3.1.3 Hydrology/Water Quality

This section describes existing hydrologic and water quality conditions within the Project site and vicinity, identifies regulatory requirements and industry standards associated with hydrologic and water quality issues, and evaluates potential impacts and mitigation measures related to implementation of the Proposed Project.

Four technical studies related to hydrology, water quality and groundwater have been prepared for the Proposed Project by Fuscoe Engineering, Inc. (Fuscoe) and GEOCON, including: (1) CEQA Drainage Study (Fuscoe 2015a); (2) Major Storm Water Management Plan (SWMP, Fuscoe 2015b); (3) Hydromodification Management Study (HMS, Fuscoe 2015c); and (4) Response to Groundwater Review Comments (GEOCON 2014b). These studies are summarized below along with other applicable data, with the complete reports included in Appendices M (Drainage and Hydromodification studies) and N (SWMP) of this EIR.

3.1.3.1 *Existing Conditions*

Watershed and Drainage Characteristics

The Project site and related off-site roadway improvements are located within the Carlsbad Hydrologic Unit (HU), one of 11 major drainage areas identified in the San Diego RWQCB *Water Quality Control Plan for the San Diego Basin* (Basin Plan, 1994 as amended). The Carlsbad HU is a generally triangular-shaped area encompassing approximately 210 square miles, and extends from the east side of Lake Wohlford to Solana Beach-Carlsbad along the coast (Figure 3.1.3-1, *Project Location within Local Hydrologic Designations*). The Carlsbad HU is divided into a number of hydrologic areas and subareas based on local drainage characteristics, with the Project site located within the Escondido Creek Hydrologic Area (HA) and the Escondido Hydrologic Subarea (HSA). Drainage within the Carlsbad HU is predominantly through a number moderate sized creeks and associated tributaries, including Escondido and San Marcos creeks in the Project vicinity. The majority of the Project site drains generally south to Escondido Creek, which continues west and south from the Project site vicinity and enters the Pacific Ocean via San Elijo Lagoon near the City of Solana Beach approximately 12 miles to the southwest (with related on- and off-site drainage patterns outlined below). The northern-most portion of the site drains generally north and ultimately flows to San Marcos Creek, although this area is within a proposed open space easement and/or areas not proposed for development/disturbance, and would not be impacted by Project implementation. Accordingly, drainage within or from the described area would not be affected or altered in any way from the Proposed Project, and is not discussed further in this analysis. Average annual precipitation in the Project site vicinity (City of San Marcos, 92078) is approximately 15.1 inches, with much of this (approximately 83 percent) occurring during the period of November through March (weather.com 2013).

The Project site includes extensive areas of agricultural development (predominantly avocado orchards), as well as equestrian facilities in the southeastern portion of the site, disturbed/undisturbed open space, minor estate residential uses, and a number of unpaved roads and trails (refer to Figure 1-2). Existing drainage facilities located within the Project site and

adjacent areas include minor crossing structures (e.g., culverts) associated with local roadways/drainage courses. Downstream drainage facilities include several larger bridge crossings along Escondido Creek at roadways including Rancho Santa Fe Road and I-5.

Surface drainage within the Project site and related watershed areas flows generally east and south, and occurs as both confined (point) and unconfined (sheet or non-point) flow. As previously noted, the majority of the Project site (including all areas proposed for development/disturbance) is tributary to Escondido Creek, which is located approximately 0.8 mile (flow distance) to the south at its closest point. Existing site drainage is divided generally into four watershed areas (or basins) in the Project Drainage Study, designated as Basins A through D. These four existing Project drainage basins are summarized below, and are depicted on the Major Hydrologic Basin Exhibit included in Appendix B of the Project Drainage Study (Fuscoe 2015a in EIR Appendix M). The corresponding proposed Drainage Basins A thorough D are also shown on the noted Major Hydrologic Basin Exhibit, and are discussed as applicable below in Subsection 3.1.3.2, *Analysis of Project Effects and Determination as to Significance*.

Drainage Basin A

Drainage Basin A includes approximately 26.8 acres, and encompasses the southwestern corner of the site and adjacent off-site areas to the west and south. Flows in this basin drain generally south through a natural off-site drainage channel, and extend through undeveloped and agricultural areas, including several related impoundments, before eventually discharging to Escondido Creek. Existing peak 100-year storm flow[1] from Basin A is approximately 48.1 cubic feet per second (cfs).

Drainage Basin B

Basin B includes approximately 214.8 acres in the south-central and southeastern portions of the site, as well as adjacent off-site areas to the west, south, east, and north. This area is drained via a natural creek that begins off-site to the west, extends generally east through the south-central and into the southeastern portions of the site, and then turns south before exiting the site along the southern property boundary. Off-site flows from Basin B merge with the described off-site flows from Basin A, with the combined flow continuing south to Escondido Creek. Similar to Basin A, off-site flows from Basin B extend through undeveloped and agricultural areas, including several related impoundments. Existing peak 100-year storm flow from Basin B is approximately 297.4 cfs.

Drainage Basin C

Basin C encompasses approximately 173.5 acres in the west-central and east-central portions of the site, along with adjacent off-site areas to the west and east. Drainage in this watershed flows through a natural creek that begins off-site to the west and extends generally east through the site. After leaving the site, this drainage turns south/southeast, confluences with flows from

[1] A 100-year storm is defined as an event with a one percent chance of occurring in any given year.

Basin B, and extends though developed (agriculture and estate residential) and undeveloped areas before ultimately discharging into Escondido Creek. Existing peak 100-year storm flow from Basin C is approximately 237.9 cfs.

Drainage Basin D

The basin includes approximately 49.1 acres in the northern-most portion of the site, as well as adjacent off-site areas to the north and east. Flows in Basin D drain through a natural creek that begins off-site to the west, and extends generally east through the site. After leaving the site, these flows extend through developed (agriculture and estate residential) and undeveloped areas, eventually turn south and merge with flows form Basin C, and continue south before ultimately entering Escondido Creek. Existing peak 100-year storm flow from Basin D is approximately 82.0 cfs.

Flood Hazards

The Federal Emergency Management Agency (FEMA) has mapped flood hazards on the Project site and vicinity. The entire Project site and associated off-site roadway improvements are designated as Zone X, or areas determined to be outside the 500-year (and 100-year) floodplain (FEMA 2012). Off-site areas adjacent to the west in the City of San Marcos are within a Zone D designation, defined as "areas where flood hazards are undetermined, but possible." Based on an Initial Study prepared for the Proposed Project by County staff, the Project is also not located within a County Floodplain Map or County Alluvial Plain Map.

Groundwater

The Project site is not located within the areal extent of any known mapped regional groundwater basins, with the closest such basins including Escondido Valley to the east and San Marcos Valley to the north (California Department of Water Resources [DWR] 2003). Pursuant to information provided in the Project Phase I and/or Phase II Environmental Site Assessments (ESAs, GEOCON 2013b and 2012c in Appendix I) and Agricultural Technical Report (Appendix D), a groundwater supply well is located on the site, and has been used for agricultural irrigation (i.e., the on-site avocado orchards). The Project analysis of groundwater issues states, however, that "…pumping has not occurred for some time..." at the on-site well (GEOCON 2014b). This well reportedly extends to a depth of 100 feet and is drilled into granitic bedrock, although no information regarding groundwater levels or pumping yields is known to be available. Two additional wells were documented in the Project site vicinity during the Phase I/II investigations, including an apparent groundwater monitoring well just south of the site (south of Mt. Whitney Road), and an undescribed well (X4340005 in DWR records) located approximately 0.7 mile east of the site. No associated data on aquifer depths or yields were located regarding these two off-site wells (GEOCON 2013b and 2012c).

Shallow perched groundwater and/or groundwater seepage was encountered in alluvial deposits during subsurface geotechnical explorations in the central and east-central portions of the site, at depths ranging from 6 to 11 feet below the surface (GEOCON 2012a). These occurrences were interpreted as perched aquifers, which consist generally of unconfined (i.e., not under pressure)

groundwater contained by impermeable or semi-permeable strata, in this case the underlying granitic rock. Specifically, perched groundwater was observed in a relatively small areas on-site associated with Boring B-3, and Trenches T-8, T-38 and T-39, as depicted on Figure 2.11-1a. The presence and/or extent of perched groundwater bodies are typically associated with and influenced by seasonal precipitation, as well as local landscape and/or agricultural irrigation. Based on conditions described in the Project Geotechnical Investigations, perched groundwater conditions may potentially occur in a number of on-site locations (GEOCON 2012a and 2012b).

Water Quality

On-site and Vicinity Water Quality

Surface water within the Project site consists of intermittent flows from storm events and runoff from agricultural or landscape irrigation, with local groundwater occurrences described above. No known surface or groundwater quality data are available for the Project site, with surface storm and irrigation flows typically subject to variations in water quality due to local conditions such as runoff rates/amounts and land use. A summary of typical pollutant sources and loadings for various land use types is provided in Table 3.1.3-1, *Summary of Typical Pollutant Sources for Urban Storm Water Runoff*, and Table 3.1.3-2, *Typical Loadings for Selected Pollutants in Runoff from Various Land Uses*. The chemical character and content of groundwater in the Escondido area is listed as "variable" in the Project ESAs, with a range of local total dissolved solids (TDS) levels for the Escondido Valley Groundwater Basin given as between 250 and 5,000 milligrams per liter (mg/l; GEOCON 2013b, DWR 2003). The previously noted well located approximately 0.7 mile east of the site had a reported TDS level of 1,200 mg/l in May 2002 (GEOCON 2013b). Additionally, while no specific water quality data are known to be available for the on-site well, it is assumed that associated groundwater quality is generally good or moderate due to the noted use of this well for irrigation of on-site avocado orchards.

Based on the nature and generally low intensity of existing development within the Project site and upstream areas, local surface water quality is expected to be generally moderate to good. Similarly, from the local aquifer and well data noted above, as well the use of local groundwater for on-site agricultural irrigation, groundwater quality in the Project site and immediate vicinity is anticipated to be generally moderate to good.

Off-site Water Quality

Receiving waters associated with the Project site include several local unnamed drainages, Escondido Creek approximately 0.8 mile to the south, and the Pacific Ocean/San Elijo Lagoon approximately 12 miles to the southwest. Existing water quality data for downstream areas include quantitative and qualitative monitoring and/or testing results, biological assessment (bioassessment) studies, and 303(d) impaired water evaluations conducted by the State Water Resources Control Board (SWRCB) and RWQCB. An overview of selected monitoring and reporting data is provided below, followed by a summary evaluation of overall water quality conditions within the Project site and related watersheds.

Surface Water Quality Monitoring Data

Historic and current water quality monitoring has been/is being conducted within the Escondido Creek watershed in association with requirements under the federal CWA, NPDES, and the associated Municipal Storm Water Permit (refer to the discussion of Regulatory Framework below for additional information).

