4.7 HYDROLOGY AND WATER QUALITY

This section of the EIR evaluates potential impacts associated with hydrology and water quality resulting from implementation of the proposed project. The following discussed is based, in part, on the Preliminary Drainage Study and Floodplain Analysis for the Alvarado Specific Plan (Fuscoe Engineering, Inc. [Fuscoe] 2020a) and Storm Water Quality Management Plan (SWQMP; Fuscoe 2018) prepared for the project, which are included as Appendices I and J of this EIR.

4.7.1 Existing Conditions

4.7.1.1 Hydrologic Setting

In California, the regulation, protection, and administration of water quality are carried out by the SWRCB. Due to the statewide variations in water quality and quantity, California is divided into nine regions for the purposes of regional administration of California's water quality control program, and each region has a RWQCB and Water Quality Control Plan. The project site is located in Region 9, the San Diego Region. The San Diego Region encompasses approximately 3,900 square miles that extend from the Pacific Ocean east to the Laguna Mountains. The northern boundary of the Region starts near Laguna Beach, and the southern boundary is the border between the United States and Mexico (RWQCB 2016).

The San Diego Region is divided into 11 hydrologic units. The project site is located within the San Diego Hydrologic Unit (HU), which is an elongated, triangular-shaped area encompassing approximately 440 square miles drained by the San Diego River. The San Diego HU includes four hydrologic areas (HA), including the Lower San Diego HA, San Vicente HA, El Capitan HA, and Boulder Creek HA. Each hydrologic area is further divided into hydrologic subareas (HSA). The project site lies within the Mission San Diego HSA (Basin 907.11) of the Lower San Diego HA. The main receiving water body in this HSA is the San Diego River. The San Diego River is located approximately 3.2 mile north of the project site; however, Alvarado Creek bisects the project site and drains into the San Diego River downstream of the site.

4.7.1.2 Water Quality

Surface Waters

Storm flows are subject to variations in water quality due to local conditions such as runoff rates/ amounts and land use. The main surface water occurring in the vicinity of the project is Alvarado Creek, which runs through the project site and drains into the San Diego River downstream before eventually discharging into the Pacific Ocean. Typical pollutant sources and loadings for various land use types provided in Table 4.7-1, *Summary of Typical Pollutant Sources for Urban Storm Water Runoff*, and Table 4.7-2, *Typical Loadings for Selected Pollutants in Runoff from Various Land Uses*.

Table 4.7-1
SUMMARY OF TYPICAL POLLUTANT SOURCES FOR URBAN STORM WATER RUNOFF

Pollutants	Pollutant Sources
Sediment and Trash/Debris	Streets, landscaping, driveways, parking areas, rooftops, construction activities, atmospheric deposition, drainage channel erosion
Pesticides and Herbicides	Landscaping, roadsides, utility rights-of-way, soil wash-off
Organic Compounds	Landscaping, streets, parking areas, animal wastes, recreation areas
Oxygen Demanding Substances	Landscaping, animal wastes, leaky sanitary sewer lines, recreation areas
Heavy Metals	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, corroding metal surfaces, combustion processes
Oil and Grease/Hydrocarbons	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, illicit dumping to storm drains
Bacteria and Viruses	Landscaping, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal wastes, recreation areas
Nutrients (Nitrogen and Phosphorus)	Rooftops, landscaping, atmospheric deposition, automobile exhaust, soil erosion, animal wastes, detergents, recreation areas

Source: USEPA 1999

Table 4.7-2
TYPICAL LOADINGS FOR SELECTED POLLUTANTS IN RUNOFF FROM VARIOUS LAND USES
(lbs/acre/year)

Land Use	TSS	TP	TKN	NH_3 - N	NO_2 + NO_3 - N	BOD	COD	Pb	Zn	Cu
Commercial	1000	1.5	6.7	1.9	3.1	62	420	2.7	2.1	0.4
Parking Lot	400	0.7	5.1	2	2.9	47	270	0.8	0.8	0.04
HDR	420	1	4.2	0.8	2	27	170	0.8	0.7	0.03
MDR	190	0.5	2.5	0.5	1.4	13	72	0.2	0.2	0.14
LDR	10	0.04	0.03	0.02	0.1	N/A	N/A	0.01	0.04	0.01
Freeway	880	0.9	7.9	1.5	4.2	N/A	N/A	4.5	2.1	0.37
Industrial	860	1.3	3.8	0.2	1.3	N/A	N/A	2.4	7.3	0.5
Park	3	0.03	1.5	N/A	0.3	N/A	2	0	N/A	N/A
Construction	6000	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: USEPA 1999
HDR = High Density Residential; MDR = Medium Density Residential; LDR = Low Density Residential
N/A = Not available; insufficient data to characterize; TSS = Total Suspended Solids; TP = Total Phosphorus; TKN = Total Kjeldahl Nitrogen; NH_3 – N = Ammonia - Nitrogen; NO_2 + NO_3 – N = Nitrite + Nitrate - Nitrogen; BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; Pb = Lead; Zn = Zinc; Cu = Copper

Beneficial Uses

The Basin Plan establishes beneficial uses for surface waters in the Region. Beneficial uses are defined in the Basin Plan as "the uses of water necessary for the survival or well-being of man, plus plants and wildlife." Identified existing and potential beneficial uses for applicable receiving waters near and downstream from the project site are summarized below:

- Alvarado Creek: Agricultural Supply (AGR), Industrial Service Supply (IND), Contact Water Recreation (REC-1), Non-contact Water Recreation (REC-2), Warm Freshwater Habitat (WARM), and Wildlife Habitat (WILD). Alvarado Creek is excluded from the MUN beneficial use.

