3.1.4 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.

Five technical studies related to hydrology and water quality have been prepared for the Proposed Project by Project Design Consultants (PDC) and Chang Consultants (Chang), including: (1) CEQA Preliminary Hydrology/Drainage Study (Drainage Study, PDC 2017a); (2) Hydromodification Screening Analysis (Chang 2016a); (3) Preliminary Hydromodification Management Study (HMS, PDC 2017b); (4) Hydraulic (Floodplain) Analyses for Harmony Grove Village South (Floodplain Analyses, Chang 2016b); and (5) Priority Development Project Storm Water Quality Management Plan (SWQMP, PDC 2017c). These studies are summarized below along with other applicable data, with the complete reports included in Appendices M (Drainage Study, Hydromodification Screening Analysis, HMS, and Floodplain Analyses) and N (SWQMP) of this EIR.

3.1.4.1 *Existing Conditions*

Watershed and Drainage Characteristics

The Project site and related off-site roadway/utility 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 3.1.4-1, *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 and vicinity 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 Creek in the Project vicinity. The Project site and related off-site roadway/utility improvement areas drain generally north and/or west before ultimately discharging to Escondido Creek, which continues west and south and enters the Pacific Ocean via San Elijo Lagoon near the City of Solana Beach approximately 10.5 miles to the southwest (with related on- and off-site drainage patterns outlined below). Average annual precipitation in the Project site vicinity (City of Escondido, 92025) is approximately 15.1 inches, with much of this (approximately 86 percent) occurring during the period of November through March (Melissadata.com 2015).

The Project site is predominantly undeveloped, with existing on-site uses including extensive disturbed and undisturbed open space, minor equestrian facilities (associated with an adjacent off-site property), structural remnants from former site uses, an electrical distribution line, and a number of paved and unpaved roads and trails (refer to Figure 1-4, *Project Site Aerial Photograph*). No known drainage facilities are located within the Project site, with off-site drainage structures including an at-grade crossing of Escondido Creek at Country Club Drive

just north of the site, as well as downstream bridge crossings of the creek at major roadways including Rancho Santa Fe Road and I-5.

Surface drainage within the Project site and related watershed areas flows generally north and west, and occurs as both confined (point) and unconfined (sheet or non-point) flow. As previously noted, the Project site is tributary to Escondido Creek, which is located approximately 200 feet to the north at its closest point. Existing site drainage is divided generally into four watershed areas (or systems) in the Project Drainage Study, designated as Systems 100 through 400. These four existing Project drainage systems are summarized below, and are depicted on the Existing Conditions Drainage Maps included as Exhibit B of the Project Drainage Study (PDC 2017a in EIR Appendix M-1). The corresponding proposed Drainage Systems are shown on the Proposed Conditions Drainage Maps in Exhibit C of the Drainage Study, and are discussed as applicable below in Subsection 3.1.4.2, *Analysis of Project Effects and Determination as to Significance*.

Existing Drainage System 100

Drainage System 100 includes approximately 18.6 acres, and encompasses the northeastern corner of the site and adjacent off-site areas to the north and east. Flows in this system drain generally north through a natural drainage channel extending through the site, and discharge to Escondido Creek. Existing peak 100-year storm flow[1] from System 100 is approximately 28.0 cubic feet per second (cfs).

Existing Drainage System 200

System 200 incorporates approximately 81.9 acres in the northern and central portions of the site (including most proposed development areas), as well as adjacent off-site areas to the east and south. This area is drained via a previously disturbed creek that begins off site to the east, extends generally northwest through the main central valley of the site, and then flows north along the east side of Country Club Drive before discharging into Escondido Creek. Existing peak 100-year storm flow from System 200 is approximately 116.4 cfs.

Existing Drainage System 300

System 300 encompasses approximately 15.7 acres in the southwestern portion of the site. Drainage in this watershed flows through a natural creek that extends generally west to a defined drainage course along the western site boundary, which continues generally north through existing residential properties located west of Cordrey Drive and ultimately flows into Escondido Creek west of the Project site. Existing peak 100-year storm flow from System 300 is approximately 26.3 cfs.

Existing Drainage System 400

This drainage system includes approximately 76.1 acres in the southern-most portion of the site, as well as adjacent off-site areas to the east and south. Flows in System 400 drain generally north through two natural creeks that begin off site to the south and east. These drainages extend

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

generally parallel through the southern portion of the site, merge near the western site boundary, and continue north to Escondido Creek through the same off-site drainage described above for System 300. Existing peak 100-year storm flow from System 400 is approximately 131.6 cfs.

Flood Hazards

The Federal Emergency Management Agency (FEMA) has mapped flood hazards on the Project site and vicinity. The majority of the Project site and associated off-site roadway/utility improvements along Country Club Drive are designated as Zone X, or areas determined to be outside the 500-year (and 100-year) floodplain (FEMA 2012a and 2012b, refer to Exhibit A of the Project Drainage Study in EIR Appendix M-1). The northern-most portion of the site, as well as adjacent portions of the proposed off-site roadway/utility improvements along Country Club Drive and the related crossing of Escondido Creek, are within one of the following mapped FEMA floodplain categories: (1) Zone AE, which includes 100-year floodplain areas where base flood elevations have been determined; (2) portions of the Escondido Creek floodway[2] that are within the AE Zone; and (3) "other flood areas" also designated as Zone X and defined by FEMA to include areas within the 500-year floodplain, areas within the 100-year floodplain with average depths of less than 1 foot or a drainage area of less than 1 square mile, and areas protected from the 100-year flood by levees.

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). Shallow groundwater/seepage was encountered in alluvial deposits during 2005 subsurface geotechnical exploration in the northern and northeastern portions of the site, at depths ranging from 4 to 16 feet below surface grade (bsg). Specifically, moderate groundwater seepage was observed at a depth of 16 feet bsg (approximately the same elevation as nearby portions of Escondido Creek) in the northernmost site area (Trench T-4, refer to Figure 3.1.2-1, *Geology Map*). Minor seepage was also observed in the northwestern (Trench T-10) and north-central (Trench T-16) portions of the site, with the 2015 Update Geotechnical Report concluding that groundwater seepage in Trench Nos. T-10 and T-16 "…was likely associated with heavy rains that had occurred prior to…field work…Groundwater levels in drainage areas can be expected to fluctuate seasonally..." Groundwater seepage was not observed in other portions of the site during geotechnical investigation, and no shallow permanent groundwater was observed (or anticipated to occur) within or adjacent to the site (Geocon 2015a, 2005).