Wet weather monitoring has been conducted seasonally since 2001 at the Escondido Creek Mass Loading Station (MLS, with no monitoring conducted in 2011/2012 or 2012/2013), located approximately 6.7 miles southwest of the Project site at the Escondido Creek/El Camino Del Norte bridge. This monitoring includes numerous physical, chemical and biological parameters, with resulting data for 2010/2011 indicating the following trends: (1) applicable water quality objectives were exceeded at a high frequency for TDS, fecal coliform bacteria, and bioassessment scores (as outlined below); and (2) water quality objectives were exceeded at a low frequency for general chemical parameters (e.g., pH and chloride), toxicity and nutrients (Weston Solutions, Inc. [Weston] 2013 and 2012). Bioassessment testing involves evaluation of the taxonomic richness and diversity of benthic macroinvertebrate (BMI) communities based on the Index of Biotic Integrity (IBI), which provides a quantified score reflecting biological conditions and associated water quality.

In addition to the above efforts, wet weather monitoring was conducted during the 2007/2008 season at the Escondido Creek Temporary Watershed Assessment Station (TWAS), located at the Escondido Creek/Country Club Drive bridge (approximately 0.6 mile south of the Project site). The associated trends at the Escondido Creek TWAS were similar to those noted above for TDS and bacteria in 2010/2011 at the Escondido Creek MLS, although the frequency levels were somewhat lower. Monitoring at the Escondido Creek TWAS in 2007/2008 also identified very low IBI scores, similar to those noted for the Escondido Creek MLS in 2010/2011 (Weston 2013, 2009).

Jurisdictional dry weather sampling was conducted most recently in 2011 at a number of locations both up- and downstream of the Project site. These efforts documented that water quality objectives were most commonly exceeded for nitrate, turbidity and conductivity; and less commonly for pollutants including pH and orthophosphate (Weston 2013).

Groundwater Quality Monitoring Data

Information regarding groundwater quality data for DWR well X4340005 (located approximately 0.7 mile east of the Project site) and the Escondido Valley Groundwater Basin is provided above under the discussion of On-site and Vicinity Water Quality. No known additional data are available regarding local or regional groundwater quality.

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

The SWRCB and RWQCBs produce bi-annual qualitative assessments of statewide and regional water quality conditions. These assessments are focused on CWA Section 303(d) impaired water listings and scheduling for assignment of total maximum daily load (TMDL) requirements. A

TMDL establishes the maximum amount of an impairing substance or stressor that a water body can assimilate and still meet water quality standards, and allocates that load among pollution contributors. TMDLs are quantitative tools for implementing state water quality standards, based on the relationship between pollution sources and water quality conditions. States are required to identify and document any and all polluted surface water bodies, with the resulting documentation referred to as the *Clean Water Act Section 303(d) List of Water Quality Limited Segments*, or more commonly the 303(d) list. This list of water bodies identifies the associated pollutants and TMDLs, along with pollutant sources and projected TMDL implementation schedules/status. The most current (2010) approved 303(d) list identifies the following impaired waters in downstream watersheds (SWRCB 2013):

- Escondido Creek (26 miles) is listed for Dichlorodiphenyltrichloroethane (DDT), enterococcus and fecal coliform bacteria, manganese, phosphate, selenium, sulfates, TDS, toxicity, and total nitrogen (as N). The expected TMDL completion date for all of the listed pollutants is 2019.

- San Elijo Lagoon (566 acres) is listed for eutrophic conditions, indicator bacteria, and sedimentation/siltation. The expected TMDL completion dates are 2015 for indicator bacteria and 2019 for other listed pollutants.

Water Quality Summary

Based on the above information, surface water quality within the Project site and immediate vicinity is assumed to be generally moderate to good. This conclusion is based primarily on the fact that associated on-site and upstream watersheds include primarily low density development. Monitoring data indicate generally moderate to poor water quality conditions in downstream portions of Escondido Creek and associated coastal waters, with some variation among individual pollutants. These conditions are associated with the higher level of urban development (and associated pollutant generation) in areas further west, as well as the ongoing implementation of water quality control measures. Specifically, the 2010/2011 Urban Runoff Monitoring Report associated with NPDES requirements documents the following long-term trends at the Escondido Creek MLS: (1) concentrations of total coliform bacteria are increasing; and (2) concentrations of total phosphorus and diazinon (an organophosphate insecticide) are decreasing (Weston 2012).

Based on the available historic and recent data described above, groundwater quality within the Project site and vicinity is characterized as generally moderate to good, while regional groundwater quality ranges from good to poor.

Regulatory Setting

The Proposed Project is subject to a number of regulatory requirements associated with federal, state and local guidelines, as summarized below.

National Pollutant Discharge Elimination System Requirements

The Proposed Project is subject to applicable elements of the CWA, including the NPDES. Specific NPDES requirements associated with the Proposed 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 No. 2010-0014-DWQ); (2) General Permit for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region Except for San Diego Bay (Groundwater Permit; NPDES No. CAG919002, RWQCB Order No. R9-2008-0002); (3) Waste Discharge Requirements for Municipal Separate Storm Sewer Systems Permit (Municipal Permit, NPDES No. CAS 0109266, RWQCB Order Nos. R9-2007-0001 and R9-2013-0001); and (4) related County standards as outlined below.

General Construction Activity Storm Water Permit

Conformance with the Construction General Permit is required prior to development of applicable sites exceeding one acre, with this permit issued by the SWRCB under an agreement with the USEPA. Specific conformance requirements include implementing a SWPPP, an associated 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, as outlined below). 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 mandatory 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 County standards (as outlined below), as well as additional sources including the *EPA National Menu of Best Management Practices for Storm Water Phase II – Construction* (USEPA 2013), and *Storm Water Best Management Practices Handbooks* (California Stormwater Quality Association [CASQA] 2009). Specific requirements for the Proposed Project under this permit would be determined during SWPPP development, after completion of Project plans and application submittal to the SWRCB.

General Groundwater Extraction Waste Discharge Permit

The Project would need to apply for coverage under the General Groundwater Extraction Waste Discharge Permit when construction activities would require discharge of extracted groundwater into receiving waters. Conformance with the noted Groundwater Permit is generally applicable to all groundwater discharge regardless of volume, with certain exceptions as noted in the

permit. Specific requirements for permit conformance include: (1) implementing an appropriate sampling, analysis, and monitoring program; (2) providing at least 30 days notification to the appropriate local agency prior to discharging to a municipal storm drain system; (3) conforming with applicable water quality standards, including (but not limited to) the Basin Plan, CWA, and State Porter-Cologne Water Quality Control Act; and (4) submittal of applicable monitoring reports.

Municipal Storm Water Permit

The current Municipal Permit (R9-2013-0001) became effective for co-permittees in San Diego County on June 27, 2013, although the associated implementation measures (e.g., Water Quality Improvement Plans and BMP Design Manuals) are not required to be completed/implemented by the co-permittees until approximately the end of 2015. Specifically, pursuant to applicable discussion in Provisions E (Jurisdictional Runoff Management Programs) and F (Reporting) of the 2013 Municipal Permit, the associated implementation measures are required to be submitted to the RWQCB "Within 24 months after commencement of this Order", with public review/comment and other administrative requirements expected to delay full implementation of the 2013 Municipal Permit until late 2015 as noted. Until this process is complete, co-permittees (including the County) are required to continue using the implementation measures developed in association with the 2007 Municipal Permit (R9-2007-0001). When fully in place, the 2013 permit will implement a more regional approach than the 2007 permit, and will focus on addressing watershed-related concerns that often encompass multiple jurisdictions. The 2013 permit is similar to previous iterations in that it identifies waste discharge requirements for urban runoff, although the focus is shifted from establishing minimum action levels to identifying the anticipated outcomes of those actions, thereby allowing co-permittee efforts and resources to focus on achieving identified goals to improve water quality (e.g., based on considerations including receiving water limitations, waste load allocations [WLAs] and water quality based effluent limitations [WQBELs]). Based on the noted implementation timing, the Project Drainage Study, SWMP, and HMS, as well as the following analysis, are based on the 2007 Municipal Permit as outlined below.

The 2007 Municipal Permit is intended to protect environmentally sensitive areas and provide conformance with pertinent water quality standards, including the CWA and the RWQCB Basin Plan. Identified requirements involve using a number of planning, design, operation, treatment, and enforcement measures to reduce pollutant discharges from individual development projects (and the municipal storm drain system as a whole) to the maximum extent practicable (MEP). Specifically, these measures include: (1) using jurisdictional planning efforts (such as discretionary general plan approvals) to provide water quality protection; (2) requiring coordination between individual jurisdictions to provide watershed-based water quality protection; (3) implementing applicable low impact development (LID), site design, source control, priority project, and/or volume- or flow-based (as defined in the permit text) treatment control BMPs to avoid, reduce and/or mitigate effects including increased erosion and

sedimentation, hydromodification[2] and the discharge of pollutants in urban runoff; and (4) using appropriate monitoring, reporting, and enforcement efforts to ensure proper implementation, documentation, and (as appropriate) modification of permit requirements. The 2007 Municipal Permit also requires co-permittees to fund and implement urban runoff management plans (URMPs) to reduce runoff and pollutants discharges to the MEP. The URMPs were initially conducted on a jurisdictional basis, and were expanded to include a watershed-based approach for subsequent efforts. The watershed-based approach is being implemented for the Project site and applicable downstream watersheds through the current Carlsbad Watershed URMP (City of Carlsbad 2008).

Pursuant to the described Municipal Permit requirements, the County (along with other applicable co-permittees) participated in developing the Standard Urban Stormwater Mitigation Plan (SUSMP, approved by the RWQCB on June 12, 2002) to address storm water quality issues, and adopted related storm water standards and ordinances as described below under County Requirements. An updated Countywide Model SUSMP was adopted by the co-permittees on February 9, 2010. The County adopted a local (County-specific) SUSMP on February 10, 2003 (per Municipal Permit requirements), with the most recent update of this document adopted in September 2012 to reflect applicable requirements including the 2007 Municipal Permit (County 2012b).

Basin Plan Requirements

The RWQCB Basin Plan establishes a number of beneficial uses and water quality objectives for surface and groundwater resources. Beneficial uses are generally 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 the Project site and applicable downstream areas of the Escondido and San Elijo HSAs (including coastal waters) include: municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (IND); contact and non-contact water recreation (REC 1 and REC 2); biological habitats of special significance (BIOL); warm freshwater habitat (WARM); cold freshwater habitat (COLD); wildlife habitat (WILD); estuarine habitat (EST); rare, threatened or endangered species (RARE); marine habitat (MAR); migration of aquatic organisms (MIGR); and spawning, reproduction and/or early development (SPWN). Identified beneficial uses for groundwater in the Escondido and San Elijo HSAs include MUN, AGR and IND. Water quality objectives identified in the Basin Plan are based on established beneficial uses, and are defined as "the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses." Water quality objectives identified for surface and groundwater resources in the Lower San Luis HA and the Bonsall HSA are summarized in Table 3.1.3-3, *Surface and Groundwater Quality Objectives for the Escondido Creek Hydrologic Area and the Escondido Hydrologic Subarea*.

