5.7 HYDROLOGY AND WATER QUALITY

This section evaluates the potential for the Kenwood Village Project to result in significant impacts to surface water and groundwater quality; stormwater flows and drainage; and flooding. The impact analysis is based, in part, on the July 2010 *Preliminary Hydrology Report* and the April 2014 *Addendum* prepared for the Project, a peer review of those reports, and the Project's grading and drainage plans.

5.7.1 Physical Setting

The project site is bounded by El Encanto Creek and multi-family residential development on the west, single-family residential development to the north and east, and Calle Real to the south. U.S. Highway 101 is located just beyond Calle Real to the south. The U.S. Geological Survey (USGS) map for the area shows an unnamed blue-line stream (El Encanto Creek) north of the project site. The stream enters an underground storm drain before it enters the residential area located north of the project site, and the storm drain discharges to surface flow at a location northwest of and adjacent to the project site.

The 10-acre project site is undeveloped and mostly covered with non-native grasses and a few groupings of shrubs and trees. Slopes on the site vary between two and five percent in the southern and southwestern parts of the site before becoming generally level adjacent to Calle Real. Slopes in the northwestern and central portion of the site range between five and 10 percent just below a knoll in the upper northeastern portion of the site. Elevations range between 55 feet above sea level near the southwestern corner and 94 feet at the top of the knoll.

The project site includes two "arm parcels" that extend to the northwest and northeast of the main project parcel, and those parcels would be used for the development of public trails and bicycle paths. The parcel that extends to the east has a dirt path that extends to Baker Lane, and from there the path has been paved and extends to Daffodil Lane. The parcel that extends to the west includes a dirt path that extends to Ellwood Station Road. A wood bridge is located along this trail and crosses a concrete channel that outlets to El Encanto Creek.

Storm Water Drainage. Drainage from the project site generally sheet flows in a southwesterly direction towards El Encanto Creek, and to a drainage ditch located between the project site and Calle Real. The road-side ditch conveys storm water runoff from east to west, opposite of the direction of the surface flows on Calle Real, which slopes from the west to the east. The ditch joins El Encanto Creek near the southwest corner of the project site where El Encanto Creek enters a large culvert that takes the water southward under Calle Real, U.S. 101 and the UPRR tracks. The creek emerges from the culvert south of the railroad tracks and is conveyed southward, mostly through a modified channel, to a location approximately 0.8 of a mile south of the project site where it enters Devereux Creek, which flows to the Devereux Slough.

Drainage from the majority of the single-family homes and streets to the north of the project site is conveyed via a municipal storm drain system directly to El Encanto Creek.

Drainage from the rear yards of the residential lots north of and adjacent to the project site sheet flows onto the project site and is transported on the surface from east to west along the existing path, then spreads out across the northwest portion of the project site before entering the creek. Storm water runoff from the multi-family development to the west of the project site also flows to El Encanto Creek.

The existing pre-development storm water runoff drainage patterns and existing natural and man-made storm water conveyance facilities are shown in Figure 5.7-1.

Groundwater. The Goleta Groundwater Basin underlies the City of Goleta. The Basin covers approximately 9,210 acres and is approximately eight (8) miles long and three (3) miles wide. There is a combined total of between 30,000 to 60,000 acre-feet of operational storage in the Basin (City of Goleta 2006). The surface and subsurface material at the project site generally consists of clayey sands and sandy clays (GeoSolutions, 2009). The clayey soil layers do not percolate well and groundwater recharge on the site appears to be very minimal (Triad/Holmes, 2010).