Water Quality

On-site and Vicinity Water Quality

Surface water within the Project site consists predominantly of intermittent flows from storm events, with local groundwater occurrences described above. No known surface water quality data are available for the Project site and adjacent areas, with surface storm and irrigation flows

[2] Generally defined as the channel of a river or stream and the adjacent portions of the floodplain that are reasonably required to efficiently carry and discharge the associated 100-year flood flow.

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 3.1.4-1, *Summary of Typical Pollutant Sources for Urban Storm Water Runoff*, and Table 3.1.4-2, *Typical Loadings for Selected Pollutants in Runoff from Various Land Uses*. No known groundwater quality data are available for the Project site and vicinity. Regional data indicate that groundwater in the Escondido Valley Basin is generally sodium-chloride in character, with observed TDS levels of between 250 and 5,000 milligrams per liter (mg/l; Geocon 2009, DWR 2003).

Off-site Water Quality

Receiving waters associated with the Project site include several local unnamed drainages, Escondido Creek approximately 200 feet to the north, and the Pacific Ocean/San Elijo Lagoon approximately 10.5 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 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 Regulatory Setting below for additional information).

Wet weather monitoring has been conducted seasonally since 2001 at the Escondido Creek Mass Loading Station (MLS), located approximately 6.3 miles southwest of the Project site at the Escondido Creek/El Camino Del Norte bridge (with no monitoring conducted during the period of 2011/2012 through 2014/2015). This monitoring includes numerous physical, chemical and biological parameters, with resulting data for the most current monitoring effort (2010/2011) indicating the following trends: (1) applicable water quality objectives were exceeded at a high frequency (more than 50 percent) for TDS, fecal coliform bacteria, and bioassessment scores (as outlined below); and (2) water quality objectives were exceeded at a low frequency (25 percent or less) 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. The IBI score for bioassessment testing at the Escondido MLS in 2010/2011 is listed as very poor (Weston 2012).

Dry weather sampling has also been conducted since 2002/2003 at several sites located downstream of the Project impact footprint. This program is focused on collecting dry season samples from storm drain facilities, rather than streams or receiving waters, to identify urban pollutants and sources. Data from the most recent (2011) dry weather sampling events documented that water quality objectives were most commonly exceeded for nitrate, turbidity

and conductivity; and less commonly for pollutants including pH, fecal/total coliform bacteria and orthophosphate (Weston 2013, 2012).

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 crossing (approximately 200 feet north 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, 2012, 2009).

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 projected TMDL implementation schedules/status. The most current (2010) approved 303(d) list identifies the following impaired waters in downstream watersheds (SWRCB 2016a):

- 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.

- The Pacific Ocean shoreline at San Elijo Lagoon (no area specified) is listed for total coliform bacteria, with the associated TMDL completion date listed as 2008.

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 natural open space and 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 most current (2010/2011) Urban Runoff Monitoring Report associated with NPDES requirements that includes the Escondido Creek MLS documents the following long-term trends: (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 data described above, regional water quality in the Escondido Valley Groundwater Basin 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.

Federal/State

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 Nos. 2010-0014-DWQ and 2012-0006-DWQ); (2) General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters Permit (Groundwater Permit; NPDES No. CAG919003, RWQCB Order No. R9-2015-0013); (3) Waste Discharge Requirements for Municipal Separate Storm Sewer Systems (MS4) Permit (Municipal Permit, NPDES No. CAS 0109266, RWQCB Order No. R9-2013-0001; as amended by Order Nos. R9-2015-0001 and R9-2015-0100); 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 1 acre, with this permit issued by the SWRCB under an agreement with the USEPA. Specific conformance requirements include implementing a Storm Water Pollution Prevention Plan (SWPPP), an associated Construction Site Monitoring Program (CSMP), employee training, and minimum BMPs, as well as a Rain Event Action Plan (REAP) for applicable projects (e.g., those in Risk Categories 2 or 3, 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 2013c), 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 Discharges to Surface Waters Permit

If Project-related construction activities entail the discharge of extracted groundwater into receiving waters, the Applicant would be required to obtain coverage under the Groundwater Permit. Conformance with this permit is generally applicable to all temporary and certain permanent groundwater discharge activities, with exceptions as noted in the permit. Specific requirements for permit conformance include: (1) submittal of appropriate application materials and fees; (2) implementation of pertinent (depending on site-specific conditions) monitoring/ testing, disposal alternative, and treatment programs; (3) provision of applicable notification to the associated local agency prior to discharging to a municipal storm drain system; (4) conformance with appropriate effluent standards (as outlined in the permit); and (5) submittal of applicable documentation (e.g., monitoring reports).

Municipal Storm Water Permit

The current Municipal Permit (R9-2013-0001) became effective for listed co-permittees, including the County, on June 27, 2013. The Municipal Permit implements a regional strategy for water quality and related concerns, and mandates a watershed-based approach that often encompasses multiple jurisdictions. The overall permit goals include: (1) providing a consistent set of requirements for all MS4 co-permittees; and (2) allowing the co-permittees to focus their efforts and resources on achieving identified goals and improving water quality, rather than just completing individual actions (which may not adequately reflect identified goals). Under this approach, the co-permittees are tasked with prioritizing their individual water quality concerns, as well as providing implementation strategies and schedules to address those priorities. Municipal Permit conformance entails considerations such as receiving water limitations (e.g., Basin Plan criteria as outlined below), waste load allocations (WLAs), and numeric water quality based effluent limitations (WQBELs). Specific efforts to provide permit conformance and reduce runoff and pollutant discharges to the maximum extent practicable (MEP) involve methods such as: (1) using jurisdictional planning efforts (e.g., discretionary general plan approvals) to provide water quality protection; (2) requiring coordination between individual jurisdictions to provide watershed-based water quality protection; (3) implementing appropriate BMPs, including low impact development (LID) measures, to avoid, minimize and/or mitigate

effects including increased erosion and sedimentation, hydromodification[3] and the discharge of pollutants in urban runoff; and (4) using appropriate monitoring/assessment, reporting, and enforcement efforts to ensure proper implementation, documentation, and (as appropriate) modification of permit requirements.

Pursuant to the described Municipal Permit requirements, the County has adopted a number of associated implementation standards, including (most recently) the BMP Design Manual (BMP DM) which became effective on February 26, 2016 (County 2016). The BMP DM, along with other related storm water standards and ordinances, are intended to address storm water quality issues. The BMP DM provides guidance for conformance with County storm water standards, including preparation of Storm Water Quality Management Plans (SWQMPs, as discussed below under analysis of Water Quality), along with the selection, design and maintenance of associated BMPs (with additional discussion provided below under local requirements).