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

County of San Diego Requirements

Pursuant to the described NPDES Permit requirements, the County has adopted and/or updated the following related standards: (1) the Watershed Protection, Storm Water Management and Discharge Control Ordinance (Storm Water Ordinance, No. 10096); (2) the associated Storm Water Standards Manual (Storm Water Manual, 2003a) and LID[3] Handbook (2007g); (3) the previously described County SUSMP; (4) the County Jurisdictional URMP (JURMP, 2010d); and (5) the County Grading Ordinance (No. 10179). These sources provide, among other things, direction for applicants to determine if and how they are subject to County and related Municipal Storm Water Permit standards, and identify requirements for the inclusion of permanent LID/site design, source control and/or LID/treatment control BMPs to provide regulatory conformance for applicable projects. The County Storm Water Ordinance/Storm Water Manual also requires construction-related BMPs to address issues including erosion and sedimentation. The County may, at its discretion, require the submittal and approval of a SWPPP to address construction-related storm water issues prior to site development (with such requirements in addition to the NPDES SWPPP criteria described above).

The San Diego County Hydrology Manual (County 2003b) provides uniform procedures for analyzing flood and storm water conditions in the County. Specific elements of these procedures include methods to estimate storm flow peaks, volumes and time distributions. These data are used in the design of storm water management facilities to ensure appropriate dimensions and capacity (typically 100-year storm flow volumes), pursuant to applicable requirements in the San Diego County Drainage Design Manual (County 2005).

The County Guidelines for Determining Significance – Hydrology (County 2007i), provide direction for evaluating environmental effects to and from hydrologic conditions and hazards. Specifically, these guidelines address potential adverse effects to hydrologic resources, life and property (pursuant to applicable CEQA standards) from issues including drainage alteration, increased water surface elevations, increased runoff velocities and peak flow rates, and flooding. The Hydrology Guidelines identify significance guidelines for the noted issues, as well as related regulatory standards, typical adverse effects, standard mitigation/design considerations, and reporting requirements.

The County Guidelines for Determining Significance – Surface Water Quality (County 2007j), provide direction for evaluating environmental effects related to water quality issues, pursuant to related CEQA standards. The Water Quality Guidelines give an overview of hydrologic resources, local watershed conditions, related regulatory standards and typical adverse effects, and provide guidance for identifying significance guidelines and standard mitigation/design considerations.

The County Guidelines for Determining Significance – Groundwater Resources (County 2007k), provide direction for evaluating environmental effects related to groundwater supplies (e.g., aquifer volumes/yields, local water table levels, and well production) and quality, pursuant

[3] The LID process is intended to mimic predevelopment hydrologic conditions by using design practices and techniques to effectively capture, filter, store, evaporate, detain and infiltrate runoff close to its source.

to related CEQA standards. The Groundwater Resource Guidelines give an overview of groundwater resources, hydrogeologic principles, aquifer/well characteristics, associated water quality concerns, regulatory standards, and typical adverse effects, and provide guidance for identifying significance guidelines and standard mitigation/design considerations.

3.1.3.2 *Analysis of Project Effects and Determination as to Significance*

Drainage Alteration

Guidelines for the Determination of Significance

A significant impact related to drainage alteration would occur if the Proposed Project would:

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

Guideline Source

Guideline No. 1 is based on the County Guidelines for Determining the Significance – Hydrology (2007i).

Analysis

As described in Section 3.1.3.1, surface flows within applicable portions of the Project site and associated off-site watersheds drain generally east and south. This flow moves through the site, exits at four primary outlet points (or nodes), and continues generally south for approximately 0.8 mile before discharging to Escondido Creek. Escondido Creek continues generally west and south from the Project site area and enters the Pacific Ocean via San Elijo Lagoon approximately 12 miles to the southwest. Project implementation would result in some modification of the described existing on-site drainage patterns and directions through proposed grading and construction. Specifically, Project development would include a series of storm drain facilities to capture, regulate and convey flows within and through the site, as depicted on Figure 1-22. The Project Drainage Study also notes that "Where possible, the off-site drainages and on-site pervious area will be provided with separate drainage systems, which will prevent the mingling of runoff from these areas with runoff from the developed areas of the site." Specifically, the Project design includes a number of drainage facilities (e.g., brow ditches) that would collect runoff from applicable locations (e.g., off-site open space to the west and certain undeveloped areas onsite) and convey it separately through and/or off the site. Because the noted runoff is "clean" (i.e., does not pass through or receive flow from developed areas that would contribute urban pollutants), it would bypass the proposed water quality BMPs described below in this section under Guideline Nos. 8 through 11, and would not be mixed with on- and/or off-site flows that do drain developed areas (and contain associated urban pollutants).

The described modifications from Project implementation would not substantially alter the overall described on- and off-site drainage patterns. That is, flows within the site would continue

to drain primarily to the east and south, and the Project design would encompass a number of appropriately designed and located drainage facilities to retain the overall existing drainage features, including the use of similar outlet points for flows discharged from the site (refer to the Existing and Proposed Conditions Hydrology Exhibits included in Appendix H of the Project Drainage Study, Fuscoe 2015a, in EIR Appendix M). As a result, post-development flows from the Project site would mimic existing conditions to the extent feasible (including runoff rates and amounts, as outlined below under Guideline No. 2), with overall runoff patterns and directions maintained and off-site flows continuing to drain generally south to Escondido Creek and ultimately entering San Elijo Lagoon and the Pacific Ocean (and the northernmost portion of the site, which drains generally north, remaining in open space with no change to drainage). Based on the described conditions, **Project-related impacts to drainage alteration would be less than significant**, including associated erosion and siltation effects (with additional information on potential erosion concerns provided below under the discussion of water quality).

Runoff Rates/Amounts and Related Drainage System and/or Flood Hazards

Guidelines for the Determination of Significance

A significant impact related to runoff, drainage systems and related flooding would occur if the Proposed Project would:

2. Result in increased velocities and peak flow rates exiting the Project site that would cause flooding downstream or exceed the storm water drainage system capacity serving the site.

Guideline Source

Guideline No. 2 is based on the County Guidelines for Determining the Significance – Hydrology (2007i).

Analysis

Implementation of the Proposed Project would result in the construction of approximately 60 acres of new impervious surfaces, including pavement and structures. These areas would increase both the rate and amount of runoff within the site by reducing infiltration capacity and concentrating flows. Proposed on-site storm drain facilities include a series of curb/gutter inlets, crossing structures (culverts), and 16 extended detention basins with bioretention, all of which would be tied to an underground storm drain system of pipelines and related structures.

The extended detention basins are intended to provide flow regulation and related hydromodification compliance (i.e., through detaining/retaining flows from design storm events and providing controlled downstream release to regulate flow rates/amounts), as well water quality treatment (as outlined below in this section). In addition, three bioretention facilities would be located in Drainage Basin B in association with the recreation area and off-site improvements to Mt. Whitney Road), although these facility would be designed for hydromodification and water quality flows only, and would not be used to regulate 100-year flows (with an additional bioretention facility to be located east of the site in association with

off-site improvements along Country Club Drive and Mt. Whitney Road, refer to Figure 1-22 and the discussion of Hydromodification below under Significance Determination Guideline No. 3). The proposed storm drain system (other than the bioretention facilities as noted) would accommodate peak 100-year storm flows, and would be designed to separate drainage from developed/undeveloped areas where feasible as previously noted. The Project Drainage Study (Fuscoe 2015a in Appendix M) includes an assessment of pre- and post-development runoff rates and amounts within and from the site, including analyses of Project-related effects to existing/proposed storm drain systems, off-site flows, and related downstream flooding hazards. Calculated post-development flows from the Project site are summarized below for the proposed drainage basins, along with the previously described existing flows (refer to the Major Hydrologic Basin Exhibit in Appendix B of the Project Drainage Study for depictions or pre- and of post-development drainage basin boundaries). In addition, a number of modifications to existing off-site drainage structures are proposed in association with off-site project roadway facilities, with these modifications discussed separately in the following discussion.

Drainage Basin A

The proposed Basin A includes 26.8 acres, and exhibits the same area and boundaries as existing basin A. The calculated peak 100-year flow from proposed Basin A is 55.7 cfs, an increase of 7.6 cfs over the existing flow of 48.1 cfs. The Proposed Project design includes a single extended detention basin with bioretention in Drainage Basin A, however (refer to Figure 1-22), that would provide detention capacity for a peak 100-year flow of 13.7 cfs (refer to Fuscoe 2015a in Appendix M). Accordingly, this detention basin would provide adequate detention capacity to accommodate the calculated increase of peak 100-year flows in Drainage Basin A. The Project design also includes the use of energy dissipation facilities (e.g., riprap aprons) at applicable proposed discharge locations in Basin A to address the Project-related increase in flow velocity.

Drainage Basin B

Proposed Drainage Basin B includes 217.7 acres compared to 214.8 acres for the existing basin, with the difference associated with basin boundary adjustments from development in Neighborhoods 2 and 4. The calculated peak 100-year flow in Basin B is 465.6 cfs, an increase of 168.2 cfs over the existing flow of 297.4 cfs. The Project design includes nine extended detention basins with bioretention in Drainage Basin B (as well as the three previously noted separate bioretention facilities), with a combined 100-year peak flow detention capacity of 168.3 cfs (refer to Figure 1-22 and Fuscoe 2015a in Appendix M). Accordingly, these detention basins would provide adequate detention capacity to accommodate the calculated increase of peak 100-year flows in Basin B. The Project design also includes the use of energy dissipation facilities at applicable proposed discharge locations in Basin B to address the Project-related increase in flow velocity.

As part of the Project Drainage Study, a Hydrologic Engineering Center-River Analysis System (HEC-RAS) analysis was conducted for the drainage course that extends generally north-south through Neighborhood 5 (as well as the natural channel extending through Neighborhood 3, as outlined below under Drainage Basin C). Specifically, this analysis was intended to identify any

affects related to water surface elevations (and associated flood hazards) on proposed downstream development in Neighborhood 5, the adjacent upstream (off-site) properties, and proposed off-site widening of Mt. Whitney Road (as discussed below, refer to Fuscoe 2015a in Appendix M). Based on this analysis, The Project Drainage Study identified several proposed crossing structure additions/modifications to accommodate proposed flows. Specifically, these include three adjoining 12-foot by 6-foot box culverts (a triple box culvert) at the existing drainage crossing of Mt. Whitney Road (with additional discussion provided below under Off-site Drainage Modifications), two 10-foot by 5-foot triple box culverts at proposed drainage crossings of Street 5A in Neighborhood 5, and associated energy dissipation structures at the associated outlets (refer to the Neighborhood 5 100-Year Storm Inundation Exhibit in Appendix F of the Project Drainage Study [Fuscoe 2015a in EIR Appendix M]). Based on these proposed conditions, the Project Drainage Study concludes that the Project design (including grading parameters and the noted triple box culverts) would provide adequate capacity to accommodate peak 100-year flows in the described area (i.e., 1,437 cfs), and would: (1) prevent associated overtopping of Mt. Whitney Road; (2) ensure that proposed pad elevations in Neighborhood 5 are a minimum of 12 inches above the 100-year peak flow surface water elevations; and (3) result in a slight decrease in 100-year peak flow surface water elevations at upstream properties, with a corresponding reduction of flood hazards (Fuscoe 2015a in EIR Appendix M).