- San Diego River: AGR, IND, REC-1, REC-2, WARM, WILD, and Rare Threatened or Endangered Species (RARE). The San Diego River is excluded from the MUN beneficial use.

- Pacific Ocean: IND, Navigation (NAV), REC-1, REC-2, Commercial and Sport Fishing (COMM), Preservation of Biological Habitats of Special Significance (BIOL), WILD, RARE, Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

Clean Water Act Section 303(d) Impaired Water Bodies and Total Maximum Daily Loads

Under Section 303(d) of the Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. Waters on the list do not meet water quality standards even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires establishment of priority rankings for water on the lists and develop action plans, called Total Maximum Daily Loads (TMDLs), to improve water quality. The San Diego RWQCB is responsible for developing the 303(d) list in the San Diego region.

The receiving waters for the CPU area that are currently listed as impaired (based on the 2014 – 2016 303[d] List) include Alvarado Creek for nitrogen and selenium; San Diego River (lower) for enterococcus, fecal chloroform, low dissolved oxygen, manganese, nitrogen, phosphorus, total dissolved solids, and toxicity; and the Pacific Shoreline at the San Diego River Outlet at Dog Park for enterococcus and total coliform.

4.7.1.3 Groundwater

Groundwater is defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Groundwater bearing formations sufficiently permeable to transmit and yield substantial quantities of water are called aquifers. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers. The principal groundwater basins in the San Diego region are relatively small in area and usually shallow. Although these groundwater basins are limited in size, the groundwater yield from the basins has been historically important to the development of the region. Nearly all of the local groundwater basins have been intensively developed for municipal and agricultural supply purposes.

Groundwater within the Mission San Diego HSA of the Lower San Diego HA of the San Diego HU has identified existing beneficial uses of AGR, IND, and Industrial Process Supply (PROC). MUN is a potential beneficial use.

According to the Geotechnical Investigation Update prepared for the project, groundwater was encountered at a depth of three feet along the southern perimeter of the project site, adjacent to Alvarado Creek (Geotechnical Exploration, Inc. 2019). As such, it is anticipated that groundwater would be encountered during grading operations in these areas of the project site.

4.7.1.4 Drainage

The existing site can be divided into two major basins. Basin 1 encompasses approximately 4.5 acres and consists of the portion of the site east of where Alvarado Creek bisects the site, while Basin 2 consists of the portion of the site to the west of where Alvarado Creek bisects the site. Topographically, Basin 1 is generally very flat, with the exception of the slopes along the southerly end of the basin. The trolley tracks and the associated storm drain lines intercept all drainage to south of the trolley line. Basin 1 also accepts drainage from a portion of Alvarado Road. This drainage enters the site through the two

entrances from Alvarado Road. The on-site drainage collects in the RV resort streets and flows over the Alvarado Creek bank in several locations.

Basin 2 encompasses approximately 7.7 acres and consists of the portion of the project site that is to the west and north of Alvarado Creek. This basin generally slopes to the west at an approximately 1.5 percent grade. Runoff from the site flows along the RV resort streets, and roughly parallels Alvarado Creek. Basin 2 also accepts drainage from a small section of Alvarado Road immediately to the west of the creek overcrossing. Drainage from Basin 2 exits the western end of the project site and is intercepted by a storm drain system constructed as part of the 70th Street trolley station.

The existing drainage conditions within the project site and adjacent areas are shown on the *Existing Hydrology Exhibit* included as Exhibit B of the project Drainage Study in Appendix I of this EIR. Peak flows under existing drainage pattern conditions total 15.28 cubic feet per second (cfs) for the 100-year storm within Basin 1 and 18.13 cfs within Basin 2 (Fuscoe 2020a).

4.7.1.5 Flood Hazards

The Federal Emergency Management Agency (FEMA) has mapped flood hazards within the project site and vicinity. The majority of the project site is designated as "Zone AE," which means it is within a 100-year floodplain and is considered a special flood hazard area with a one percent annual chance of flooding (FEMA 2020, 2012). Alvarado Creek and the immediate surrounding areas are specifically classified as a Regulatory Floodway, which is defined as an area that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA 2019). The base flood elevations for the project site are listed as approximately 409 feet AMSL at the western end of the site and gradually increase to approximately 425 feet AMSL at the eastern boundary of the site. Most of the eastern portion of the project site located east of Alvarado Creek is designated as "Zone X," which means these areas are outside of identified 100-year floodplains and are considered minimal flood hazard areas.

4.7.2 Regulatory Setting

4.7.2.1 Federal

Clean Water Act/National Pollutant Discharge Elimination System Requirements

The project is subject to applicable elements of the CWA, including the NPDES. Specific NPDES requirements associated with the project include conformance with the following: (1) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit, NPDES No. CAS000002, SWRCB Order 2009-0009-DWQ; as amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ); (2) General Groundwater Extraction Discharges to Surface Waters Permit (Groundwater Permit; NPDES No. CAG919003, Order No. R9-2015-0013); (3) Waste Discharge Requirements for MS4 Permit (Municipal Permit, NPDES No. CAS 0109266, Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100). In California, USEPA has delegated authority for implementing NPDES requirements to the SWRCB and RWQCB, with these permits described below under state standards.