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 aired2); 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 Escondido Creek HA and the Escondido HSA are summarized in Table 3.1.4-3, *Surface and Groundwater Quality Objectives for the Escondido Creek Hydrologic Area and the Escondido Hydrologic Subarea*.

Local

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. 10410); (2) the associated BMP Design Manual (County 2016, as previously described) and LID[4] Handbook (County 2007j); (3) the County Jurisdictional Urban Runoff Management Program (JURMP, County 2015b); and

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

[4] 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.

(4) the County Grading Ordinance (No. 10224). 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 pollutant control BMPs to provide regulatory conformance for applicable projects. The County Storm Water Ordinance/BMP DM 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 2003) 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 Hydraulic Design Manual (County 2014b).

The County Guidelines for Determining Significance – Hydrology (County 2007g), 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 2007h), 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 2007e), 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 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.

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

Drainage Alteration

Guideline 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 (County 2007g).

Analysis

As described above in Section 3.1.4.1, surface flows within applicable portions of the Project site and associated off-site watersheds drain generally north and west. These flows move through the site, exit at four primary outlet points, and continue generally north and/or west 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 10.5 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, with these facilities included as part of the Proposed Project design and depicted on Figure 1-13, *Conceptual Drainage Plan* (refer also to the related discussion under *Drainage* in Section 1.2.2.2).

In addition, an analysis of hydraulic conditions associated with the Proposed Project, including the proposed bridge crossing of Escondido Creek (Chang 2016b), as well as an HMS (PDC 2017b), were conducted to assess downstream conditions in the creek. The Hydraulic (Floodplain) Analyses involved preparing a Hydrologic Engineering Center-River Analysis System (HEC-RAS) model to assess potential changes to 100-year water surface and floodway elevations from implementation of the Proposed Project. This analysis incorporated the results of an approved Conditional Letter of Map Revision (CLOMR) for an upstream project along Escondido Creek (HGV), which includes a bridge crossing and adjacent development, as the existing baseline condition. The associated baseline data, along with grading and construction for the Proposed Project, were used in the Project HEC-RAS model to determine water surface and floodway elevations. The Hydraulic Analyses concludes that the Proposed Project would "…not result in any increase in flood levels or the volume or velocity of flood flows during the…base flood discharge within Escondido Creek in compliance with County of San Diego Ordinance Section 811.506." based on the flowing summary conditions (with additional information provided in Appendix M-4):

- The 100-year water surface elevations evaluated in the Project Hydraulic Analyses are identical to the baseline conditions, except at the two cross-sections bounding the proposed bridge, with associated water surface elevations to be equaled or slightly reduced at these locations (i.e., by approximately 0.00 foot at the downstream cross-section and 0.48 foot at the upstream cross-section). As a result, the analysis concludes that "…the bridge and grading will not raise the 100-year water surface elevations. Therefore, the County's no-rise policy is met."

- While the proposed bridge would encroach within the CLOMR floodway, the associated floodway surcharges at the up- and downstream bridge cross-sections were calculated at 0.10- and 0.19-foot, respectively. Accordingly, the revised floodway would be within the allowable base flood elevation increase of 1.0 foot, per County guidelines.

A Hydromodification Screening Analysis (Chang 2016a) and a related Preliminary HMS (PDC 2017b) were also completed for the Proposed Project, to assess potential downstream hydromodification effects per applicable County requirements. The results of these analyses conclude that proposed flow regulation in applicable locations would avoid any adverse downstream hydromodification effects, with additional information provided below under the analysis of Guideline No. 3 (Hydromodification).

Based on the information outlined above, the described modifications from Project implementation would not substantially alter the overall described on- and off-site drainage patterns and flow conditions. That is, flows within the site would continue to drain primarily to the north and west, the Proposed Project design would encompass a number of appropriately designed and located drainage facilities as noted above to retain the overall existing drainage features (including the use of similar outlet points for flows discharged from the site), and downstream flow conditions would not change substantially from the existing baseline conditions. Specifically, the Project Drainage Study (PDC 2017a) provides the following related conclusions:

- "The ultimate discharge points…, in relation to the project boundary, are effectively the same as the existing condition: north to Escondido Creek and west to the defined drainage along the western project boundary…"

- "The project's drainage patterns mimic the existing conditions…The project does not propose to substantially alter the adjacent Escondido Creek."

- "Development of the project will not result in substantial erosion or siltation on or off-site."

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 north and/or west to Escondido Creek and ultimately entering San Elijo Lagoon and the Pacific Ocean. Accordingly, with the inclusion of the proposed storm drain facilities in the Project design per the referenced Drainage Study (refer to Exhibits B and C, of the Project Drainage Study included in EIR Appendix M-1), **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

Guideline 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 (County 2007g).

Analysis

Implementation of the Proposed Project would result in the construction of approximately 38 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 and two detention/hydromodification facilities (north and south vaults), all of which would be tied to an underground storm drain system of pipelines and related structures (refer to Figure 1-13). The proposed north and south vaults are intended to provide flow regulation for post-development drainage control and hydromodification compliance, as well as water quality treatment (as outlined below in this section). The proposed storm drain facilities would accommodate peak 100-year storm flows pursuant to County guidelines. The Project Drainage Study (PDC 2017a in Appendix M-1) 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 systems, along with the previously described existing flows (refer to Exhibits B and C of the Project Drainage Study for depictions or pre- and of post-development drainage basin boundaries).

Proposed Drainage System 100

Proposed Drainage System 100 includes 17.4 acres compared to 18.6 acres for the existing system, with similar boundaries. The calculated peak 100-year flow from proposed System 100 is 27.4 cfs, a decrease of 0.6 cfs over the existing flow of 28.0 cfs. Specifically, the noted flow reduction is associated with off-site flows from undeveloped areas to the east, which would be routed around the Project development and discharged to Escondido Creek (i.e., similar to the existing off-site flow in this area). This system would incorporate primarily undeveloped areas,

with associated flows to discharge into an on-site segment of the drainage course that conveys flows in existing System 100 and continues north to Escondido Creek (except for off-site flows from the east as described). The related Project outlets would be equipped with energy dissipation facilities (e.g., riprap aprons) as applicable to reduce flow velocities and address potential erosion hazards. Because this system exhibits a minor net reduction of flows relative to the existing System 100, no flow regulation is required.

