beneficial Use Designations

Designation	Code	Definition
Municipal and Domestic Supply	MUN	Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
Agricultural Supply	ARG	Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Industrial Service Supply	IND	Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
Industrial Process Supply	PROC	Includes uses of water for industrial activities that depend primarily on water quality.
Ground Water Recharge	GWR	Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion.
Freshwater Replenishment	FRSH	Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
Navigation	NAV	Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
Hydropower Generation	POW	Includes uses of water for hydropower generation.
Contact Water Recreation	REC-1	Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.
Non-contact Water Recreation	REC-2	Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
Commercial and Sport Fishing	COMM	Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
Aquaculture	AQUA	Includes uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
Warm Freshwater Habitat	WARM	Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
Cold Freshwater Habitat	COLD	Includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
Inland Saline Water Habitat	SAL	Includes uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.
Estuarine Habitat	EST	Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Table 5-8 continued

Designation	Code	Definition
Marine Habitat	MAR	Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
Wildlife Habitat	WILD	Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife, or wildlife water and food sources.
Preservation of Biological Habitats of Special Significance	BIOL	Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
Rare, Threatened, or Endangered Species	RARE	Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
Migration of Aquatic Organisms	MIGR	Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
Spawning, Reproduction, and/or Early Development	SPWN	Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is only applicable for the protection of anadromous fish.
Shellfish Harvesting	SHELL	Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sport purposes.

Source: San Diego RWQCB 1994

San Diego Watershed Urban Runoff Management Program

The purpose of the San Diego Bay WURMP, which was developed by the co-permittees of the San Diego Bay Watershed Management Area pursuant to the NPDES Municipal Permit (described above), is to cooperatively and through collaborative strategic planning decrease the sources and reduce the discharge of pollutants from MS4s within the Watershed Management Area that have been identified as causing high priority water quality problems. The WURMP identifies five primary objectives to strive towards this goal: 1) develop and expand methods to assess and improve water quality within the watershed; 2) implement activities to address the Watershed Management Area high priority water quality problems; 3) integrate watershed principles into land use planning; 4) enhance public understanding of sources of water pollution, and 5) encourage and develop stakeholder participation.

The WURMP provides guidance and coordination for water quality, education, land use planning activities, and program implementation to efficiently achieve the greatest protection of beneficial use of receiving waters.

5.8.1.4 Local

City of La Mesa Storm Water BMP Manual

The City's Storm Water BMP Manual was developed to meet the JURMP and SUSMP requirements of the NPDES Municipal Permit (described above). The purpose of the Storm Water BMP Manual is to: 1) reduce discharges from the MS4 to the maximum extent practicable; 2) prevent discharges of pollutants from the MS4 from causing or contributing to a violation of water quality standards; and 3) manage increases in runoff discharge rates and durations from development projects that are likely to cause

increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force. Part I of the Storm Water BMP Manual contains the BMP requirements for industrial and commercial facilities, municipal facilities, and residences (City of La Mesa 2010). Part II of the Storm Water BMP Manual contains both construction BMP requirements and post-construction SUSMP requirements, including Low Impact Development (LID) design guidelines and other permanent BMPs (City of La Mesa 2011).

City of La Mesa Watercourse Protection, Storm Water Management, and Discharge Control Ordinance

La Mesa Municipal Code Chapter 7.18, Storm Water Management and Discharge Control, regulates all discharges into the storm water conveyance system and the waters of the State in order to preserve and enhance water quality for beneficial uses by:

a) Prohibiting non-storm water discharges to the storm water conveyance system;

b) Eliminating pollutants in storm water to the maximum extent practicable, including pollutants from both point and non-point sources;

c) Prohibiting activities which cause, or contribute to, exceeding state and federal receiving water quality objectives; and

d) Protecting watercourses from disturbance and pollution.

The ordinance requires all dischargers to implement, install, use, and maintain all applicable BMPs and to comply with the City's Storm Water BMP Manual, which is incorporated by reference, in order to reduce pollutants to the maximum extent practicable.

5.8.2 Existing Conditions

5.8.2.1 Hydrologic Setting

Collier Park is located within the Sweetwater Hydrologic Unit of the San Diego Bay watershed (San Diego RWQCB 1994). The San Diego Bay watershed encompasses a 415-square mile area that extends more than 50 miles inland (east) from San Diego Bay to the Laguna Mountains. The watershed lies at sea level at San Diego Bay and reaches a maximum elevation of approximately 6,000 feet above mean sea level at its eastern boundary. The headwaters of the watershed begin in the eastern, unincorporated area of San Diego County and then transect all or portions of seven cities, including San Diego, National City, Chula Vista, Imperial Beach, Coronado, Lemon Grove, and La Mesa. The San Diego Bay watershed is comprised of three hydrologic units: Pueblo San Diego Hydrologic Unit, Sweetwater Hydrologic Unit, and Otay Hydrologic Unit.