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. 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.

4.7.2.2 State

NPDES Construction General Permit

Construction activities exceeding one acre (or meeting other applicable criteria) are subject to pertinent requirements under the Construction General Permit. This permit was issued by the SWRCB, pursuant to authority delegated by the USEPA. Specific conformance requirements include implementing a SWPPP, an associated Construction Site Monitoring Program (CSMP), employee training, and minimum BMPs, as well as a Rain Event Action Plan (REAP) for applicable projects (e.g., those in Risk Categories 2 or 3). Under the Construction General Permit, project sites are designated as Risk Level 1 through 3 based on site-specific criteria (e.g., sediment erosion and receiving water risk), with Risk Level 3 sites requiring the most stringent controls. Based on the site-specific risk level designation, the SWPPP and related plans/efforts identify detailed measures to prevent and control the off-site discharge of pollutants in storm water runoff. Depending on the risk level, these may include efforts such as minimizing/ stabilizing disturbed areas, mandatory use of technology-based action levels, effluent and receiving water monitoring/reporting, and advanced treatment systems (ATS). Specific pollution control measures require the use of best available technology economically achievable (BAT) and/or best conventional pollutant control technology (BCT) levels of treatment, with these requirements implemented through applicable BMPs. While site-specific measures vary with conditions such as risk level, proposed grading, and slope/soil characteristics, detailed guidance for construction-related BMPs is provided in the permit and related City standards (as outlined below), as well as additional sources including the *EPA National Menu of Best Management Practices for Storm Water Phase II – Construction*, and California Stormwater Quality Association (CASQA) *Storm Water Best Management Practices Handbooks*. Specific requirements for the project under this permit would be determined during SWPPP development, after completion of site development plans and application submittal to the SWRCB.

NPDES Groundwater Permit

Shallow groundwater is expected to occur on site as previously described. If project-related construction activities entail the discharge of extracted groundwater into receiving waters, the applicant would be required to obtain coverage under the Groundwater Permit. Conformance with this permit is generally

applicable to all temporary and certain permanent groundwater discharge activities, with exceptions as noted in the permit fact sheet. Specific requirements for permit conformance include: (1) submittal of appropriate application materials and fees; (2) implementation of pertinent (depending on site-specific conditions) monitoring/testing, disposal alternative, and treatment programs; (3) provision of applicable notification to the associated local agency prior to discharging to a municipal storm drain system; (4) conformance with appropriate effluent standards (as outlined in the permit); and (5) submittal of applicable documentation (e.g., monitoring reports).

NPDES Municipal Permit

The Municipal Permit implements a regional strategy for water quality and related concerns and mandates a watershed-based approach that often encompasses multiple jurisdictions. The overall permit goals include: (1) providing a consistent set of requirements for all co-permittees; and (2) allowing the co-permittees to focus their efforts and resources on achieving identified goals and improving water quality, rather than just completing individual actions (which may not adequately reflect identified goals). Under this approach, the co-permittees are tasked with prioritizing their individual water quality concerns, as well as providing implementation strategies and schedules to address those priorities. Municipal Permit conformance entails considerations such as receiving water limitations (e.g., Basin Plan criteria as outlined below), waste load allocations (WLAs), and numeric water quality-based effluent limitations (WQBELs). Specific efforts to provide permit conformance and reduce runoff and pollutant discharges to the maximum extent practicable (MEP) involve methods such as: (1) using jurisdictional planning efforts (e.g., discretionary general plan approvals) to provide water quality protection; (2) requiring coordination between individual jurisdictions to provide watershed-based water quality protection; (3) implementing appropriate BMPs, including LID measures, to avoid, minimize, and/or mitigate effects such as increased erosion and off-site sediment transport (sedimentation), hydromodification[1] and the discharge of pollutants in urban runoff; and (4) using appropriate monitoring/assessment, reporting, and enforcement efforts to ensure proper implementation, documentation, and (as appropriate) modification of permit requirements. The City has implemented a number of regulations to ensure conformance with these requirements, as outlined below under local standards.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the principal California legal and regulatory framework for water quality control. The Porter-Cologne Water Quality Control Act is embodied in the California Water Code. The California Water Code authorizes the SWRCB to implement the provisions of the federal CWA. The State of California is divided into nine regions governed by RWQCBs. The RWQCBs implement and enforce provisions of the California Water Code and the CWA under the oversight of the SWRCB. The City is located within the purview of the San Diego RWQCB (Region 9). The Porter-Cologne Act also provides for the development and periodic review of Basin Plans that designate beneficial uses of California's major rivers and other surface waters and groundwater basins and establish water quality objectives for those waters.

[1] Hydromodification is generally defined in the Municipal Permit as the change in natural watershed hydrologic processes and runoff characteristics (interception, infiltration and overland/groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport.

4.7.2.3 Local

Water Quality Control Plan for the San Diego Basin

The San Diego Basin encompasses approximately 3,900 square miles, including most of San Diego County and portions of southwestern Riverside and Orange Counties. The basin is composed of 11 major hydrologic units, 54 hydrologic areas, and 147 hydrologic subareas, extending from Laguna Beach southerly to the United States/Mexico border. Drainage from higher elevations in the east flow to the west, ultimately into the Pacific Ocean. The RWQCB prepared the Water Quality Control Plan for the Basin Plan (Basin Plan), which defines existing and potential beneficial uses and water quality objectives for coastal waters, groundwater, surface waters, imported surface waters, and reclaimed waters in the basin. Water quality objectives seek to protect the most sensitive of the beneficial uses designated for a specific water body.