Proposed Drainage System 200

Proposed Drainage System 200 includes 81.2 acres compared to 81.9 acres for the existing system (with similar boundaries), and encompasses the majority of the proposed development (including single- and multi-family residential areas, community facilities and the potential on-site WTWRF site). The calculated peak 100-year flow in proposed System 200 is 215.6 cfs, an increase of approximately 99.2 cfs over the existing flow of 116.4 cfs. Flows within this system would be collected in the proposed storm drain facilities and conveyed to the north vault, which would provide detention and reduce the associated (detained) 100-year flow from System 200 to approximately 101.3 cfs. Flows from the north vault would discharge directly to Escondido Creek, with the proposed design including an energy dissipation facility at the north vault outlet to ensure that discharged flows would exhibit non-erosive velocities (PDC 2017a).

Proposed Drainage System 300

Proposed Drainage System 300 includes 14.1 acres and exhibits similar boundaries as existing System 300 (which includes 15.7 acres). This system incorporates the southern portion of the proposed development area, including single- and multi-family residential uses. Calculated peak 100-year flows in proposed System 300 are 58.2 cfs, an increase of 31.9 cfs over the existing flow of 26.3 cfs. Flows within System 300 would be collected in the proposed storm drain facilities and conveyed to the south vault, which would provide detention and reduce the associated (detained) 100-year flow from System 300 to approximately 25.1 cfs. Flows from the south vault would be discharged from the site further south at the existing outlet point along the western site boundary (refer to Figure 1-13). These flows would continue north and west within an existing defined channel to Escondido Creek, as previously described for existing drainage conditions. An energy dissipation facility also would be provided at the south vault outlet to ensure that discharged flows would exhibit non-erosive velocities (PDC 2017a).

Proposed Drainage System 400

Proposed Drainage System 400 includes 76.8 acres compared to 76.1 acres for the existing system, with similar boundaries. The calculated peak 100-year flow in System 400 is 132.6 cfs, an increase of one cfs over the existing flow of 131.6 cfs. This system would incorporate primarily undeveloped areas (including off-site flows from the south), with associated flows to continue to the existing outlet point along the western site boundary noted above for System 300 (and continue north and west to Escondido Creek as described). Because this system exhibits a minimal (less than one percent) increase in existing flows and does not encompass a defined discharge point into the associated existing natural drainage course, no related flow regulation or energy dissipation is required.

Proposed Drainage System 500

Proposed Drainage System 500 includes approximately 1.4 acres associated with proposed off-site roadway/utility improvements along Country Club Drive (including the bridge crossing of Escondido Creek, with additional discussion provided below under Guideline No. 5) and the related intersection with Harmony Grove Road (refer to Figure 1-6a, *Site Plan*). Specifically, proposed Drainage System 500 is located within the areal extent of existing Drainage System 200, with the associated acreage and pre-development 100-year flow described in Section 3.1.4.1. Calculated peak 100-year flow from this proposed new drainage system would be 9.6 cfs, with these flows to discharge directly to Escondido Creek via a separate pipeline (i.e., with no intervening development or storm drain facilities). Accordingly, flow regulation is not required as these flows would be combined with the previously described detained flow from proposed Drainage System 200, and the combined flow would result in a minor reduction from the existing Drainage System 200 runoff total. The related outlet from proposed Drainage System 500 would, however, be equipped with an energy dissipation facility to address associated potential erosion hazards.

Summary of Runoff-related Impacts

As noted above, Project drainage facilities (including improvements associated with off-site roadway/utility features) would accommodate peak 100-year storm flows and provide flow regulation (detention) and energy dissipation where applicable, with the identified storm drain system included as part of the proposed design (refer to Figure 1-13 and the related discussion in Section 1.2.2.2). Additionally, as previously described for Guideline No. 1, Drainage Alteration (and below for Guideline No. 3, Hydromodification), downstream flow conditions would not change substantially from the existing baseline conditions based on the results of the Project Hydraulic (Floodplain) Analysis and related HEC-RAS model, as well as the Hydromodification Screening Analysis/Preliminary HMS. As a result, the Project Drainage Study (PDC 2017a) and Hydraulic Analyses (Chang 2016b) provide the following related conclusions:

- Post-development flows from the Project site (including proposed detention in the north and south vaults) would total 138.3 cfs for the northern outfalls (proposed Drainage Systems 100, 200 and 500), and 157.7 cfs for the southern outfalls (proposed Drainage Systems 300 and 400). The combined flow of 296.0 cfs would comprise approximately 98 percent of the existing Project site flow total of 302.3 cfs. As a result, "The project will not… increase the rate or amount of surface runoff compared to the pre-project rates in the receiving streams…" (including the drainage located along the western site boundary and Cordrey Drive) and "…the storm drain system will be sufficient to satisfy County criteria in the post-development condition."

- "…the project will not contribute runoff water which would substantially change the existing condition to exceed the capacity of existing or planned storm water drainage systems."

- The Proposed Project "…will not result in any increase in flood levels or the volume or velocity of flood flows during the occurrence of the base flood discharge within the Escondido Creek."

Based on the noted considerations, and with the inclusion of the proposed storm drain facilities in the Project design per the Project Drainage Study (PDC 2017a), 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

Guideline 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 2011e).

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 Final Hydromodification Management Plan (HMP) (County 2011f) and the BMP Design Manual (DM; County 2016).

Analysis

Pursuant to requirements under the NPDES Municipal Permit (as outlined above), the County of San Diego prepared the BMP DM (February 2016) for Priority Development Projects (PDPs), with the final (adopted) BMP DM dated February 2016. Specifically, the BMP DM requires that all PDPs must demonstrate compliance with pollutant control criteria and also 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 BMP DM.