Drainage Basin C

Proposed Basin C includes 173.3 acres, and exhibits essentially the same area and boundaries as existing basin C (which includes 173.5 acres). The calculated peak 100-year flow from proposed Basin C is 349.5 cfs, an increase of 111.6 cfs over the existing flow of 237.9 cfs. The Project design includes four extended detention basins with bioretention in Drainage Basin C, with a combined 100-year peak flow detention capacity of 117 cfs (refer to Figure 1-22 and Fuscoe 2015a in Appendix M). Accordingly, these detention basins would provide adequate detention capacity to accommodate the calculated increase of peak 100-year flows in Basin C. The Project design also includes the use of energy dissipation facilities (e.g., riprap aprons) at applicable proposed discharge locations in Basin C to address the Project-related increase in flow velocity.

As noted above, the Project HEC-RAS analysis included assessment of proposed water surface elevations for the natural channel extending through Neighborhood 3. Specifically, based on a calculated peak 100-year flow rate of 248.5 cfs at the upstream end of the channel under proposed conditions (not including detention), the HEC-RAS analysis concluded that all applicable pad elevations in Neighborhood 3 are a minimum of 12 inches above the 100-year peak flow surface water elevations (Fuscoe 2015a in EIR Appendix M).

Drainage Basin D

Proposed Drainage Basin D includes 46.4 acres compared to 49.1 acres for the existing basin, with the difference associated with basin boundary adjustments from development in Neighborhood 4. The calculated peak 100-year flow in Basin D is 112.6 cfs, an increase of 30.6 cfs over the existing flow of 82 cfs. The Project design includes two extended detention basins with bioretention in Drainage Basin D, with a combined 100-year peak flow detention

capacity of 32.5 cfs (refer to Figure 1-22 and Fuscoe 2015a in Appendix M). Accordingly, these detention basins would provide adequate detention capacity to accommodate the calculated increase of peak 100-year flows in Basin D. The Project design also includes the use of energy dissipation facilities at applicable proposed discharge locations in Basin D to address the Project-related increase in flow velocity.

Off-site Drainage Modifications

Proposed off-site facilities involve three local roadways, including minor widening/modification of Hill Valley Drive, Eden Valley Lane, and Mt. Whitney Road in areas adjacent to the Project site (refer to Figures 1-15a and 1-15b). The existing drainage patterns, associated facilities, and runoff characteristics in these areas would be preserved to the maximum extent feasible, with no substantial increase in runoff rates/amount anticipated from the noted improvements due to the minor amount of additional impervious surface (i.e., approximately 0.96 acre). No substantial changes to drainage conditions or facilities would result from the proposed modifications to Eden Valley Lane, based on the minor extent of widening and the fact that drainage in this location moves parallel to the affected roadway segment (i.e., no crossing structures are present within the proposed widening area).

Proposed improvements along Hill Valley Drive would include widening as depicted on Figure 1-15a, as well as two 30-inch diameter reinforced concrete pipe (RCP) culverts at an associated drainage crossing to replace the existing 24-inch culvert. Under existing conditions, Hill Valley Drive is subject to flooding at the noted crossing during peak 100-year flows, with an estimated flow depth of approximately eight inches on the roadway (refer to Fuscoe 2015a in Appendix M). The proposed facilities would provide adequate capacity to accommodate the associated 100-year peak flow of 61.1 cfs, and would include an energy dissipation structure on the downstream (south) end. Based on the noted conditions, the Project Drainage Study concludes that the proposed improvements along Hill Valley Drive "…will prevent overtopping of the road, and reduce the water surface elevations on the adjacent properties upstream of the property."

Proposed improvements to Mt. Whitney Road would include widening as depicted on Figure 1-15b, as well as the previously described triple box culvert and associated energy dissipation structure. As noted above under the discussion of Drainage Basin B, this design would provide adequate capacity to accommodate peak 100-year flows in the noted drainage, prevent associated overtopping of Mt. Whitney Road, and result in a slight decrease in 100-year peak flow surface water elevations at upstream properties (with a corresponding reduction of flood hazards, refer to Fuscoe 2015a in Appendix M).

Summary of Drainage Alteration Impacts

As noted above, Project drainage facilities (including improvements associated with off-site roadway modifications) would accommodate peak 100-year storm flows, provide flow regulation through the use of detention/retention facilities, and avoid or reduce associated potential flood hazards. As a result, the Project Drainage Study concludes that, after Project implementation, "…the flows leaving the site will be less than or equal to the existing condition" (Fuscoe 2015a).

Based on these considerations, potential **Project-related impacts associated with increased peak flow rates and amounts, associated flooding hazards, and the capacity of existing or planned storm drain systems would be less than significant.**

Hydromodification

Guidelines for the Determination of Significance

A significant impact related to hydromodification would occur if the Proposed Project would:

3. Exceed applicable hydromodification requirements or conflict with the County of San Diego Final Hydromodification Management Plan (HMP; County 2011).

Guideline Source

Guideline No. 3 is derived from hydromodification requirements included in the previously described RWQCB NPDES Municipal Permit, and related County standards including the HMP.

Analysis

Pursuant to requirements under the NPDES Municipal Permit (as outlined above), the County of San Diego prepared an HMP for Priority Development Projects (PDPs), with the final (adopted) HMP dated March 2011. Specifically, the HMP requires that all PDPs must either demonstrate that the project is exempt from HMP requirements based on the identified criteria, or provide compliance with the requirements to address hydromodification as outlined in the HMP.

The stated purpose of the HMP is "…to manage increases in runoff discharge rates and durations from all PDPs, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force". In general terms, hydromodification consists of the erosive impacts caused by cumulative changes in the quantity and duration of storm water flows resulting from the increase in impervious surfaces associated with development. Specifically, an increase in impervious areas typically generates related increases in both the rate and amount of storm water runoff compared to pre-development conditions. Flow thresholds associated with hydromodification requirements are typically expressed in terms of less intense storms (e.g., 2- to 10-year storm events) which, due to the increased of impervious area in associated watersheds, can potentially result in more accelerated cumulative long-term erosion than one larger storm event (such as a 100-year storm). As a result, hydromodification management techniques are aimed at reducing the duration and quantity of storm flows from the smaller and more frequent storm events.

The Proposed Project is a PDP and must therefore comply with the HMP requirements. Accordingly, an HMS was prepared for the Project to evaluate the HMP compliance efforts incorporated into the Project design (Fuscoe 2015c in Appendix M). Flow duration control is the most common form of hydromodification management, and is intended to address associated effects prior to downstream discharge. Flow duration control typically involves the

use of facilities such as infiltration basins, bioretention areas, detention basins, or cisterns to regulate and/or reduce flows and help reduce associated impacts to downstream receiving waters. Based on analysis in the Project HMS, the following observations and conclusions regarding hydromodification effects and related HMP requirements were identified for the Proposed Project:

- The four previously described drainage basins encompassing the site were divided into a number of smaller on-site DMAs to evaluate Project-related hydromodification impacts and attenuation facilities. The DMAs include a number of discharge points within and from the site, which are referred to as point of compliance (POC) locations (refer to Figure 1-22). Where Project implementation would result in an increase of post-development flow at the POCs, BMPs are identified to address these conditions are provide compliance with the HMP.

- As previously noted, the Project design includes a number of areas that would be undeveloped and/or that would contain less than 5 percent of impervious surfaces, with separate drainage systems to be provided in these areas where feasible to avoid mingling associated runoff with that from developed areas. Accordingly, the undeveloped areas would be "self-treating" and would not require BMPs. The areas proposed for development were evaluated under HMP requirements in the HMS analysis. Pursuant to the above discussion of HMP requirements, the Project HMP analysis evaluates flows ranging from 10 percent of a 2-year storm ($0.1Q_2$) to a 10-year storm (Q_{10}). Based on the associated calculations, the previously described extended detention basins and bioretention facilities were identified (and appropriately designed/sized) to serve as BMPs, and would provide appropriate flow control management and ensure conformance with applicable HMP requirements. The locations of these facilities, along with the associated DMAs and POCs, are provided on Figure 1-22. It should also be noted that the bioretention basin located off-site to the east (BIO CC1 on Figure 1-22) differs from the other three bioretention facilities in that it does not connect to any existing or proposed storm drain facilities (with no such facilities present at this location). Accordingly, BIO CC1 would not include a perforated subdrain or grated inlet, with runoff to overtop the basin and continue downstream in the existing drainage course when ponded depths exceed 10 inches (Fuscoe 2015c in Appendix M).

A number of conservative assumptions were incorporated into the Project HMS analysis, including the detention basin volumes and the fact that Hydrologic Group D soils were assumed for the entire site (with Group D soils exhibiting the lowest infiltration rates). The identified detention basins and bioretention facilities are also proposed to be used as water quality treatment BMPs, as outlined above and described in more detail below in this section, and the detention basins would exhibit drawdown times of between 18 and 87 hours (i.e., less than the required maximum of 96 hours to ensure vector control). Based on the described conclusions and considerations, the Project design incorporates appropriate detention and bioretention facilities to provide compliance with applicable requirements under the HMP, and would avoid or reduce potential **effects related to hydromodification to a less than significant level.**

Floodplains, Floodwater Surface Water Elevations and Related Flood Hazards

Guidelines for the Determination of Significance

A significant impact related to floodplains, floodwater surface elevations, and related flood hazards would occur if the Proposed Project would:

4. Place housing, habitable structures, or unanchored impediments to flow in a 100-year floodplain area or other special flood hazard area, as shown on a Flood Insurance Rate Map (FIRM), a County Floodplain Map or County Alluvial Plain Map, which would subsequently endanger health, safety and property due to flooding; or

5. Place structures within a 100-year flood hazard or alter the floodway in a manner that would redirect or impede flow resulting in any of the following:

    a. Alter the Lines of Inundation resulting in the placement of other housing in a 100-year flood hazard; or

    b. Increase the water surface elevation in a watercourse with a watershed equal to or greater than one square mile by one foot or more in height.

Guideline Sources

Guideline Nos. 4 and 5 are from Section 4.0 of the County Guidelines for Determining Significance – Hydrology (County 2007i).