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 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 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.

4.7.3 Methodology and Assumptions

Potential hydrology and water quality impacts resulting from implementation of the proposed project were evaluated based on relevant information from Appendices I and J, as well as a review of relevant hydrology and water quality plans and maps. Runoff calculations were conducted using the design criteria contained in the County Department of Public Works Flood Control Division Hydrology Manual and based on the 100-year storm frequency. Floodplain analysis was conducted using the HEC-RAS model.

4.7.4 Significance Thresholds

According to Appendix G of the CEQA Guidelines a significant impact related to hydrology and water quality would occur if implementation of the proposed project would result in any of the following:

1. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

2. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

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 or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff; or impede or redirect flood flows?

4. Would the project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

5. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

4.7.5 Impact Analysis

4.7.5.1 Water Quality

Threshold 1: Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Potential project-related water quality impacts are associated with both short-term construction activities and long-term operation and maintenance, as described below.

Construction Impacts

Potential water quality impacts related to project construction include erosion/sedimentation, the use and storage of construction-related hazardous materials (e.g., fuels, etc.), generation of debris from demolition activities, and disposal of extracted groundwater (if required).

Erosion and Sedimentation

Project-related excavation, grading, and construction activities could potentially result in associated erosion and sedimentation effects. Construction activities would involve the removal of surface stabilizing features such as structure, paved surfaces, and vegetation; excavation of existing compacted materials from cut areas, redeposition of excavated material as fill in development areas, and potential erosion from disposal of extracted groundwater (if required). Project-related erosion could result in the deposition of sediment into downstream receiving waters, with associated water quality effects such as turbidity and transport of other pollutants that tend to adhere to sediment particles (e.g., hydrocarbons).

While graded, excavated, and filled areas associated with construction activities would be stabilized through efforts such as compaction and installation of hardscape and landscaping, erosion potential would be higher in the short-term than for existing conditions. Proposed development areas would be especially susceptible to erosion between the beginning of grading/construction and the installation of structures/pavement or establishment of permanent cover in landscaped areas.

Although it is anticipated that the proposed project would be constructed in two phases, grading of the entire project site may occur during the first phase with the development of the second phase improvements (Building 4 and associated improvements on the portion of the site east of Alvarado Creek) 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 SDACPD Rule 55, NPDES Construction General Permit, and City's Storm Water BMP Manual until permanently stabilized in accordance with the standards contained within these regulations.

Erosion and sedimentation are not considered to be long-term concerns for the project, as developed areas would be stabilized through installation of hardscape or landscaping as noted. The project would also incorporate long-term water quality controls pursuant to City and NPDES guidelines, including (among other efforts) measures that would avoid or reduce off-site sediment transport. This would include efforts such as the use of water quality (detention and filtration) facilities and drainage facility maintenance (e.g., to remove accumulated sediment).

Short-term water quality effects from project-related erosion and sedimentation could potentially affect downstream waters and associated wildlife habitats. These potential impacts would be addressed through conformance with City storm water standards and the related NPDES Construction General Permit. This would include implementing an authorized SWPPP for proposed construction, including (but not limited to) erosion and sedimentation BMPs.

The SWQMP prepared for the project identifies construction-related requirements for implementing a SWPPP and related BMPs, including efforts related to erosion/sedimentation. While project-specific BMPs would be determined during the SWPPP process based on site characteristics, they would include standard industry measures and guidelines from the City Storm Water BMP Manual and NPDES Construction General Permit. Typical erosion and sediment control BMPs that may be required in the

project SWPPP include: (1) seasonal grading restrictions during the rainy season; (2) preparation and implementation of a CSMP and, if applicable, a REAP to provide enhanced erosion and sediment control measures prior to predicted storm events; (3) use of erosion control/stabilizing measures such as geotextiles, mats, fiber rolls, or soil binders; (4) use of sediment controls to protect the site perimeter and prevent off-site sediment transport, including measures such as inlet protection, silt fencing, fiber rolls, gravel bags, temporary sediment basins, street sweeping, stabilized construction access points and sediment stockpiles, and use of properly fitted covers for sediment transport vehicles; (5) compliance with local dust control measures; (6) appropriate BMP performance monitoring and as-needed maintenance; and (7) implementation of additional BMPs as necessary to ensure adequate erosion/sediment control and regulatory conformance.

Construction-related Hazardous Materials

Project construction would involve the on-site use and/or storage of hazardous materials such as fuels, lubricants, solvents, concrete, paint, and portable septic system wastes. The accidental discharge of such materials during construction could potentially result in significant impacts if these pollutants reach downstream receiving waters, particularly materials such as petroleum compounds that are potentially toxic to aquatic species in low concentrations. As described in Section 4.7.1.2, identified impairments in downstream receiving waters include toxicity and metals, with pollutants affecting these impairments to potentially be generated during construction from sources such as vehicle and equipment operations. Implementation of a SWPPP would be required under City and NPDES guidelines as previously described and would include d measures to avoid potential impacts related to the use and potential discharge of construction-related hazardous materials.