The stated purpose of the BMP DM is to provide guidance for complying with updated post-construction storm water requirements for Standard Projects and PDPs, and provides updated procedures for planning, preliminary design, selection and design of permanent storm water BMPs based on the performance standards presented in the MS4 Permit and County Watershed Protection Ordinance." 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 increase 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, a Hydromodification Screening Analysis and a related HMS were prepared for the Project to evaluate the HMP compliance efforts incorporated into the Project design (Chang 2016a and PDC 2017b in Appendices M-2 and M-3, respectively). Flow duration control is the most common form of hydromodification management and typically involves the use of facilities such as infiltration basins, bio-retention 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 Project would implement flow duration control to address potential hydromodification issues and requirements in applicable portions of the site, including virtually all areas proposed for development. Specifically, in addition to detention as noted above under Guideline 2 (Runoff Rates/Amounts), the two previously described on-site vaults would provide flow duration control to address hydromodification requirements at the two associated outlets, or point of compliance (POC) site Nos. 1 and 2. POC No. 1 is associated with the north vault, which would receive flows from the 81.2-acre proposed Drainage System 200, as previously described. These flows, as well as runoff from proposed drainage systems 100 (17.4 acres) and 500 (1.6 acres), would enter Escondido Creek under similar flow and discharge point conditions as the existing drainage (with flows from proposed system 500 conveyed to Escondido Creek through a separate pipeline as previously described). POC No. 2 is associated with the south vault, which would receive flows from the 14.1-acre proposed Drainage System 300. These flows, as well as undetained runoff from proposed Drainage System 400, would outlet to the existing drainage course along the western site boundary and continue north and west to Escondido Creek, similar to existing conditions.

  The modeled hydromodification capacities for the north and south vault facilities identified in the Project HMS are 6.1 acre-feet[5] for the north vault, and 1.8 acre-feet for the south vault (PDC 2017b). These modeled sizes were based on applicable criteria for the Project site and proposed development per requirements in the referenced HMP, and include: (1) soil types (A, C and D); (2) slopes and land cover (flat [0 to 5 percent] to steep [more than 10 percent] grades with vegetation and impervious areas); (3) precipitation data (from the Escondido gauge); and (4) lower and upper flow thresholds for associated storm events, including 50 percent of a 2-year storm ($0.5Q_2$) for the low-flow threshold, and a 10-year storm (Q_{10}) for the upper-flow threshold. It should also be noted that the lower (water quality) portions of the vaults would discharge to the "harvest and reuse system" (as described below under Guideline Nos. 8-11, Water Quality), while the upper portions of the vaults would discharge directly to Escondido Creek (north vault) or a related tributary drainage (south vault). Accordingly, the vault design was also modeled to address this situation (refer to Section 4.3 of the Project HMS for additional information). From this design analysis, the Project HMS concludes that

[5] One acre-foot is the amount of water required to cover a 1-acre area to a depth of 1 foot, or approximately 326,000 gallons.

the proposed vaults would adequately address increased flows and durations from the Proposed Project, per applicable criteria in the HMP (PDC 2017b).

- The HMP requires that hydromodification vaults exhibit a maximum drawdown time of 96 hours to avoid the creation of potential vector (e.g., mosquito) habitat (per County DEH standards). This requirement has been incorporated into the preliminary vault design criteria, and the Proposed Project would comply with related DEH guidelines.

- As previously noted, the Project design includes a number of areas that would be undeveloped and/or otherwise not subject to HMP requirements, including Proposed Drainage Systems 100, and 400, as well as a small portion of Proposed Drainage System 500 (the off-site improvements along Country Club Drive) located downstream of the Escondido Creek crossing. Flows from these areas would be conveyed directly to existing drainage courses via Project storm drain facilities, with energy dissipation provided where appropriate (as previously described).

Based on the described conclusions and considerations, **the Project design incorporates appropriate flow duration control 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 1 square mile by 1 foot or more in height.

Guidelines Source

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

Analysis

As described above in Section 3.1.4.1, most portions of the Project site, including all proposed habitable structures, are not located within a mapped 500- or 100-year floodplain area as depicted on the associated FEMA FIRM panel (FEMA 2012a and 2012b), a County Floodplain Map or a County Alluvial Plain Map. The northernmost portion of the site includes areas mapped as Zone AE and "other flood areas" (Zone X), with associated Project facilities located within these designations including the potential wastewater treatment plant site and the portion of the off-site improvements along Country Club Drive extending across Escondido Creek. Specifically, as described in Section 1.2.2.1, the off-site improvements to Country Club Drive would encompass a bridge crossing of Escondido Creek. Depending on the implementation timing for the Proposed Project, the Project Applicant would be subject to appropriate responsibilities related to technical/environmental analysis and funding of the proposed bridge. Accordingly, the Project Drainage Study (PDC 2017a) and Hydraulic (Floodplain) Analyses (Chang 2016b) provide evaluations of associated flood-related conditions and potential impacts. Specifically, the Drainage Study assesses flood-related concerns associated with the potential wastewater treatment plant site, while the Hydraulic Analyses include a HEC-RAS model to assess potential changes to 100-year water surface and floodway elevations from implementation of the Proposed Project. The associated results and conclusions from these investigations are summarized below.

- Preliminary design for the potential on-site wastewater treatment plant identifies a pad elevation of approximately 584 feet (refer to Figure 1-6a), with mapped 100-year flood elevations in this portion of the site ranging between 570 and 574 feet (FEMA 2012a, refer to Exhibit A of the Project Drainage Study in EIR Appendix M-1). Accordingly, the potential treatment plant site would be elevated above the 100-year flood level under the Proposed Project design, and would not notably redirect/impede flood flows (with additional supporting information from the Project Hydraulic Analyses outlined below).

- As described above under the analysis for Guideline No. 1, Drainage Alteration, the Project Hydraulic Analyses used an approved CLOMR/HEC-RAS model prepared for the adjacent portion of Escondido Creek as the existing baseline condition. The resulting HEC-RAS model prepared for the Proposed Project (including the bridge and wastewater treatment plant) was used to determine associated water surface and floodway elevations, with the evaluation concluding that implementation of the Proposed Project would: "…not result in any increase in flood levels or the volume or velocity of flood flows during the…base flood discharge within Escondido Creek…and will not raise the 100-year water surface elevations." (Chang 2016b).

- While the proposed bridge would encroach within the CLOMR floodway, the associated floodway surcharges at the up- and downstream bridge cross-sections were calculated at 0.10- and 0.19-foot, respectively. Accordingly, the revised floodway would be within the allowable base flood elevation increase of 1.0 foot.

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.

Guidelines Sources

Guideline No. 6 is derived from Section 4.0 of the County Guidelines for Determining Significance – Groundwater Resources (County 2007e); while Guideline No. 7 is derived from Appendix G, Section VIe, of the CEQA Guidelines for septic system operation, and Section 4.0 of the County Guidelines for Determining Significance – Geologic Hazards (County 2007d).