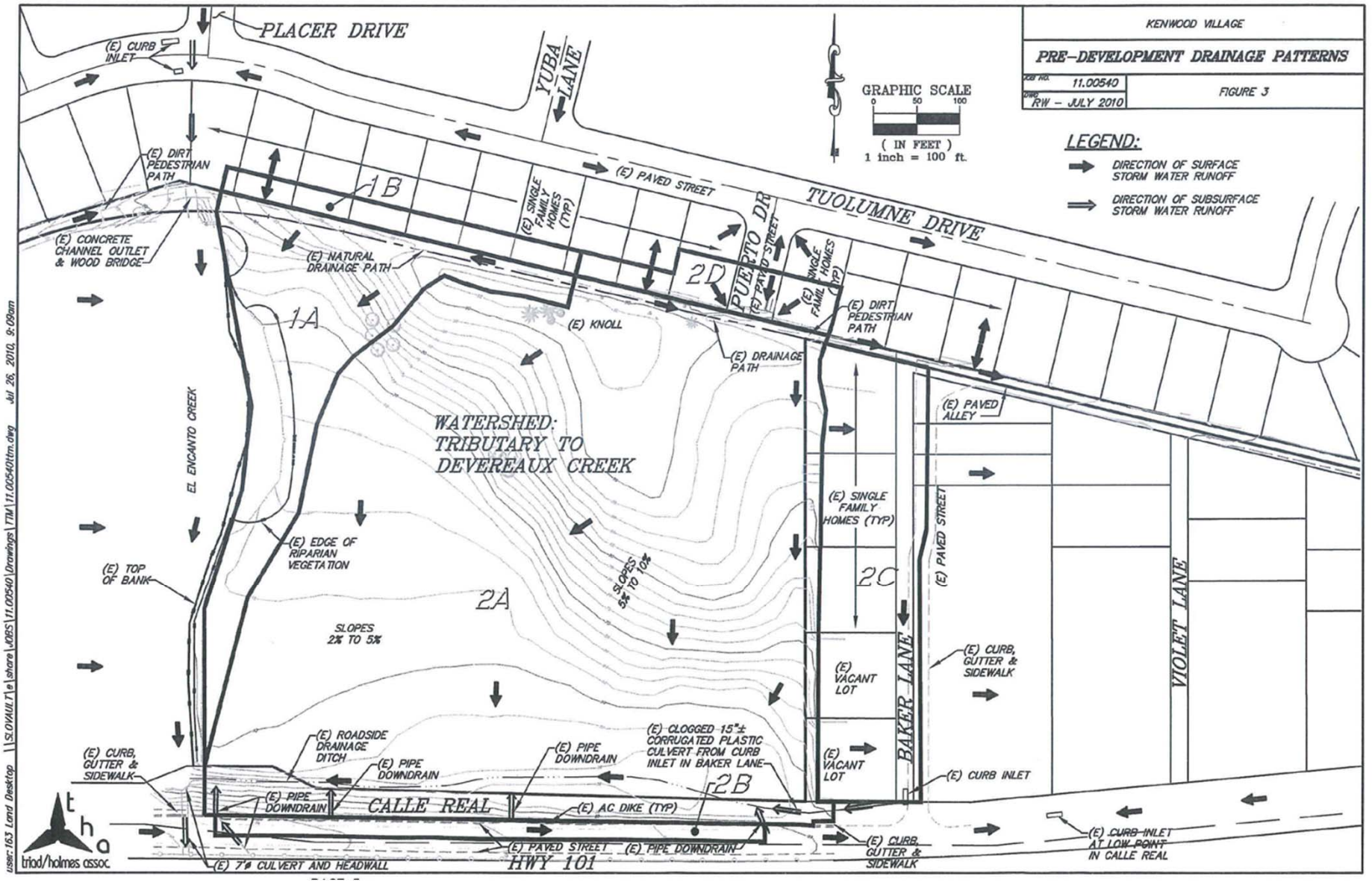
Water Quality. There are no water quality impaired water bodies on or adjacent to the project site that have been identified by the State Water Resources Control Board (SWRCB) or the Regional Water Quality Control Board (RWQCB) under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act). Devereux Creek, which receives flows from El Encanto Creek, is included on the 2010 U.S. EPA 303(d) list as a water quality limited segment for pathogens (fecal coliform) and nutrients (low dissolved oxygen).