As noted above under the discussion of erosion and sedimentation, the Project SWQMP identifies requirements for implementing a SWPPP and related BMPs. While detailed BMPs would be determined as part of the NPDES/SWPPP process based on project-specific parameters, they are likely to include standard industry measures and guidelines from sources including the City Storm Water Manual and Construction General Permit. Typical BMPs associated with construction-related hazardous materials that may be required in the project SWPPP include the following: (1) minimizing and properly locating (e.g., away from drainages/storm drains) hazardous material use/storage areas; (2) providing appropriate covers/enclosures, secondary containment (e.g., berms), monitoring/maintenance, and inventory control (e.g., delivery logs/labeling) for hazardous material use/storage areas; (3) restricting paving operations during wet weather and providing appropriate sediment control downstream of paving activities; (4) utilizing properly designed and contained washout areas for materials including concrete, drywall, and paint; (5) properly maintaining all construction equipment and vehicles, and providing appropriate containment for associated fueling and maintenance operations; (6) providing training to applicable construction employees on the proper use, handling, storage, disposal, and notification/cleanup procedures for construction-related hazardous materials; (7) storing appropriate types and quantities of containment and cleanup materials on site; (8) implementing appropriate solid waste containment, disposal, and recycling efforts; and (9) properly locating, maintaining, and containing portable wastewater facilities.

Demolition-related Debris Generation

Implementation of the project would involve the demolition of existing on-site facilities including structures and pavement. These activities would generate construction debris, potentially including particulates (e.g., from pavement removal), concrete, asphalt, glass, metal, drywall, paint, insulation,

fabric, and wood. The introduction of demolition-related debris into local drainages or storm drain systems could result in downstream water quality impacts, potentially including pollutants contributing to identified downstream water quality impairments.

Project construction would be subject to a number of regulatory controls related to demolition, including City storm water standards and related NPDES/SWPPP requirements as previously described. While detailed BMPs would be determined as part of the NPDES/SWPPP process based on project-specific parameters, they are likely to include the following types of standard industry measures and guidelines from sources including the City Storm Water BMP Manual and Construction General Permit: (1) recycle appropriate (i.e., non-hazardous) construction debris for on- or off-site use whenever feasible; (2) properly contain and dispose of construction debris to avoid contact with storm water; (3) use dust-control measures such as watering to reduce particulate generation for pertinent locations/activities (e.g., concrete removal); and (4) implement appropriate erosion prevention and sediment control measures downstream of all demolition activities.

Disposal of Extracted Groundwater

Shallow groundwater is expected to occur in the project site and vicinity and thus, construction dewatering could potentially be required during construction. Disposal of groundwater extracted during construction activities into local drainages and/or storm drain facilities could potentially generate significant water quality impacts through erosion/sedimentation or the possible occurrence of pollutants in local aquifers (including pollutants associated with impaired waters). Project construction would require conformance with NPDES Groundwater Permit criteria prior to disposal of extracted groundwater.

Operational Impacts

Based on analysis in the project SWQMP (Fuscoe 2018), the project is identified as a Priority Development Project. As a result, project development would require the implementation of applicable pollutant (treatment) and hydromodification control BMPs, in addition to site design and source control BMPs.

Urban pollutants accumulate in areas such as streets, parking areas, and drainage facilities, and are picked up in runoff during storm events. Runoff within the project site would be generated from construction of impervious surfaces as previously described, with corresponding pollutant loading potential. Because the site is currently developed, existing runoff also includes associated pollutant loading, and due to the date of existing site development (1950s) it is anticipated that standard pollutant control BMPs required by current regulatory criteria are not present. Accordingly, long-term operation could result in the on- and off-site transport of urban pollutants and associated effects per current regulatory standards, such as increased turbidity, oxygen depletion, and toxicity to attendant species in downstream receiving waters. As a result, based on the described conditions and related CWA Section 303(d) impaired water listings outlined in Section 4.7.1.2, implementation of the project could potentially result in long-term water quality impacts under current regulatory standards. The project SWQMP identifies measures to address potential long-term pollutant generation from implementation of the project, based on procedures identified in the City storm water standards and related NPDES Municipal Permit. Specifically, the project design would conform to applicable City and NPDES storm water standards to address these concerns, with such conformance to include the use of appropriate post-construction LID site design, source control, pollutant (treatment) control, and hydromodification

management BMPs. Specific proposed BMPs are identified in the project SWQMP (Appendix J) and include applicable requirements from the City Storm Water BMP Manual and the NPDES Municipal Permit. These measures are summarized below, followed by a discussion of associated monitoring and maintenance activities.

Source Control BMPs

Source control BMPs are intended to avoid or minimize the introduction of pollutants into storm drains and natural drainages to the MEP by reducing on-site pollutant generation and off-site pollutant transport. Specific source control BMPs are identified in the project SWQMP, based on requirements in the City Storm Water BMP Manual. These include efforts to prevent illicit discharges; provide appropriate "no dumping" signs/stencils at storm drain system inlets/catch basins; protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal; properly design/contain trash storage areas (e.g., by providing containment); protect storm drain inlets; provide interior floor drains and elevator shaft sump pumps; provide interior parking structures; implement non-chemical pest control measures; and provide applicable pollutant controls for pools, water features, plazas, sidewalks, and parking lots, refuse areas, and fire sprinkler test water. All of the proposed source control BMPs would help to improve long-term water quality within and downstream from the project site by avoiding or minimizing pollutant generation and exposure to storm flows at the source.