Analysis

Domestic water supplies for the Proposed Project would be obtained from the Rincon MWD, with no groundwater use proposed for domestic or other purposes. As previously noted, implementation of the Proposed Project would result in the addition of approximately 38 acres of impervious surfaces in the form of pavement and structures. As a result, approximately 73 acres (or approximately 66 percent) of the site would remain pervious, including areas such as open space, landscaping, and unlined drainage facilities (refer to Figures 1-6a and 1-13). Based on these conditions, as well as the fact that virtually all areas proposed for development currently encompass Hydrologic Group C or D soils (with low or very low water transmission rates; PDC 2017a), infiltration of surface flows and related recharge capacity within the Project site are anticipated to exhibit a only a relatively minor reduction compared to existing conditions.

Project construction may also require localized extraction/disposal of shallow groundwater to accommodate activities such as grading and excavation. Because shallow groundwater is limited to the northernmost portion of the site, however (as described above in Section 3.1.4.1), construction-related dewatering is anticipated to be minor in extent and short-term in duration (refer also to the related discussion of potential groundwater extraction and associated water quality requirements below in this section under Guideline Nos. 8 through 11).

Based on the above considerations, **Project-related 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 Guideline No. 2, Runoff Rates/Amounts and Related Drainage System and/or Flood Hazards, Project implementation would generate approximately 140 cfs of additional 100-year storm flow within the site due to the proposed construction of

impervious surfaces (i.e., compared to existing flows and prior to detention). The majority of this additional runoff would be captured in the Project site storm drain system via a series of inlets, pipelines, etc., and conveyed to two proposed on-site vaults prior to off-site discharge or harvest/reuse (with some additional minor flows bypassing the vaults, as previously described). While some infiltration of these flows would occur from runoff routed through landscaping or conveyed within unlined drainage facilities (e.g., the central drainage feature, refer to Figure 1-13), most drainage structures would be impervious (streets, pipelines, etc.). Accordingly, infiltration associated with flows conveyed by the Project storm drain system would be minor.

An additional potential source of infiltration at the Project site would be associated with irrigation of landscaped areas. Infiltration within these areas is anticipated to generally minor, however, 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; (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) landscaped areas within the Project site would encompasses compacted fill and/or predominantly low-transmission soils (hydrologic groups C or D), as previously noted.

Based on the described conditions, as well as the fact that the Proposed Project would be expected to result in an overall minor reduction of on-site infiltration as outlined above, **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**.

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 BMP Design 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.

Guidelines Source

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

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/utility 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 measures that would avoid or reduce off-site sediment transport. This would include efforts such as the use of detention/hydromodification vaults (which would also include a water quality treatment component), 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 3.1.4.1 under Regulatory Setting. This would include implementing an authorized NPDES/County SWPPP for proposed construction, including (but not limited to) erosion and sedimentation BMPs.

While specific BMPs related to erosion/sedimentation 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 General Permit and County Stormwater Ordinance/BMP DM, as well as the additional sources identified in Section 3.1.4.1 under Regulatory Setting. A summary of anticipated erosion and sedimentation BMPs that would be applicable to the Proposed Project are provided in Table 3.1.4-4, *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 3.1.4-4.

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 as noted, and would include detailed measures to avoid or mitigate potential impacts related to the use and potential discharge of construction-related hazardous materials.

While detailed BMPs for construction-related hazardous materials 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/BMP DM, as well as the additional sources identified in Section 3.1.4.1 under Regulatory Setting. A summary of anticipated construction-related hazardous material BMPs that would be applicable to the Proposed Project is provided in Table 3.1.4-5, *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 3.1.4-5.

Demolition-related Debris Generation. The Proposed Project would involve the demolition of existing on-site facilities including minor pavement and structural remains (e.g., foundations and building remnants from an abandoned residence, and a concrete cistern. These activities could generate variable amounts of construction debris, potentially including concrete, glass, metal, etc. Demolition activities could also potentially generate particulates, as well as pollutants related to hazardous materials including lead-based paint and asbestos insulation. (Asbestos can be found in products such as asphalt roofing products, insulation inside fuse boxes and old wire insulation, shingles and siding, and floor tile. Because structural remains are currently restricted to cement pads, some partial cement walls and a chimney remnant, materials associated with roofing, insulation, etc., are not expected [refer to Section 3.1.3]). 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 Section 3.1.3. 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 3.1.4-6, *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 Section 3.1.3 of this EIR (as summarized in Table 3.1.4-6).

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 3.1.4-6.

Disposal of Extracted Groundwater. Shallow groundwater may potentially 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 3.1.4.1). Conformance with this permit is generally applicable to all temporary and certain permanent groundwater discharge activities, with exceptions as noted in the permit fact sheet. Specific requirements for permit conformance include: (1) submittal of appropriate application materials and fees; (2) implementation of pertinent (depending on site-specific conditions) monitoring/testing, disposal alternative, erosion control and treatment programs; (3) provision of applicable notification to the associated local agency prior to discharging to a municipal storm drain system; (4) conformance with appropriate effluent standards (as outlined in the permit); and (5) submittal of applicable documentation (e.g., monitoring reports).

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 SWQMP (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/BMP DM, JURMP and LID Manual, as well as the related NPDES Municipal Permit (as outlined below). The Proposed Project is identified as a PDP due to the inclusion of proposed development categories such as residential and commercial 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 Form I-3B, Page 7, of the SWQMP [PDC 2017c] in Appendix N). 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.

County standards require the use of LID/site design and source control BMPs for all development projects, as well as pollutant control BMPs for PDPs. The selection of pollutant control BMPs further requires initial screening to determine the feasibility of using retention (infiltration) BMPs for pollutant control. If infiltration is not feasible, PDPs are required to consider (in order of priority) harvest and reuse BMPs, biofiltration BMPs, and flow-through BMPs. 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 pollutant control BMPs. Specific proposed BMPs are identified in the Project SWQMP (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 SWQMP 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.

- SD-1; Maintain Natural Drainage Pathways and Hydrologic Features. Specific efforts would include providing appropriate set-backs from drainages for development envelopes, and restricting construction equipment access in planned green/open space areas.

- SD-2; Conserve Natural Areas, Soils and Vegetation. This measure would include efforts such as preserving well-draining (Type A) soils, significant trees, critical areas (e.g., steep slopes and floodplains), and other sensitive areas wherever feasible.

- SD-3; Minimize Impervious Surfaces. This measure would involve designing hardscape areas (e.g., streets) to the minimum widths necessary to meet regulatory/safety standards, as well as providing covered parking (e.g., garages) where feasible.