Analysis

As described above in Section 3.1.3.1, *Existing Conditions*, the Project site is not located within a mapped 500- or 100-year floodplain area pursuant to the associated FIRM, or within a County Floodplain Map or County Alluvial Plain Map (County 2013). Based on the discussion provided above under Runoff Rates/Amounts and Related Drainage System and/or Flood Hazards, however, Project implementation would result in the generation of additional runoff from proposed construction of impervious surfaces, with associated potential effects to water surface elevations and related flood hazards both on- and off-site. These potential effects were evaluated in the Project Drainage Study (Fuscoe 2015a in Appendix M), with a HEC-RAS analysis conducted for all areas of the Project site with drainage basins larger than 100 acres to identify any affects related to water surface elevations (and associated flood hazards) on proposed downstream development. This includes the creek that crosses Mt. Whitney Road in the easterly portion of the Project site and runs through Neighborhood 5, as well as the natural channel running through Neighborhood 3. In addition, proposed off-site roadway improvements along Eden Valley Lane and Hill Valley Drive were also evaluated in the Project Drainage Study to assess potential on- and off-site flood hazards related to Project development and associated runoff rates and amounts. As described above under the discussion of Runoff Rates/Amounts and Related Flood Hazards, these analyses provide the following conclusions:

- The proposed crossing structures associated with Mt. Whitney Road would provide adequate capacity to accommodate associated peak 100-year flows (i.e., 1,437 cfs and, along with other pertinent Project design features, would: (1) prevent associated overtopping of the roadway; (2) ensure that proposed pad elevations in Neighborhood 5 are a minimum of 12 inches above the 100-year peak flow surface water elevations; and (3) result in a slight decrease in 100-year peak flow surface water elevations at upstream properties, with a corresponding reduction of flood hazards (Fuscoe 2015a in EIR Appendix M).

- Based on a calculated peak 100-year flow rate of 248.5 cfs at the upstream end of the channel extending through Neighborhood 3 under proposed conditions (not including detention), all applicable pad elevations in Neighborhood 3 are a minimum of 12 inches above the 100-year peak flow surface water elevations, as shown on the Proposed Project conceptual grading plans and demonstrated in the CEQA Drainage Study (Fuscoe 2015a in EIR Appendix M).

From the above analysis, **potential impacts associated with floodplains, floodwater surface elevations, and related flood hazards would be less than significant.**

Groundwater

Guidelines for the Determination of Significance

A significant impact related to groundwater level drawdown/reduced well yields, or increased groundwater aquifer levels would occur if the Proposed Project would:

6. Cause or contribute to substantial drawdown of local groundwater aquifers, or cause or contribute to a substantial reduction in local groundwater well yields.

7. Cause or contribute to a substantial increase in local groundwater aquifer levels, resulting in adverse effects to conditions such as liquefaction/settlement potential, or the operation of septic systems.

Guideline Sources

Guideline No. 6 is derived from Section 4.0 of the County Guidelines for Determining Significance – Groundwater Resources (County 2007k), as well as comments received during the Project NOP public review period.

Guideline No. 7 is derived from Appendix G, Section VIe, of the CEQA Guidelines for septic system operation, Section 4.0 of the County Guidelines for Determining Significance – Geologic Hazards for liquefaction/settlement, and comments received during the Project NOP public review period.

Analysis

While domestic water supplies for the Proposed Project would be obtained from the Rincon MWD (with no groundwater use proposed for domestic purposes), groundwater use on the Project site would continue in association with the proposed retention of approximately 36.5 acres of agricultural use in the northern portion of the site (refer to Figure 1-4b). Specifically, as discussed above in Subsection 3.1.3.1, groundwater from an existing on-site well has been used to irrigate approximately 117 acres of on-site avocado orchards (although groundwater pumping from the on-site well has apparently "not occurred for some time" GEOCON 2014b). While no known data are available regarding the quantity of groundwater used for this irrigation, use under the Proposed Project would represent nearly a 70 percent reduction based on the areas involved. That is, because the nature of the irrigated areas (and associated water requirements) would not change substantially, the amount of groundwater used per acre is also assumed to be the same, with the projected decrease in groundwater use derived from the net reduction of irrigated acreage. In addition, because roughly 179 acres (75 percent) of the Project site would remain pervious under the proposed design (i.e., due to the retention of substantial pervious areas in designated open space/easements and on residential lots, refer to Appendix N), as well as the fact that portions of the area proposed for development with impervious surfaces encompass Hydrologic Group C or D soils (with low or very low water transmission rates; County 2003b), infiltration of surface flows and related recharge capacity within the Project site is anticipated to exhibit a only a relatively minor reduction compared to existing conditions. Based on the noted conditions, **impacts associated with drawdown of local groundwater aquifers or reductions in local groundwater well yields would be less than significant.**

As described above under the discussion of Runoff Rates/Amounts and Related Drainage System and/or Flood Hazards, Project implementation would generate approximately 318 additional cfs of 100-year storm flow within the site due to the proposed construction of impervious surfaces. This additional runoff would be captured in the Project site storm drain system via a series of inlets, pipelines, etc., and conveyed to 16 proposed on-site extended detention basins with bioretention prior to off-site discharge. Potential infiltration of these flows within the site would be limited, due to the fact that most of the areas conveying flows (streets, pipelines, etc.) would be impervious, as well as the fact that the 16 detention basins would include an impermeable layer (e.g., concrete or impermeable membrane) beneath the vegetation-lined surface and bioretention layer.

The four proposed bioretention facilities would provide some additional infiltration, although this would be limited due to the relatively minor flow quantities associated with these facilities (i.e., between approximately 3.5 and 7.3 cfs in a 100-year storm). Based on the described conditions, as well as the fact that roughly 75 percent of the site would remain pervious under the proposed design (as noted above), infiltration of surface flows within the Project site is anticipated to exhibit a relatively minor reduction of infiltration capacity compared to existing conditions.

Post-development runoff from the site would be regulated by the noted detention/retention facilities, with flows to be equal to or less than the existing condition (Fuscoe 2015a). After

leaving the site, these flows would move through existing drainage courses and storm drain facilities associated with downstream development, before ultimately entering Escondido Creek approximately 0.8 mile downstream of the Project site. Downstream storm drain systems, similar to those described for the Proposed Project, consist primarily of impervious facilities such as streets and pipelines, with no associated major increase in local infiltration potential. Most downstream drainage courses also encompass soils in hydrologic groups C or D, which exhibit low or very low water transmission rates as previously noted. Accordingly, any potential increase to local infiltration rates in these areas from Project-related runoff would be minor.

An additional potential source of infiltration at the Project site would be recycled water effluent produced at the on-site WTWRF and stored seasonally in the 1.6-acre wet weather storage area (refer to Figure 1-4b). Operations at both the WTWRF and the wet weather storage area, including infiltration and associated potential effects to groundwater resources, would be subject to review and approval by the RWQCB (e.g., through an associated Waste Discharge Permit). Recycled water produced at the Project wastewater reclamation facility would likely be used onsite and/or sold for off-site use to supplement/replace potable water for applicable uses such as landscape irrigation. Accordingly, due to the associated economic benefits of reducing potable water use, it is considered likely that the wet weather storage area would be designed to include an impermeable (or low-permeability) liner to avoid or minimize potential infiltration. The use of recycled water for on-site landscape irrigation water in lieu of (or to supplement) potable water supplies would be expected to result in only minimal infiltration, based on the following considerations: (1) The Project design includes extensive use of native and /or drought-tolerant landscape varieties, with correspondingly low irrigation requirements that would avoid or minimize potential infiltration; (2) Project site irrigation systems would encompass "smart irrigation" technology, including appropriate water schedules and rain/pressure-sensitive shutoff devices, to minimize application rates, preclude unnecessary watering (e.g., during/after precipitation events), and avoid runoff; and (3) the Project site encompasses primarily low-transmission soils (hydrologic groups C or D) and/or shallow bedrock in undeveloped areas (with low infiltration potential), while developed areas under the proposed design would include compacted fill and appropriate drainage facilities (e.g., subdrains) in applicable locations, such as canyons or areas of shallow groundwater/seepage, to direct subsurface flows to the Project storm drain system and avoid near-surface saturation (refer to Figure 2.11-1a).

It should also be noted that the proposed reduction of groundwater extraction for irrigation of avocado groves or other agricultural uses in the on-site easement (i.e., from approximately 117 to 36.5 acres, a 69 percent reduction) is not expected to result in any substantial near-surface increase in local aquifer levels (GEOCON 2014b). Specifically, this conclusion is based on the following considerations: (1) the associated well extends to a depth of approximately 100 feet below the surface, and is drilled into granitic rock; and (2) groundwater pumping from the on-site well has apparently "not occurred for some time" as previously noted, and no known issues regarding increased aquifer levels have occurred (GEOCON 2014b). Accordingly, based on the described conditions and the previously noted minor decrease in the overall Project site infiltration capacity, no significant impacts related to liquefaction/settlement or septic system operation from increased groundwater levels within the site and vicinity are anticipated as a result of Project implementation. In addition, while no substantial increase in aquifer levels are expected as described, potential liquefaction hazards associated with localized perched aquifers

within the site are addressed in Subchapter 2.10, *Geology and Soils*, of this EIR, and were concluded to be potentially significant.

Based on the described conditions, no substantial increase in local groundwater aquifer levels are anticipated from Project implementation, and **associated potential effects to local liquefaction potential or septic system operations would be less than significant**.

Project construction may also require extraction/disposal of local groundwater to accommodate activities such as grading and excavation. Based on the temporary nature of potential dewatering activities associated with Project construction, however, **related potential impacts to local groundwater resources such as aquifer drawdown or depletion would be less than significant** (refer also to the related discussion of potential groundwater extraction and associated requirements below in this section under Guideline Nos. 8 through 11).

Water Quality

Guidelines for the Determination of Significance

A significant impact related to water quality would occur if the Proposed Project would:

8. Consist of a development project listed in County of San Diego, Code of Regulatory Ordinances (Regulatory Ordinances), Section 67.804(g), as amended and does not comply with the standards set forth in the County Stormwater Standards Manual, Regulatory Ordinances 67.813, as amended, or the Additional Requirements for Land Disturbance Activities set forth in Regulatory Ordinances, Section 67.

9. Drain to a tributary of an impaired water body listed on the Clean Water Act Section 303(d) list, and contribute substantial additional pollutants for which the receiving water body is already impaired.

10. Contribute pollution in excess of that allowed by applicable state or local water quality objectives or cause or contribute to the degradation of beneficial uses.

11. Fail to conform to applicable Federal, State or local "Clean Water" statutes or regulations including, but not limited to, the Federal Water Pollution Control Act (Clean Water Act) California Porter-Cologne Water Quality Control Act and the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance.

Guideline Sources

Guideline Nos. 8 through 11 are derived from Section 4.0 of the County Guidelines for Determining Significance – Surface Water Quality (County 2007j).

Analysis

Conformance with Federal, State and Local Water Quality Statues and Associated Regulations

Potential Project-related water quality impacts are associated with both short-term construction activities and long-term operation and maintenance. Project-related activities that could potentially result in direct effects to groundwater quality are limited to the percolation of Project-related surface runoff and associated pollutants (e.g., in pervious portions of the proposed storm drain system). Accordingly, the following assessment of potential water quality impacts is applicable to both surface and groundwater resources.

Short-term Construction Impacts. Potential water quality impacts related to on- and off-site 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), as described below.