LID Site Design BMPs

LID site design BMPs are intended to avoid, minimize, and/or control post-development runoff, erosion potential and pollutant generation to the MEP. The LID process employs design practices and techniques to effectively capture, filter, store, evaporate, detain, and infiltrate runoff close to its source. Specific LID site design BMPs are identified in the project SWQMP, based on requirements in the City Storm Water BMP Manual. These strategies/measures include efforts to maintain natural drainage pathways and hydrologic features, minimize impervious areas, collect runoff, and use native and/or drought-tolerant landscaping. All of the proposed LID site design BMPs would help reduce long-term urban pollutant generation by minimizing runoff rates and amounts, retaining permeable areas, increasing on-site filtering, and reducing erosion/sedimentation potential.

Pollutant Control BMPs

Pollutant control BMPs are designed to remove pollutants from urban runoff for a design storm event to the MEP through means such as filtering or treatment. Pollutant control BMPs are required to address applicable pollutants of concern for Priority Development Projects and must provide medium or high levels of removal efficiency for these pollutants (per applicable regulatory requirements). Pursuant to Chapter 5 of the City Storm Water BMP Manual (Part 1), preliminary pollutant control BMPs identified in the project SWQMP include biofiltration modular wetland units and two detention basins.

The selection and design of the proposed BMPs was based on applicable site-specific conditions and City requirements, including the identification of associated Drainage Management Areas (DMAs) within the site. Specifically, four DMAs (were identified on site). The proposed pollutant control BMPs would operate as part of a "treatment train" in concert with the LID site design and source control BMPs described above. Summary descriptions of proposed pollutant control BMPs are provided below.

Runoff from Alvarado Road would be conveyed through a series of roadside proprietary filtration devices (Bioclean Modular Wetlands or equivalent approved facilities) and then discharged to

Alvarado Creek. On-site runoff would be conveyed via a series of roof drains, area drains, and storm drain pipes to two, on-site drainage basins: one in the eastern portion of the site west of Building 4, and one in the western portion of the site adjacent to Building 1. These basins would include a shallow 6-inch ponding layer of mulch, 18 inches of biofiltration soil media, and a 12-inch to 36-inch storage layer. Following treatment within the basins, runoff would be discharged to Alvarado Creek.

Hydromodification Management Facilities

The proposed biofiltration basins also would be designed to address potential hydromodification impacts. Specifically, discharge from the hydromodification storage facility would be subject to appropriate flow regulation to meet applicable hydromodification requirements, prior to discharging to Alvarado Creek. As a result, the project would comply with applicable hydromodification requirements.

Post-construction BMP Monitoring/Maintenance Schedules and Responsibilities

Identified BMPs include physical structures such as biofiltration basins, modular wetlands, and signs/stencils that require ongoing monitoring and maintenance. Pursuant to requirements in the City Storm Water BMP Manual and the related NPDES Municipal Permit (as outlined in Attachment 3 of the project SWQMP), the owner/permittee would be required to enter into a written Maintenance Agreement with the City for applicable facilities and implement an associated Operation and Maintenance Plan. Specifically, this process would entail identifying and documenting maintenance responsibilities, funding sources, activities, and schedules to ensure proper BMP function in perpetuity.

Conclusion

Based on the implementation of the project design elements, construction and post-construction BMPs, related maintenance efforts, and required conformance with City storm water standards (including the NPDES Construction General, Municipal and Groundwater permits), the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Water quality impacts would be less than significant.

4.7.5.2 Groundwater

Threshold 2: Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project site is developed and almost the entirely paved or otherwise contains impervious surfaces. There are some pervious areas associated with landscaping and Alvarado Creek, but groundwater recharge is minimal as runoff drains as surface flow over the paved areas and into Alvarado Creek. The project would include landscaped areas and two biofiltration basins but would result in a net increase in impervious areas of approximately 30,000 square feet (Fuscoe 2018). This would be an approximately 10-percent increase over the existing condition but would not substantially interfere with groundwater recharge at the site since it is currently minimal given existing drainage patterns and characteristics.

The groundwater table within the project area is shallow and it is anticipated that during construction, dewatering would be required. The City would be required to obtain a dewatering permit from the RWQCB. Dewatering permits are used to approve short-term discharges of groundwater to the sewer system and would include appropriate measures to safeguard against temporary adverse effects to

groundwater recharge. The project does not propose the long-term use of groundwater, as potable water service would be provided by the Helix Water District. Thus, the project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Water quality impacts related to groundwater would be less than significant.

4.7.5.3 Drainage Pattern Alteration

Threshold 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 or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff; or impede or redirect flood flows?

Drainage Patterns

As discussed in Section 4.7.1.4, the project site is currently divided into two major drainage basins. Basin 1 encompasses approximately 4.5 acres and consists of the portion of the site east of where Alvarado Creek bisects the site. Basin 2 encompasses approximately 7.7 acres and consists of the portion of the site to the west of where Alvarado Creek bisects the site. The existing on-site drainage pattern within Basin 1 flows northerly and westerly within the existing RV resort streets and into Alvarado Creek. Basin 1 also accepts drainage from a portion of Alvarado Road, which flows from the two site entrances within the RV resort streets and then westerly into Alvarado Creek. Within Basin 2, on-site drainage flows southerly and westerly along the RV resort streets and discharges into Alvarado Creek at the west end of the project site. Basin 2 also accepts some drainage from Alvarado Road.