Flooding. The most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the area shows that the project site is outside of the 100-year floodplain. The designated 100-year floodplain nearest the project site is located adjacent to the south side of U.S. 101.

5.7.2 Regulatory Setting

Federal Requirements

Clean Water Act (33 U.S.C. §§ 1251, *et seq*.). The primary goals of the Clean Water Act (CWA) are to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to make all surface waters fishable and swimmable. The CWA provides the legal framework for several water quality regulations, including the National Pollutant Discharge Elimination System (NPDES), effluent limitations, water quality standards, pretreatment standards, anti-degradation policy, non-point source discharge programs, and wetlands protection. The U.S. Environmental Protection Agency has delegated the responsibility for administration of portions of the CWA to state and regional agencies.



City of Goleta

Kenwood Village Project

Figure 5.7-1

Existing Drainage Patterns

Section 303(d) of the CWA requires identification and listing of water-quality limited or "impaired" water bodies where water quality standards are not met. After a water body is listed as "impaired," total maximum daily loads (TMDLs) must be established for the pollutants causing the impairment.

Federal Flood Insurance Program. FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues Flood Insurance Rate Maps for communities participating in the NFIP.

State Requirements

Porter-Cologne Water Quality Control Act (Water Code §§ 13000, *et seq*.)**.** The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) was enacted in 1969 by the State of California to address requirements of the CWA. The Act is broad in scope and addresses issues relating to the conservation, control, and utilization of the water resources of the state.

The SWRCB and its nine RWQCBs are agencies within the umbrella structure of the California Environmental Protection Agency (CalEPA). The SWRCB has the principal responsibility for the development and implementation of California water quality policy and must develop programmatic water quality control procedures to be followed by the RWQCBs. The Central Coast Regional Water Quality Control Board (CCRWQCB) is the region that oversees water quality permitting in the City of Goleta. The CCRWQCB adopted a Revised Water Quality Control Plan (Basin Plan) on September 8, 1994. The Basin Plan designates beneficial uses and establishes water quality objectives for groundwater and surface water within the Central Coast Region.

Discharge Permits. The SWRCB has issued a statewide NPDES General Permit for storm water discharges associated with construction activities (known as the Construction General Permit [SWRCB Order No. 99-08-DWQ]). Any project that disturbs an area larger than one acre requires a Notice of Intent to discharge under the Construction General Permit. The Construction General Permit includes measures to eliminate or reduce pollutant discharges through implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must list best management practices (BMPs) that will be used to protect storm water runoff quality. The SWPPP must also contain a visual monitoring program, and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs.

The CCRWQCB issues combined NPDES Permits under the CWA and California Water Code to all point source dischargers of waste to surface waters. To ensure protection of water quality, NPDES Permits may contain effluent limitations for pollutants of concern, pollutant monitoring frequencies, reporting requirements, schedules of compliance (when necessary), mandates for operating conditions, BMPs, and administrative requirements. NPDES Permits apply to publicly owned treatment works discharges, industrial wastewater discharges, and municipal, industrial, and construction site storm water discharges.

CCRWQCB Post-Construction Stormwater Management Requirements. The CCRWQCB adopted Resolution No. R3-2013-0032 (July 12, 2013), which implements post-construction requirements for management of storm water discharges from development projects within the Central Coast region. Specifically, projects must comply with four categories of performance requirements: (1) site design and runoff reduction; (2) water quality treatment; (3) runoff retention; and (4) peak flow management. Within the City, the Central Coast post-construction requirements apply to private development projects that did not receive the first discretionary approval of project design by March 6, 2014. The Central Coast post-construction requirements are summarized in Table 5.7-1.

Local Requirements

Project Clean Water. Project Clean Water is the County of Santa Barbara's storm water quality program initiated in 1998 to improve water quality in local creeks and the ocean by implementing many of the aspects of NPDES BMPs. This program also includes watershed planning and restoration as well as pilot treatment control BMPs and monitoring.