Erosion and Sedimentation. Proposed excavation, grading, and construction activities on the Project site and associated off-site (road improvement) areas could potentially result in related erosion and off-site sediment transport (sedimentation). Project activities would involve the removal of surface stabilizing features such as vegetation, excavation of existing compacted materials from cut areas, redeposition of excavated (and/or imported) material as fill in proposed development sites, and potential erosion from disposal of extracted groundwater (if required). Project-related erosion could result in the influx of sediment into downstream receiving waters (including San Elijo Lagoon which includes a 303[d] listing for sedimentation/siltation), with associated water quality effects such as turbidity and transport of other pollutants that tend to adhere to sediment particles.

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. Developed areas would be especially susceptible to erosion between the beginning of grading/construction and the installation of pavement or establishment of permanent cover in landscaped areas. Erosion and sedimentation are not considered to be significant long-term concerns for the Proposed Project because developed areas would be stabilized through installation of hardscape or landscaping as noted. The Project also would incorporate long-term water quality controls pursuant to County 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 detention/water quality basins, bioretention facilities, energy dissipators, irrigation controls and drainage facility maintenance (i.e., to remove accumulated sediment).

The short-term water quality effects from Project-related erosion and sedimentation could potentially affect downstream waters and associated wildlife habitats, with such impacts considered potentially significant. Short-term (construction) erosion and sedimentation impacts would be addressed through conformance with the NPDES Construction General Permit and associated County standards, as described above in Subsection 3.1.3.1 under Regulatory

Framework. This would include implementing an authorized NPDES/County SWPPP for proposed construction, including (but not limited to) erosion and sedimentation BMPs.

The Project SWMP identifies a number of preliminary construction BMPs, including measures related to erosion/sedimentation (Appendix N). While specific BMPs would be determined during the SWPPP process based on site characteristics (soils, slopes, etc.), they would include standard industry measures and guidelines from the NPDES Construction Permit and County Stormwater Ordinance/Stormwater Standards Manual, as well as the SWMP and additional sources identified in Section 3.1.3.1 under Regulatory Framework. A summary of anticipated erosion and sedimentation BMPs that would be applicable to the Proposed Project are provided in Table 3.1.3-4, *Potential Measures to Avoid or Minimize Impacts Related to Erosion and Sedimentation*. Based on the implementation of these and/or other appropriate erosion and sediment control BMPs as part of (and in conformance with) the Project SWPPP and related requirements, **associated short-term (construction) erosion/sedimentation impacts would be less than significant**. Erosion and sedimentation controls implemented for the Proposed Project would be further defined during the NPDES/County SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures listed in Table 3.1.3-4.

Construction-related Hazardous Materials. Project construction would involve the 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 Project 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. Implementation of a SWPPP would be required under NPDES and (potentially) County guidelines, and would include detailed measures to avoid or mitigate potential impacts related to the use and potential discharge of construction-related hazardous materials.

The Project SWMP identifies a number of preliminary construction BMPs, including measures related to the proper use and storage of hazardous materials (Appendix N). While detailed BMPs would be determined as part of the NPDES/SWPPP process based on Project-specific parameters, they are likely to include the standard industry measures and guidelines from the NPDES Construction General Permit and County Stormwater Ordinance/Stormwater Standards Manual, as well as the SWMP and additional sources identified in Section 3.1.3.1 under Regulatory Framework. A summary of anticipated construction-related hazardous material BMPs that would be applicable to the Proposed Project is provided in Table 3.1.3-5, *Potential Measures to Avoid or Minimize Impacts Related to the Use and Storage of Construction-related Hazardous Materials*. Based on the implementation of these and/or other appropriate hazardous material BMPs as part of (and in conformance with) the Project SWPPP and related requirements, **associated short-term (construction) hazardous materials impacts would be less than significant**. Construction-related hazardous materials controls implemented for the Project would be further defined during the NPDES/County SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures in Table 3.1.3-5.

Demolition-related Debris Generation. The Proposed Project would involve the demolition of existing on-site facilities including structures and pavement. These activities would generate

variable amounts of construction debris, potentially including concrete, asphalt, glass, metal, drywall, paint, insulation, fabric and wood. Demolition activities could also potentially generate particulates, as well as pollutants related to hazardous materials including lead-based paint and asbestos insulation. The introduction of demolition-related particulates or hazardous material pollutants into local drainages or storm drain systems could potentially result in significant downstream water quality impacts.

Project construction would be subject to a number of regulatory controls related to demolition, including NPDES/SWPPP requirements and hazardous materials controls described in Subchapter 2.9, *Hazards and Hazardous Materials*. The Project SWPPP would include measures to address potential effects associated with pollutant generation from demolition activities, with detailed requirements to be determined as part of the SWPPP process. A number of standard BMPs that would likely be applicable to Project demolition efforts are provided in Table 3.1.3-6, *Potential Measures to Avoid or Minimize Impacts Related to the Generation of Debris during Demolition Activities*. Demolition-related activities involving hazardous materials, if required, would conform to the associated regulatory requirements described in Subchapter 2.9 of this EIR. Such conformance would include applicable measures to regulate sampling and monitoring procedures; contain/abate contaminated materials during construction; provide protective gear for workers handling contaminated materials; ensure acceptable exposure levels; and provide for safe and appropriate handling, transport and disposal of hazardous materials generated during Project construction.

Based on implementation of appropriate BMPs as part of (and in conformance with) an NPDES/County SWPPP, as well as conformance with applicable hazardous material regulations, **potential water quality impacts from Project-related generation of demolition debris would be less than significant**. Project controls for demolition-related debris generation would be further defined during the NPDES permitting and SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures listed in Table 3.1.3-6.

Disposal of Extracted Groundwater. Shallow groundwater may be encountered during Project-related excavation and 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 groundwater aquifers. Project construction would require conformance with applicable NPDES Groundwater Permit criteria prior to disposal of extracted groundwater (as outlined under Regulatory Framework in Section 3.1.3.1). While specific BMPs to address potential water quality concerns from disposal of extracted groundwater would be determined based on site-specific parameters, they would likely include standard measures from the Groundwater Permit, with typical requirements outlined below.

- Use erosion and sediment controls similar to those described in Table 3.1.3-4 for applicable areas/conditions (e.g., disposal of extracted groundwater on slopes or graded areas).

- Test extracted groundwater for appropriate contaminants prior to discharge.

- Treat extracted groundwater prior to discharge, if required, to provide conformance with applicable discharge criteria (e.g., through methods such as filtration, aeration, adsorption, disinfection, and/or conveyance to a municipal wastewater treatment plant).

Based on the required conformance with NPDES Groundwater Permit standards and the implementation of related BMPs, **water quality impacts from Project-related disposal of extracted groundwater would be less than significant**.

Long-term Operation and Maintenance Impacts. The Project SWMP (Appendix N) identifies pollutants of concern and appropriate control measures related to development of the Proposed Project, based on procedures identified in the County Stormwater Ordinance/Manual, SUSMP and LID Manual, as well as the related NPDES Municipal Permit. The Proposed Project is identified as a PDP due to the inclusion of proposed development categories such as residential properties, hillside development, parking areas, and roadways. Anticipated and potential pollutants associated with the Proposed Project include sediment, nutrients, heavy metals, organic compounds, trash and debris, oxygen demanding substances, oil and grease, bacteria and viruses, and pesticides (refer to Table 6 of the SWMP [Fuscoe 2015b] in Appendix N). Based on the condition and related 303(d) listings of the downstream receiving waters (refer to Section 3.1.3.1), the primary target pollutants for the Proposed Project are sediment, nutrients, heavy metals, oxygen demanding substances, bacteria and viruses, and pesticides. Secondary pollutants of concern for the Project include organic compounds, trash and debris, and oil and grease. 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 increase as a result of constructing impervious surfaces, with a corresponding increase in pollutant loading potential. Based on these conditions, long-term Project operation could result in the on- and off-site transport of urban pollutants and associated significant effects such as increased turbidity, oxygen depletion, and toxicity to attendant species in downstream receiving waters.

The Proposed Project would conform to applicable County and NPDES storm water standards, with such conformance to include the use of appropriate post-construction LID/site design, source control and LID/treatment control BMPs. Specific proposed BMPs are identified in the Project SWMP (Appendix N), with these measures summarized below and followed by a discussion of associated monitoring and maintenance activities.

LID/Site Design BMPs. LID/site design BMPs are intended to avoid, minimize and/or control post-development runoff, erosion potential and pollutants generation to the MEP by mimicking the natural hydrologic regime. The LID process employs design practices and techniques to effectively capture, filter, store, evaporate, detain and infiltrate runoff close to its source. Specific LID and site design BMPs identified in the Project SWMP are summarized below, with additional discussion provided in Appendix N. All of the proposed LID and 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 infiltration, and reducing erosion/sedimentation potential.

- Conserve Natural Areas, Soils and Vegetation. This measure would include efforts such as preserving well-draining (Type B) soils, significant trees, critical areas (e.g., steeper slopes), and areas near drainages wherever feasible to provide natural buffer zones.

- Minimize Disturbance to Natural Drainages. Specific efforts would include providing appropriate set-backs from drainages for development envelopes, and restricting construction equipment access in planned green/open space areas.

- Minimize and Disconnect Impervious Surfaces. This measure would involve providing curb cuts to direct flows into landscaping in recreation/park areas, minimizing street widths (e.g., by limiting parking and/or sidewalks to one side only), and using permeable surfacing in applicable areas (e.g., multi-purpose trails).

- Minimize Soil Compaction. Individual efforts to minimize soil compaction would include restricting construction equipment access in planned green/open space areas, and collecting/storing native soil layers for reuse in on-site landscaping efforts.

- Driveway, Sidewalk and Bike Path Design. This measure would involve eliminating sidewalks or providing sidewalks on one side only (to reduce pavement), and/or using permeable surfacing in applicable areas (e.g., multi-purpose trails, Hill Valley Road emergency access).

- Building Design. Specific measures would include use of downspouts to direct rooftop drainage into vegetated areas where feasible.

- Landscaping Design. Individual landscaping design efforts would include reusing native soils as previously noted, installing "smart" irrigation systems (e.g., appropriate water schedules and rain/pressure-sensitive shutoff devices), and installing appropriate landscaping, including street trees.

- Minimize Erosion From Slopes. Specific measures would include limiting disturbance and cut and fill areas on slopes to the minimum amount feasible, incorporating retaining walls to reduce manufactured slope dimensions, rounding/shaping slopes to reduce concentrated flows, and collecting concentrated flows in stabilized drains and channels.

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 identified in the Project SWMP are summarized below, with additional discussion provided in the Project SWMP (Appendix N). 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.

- Install "no dumping" stencils/tiles and/or signs with prohibitive language (per current County guidelines) at applicable locations such as drainages, storm drain inlets, catch basins and public access points to discourage illegal dumping.