The Sweetwater Hydrologic Unit, which encompasses an area of approximately 230 square miles, is the largest of the three hydrologic units that discharge into San Diego Bay. The Sweetwater Hydrologic Unit forms an elongated northeasterly trending strip which is traversed along its length by the Sweetwater River. The Sweetwater Hydrologic Unit is comprised of three hydrologic areas, which are further divided into hydrologic subareas. Collier Park lies within the La Nacion Hydrologic Subarea (Basin 9.12) of the Lower Sweetwater Hydrologic Area. Major water bodies in the Sweetwater Hydrologic Unit include the

Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay, all of which support important wildlife habitat and provide public recreational opportunities.

Between the headwaters and the outlet to San Diego Bay, the Sweetwater River watershed contains a variety of habitat types including oak and pine woodlands, riparian forest, chaparral, coastal sage scrub, and coastal salt marsh. The upper portion of the watershed contains large undeveloped areas within the Cleveland National Forest and Cuyamaca Rancho State Park, the unincorporated communities of Pine Valley, Descanso, and Alpine, and the Viejas Indian Reservation. Unincorporated rural and suburban communities characterize the central part of the watershed. The lower portion of the watershed contains urbanized areas of several cities including San Diego, National City, Chula Vista, La Mesa, and Lemon Grove. The dominant land uses in the Sweetwater River watershed are urban (29 percent), open space/agriculture (22 percent), and undeveloped (49 percent), with approximately two-thirds of the land area categorized as urban being composed of residential communities (Project Clean Water 2012).

5.8.2.2 Water Quality

Surface Waters

There are no major surface waters in the vicinity of Collier Park. The portion of La Mesa that lies generally south of Interstate 8 and east of Spring Street, which includes the project site, drains into Spring Valley Creek which feeds into Sweetwater River and ultimately discharges into San Diego Bay. The designated beneficial uses of these three receiving waters are listed in Table 5.8-2. The Section 303(d) List of Water Quality Limited Segments (SWRCB 2006) identifies the San Diego Bay Shoreline at Bayside Park as impaired due to indicator bacteria (enterococcus and total coliform) and the San Diego Bay Shoreline at Chula Vista Marina as impaired due to copper. In addition, San Diego Bay is generally listed as impaired due to polychlorinated biphenyls (PCBs). Spring Valley Creek and Sweetwater River are not identified on the Section 303(d) List.

Table 5.8-2 Beneficial Uses of Surface Waters

	Basin Number	Beneficial Use[(1)]																					
		MUN	AGR	IND	PROC	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL
Inland Surface Waters																								
Spring Valley Creek	9.12	+		●						○	●			●					●					
Sweetwater River	9.12	+		●						○	●			●					●		●			
Coastal Waters																								
San Diego Bay	--			●				●		●	●	●					●	●	●	●	●	●	●	●

● = Existing Beneficial Use; ○ = Potential Beneficial Use; + = Excepted From MUN

(1) Refer to Table 5.8-1 for definitions of the beneficial use designations.

Source: San Diego RWQCB 1994

Groundwater

According to the Preliminary Geotechnical Investigation (Geocon Incorporated 2010), neither a static groundwater table nor subsurface seepage was encountered during exploratory excavations at Collier Park. However, due to the permeability characteristics of the geologic formation underlying the project site, it would not be uncommon for groundwater seepage conditions to develop where none previously

existed. During periods of heavy or prolonged rainfall, perched groundwater conditions are likely to develop within drainage areas. Groundwater elevations tend to vary because they are dependent upon a number of factors such as seasonal precipitation, irrigation, and land use. The designated beneficial uses of the groundwater underlying Collier Park, which is part of the La Nacion Hydrologic Subarea, are listed in Table 5.8-3.