Project implementation would result in modification of the existing on- and off-site drainage patterns and directions through proposed grading and construction. While Basins 1 and 2 would be the same upon project development, these two major basins would include a total of four sub basins. Basin 1 would include Sub Basins 100 and 300, and Basin 2 would include Sub Basins 200 and 400. With implementation of the project, Alvarado Road would no longer drain into the site due to the raising of the project site and proposed improvements along Alvarado Road. The proposed drainage conditions within the project site and adjacent areas are shown on the *Proposed Hydrology Exhibit* included as Exhibit B of the project Drainage Study in Appendix I of this EIR.

With implementation of the project, Sub Basin 100 would encompass the area of the project site to the east of Alvarado Creek, excluding Alvarado Road. Drainage from the building roofs and project streets would be directed to grass-lined swales or area drains. The swales would lead to storm drain catch basins. From the catch basins, drainage would be directed to a treatment/detention system for water quality treatment and detention of the peak flow from the project site. This treatment system would be in the southwesterly corner of Sub Basin 100, just west of Building 4. A storm drain line from the detention basin would outlet to Alvarado Creek through a headwall.

Sub Basin 200 would consist of the portion of the project site to the west of Alvarado Creek, excluding Alvarado Road. A system of grass-lined swales, catch basins, and storm drainpipes would be used to

collect drainage from the project facilities. A treatment/detention system would be located at the westerly end of the project site and would outlet through the retaining wall into Alvarado Creek to the south.

Sub Basin 300 would only encompass the area of the Alvarado Road site frontage to the east of Alvarado Creek. Drainage from the road would be directed to proposed gutters and drain to a biofiltration system for water quality treatment located at the southwest corner of Sub Basin 300. Drainage would then be discharged into Alvarado Creek.

Sub Basin 400 would only encompass the area of the Alvarado Road to the west of Alvarado Creek. Drainage from the road would be directed to proposed gutters and drain to two biofiltration system for water quality treatment located at the southwest corner and midway entrance of Sub Basin 400. Drainage would then be discharged into Alvarado Creek.

On-site flows would continue to be directed to Alvarado Creek and after leaving the site, all project-related flows would continue to the San Diego River and ultimately to the Pacific Ocean, similar to existing conditions. Based on the described considerations, overall post-development drainage patterns would be similar to existing conditions.

Watercourse Alteration

Improvements are proposed to the Alvarado Creek channel that traverses the site to control flood and storm water flows within the channel, as well as to enhance the creek as an open space amenity and natural feature. Most sections of the existing trapezoidal concrete-lined banks along the channel would be removed and replaced with retaining walls to increase the width of the channel bottom. The improved creek would accommodate 100-year storm events to resolve the existing flooding conditions that occur on the project site during large storm events. These improvements would not alter the existing general alignment of Alvarado Creek or impede or redirect flood flows within Alvarado Creek, nor would they alter existing on-site drainage patterns, which would continue to be directed to Alvarado Creek. Associated drainage impacts would be less than significant.

Drainage Rates

Peak discharge rates and times of concentrations[2] were calculated for the 100-year storms under the existing and proposed drainage patterns on the project site to determine potential impacts related to surface runoff. The results of the calculations are shown in Table 4.7-3, *Drainage Discharge Under Existing and Proposed Conditions*.

[2] Time of concentration is a concept used in hydrology to measure the response of a watershed to a rain event. It is defined as the time needed for water to flow from the most remote point in a watershed to the watershed outlet and is a function of the topography, geology, and land use within the watershed.

Table 4.7-3
DRAINAGE DISCHARGE UNDER EXISTING AND PROPOSED CONDITIONS

Drainage Basin	Area (acres)	Existing Conditions Q (cfs)	Existing Conditions T_C (min)	Proposed Conditions Q (cfs)	Proposed Conditions T_C (min)
Basin 1	4.5	15.28	9.57	12.74	12.48
Basin 2	7.7	18.13	15.00	23.39	13.10

Source: Fuscoe 2020a
Q = discharge; cfs = cubic feet per second; TC = time of concentration; min = minutes

With implementation of the proposed project, the peak discharge under the 100-year storm event would decrease in Basin 1 from 15.28 cfs with a T_C of 9.57 minutes to 12.74 cfs with a T_C of 12.48 minutes. The decreased discharge in Basin 1 is due to the increased time of concentration. The peak discharge from Basin 2, however, would increase from 18.13 cfs with a T_C of 15.00 minutes to 23.39 cfs with a T_C of 13.10 minutes. The increased discharge in Basin 2 is primarily due to the slight increase in impervious surfaces and the decreased time of concentration. To minimize drainage impacts, the project would incorporate hydrologic features into the project design. A detention basin would be provided in Basin 2 to limit the peak discharge to existing conditions for the 100-year storm. Additionally, flow throughout the project site would be collected by a system of grass-lined swales, catch basins, and storm drains that have been sized for the 100-year storm (refer to Figure 3-1). Therefore, the design of the storm drain system for the project would have sufficient capacity to convey the 100-year storm event without causing flooding of the proposed streets and development. Impacts related to drainage rates and storm drain system capacity would be less than significant.