- Design trash storage areas in applicable locations (i.e., the WTWRF and public areas such as parks) to reduce pollutant discharge through methods such as providing an adequate number of receptacles, paving with impervious surfaces, installing screens or walls to prevent trash dispersal, providing attached lids and/or roofs for trash containers to prevent direct precipitation contact, precluding disposal of liquid or hazardous materials (e.g., through signage), implementing daily inspection/clean up and as-needed facility repair, storing clean up materials on-site, providing pre-treatment (e.g., grease traps) prior to runoff discharge, and discharging to a sanitary sewer if applicable.

- Implement regular street sweeping (e.g., monthly, or as needed based on site-specific conditions) in areas such as plazas, sidewalks and parking lots, and preclude debris and washwater containing cleaning agents/degreasers from entering the storm drain system (e.g., through discharge to the sanitary sewer).

- Design site landscaping to maximize the retention of native vegetation and use of appropriate native, pest-resistant, and/or drought-tolerant varieties; use efficient irrigation systems as described above for Site Design and LID BMPs; and use appropriate plant varieties in areas such as storm water detention/retention facilities to ensure successful establishment and viability.

- Minimize applications of chemical pesticides, herbicides, fertilizers; use licensed professionals for application of such chemicals in common landscaped areas; restrict the rates and times of fertilizer applications to minimize potential discharge in irrigation or precipitation runoff; use building design features such as sand barriers under floor slabs to act as pest shields; and provide Integrated Pest Management information to on-site owners, lessees and operators.

- Restrict industrial processes and associated drainage to indoor areas at the Project site wastewater reclamation facility.

- Implement proper outdoor material/equipment storage at the Project site WTWRF, potentially including measures such as preventing run-on and runoff (e.g., through structural controls), use of secondary containment/covers, pre-treatment of runoff prior to discharge to the storm drain system (e.g., clarifiers), and compliance with hazardous materials requirements if applicable (e.g., limiting on-site storage quantities and use of proper storage/containment).

- Provide secondary containment for rooftop equipment with the potential to produce pollutants; and avoid the use of copper or other unprotected metals for roofing, gutters and trim.

LID and Treatment Control BMPs. Treatment control (or structural) BMPs are designed to remove pollutants from urban runoff for a design storm event to the MEP through means such as filtering, treatment, or infiltration. Treatment control and/or LID BMPs are required to address the identified priority pollutants of concern, and treatment control BMPs must provide medium or high levels of removal efficiency for these pollutants (per applicable regulatory requirements). Specific LID and treatment control BMPs identified in the Project SWMP include extended/dry detention basins with grass/vegetated linings and LID bioretention layers (water quality basins), trash rack catch basin inserts with hydrocarbon booms, and bioretention facilities. Water quality basins would be used to treat runoff from most of the site prior to discharge, with 16 individual basins proposed in the Project as previously described (refer to Figure 1-22). Water quality basins with a bioretention layer exhibit a high removal efficiency for coarse sediment/trash and pollutants that tend to associate with fine particles during treatment (sediment, nutrients, heavy metals, organic compounds, oxygen demanding substances, pathogens, oil and grease, and pesticides); and a medium removal efficiency for pollutants that tend to be dissolved during treatment (nutrients). The extended detention basins would be used in conjunction with the trash racks/booms as a "treatment train" to further improve the efficiency of removing dissolved pollutants. In addition, the Project would incorporate related efforts to reduce the potential for nutrient discharge in site runoff, including the use of native and/or drought-tolerant landscaping to reduce fertilizer application, restricting the rates and times of fertilizer use, and utilizing "smart" irrigation techniques to minimize irrigation runoff and associated nutrient discharge.

The proposed trash rack catch basin inserts would be used to remove coarser pollutants (trash and debris) from storm water flows, while the hydrocarbon booms would provide removal of materials such as petroleum compounds. These facilities would provide a high removal efficiency for coarse sediment/trash, and a low removal efficiency for pollutants that tend to associate with fine particles during treatment (as outlined above) and pollutants that tend to be dissolved during treatment (nutrients).

The proposed bioretention facilities would provide treatment in DMAs 2F, MWA-1, MWA-2 and off-site CC1 (refer to Figure 1-22), with such facilities providing a high removal efficiency for coarse sediment/trash and pollutants that tend to associate with fine particles during treatment (as outlined above); and a medium removal efficiency for pollutants that tend to be dissolved during treatment (nutrients).

The proposed LID/treatment control BMPs would help to improve long-term water quality within and downstream of the Project site by treating/removing pollutants from urban runoff prior to downstream discharge. Detailed discussion of proposed LID/treatment control BMP design, locations, sizing, and performance criteria is provided in the Project SWMP (Appendix N).

Post-construction BMP Monitoring/Maintenance Schedules and Responsibilities. Identified BMPs include physical facilities such as no dumping signs/tiles, water quality basins, trash racks/hydrocarbon booms, and bioretention facilities that require ongoing monitoring and maintenance. The proposed extended detention basins with bioretention layers, bioretention facilities and trash racks are Second Category BMPs. Second Category BMPs are "…moderately complex,…typical for…multi-residential land uses, and the County needs to

ensure ongoing maintenance." (County 2012). Accordingly, monitoring and maintenance efforts for all of the noted treatment BMPs would be implemented by the Project owner(s) (e.g., via the homeowner's association). Specifically, the owner(s) must enter into a written BMP Maintenance Agreement with the County, which includes requirements that the facilities be limited to the proposed use, an access easement is granted to the County, and adequate funding is provided through means such as a cash deposit, letter of credit, or other means acceptable to the County. Specific monitoring and maintenance efforts associated with proposed BMP facilities and programs include monitoring and reporting to document that programs/activities are being implemented as designed, inspection and maintenance of physical facilities, and making necessary modifications/repairs to ensure that intended BMP functions and regulatory efforts are being met. A detailed discussion of individual monitoring and maintenance requirements for the Proposed Project treatment BMPs is provided in Attachment F of the Project SWMP (Fuscoe 2015b in Appendix N).

Based on implementation of proposed LID/site design, source control, and LID/treatment control BMPs in conformance with County storm water standards and the related NPDES Municipal Storm Water Permit (along with related monitoring/maintenance efforts), **long-term Project-related water quality impacts would be less than significant**.

Drainage to 303(d) List Impaired Waters or Tributaries

As described in Section 3.1.3.1, the Project site is tributary to 303(d) listed waters including Escondido Creek and San Elijo Lagoon. Based on Guideline No. 9 under Water Quality and the identified list of anticipated and potential pollutants from the Proposed Project, associated potential impacts to 303(d) listed waters would be related to pollutants including sediment (for sedimentation/siltation impairment), nutrients (e.g., for TDS and nitrogen impairment), heavy metals (e.g., for manganese and selenium impairment), oxygen-demanding substances (e.g., for eutrophic conditions), bacteria and viruses (e.g., for bacterial indicator impairment), and pesticides (e.g., for DDT impairment). Pursuant to the discussion of short- and long-term water quality issues provided above under the analysis of regulatory conformance, the Proposed Project would incorporate treatment BMPs that provide medium or high avoidance/removal efficiencies for all applicable pollutants, as well as additional measures to minimize the use and/or potential discharge of pollutants including nutrients (e.g., site design/LID and source control BMPs). Specifically, these additional measures would involve efforts such as using native and drought-tolerant landscaping to reduce irrigation needs and fertilizer (nutrient)/ chemical pesticide use, restricting the rates and times of fertilizer applications, and employing "smart" irrigation to minimize potential runoff and related nutrient/pesticide discharge. Based on the use of these and other appropriate measures in conformance with applicable County and NPDES regulatory requirements, **potential Project-related impacts associated with drainage to 303(d) listed waters or tributaries would be less than significant**.

Protection of Water Quality Objectives and Beneficial Uses

A summary of applicable San Diego Basin Plan water quality objectives and related beneficial uses is provided in Section 3.1.3.1, under the discussion of Regulatory Framework (refer also to Table 3.1.3-3). Pursuant to the discussion of short- and long-term water quality issues

provided above under the analysis of regulatory conformance, the Proposed Project would incorporate a number of BMPs and related efforts to ensure conformance with the CWA, NPDES, California Porter-Cologne Water Quality Control Act, San Diego Basin Plan, and pertinent County of San Diego water quality requirements. Based on this conformance, the Proposed Project would not generate pollutants that exceed surface water quality objectives or cause or contribute to the degradation of associated beneficial uses, and related potential impacts would be **less than significant**.

3.1.3.3 *Cumulative Impact Analysis*

As described in the preceding analysis, implementation of the Proposed Project would require conformance with a number of regulatory requirements related to hydrology and water quality, including applicable elements of the CWA, NPDES, County storm water standards, California Porter-Cologne Water Quality Control Act, and RWQCB Basin Plan. Based on such conformance (including the design measures described in Chapter 7.0 of this EIR), all identified Project-level hydrology and water quality impacts from the Proposed Project would be avoided or reduced below a level of significance.

The described regulatory requirements constitute a regional effort to implement hydrology and water quality protections through a watershed-based program designed to meet applicable criteria such as Basin Plan Beneficial Uses and Water Quality Objectives. To this end, these standards require the implementation of efforts to reduce runoff and contaminant discharges to the MEP, with the NPDES Municipal Permit identifying the goal of "…promoting attainment of water quality objectives necessary to support designated beneficial uses." The County has implemented all of these requirements in the form of the SUSMP, Stormwater Ordinance/ Manual and URMPs, as well as applicable education, planning, and enforcement procedures. Based on the described regional/watershed based approach required for hydrology and water quality issues in existing regulatory standards, as well as the fact that conformance with these requirements would be required for all identified projects within the cumulative projects area (including the Proposed Project), **cumulative hydrology/water quality impacts would be less than significant**.

3.1.3.4 *Significance of Impacts*

Identified potential hydrology/water quality impacts associated with the Proposed Project would be less than significant prior to mitigation, based on the implementation of identified proposed design measures and conformance with applicable regulatory requirements. Accordingly, no mitigation measures are required or proposed.