Table 5.8-3 Beneficial Uses of Groundwater

	Basin Number	Beneficial Use[1]																					
		MUN	AGR	IND	PROC	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL
Groundwater																								
La Nacion Hydrologic Subarea	9.12	●	●	●																				

● = Existing Beneficial Use; ○ = Potential Beneficial Use; + = Excepted From MUN
[1] Refer to Table 5.8-1 for definitions of the beneficial use designations.
Source: San Diego RWQCB 1994

Additionally, a natural spring occurs within Collier Park. The spring water was sampled and analyzed to assess water quality and potential beneficial uses, and the following determinations were made regarding its suitability for irrigation, a pond, and recreational uses (D-Max Engineering, Inc. 2009):

- Irrigation. Detected levels of residual chlorine were below the reporting limit and measurements of electrical conductivity, total dissolved solids, sodium, and nitrogen indicate a slight to moderate degree of usage restriction for irrigation. Due to the slightly lower pH (i.e., greater acidity) and fairly high sodium levels, surrounding plant sensitivity to acidic environments and sodium levels needs to be taken into consideration prior to using the spring water for irrigation.
- Ponding. Dissolved oxygen was determined to be at a good level to support aquatic life forms and detected levels of organics and metals were below reporting limits. The slightly elevated levels of nutrients (orthophosphates in combination with nitrite and nitrate) may stimulate growth of algae and lead to future euthrophication. In addition, the slightly lower pH level may stress some species of fish and aquatic life that may be incorporated into an ornamental pond.
- Non-Contact and Contact Recreation. The detected levels of total and fecal coliform, organics, and metals were below reporting limits and considered acceptable for both non-contact and contact recreational uses. The slightly lower pH level would not affect the parameters used for non-contact and contact recreational uses.

Urban Runoff

Urban runoff discharged via MS4s has been identified as one of the principal causes of water quality problems in most urban areas. The City of La Mesa's storm water drainage system, which collects runoff from streets, rooftops, driveways, parking lots, and other impervious areas, flows directly into receiving waters without receiving treatment. Thus, urban runoff has the potential to discharge pollutants into receiving waters, thereby affecting water quality, associated wildlife, and public health. Potential pollutants contained in urban runoff and associated environmental effects include the following:

- Sediments. Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organism survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- Nutrients. Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
- Metals. Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations that naturally occur in soils, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources and bioaccumulation of metals in fish and shellfish. Environmental concerns regarding the potential for release of metals to the environment have already led to restricted metal usage in certain applications.
- Organic Compounds. Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
- Trash and Debris. Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
- Oxygen Demanding Substances. Oxygen demanding substances include biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
- Oil and Grease. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to water bodies is very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

- Bacteria and Viruses. Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- Pesticides. Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

5.8.2.3 Drainage Facilities

A concrete-lined drainage channel transects the southern half of Collier Park, running from Pasadena Avenue to just north of the existing playground, where it discharges into an underground storm drain line. The drainage channel, which is approximately five-feet wide, conveys nuisance runoff and storm water flows discharging from a storm drain inlet on Pasadena Avenue and from the surrounding parkland. A natural spring, emanating from beneath the Spring House, also discharges into the drainage channel through a small pipe just east of the Spring House. Discharges from the drainage channel are conveyed via the on-site underground storm drain line to a catch basin at the southern boundary of the park. This catch basin, which also collects discharges from an off-site concrete v-ditch and storm drain line, appears to be the low point of the park and connects to the City's enclosed storm water drainage system.

5.8.3 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a significant impact associated with hydrology and drainage would occur if implementation of the proposed project would:

- **Threshold 1:** Violate any water quality standards or waste discharge requirements.
- **Threshold 2:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site.
- **Threshold 3:** 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:** Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- **Threshold 5:** Otherwise substantially degrade water quality.
- **Threshold 6:** Place structures within a 100-year flood hazard area which would impede or redirect flood flows.
- **Threshold 7:** 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.
- **Threshold 8:** Result in a substantial increase in risk of exposure to inundation by seiche, tsunami, or mudflow.

In accordance with Section 15128 of the CEQA Guidelines, impacts related to 1) depletion of groundwater supplies or interference with groundwater recharge, and 2) placing housing within a 100-year flood hazard area, were determined not to be significant and are discussed briefly in Section 7.1, Effects Found Not to be Significant, of this EIR.

5.8.4 Impacts

5.8.4.1 Water Quality Standards

Threshold 1: Would the project violate any water quality standards or waste discharge requirements?

Threshold 5: Would the project otherwise substantially degrade water quality?