Increase in Impervious Areas

Development of the project would result in the construction of impervious surfaces such as structures and pavement, which can increase both the rate and amount of runoff within and from a site by reducing infiltration capacity and concentrating flows. Such conditions can potentially generate impacts related to local flooding hazards (e.g., if storm drain capacities are exceeded), erosion and sedimentation (e.g., if increased runoff rates or amounts occur in local receiving waters), and/or local groundwater recharge rates if impervious areas are increased. The site is currently developed and largely impervious and as discussed in Section 4.7.5.2, implementation of the project would result in a net increase in impervious areas of approximately 30,000 square feet (Fuscoe 2018). This would be an approximately 10-percent increase over the existing condition. However, as discussed above, the storm drain system designed for the project would have sufficient capacity to convey the 100-year storm event. Thus, associated drainage impacts related to an increase in impervious areas would be less than significant.

Conclusion

Based on the above analysis, the proposed project would not substantially alter the existing drainage pattern of the site or area that would result in substantial erosion or siltation on- or off-site, substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional resources of polluted runoff or impeded or redirect flood flows. Impacts related to drainage pattern alteration would be less than significant.

4.7.5.4 Flood, Tsunami, and Seiche Zones

Threshold 4: Would the project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

As previously discussed, FEMA has mapped the majority of the project site as a special flood hazard area within a 100-year floodplain and a small portion in the eastern end of the site as a minimal flood hazard area. Additionally, the portion of Alvarado Creek that bisects the project site is classified as a Regulatory Floodway. The project site also has a history of experiencing flood conditions during large storm events.

Because most of the site is located within a floodplain, the project would raise the existing grade to be above the base floodplain elevation. The top of bank elevation, ground floor finished floor, and garage entry elevations would all be elevated at least one foot above the 100-year flood elevation. Improvements would also be made to Alvarado Creek to contain the 100-year flood within the creek channel. Most sections of the existing trapezoidal concrete-lined banks along the channel would be removed and replaced with retaining walls to increase the width of the channel bottom. To analyze the impacts of the proposed improvements on the water surface elevation, floodplain analysis using HEC-RAS model was conducted. The water surface elevations were then compared to the existing conditions model. Based on the results of the HEC-RAS model, the proposed improvements would fully contain the 100-year flow within the creek channel, with no adverse impacts to the water surface elevations upstream of the project site. Additionally, the proposed on-site storm drain system for the project has been designed with sufficient capacity to convey the 100-year storm event without causing flooding of the proposed streets and development, as discussed in Section 4.7.5.1. By incorporating the project site improvements, water quality impacts related to flooding would be less than significant.

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 12.5 miles east of the Pacific Ocean and sits at an elevation ranging from 408 to 425 feet AMSL. Due to the distance from the ocean and high elevation, the project site would not be subject to inundation by tsunami. Therefore, water quality impacts associated with tsunamis would not occur as a result of the proposed project.

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 0.7 mile southeast of Lake Murray and approximately 2.9 miles west 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 water quality impacts associated with seiches would occur as a result of the proposed project.

4.7.5.5 Water Quality Plans

Threshold 5: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The project site is located within the San Diego River Watershed (907.11) as identified in the Basin Plan (RWQCB 2016). Alvarado Creek traverses the site and is listed as impaired on the Section 303(d) List for nitrogen and selenium. Runoff from the project site would be collected by the on-site storm drain system, treated in accordance with the water quality regulations, and then discharged into Alvarado

Creek. The proposed project would implement a site-specific SWPPP pursuant to the NPDES Construction General Permit and the City's Storm Water BMP Manual and would adhere to applicable requirements outlined in the project SWQMP, as described in Section 4.7.5.3. The project would also comply with all storm water quality standards during construction and operation, as detailed in Section 4.7.5.1. Conformance with the Basin Plan water quality objectives would be demonstrated through compliance with applicable regulations and implementation of construction and post-construction BMPs. Thus, the project would be consistent with the Basin Plan.

The project would not directly involve groundwater use, as no wells are proposed on-site and the project would not significantly alter groundwater percolation relative to the existing conditions, as discussed in Section 4.7.5.2. The site is also not within an alluvial groundwater basin identified by the San Diego County Water Authority (San Diego County Water Authority 2020) and the Basin Plan does not identify municipal groundwater or groundwater as a beneficial use for the Alvarado Creek area (RWQCB 2016). Therefore, implementation of the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Impacts would be less than significant.

4.7.6 Mitigation Measures

4.7.6.1 Water Quality

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

4.7.6.2 Groundwater

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

4.7.6.3 Drainage Patterns

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

4.7.6.4 Flood, Tsunami, and Seiche Zones

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

4.7.6.5 Water Quality Plans

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

4.7.7 Significance Determination

The significance of hydrology and water quality impacts before and after mitigation is summarized in Table 4.7-4, *Significance Determination Summary of Hydrology and Water Quality Impacts*. Implementation of the proposed project would not result in any significant impacts to hydrology and

water quality. Impacts related to water quality, groundwater, drainage pattern alterations, flood/tsunami/seiche zones, and water quality plans would be less than significant with adherence to applicable regulatory/industry standards and codes, including NPDES requirements and the hydrologic design measure incorporated into the project. No mitigation is required.

Table 4.7-4
SIGNIFICANCE DETERMINATION SUMMARY OF HYDROLOGY AND WATER QUALITY IMPACTS

Issue	Significance Before Mitigation	Mitigation Measure	Significance After Mitigation
Water Quality	Less than significant	None required	Less than significant
Groundwater	Less than significant	None required	Less than significant
Drainage Pattern Alteration	Less than significant	None required	Less than significant
Flood, Tsunami, and Seiche Zones	Less than significant	None required	Less than significant
Water Quality Plans	Less than significant	None required	Less than significant

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