- SD-4; Minimize Soil Compaction. Individual efforts to minimize soil compaction would include restricting construction equipment access in planned green/open space areas, re-tilling soils compacted during construction, and collecting native soil layers for reuse in on-site landscaping efforts.

- SD-7; Landscaping with Native or Drought-Tolerant Species. Individual landscaping design efforts would include revegetating/stabilizing disturbed slopes as soon as possible after/during construction, using native and/or drought-tolerant varieties in all permanent landscaping, and incorporating "smart irrigation" technology (including appropriate water schedules and rain/pressure-sensitive shutoff devices).

- SD-8; Harvesting and Using Precipitation. A harvest/reuse component would be included in the two proposed detention/hydromodification vaults, with additional information provided below under the discussion of PDP Pollutant Control BMPs.

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 SWQMP are summarized below, with additional discussion provided in the Project SWQMP (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.

- SC-1; Prevention of Illicit Discharges into the MS4. This measure would include efforts such as conveying flows from applicable sources (e.g., fire sprinkler tests and wash water) to the sanitary sewer.

- SC-2; Storm Drain Stenciling or Signage. This measure would involve efforts such as installing "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.

- SC-4; Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff and Wind Dispersal. This may include efforts such as minimizing storage of potential pollutants, enclosing/covering storage areas, providing secondary containment (e.g., berms), implementing appropriate record keeping, providing appropriate employee/ user training, and conducting applicable site inspection and maintenance.

- SC-5; Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal. Specific efforts under this measure may include designing trash storage areas in applicable locations (i.e., multi-family residential sites and public areas such as parks and the Center House/community center) to reduce pollutant discharge through methods such as preventing runon/runoff (e.g., through grading), paving enclosure areas with impervious surfaces, and providing attached lids and/or roofs for trash containers to prevent direct precipitation contact and reduce trash dispersal.

- SC-6; Additional BMPs Based on Potential Sources of Runoff Pollutants. This would include efforts such as on-site storm drain inlet protection; proper control/treatment of runoff from sources such as food service/refuse areas, interior parking garages, manufactured slopes and paved plazas, sidewalks and parking lots (e.g., by directing runoff into landscaped/vegetated areas where feasible); use of structural pest controls (i.e., in lieu of chemical pesticides); proper use/control of chemical pesticides when required; provision of educational materials on storm water issues to residents and maintenance staff (e.g., proper disposal of household hazardous waste and use of structural pest controls); and appropriate design/maintenance of water features, *PDP Pollutant Control BMPs.* Pollutant control BMPs are designed to remove pollutants from urban runoff for a design storm event to the MEP through means such as filtering, treatment, or infiltration. As previously described, pollutant control BMPs are required for PDPs under County standards to address identified pollutants. Specific pollutant control BMPs identified in the Project SWQMP include harvest/reuse components in the two previously described north and south vaults, and two proprietary biofiltration units (with infiltration BMPs determined to be infeasible at the Project site, PDC 2017c). The harvest/reuse components would collect the identified water quality flow volumes from the associated north and south drainage management areas (DMAs), which encompass approximately 81.2 and 14.1 acres, respectively (refer to EIR Figure 1-12, *Conceptual Reclaimed Water and Sewer Plan*, and the DMA exhibit included in Attachment 1 of the Project SWQMP). This harvested water would then be conveyed to the proposed (subsurface) on-site wet weather storage facility, enter the recycled water (purple pipe) system owned by the Rincon MWD, and be used for landscape (or other) irrigation.

  The two proprietary biofiltration (Bioclean modular wetland) units would be located along the east and west sides of Country Club Drive north of Escondido Creek (off site), and would treat flows from the associated DMAs which encompass a combined area of approximately 1.4 acres. Treated flows from these biofiltration units would be discharged directly to Escondido Creek.

The proposed pollutant control BMPs would help to improve long-term water quality within and downstream of the Project site by harvesting/reusing urban runoff and/or treating/removing associated pollutants prior to downstream discharge. Additional discussion of proposed pollutant control BMP design, locations, sizing, and performance criteria is provided in the Project SWQMP (Appendix N).

Post-construction BMP Monitoring/Maintenance Schedules and Responsibilities. Identified BMPs include physical facilities that require ongoing monitoring and maintenance, such as no dumping signs/tiles, irrigation systems, the north and south vaults, and Bioclean modular

wetland (biofiltration) units. Applicable non-pollutant control BMPs (e.g., sign/tiles and irrigation systems), as well as the north and south vaults, would be owned and maintained by the Project HOA, with funding to be derived from HOA fees and/or recycled water sales (PDC 2017c). Specifically, the Project owner(s) or HOA must enter into a written Maintenance Agreement with the County for these BMPs, which would include requirements that the facilities be limited to the proposed use, include an access easement to the County where applicable, and provide adequate funding through means acceptable to the County.

The proposed Bioclean modular wetland (biofiltration) units would be owned and maintained by the County, with funding to be derived from County road maintenance funds (PDC 2017c). Accordingly, these facilities would require dedication to the County (along with associated property/access), and the County would implement all related monitoring and maintenance efforts. The Project owner(s) or HOA may be responsible for initial funding through means such as a cash deposit, letter of credit, or other source(s) acceptable to the County, with long-term funding provided by the County as noted.

Specific monitoring and maintenance efforts associated with applicable proposed BMPs include the following:

- Non-Pollutant Control BMPs. Typical measures include monitoring and reporting to document proper implementation/operation, regularly scheduled inspection and maintenance efforts, and making necessary modifications/repairs to ensure that intended BMP functions and regulatory efforts are being met (e.g., sign/tile replacement to ensure legibility, and as-needed repair/replacement of irrigation system hardware).

- Bioclean Modular Wetland (Biofiltration) Units. Typical measures include monitoring and reporting to document proper implementation/operation, regularly scheduled inspection and maintenance efforts, removal of trash from the screening device (typically every 6 to 12 months), removal of sediment from the separation chamber (typically every 12 to 24 months), replacement of the cartridge and drain down filter media (typically every 12 to 24 months), vegetation trimming/management (typically every 6 to 12 months), and as-needed repair/replacement.

- North and South Harvest and Reuse Vaults. Typical measures include monitoring and reporting to document proper implementation/operation, clearing of inlet/outlet obstructions, and implementation of as-needed repairs/replacement.

A detailed discussion of individual monitoring and maintenance requirements for the proposed PDP structural BMPs is provided in Attachment 3 (Structural BMP Maintenance Plan) of the Project SWQMP (Appendix N).