Table 3.1.3-1
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 right-of-ways, 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 1999a

Table 3.1.3-2
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
Grains/Hay	400	0.8	N/A	N/A	N/A	20	150	N/A	N/A	N/A
Citrus/Vegetables	400	1.5	N/A	N/A	N/A	30	200	N/A	N/A	N/A

Sources: USEPA 1999a; RWQCB 1988
HDR = High Density Residential; MDR = Medium Density Residential; LDR = Low Density Residential
N/A = Not available; insufficient data to characterize
Abbreviations: 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

Table 3.1.3-3
SURFACE AND GROUNDWATER QUALITY OBJECTIVES FOR THE ESCONDIDO CREEK HYDROLOGIC AREA AND THE ESCONDIDO HYDROLOGIC SUBAREA[1]

SURFACE WATER												
Escondido Creek Hydrologic Area												
Constituent (mg/l or as noted)												
TDS	**Cl**	**SO_4**	**% Na**	**N&P**	**Fe**	**Mn**	**MBAS**	**B**	**Odor**	**Turb NTU**	**Color Units**	**F**
500	250	250	60	--[2]	0.3	0.05	0.5	0.75	None	20	20	1.0
GROUNDWATER												
Escondido Hydrologic Subarea												
Constituent (mg/l or as noted)												
TDS	**Cl**	**SO_4**	**% Na**	**NO_3**	**Fe**	**Mn**	**MBAS**	**B**	**Odor**	**Turb NTU**	**Color Units**	**F**
1,000	300	400	60	10	0.3	0.05	0.5	0.75	None	5	15	1.0

Source: RWQCB 1994, as amended
[1] Concentrations not to be exceeded more than 10% of the time during any one-year period; refer to Figure 3.1.3-1 for local hydrologic designation locations.
[2] Shall be maintained at levels below those that stimulate algae and emergent plant growth.
Abbreviations: TDS = Total Dissolved Solids; Cl = Chlorides; SO_4 = Sulfate; Na = Sodium; N&P = Nitrogen and Phosphorus; NO_3 = Nitrate; Fe = Iron; Mn = Manganese; MBAS = Methylene Blue Activated Substances (e.g., commercial detergent); B = Boron; Turb = Turbidity (measured in Nephelometric Turbidity Units [NTU]); F = Fluoride.

Table 3.1.3-4
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO EROSION AND SEDIMENTATION

- Comply with seasonal grading restrictions during the rainy season (October 1 to April 30) for applicable locations/conditions.
- Prepare and implement a CSMP to ensure appropriate monitoring, testing, BMP effectiveness, and conformance with applicable discharge requirements.
- Prepare and implement a REAP, if applicable (i.e., depending on risk level), to ensure that active construction areas/activities have adequate erosion and sediment controls in place within 48 hours of the onset of any likely precipitation event (i.e., 50 percent or greater probability of producing precipitation, per National Oceanic and Atmospheric Administration projections).
- Preserve existing vegetation wherever feasible, and use phased grading schedules to limit the area subject to erosion at any given time.
- Properly manage storm water and non-storm water flows to minimize runoff.
- Use erosion control/stabilizing measures such as geotextiles, mulching, mats, plastic sheets/tarps, fiber rolls, soil binders, compost blankets, soil roughening, and/or temporary hydroseeding (or other plantings) established prior to October 1 in appropriate areas (e.g., disturbed areas and graded slopes).
- Use sediment controls to protect the construction site perimeter and prevent off-site sediment transport, including measures such as temporary inlet filters, silt fence, fiber rolls, silt dikes, biofilter bags, gravel bag berms, compost bags/berms, temporary sediment basins, check dams, street sweeping/vacuuming, ATS (if applicable based on risk assessment), energy dissipators, stabilized construction access points/sediment stockpiles, and properly fitted covers for sediment transport vehicles.
- Store BMP materials in applicable on-site areas to provide "standby" capacity adequate to provide complete protection of exposed areas and prevent off-site sediment transport.

Table 3.1.3-4 (cont.)
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO EROSION AND SEDIMENTATION

- Provide full erosion control for disturbed areas not scheduled for additional activity for 14 or more consecutive calendar days.
- Provide appropriate training for the personnel responsible for BMP installation and maintenance.
- Use solid waste management efforts such as proper containment and disposal of construction debris.
- Comply with local dust control requirements, potentially including measures such as regular watering, use of chemical palliatives, limiting construction vehicle/equipment speeds, and restricting/precluding construction operations during periods of high wind speeds.
- Install permanent landscaping, with emphasis on native and/or drought-tolerant varieties, as soon as feasible during or after construction.
- Implement appropriate monitoring and maintenance efforts (e.g., prior to and after storm events) to ensure proper BMP function and efficiency.
- Implement sampling/analysis, monitoring/reporting and post-construction management programs per NPDES and/or County requirements.
- Implement additional BMPs as necessary to ensure adequate erosion and sediment control (e.g., enhanced treatment and more detailed monitoring/reporting).

Table 3.1.3-5
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE USE AND STORAGE OF CONSTRUCTION-RELATED HAZARDOUS MATERIALS

- Minimize the amount of hazardous materials used and stored on site, and restrict storage/use locations to areas at least 50 feet from storm drains and surface waters.
- Use raised (e.g., on pallets), covered, and/or enclosed storage facilities for all hazardous materials.
- Maintain accurate and up-to-date written inventories and labels for all stored hazardous materials.
- Use berms, ditches, and/or impervious liners (or other applicable methods) in material storage and vehicle/equipment maintenance and fueling areas to provide a containment volume of 1.5 times the volume of stored/used materials and prevent discharge in the event of a spill.
- Place warning signs in areas of hazardous material use or storage and along drainages and storm drains (or other appropriate locations) to avoid inadvertent hazardous material disposal.
- Properly maintain all construction equipment and vehicles.
- Restrict paving operations during wet weather, use appropriate sediment control devices/methods downstream of paving activities, and properly contain and dispose of wastes and/or slurry from sources including concrete, dry wall and paint, by using properly designed and contained washout areas.
- Provide training for applicable employees in the proper use, handling and disposal of hazardous materials, as well as appropriate action to take in the event of a spill.
- Store absorbent and clean-up materials in readily accessible on-site locations.
- Properly locate, maintain and contain portable wastewater facilities.
- Regularly (at least weekly) monitor and maintain hazardous material use/storage facilities and operations to ensure proper working order.
- Implement solid waste management efforts such as proper containment and disposal of construction debris, and restrict construction debris storage areas to appropriate locations at least 50 feet from storm drain inlets and water courses.

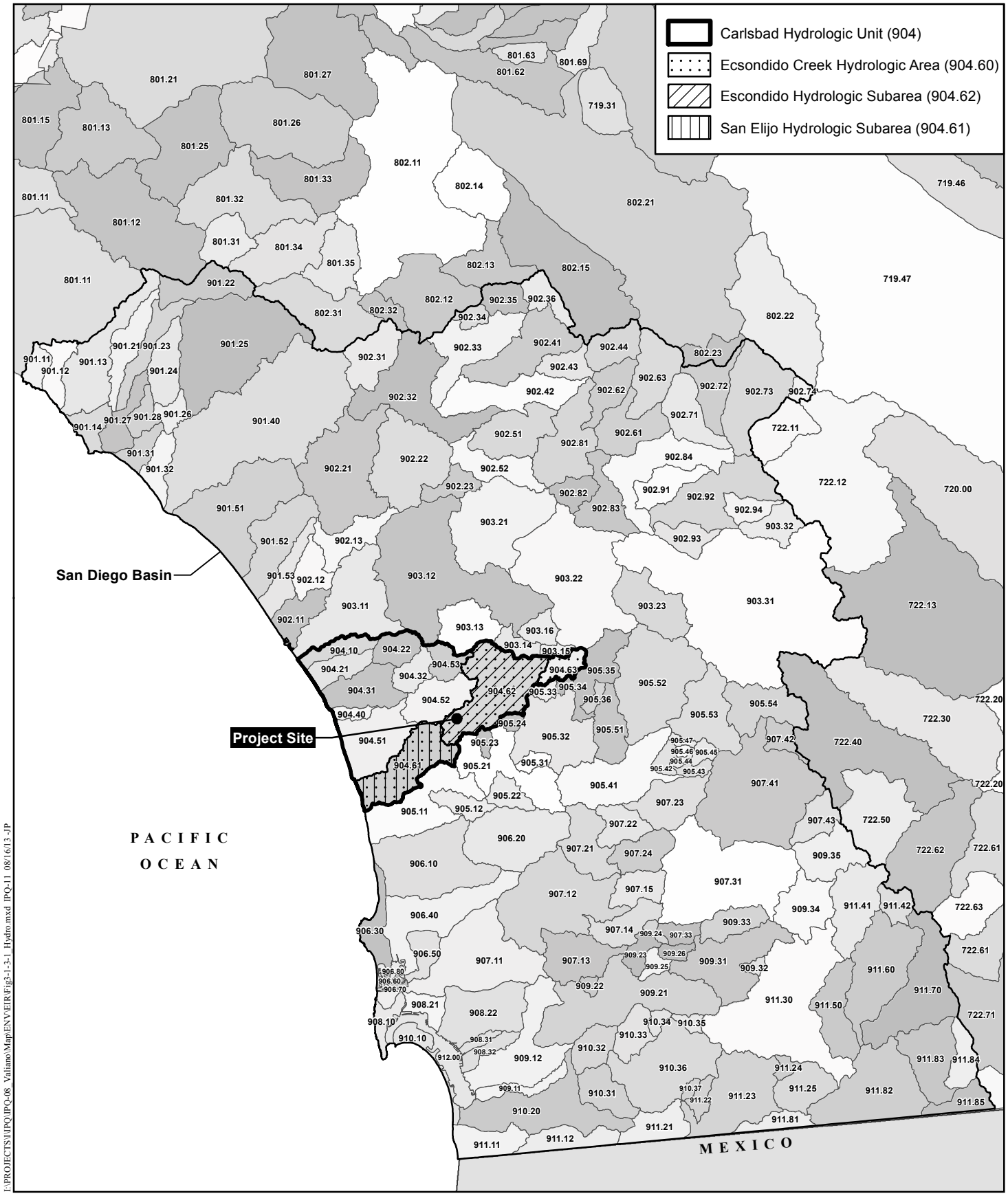
Table 3.1.3-5 (cont.)
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE USE AND STORAGE OF CONSTRUCTION-RELATED HAZARDOUS MATERIALS

- Employ a licensed waste disposal operator to regularly (at least weekly) remove and dispose of construction debris at an authorized off-site location.
- Use recycled or less hazardous materials wherever feasible.
- Post regulatory agency telephone numbers and a summary guide of clean-up procedures in a conspicuous on-site location.
- Regularly (at least weekly) monitor and maintain hazardous material use/storage facilities and operations to ensure proper working order.
- Implement additional BMPs as necessary (and in conformance with applicable requirements) to ensure adequate hazardous material control.

Table 3.1.3-6
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE GENERATION OF DEBRIS DURING DEMOLITION ACTIVITIES

- Recycle appropriate (i.e., non-hazardous) construction debris for on- or off-site use whenever feasible.
- Use dust-control measures such as watering to reduce particulate generation for pertinent locations/activities (e.g., concrete removal).
- Use appropriate erosion prevention and sediment control measures downstream of all demolition activities.
- Conform with applicable requirements related to the removal, handling, transport and disposal of hazardous materials generated during demolition, including efforts such as implementing appropriate sampling and monitoring procedures; proper containment of contaminated materials during construction; providing protective gear for workers handling contaminated materials; ensuring acceptable exposure levels; and ensuring safe and appropriate handling, transport and disposal of hazardous materials generated during Project construction.

THIS PAGE INTENTIONALLY LEFT BLANK



Project Location within Local Hydrologic Designations

VALIANO

HELIX Environmental Planning

N 0 12 Miles

Figure 3.1.3-1

I:\PROJECTS\1\IPQ\IPQ-08_Valiano\Map\ENVEIR\Fig3-1.3-1_Hydro.mxd IPQ-11 08/16/13 JP