Construction Impacts

Construction of the proposed project would generate pollutants that could potentially degrade the surface water quality of downstream receiving waters. Sediment associated with earth-moving activities and exposed soils is the most common pollutant associated with construction sites. Other pollutants associated with construction sites include hydrocarbons from spills or leaks of fuels, oils, and other fluids used for construction equipment; paints, concrete slurries, asphalt, and other hazardous materials; and debris, trash, and other solid waste materials generated during construction activities. Storm water and non-storm water runoff could potentially carry these pollutants into the on-site drainage facilities and the City's storm water drainage system, which discharge to downstream receiving waters (Spring Valley Creek and Sweetwater River) that ultimately drain to San Diego Bay. However, the proposed project must comply with the NPDES Construction General Permit and the City's Storm Water BMP Manual, which require the preparation and implementation of a SWPPP. The SWPPP would identify site-specific construction BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water runoff from the project site. Construction BMPs would include, but are not limited to, the following:

- Minimization of disturbed areas to the portion of the project site necessary for construction;
- Stabilization of exposed or stockpiled soils and cleared or graded slopes;
- Establishment of permanent re-vegetation or landscaping as early as feasible.
- Removal of sediment from surface runoff before it leaves the project site by silt fences or other similar devices around the site perimeter;
- Diversion of upstream runoff around disturbed areas of the project site;
- Protection of all storm drain inlets on site or downstream of the project site to eliminate entry of sediment;
- Prevention of tracking soil off site through use of a gravel strip or wash facilities at exits from the project site;
- Proper storage, use, and disposal of construction materials; and
- Continual inspection and maintenance of all specified BMPs through the duration of construction.

Although the proposed project would be completed in phases, grading of the entire project site may occur during the initial Panhandle phase with the actual development of the Spring House, History Hill

and Collier Club House phases occurring much later, thereby leaving graded areas exposed during the interim period. All graded areas that would not be developed immediately would remain subject to the NPDES Construction General Permit and the City's Storm Water BMP Manual until permanently stabilized in accordance with the standards contained within these regulations. As indicated above, compliance with these regulations requires the implementation of construction BMPs, which include provisions for the stabilization of inactive disturbed areas and graded slopes. Stabilization methods include hydroseeding, soil binders, chemical soil stabilizers, geotextiles, tarps, fencing, or other erosion control measures. Implementation of construction BMPs in compliance with the NPDES Construction General Permit and the City's Storm Water BMP Manual would maintain downstream water quality in accordance with RWQCB standards, such that project construction would not violate any water quality standards or waste discharge requirements and would not otherwise substantially degrade water quality. Therefore, construction impacts related to water quality degradation would be less than significant.

Post-Construction Impacts

Following construction, the proposed project could potentially contribute to higher pollutant levels in urban runoff due to the increased amount of impervious area and increased park usage. However, the proposed project must comply with the NPDES Municipal Permit and the City's Storm Water BMP Manual, which require implementation of post-construction BMPs developed in accordance with the City's SUSMP. The proposed project qualifies as a "Priority Development Project," as defined in the City's SUSMP, because it includes the development of a parking lot greater than or equal to 5,000 square feet. Priority Development Projects must prepare and submit a Post-Construction Water Quality Technical Report to demonstrate compliance with the SUSMP requirements, which include the incorporation of feasible LID features, source control BMPs, and treatment control BMPs into the project design to reduce the discharge of storm water pollutants to the maximum extent practicable.

Consistent with the LID design guidelines, proposed drainage improvements include the installation of grass swales and cobble drainage swales, as well as the replacement of the existing concrete-lined channel with a bioswale and bioinfiltration basin, which would reduce flow rates and allow surface runoff to infiltrate on site. In addition, a large portion of the park would be re-graded and replanted to better manage site drainage and limit the amount of water that leaves the site. Implementation of post-construction BMPs in compliance with the NPDES Municipal Permit and the City's Storm Water BMP Manual would maintain downstream water quality in accordance with RWQCB standards, such that project development would not violate any water quality standards or waste discharge requirements and would not otherwise substantially degrade water quality. Therefore, post-construction impacts related to water quality degradation would be less than significant.

5.8.4.2 Drainage Alterations

Threshold 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, in a manner, which would result in substantial erosion or siltation on- or off-site?

Threshold 5: 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 6: Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Construction Impacts

Construction of the proposed project would temporarily alter the localized drainage pattern at the project site due to ground-disturbing activities such as grading and excavation. Such alterations in the drainage pattern may temporarily result in erosion or siltation and may temporarily increase the rate or amount of surface runoff if substantial drainage is rerouted. However, as described in Section 5.8.4.1 above, implementation of construction BMPs would minimize the potential for erosion and siltation and would control surface runoff such that flooding does not occur and off-site flow does not exceed the capacity of the City's storm water drainage system. Construction BMPs would also minimize the discharge of polluted runoff from the project site. Therefore, construction impacts associated with drainage alterations would be less than significant.