Based on implementation of proposed LID/site design, source control, and pollutant 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 3.1.4.1, the Project site is tributary to 303(d) listed waters including Escondido Creek, San Elijo Lagoon and the Pacific Ocean shoreline. 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, the Proposed Project would incorporate a "treatment train" of LID/site design, source control and pollutant control BMPs to provide treatment for Project water quality flow volumes in conformance with applicable regulatory standards (including appropriate measures to address pollutants related to impaired water listings). As a result, **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 3.1.4.1, under the discussion of Regulatory Setting (refer also to Table 3.1.4-3). 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.

3.1.4.3 *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 Stormwater Ordinance/BMP DM. LID

Handbook, JURMP and related Municipal Code standards, 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**.

3.1.4.4 *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.

3.1.4.5 *Conclusion*

Based on the discussions provided above, potential Project-specific and cumulative hydrology and water quality impacts associated with implementation of the Proposed Project would be effectively avoided or reduced below identified significance guidelines through implementation of recommendations provided in the Project Drainage Study, HMS, Hydraulic (Floodplain) Analyses and SWQMP, as well as conformance with established regulatory requirements.

Table 3.1.4-1
SUMMARY OF TYPICAL POLLUTANT SOURCES
FOR URBAN STORM WATER RUNOFF

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

Source: USEPA 1999

Table 3.1.4-2
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 1999; RWQCB 1988
HDR = High Density Residential; MDR = Medium Density Residential; LDR = Low Density Residential
N/A = Not available; insufficient data to characterize; TSS = Total Suspended Solids; TP = Total Phosphorus;
TKN = Total Kjeldahl Nitrogen; NH_3 – N = Ammonia - Nitrogen; NO_2 + NO_3 – N = Nitrite + Nitrate - Nitrogen;
BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; Pb = Lead; Zn = Zinc; Cu = Copper

Table 3.1.4-3
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 3.1.4-1 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 3.1.4-4
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO EROSION AND SEDIMENTATION

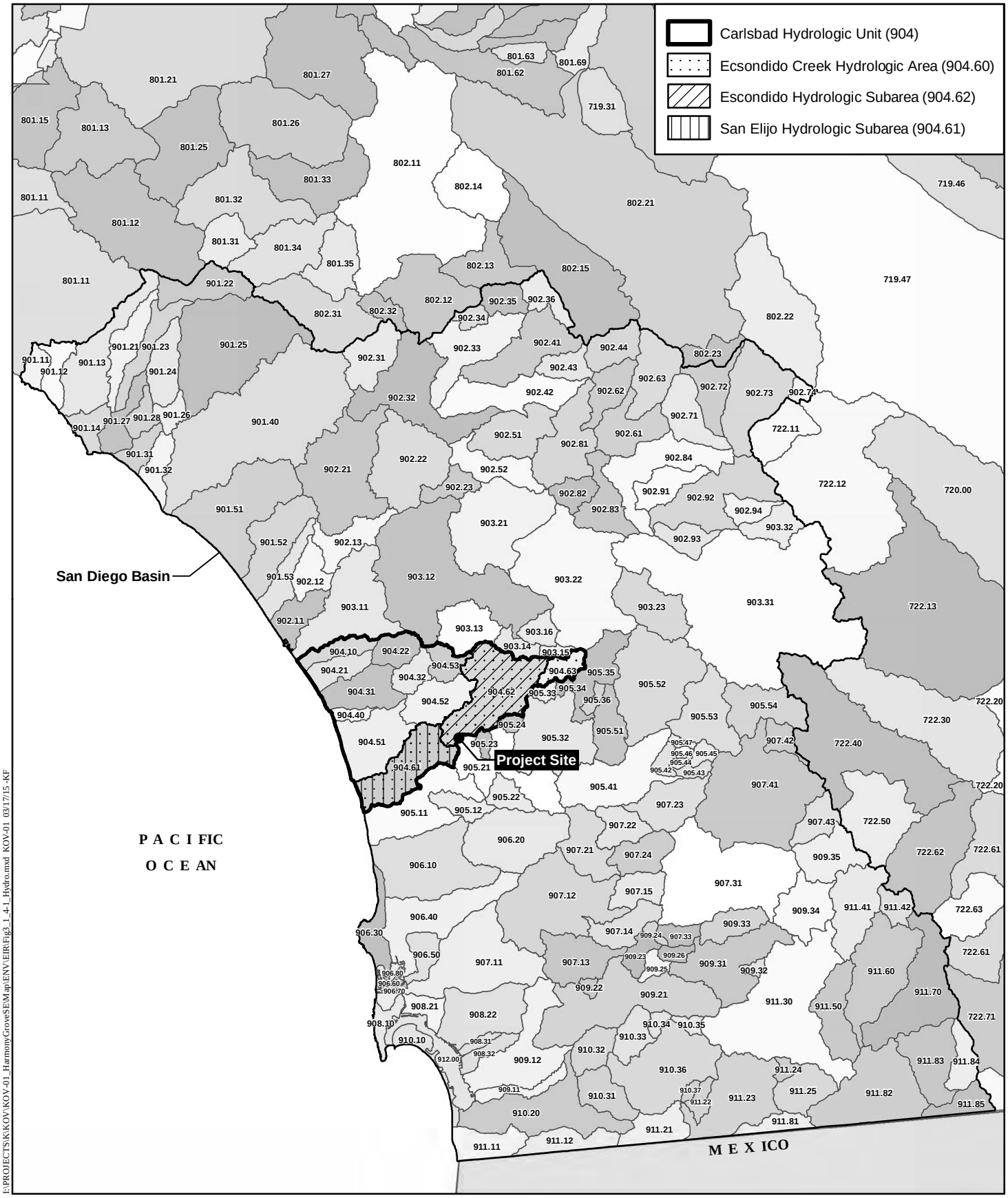
- Comply with seasonal grading restrictions during the rainy season (October 1 to April 30) for applicable locations/conditions.
- Prepare and implement a CSMP to ensure appropriate monitoring, testing, BMP effectiveness, and conformance with applicable discharge requirements.
- Prepare and implement 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.
- 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 3.1.4-5
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.
- 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.
- Implement additional BMPs as necessary (and in conformance with applicable requirements) to ensure adequate hazardous material control.

Table 3.1.4-6
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.



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Project Location within Local Hydrologic Designations

HARMONY GROVE VILLAGE SOUTH

HELIX Environmental Planning

N 0 12 Miles

Figure 3.1.4-1