Post-Construction Impacts

Following construction, any remaining disturbed areas of the project site would be stabilized with landscaping to prevent erosion or siltation. Although the proposed project would substantially alter the localized drainage pattern at the project site, such alterations are intended to improve existing drainage conditions and would not result in flooding. Proposed drainage improvements include the installation of grass swales and cobble drainage swales, as well as the replacement of the existing concrete-lined channel with a bioswale and bioinfiltration basin, which would reduce flow rates and allow surface runoff to infiltrate on site. In addition, a large portion of the park would be re-graded and replanted to better manage site drainage and limit the amount of water that leaves the site. Thus, off-site flow would be minimal and would not exceed the capacity of the City's storm water drainage system. Furthermore, as discussed in Section 5.8.4.1 above, implementation of post-construction BMPs would minimize the discharge of polluted runoff from the project site. Therefore, post-construction impacts associated with drainage alterations would be less than significant.

5.8.4.3 Flood Hazards

Threshold 6: Would the project place structures within a 100-year flood hazard area which would impede or redirect flood flows?

Threshold 7: 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 dam?

FEMA has mapped zones of anticipated flooding based on base flood elevations for 100-year and 500-year flood events. According to Flood Insurance Rate Map Number 06073C 1644H (FEMA 2012), the project site is located within Zone X, which designates areas determined to be outside the 0.2 percent annual chance (500-year) floodplain. The project site also lies outside the 100-year flood hazard area.

The nearest dam to the project site is Loveland Reservoir. Although this dam has a high relative hazard rating, it is located over 12 miles upstream from the project site (County of San Diego 2010). As such, the project site is located outside of potential zones of inundation due to dam failure (SanGIS 2012). Thus, the proposed project would not place structures within a 100-year flood hazard area and would

not expose people or structures to a significant risk of loss, injury, or death involving flooding. Therefore, no impacts associated with flood hazards would occur as a result of the proposed project.

5.8.4.4 Seiche, Tsunami, and Mudflow

Threshold 8: Would the project result in a substantial increase in risk of exposure to inundation by seiche, tsunami, or mudflow?

Seiches are standing waves caused by resonances in an enclosed or partially enclosed body of water (lake, reservoir, bay, harbor) that has been disturbed by meteorological effects (wind and atmospheric pressure variations). The project site is located approximately two miles southeast of Lake Murray and approximately two miles southwest of Mount Helix Reservoir, which are the nearest inland bodies of water. Due to the distance from these bodies of water, the project site would not be subject to inundation by seiche. Therefore, no impacts associated with seiche would occur as a result of the proposed project.

Tsunamis are series of ocean waves generated by sudden displacements of a large volume of water due to earthquakes, landslides, or volcanic activity. The project site is located approximately 14 miles inland (east) of the Pacific Ocean. Due to the distance from the ocean, the project site would not be subject to inundation by tsunami. Therefore, no impacts associated with tsunami would occur as a result of the proposed project.

Mudflows, also known as debris flows, are shallow water-saturated landslides that travel rapidly down slopes carrying rocks, brush, and other debris. Mudflows occur naturally as a result of heavy rainfall on steep slopes that contains loose soil or debris. The project site does not contain loose soil or debris. According to the San Diego County Multi-Jurisdictional Hazard Mitigation Plan (County of San Diego 2010), the project site is not located within a rain-induced landslide hazard area. Thus, the project site would not be subject to inundation by mudflow. Therefore, no impacts associated with mudflows would occur as a result of the proposed project.

5.8.5 Mitigation Measures

5.8.5.1 Water Quality Standards

No significant impacts related to the water quality standards would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.8.5.2 Drainage Alterations

No significant impacts related to drainage alterations would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.8.5.3 Flood Hazards

No significant impacts related to flood hazards would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.8.5.4 Seiche, Tsunami, and Mudflow

No significant impacts related to seiche, tsunami, and mudflow would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.8.6 Significance Determination

The significance of hydrology and water quality impacts before and after mitigation is summarized in Table 5.8-4. Implementation of the proposed project would not result in any significant impacts related to the water quality standards, drainage alterations, flood hazards, or seiche, tsunami, and mudflow. Therefore, impacts associated with hydrology and water quality would be less than significant without mitigation.

Table 5.8-4 Summary of Significance of Hydrology and Water Quality Impacts

Issue	Significance before Mitigation	Mitigation	Significance after Mitigation
Water Quality Degradation	Less than Significant	None	Less than Significant
Drainage Alterations	Less than Significant	None	Less than Significant
Flood Hazards	Less than Significant	None	Less than Significant
Seiche, Tsunami, and Mudflow	Less than Significant	None	Less than Significant

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