City of Goleta Stormwater Management Plan. Planning, implementation, and enforcement related to storm water management during construction and post-construction activities on proposed and active development sites are governed by the City of Goleta Stormwater Management Plan (SWMP) (City of Goleta 2010). The Goleta SWMP was prepared pursuant to SWRCB General Permit No. CAS000004 for NPDES Phase II. The purpose of the SWMP is to implement and enforce a program designed to reduce the discharge of pollutants to the maximum extent practicable to protect water quality. The SWMP outlines the means by which the City will (1) protect the health of the recreational public and the environment; (2) meet CWA mandates through compliance with Phase II NPDES Permit requirements and applicable regulations; and (3) foster increased public involvement and awareness.

City of Goleta Floodplain Management Regulations. The City's Floodplain Management Ordinance (Goleta Municipal Code, Chapter 15) allows structural development within the 100-year floodplain if the finished floor elevation is raised at least 2 feet above the base flood elevation.

City of Goleta General Plan/Coastal Land Use Plan (GP/CLUP). The General Plan/Coastal Land Use Plan (GP/CLUP) contains policies in the Conservation Element regarding protection of water quality, including Policy CE 2, Protection of Creeks and Riparian Areas; Policy CE 3, Protection of Wetlands; and Policy CE 10, Watershed Management and Water Quality.

Table 5.7-1
Central Coast Regional Water Quality Control Board
Post-Construction Requirements Summary

Type of Project	Performance Requirements
Small Development Project • Projects, including single-family homes that are not part of a larger plan of development, that create or replace 2,500 square feet or more of impervious surface.	**Performance Requirement No. 1: Site Design and Runoff Reduction** • Limit disturbance of natural drainage features. • Minimize compaction of highly permeable soils. • Limit clearing, grading, and soil compaction. • Minimize impervious surfaces. • Minimize runoff by dispersing runoff to landscape or using permeable pavements.
Medium Development Project • Projects, other than single-family homes, that create or replace 5,000 square feet or more net impervious surface.(1) • Single-family homes that create or replace 15,000 square feet or more of net impervious surface.*	**Performance Requirement No. 1, plus Performance Requirement No. 2: Water Quality Treatment** • Treat runoff with an approved and appropriately sized Low Impact Development (LID) treatment system prior to discharge from the site.
Medium-Large Development Project • Projects, other than single-family homes, that create or replace 15,000 square feet or more of impervious surface. • Single-family homes that create or replace 15,000 square feet or more of net impervious surface.*	**Performance Requirements No. 1 & 2, plus Performance Requirement No. 3: Runoff Retention** • Prevent off-site discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.
Large Development Project • Projects that create or replace 22,500 square feet of impervious surface.	**Performance Requirements No. 1, 2 & 3, plus Performance Requirement No. 4: Peak Management** • Control peak flows to not exceed pre-project flows for the 2-year through 10-year events.

Source: County of Santa Barbara, 2014, *Stormwater Technical Guide for Low Impact Development.*

(1) Net impervious surface equals new and replaced impervious area minus the total pre-project–to–post-project reduction in impervious area (if any).

Final Drainage/Stormwater Quality Protection Plan. The permittee must prepare a final drainage/stormwater quality protection plan consistent with the City's Stormwater Management Guidance Document and CCRWQCB Post-Construction Stormwater Management Requirements. The final drainage/stormwater quality protection plan must be prepared by a licensed civil engineer and submitted to the City for review and approval before issuance of any grading permit. The plan will include, without limitation, the following:

1. A final drainage analysis that provides final calculations on pre/post-development stormwater runoff volumes, peak flows, effective impervious area, required storage capacity, and specifications of all elements of the drainage control system.

2. Catch basin filter inserts capable of capturing sediment, trash, debris, and petroleum products from low-flow (first flush) stormwater runoff will be installed in each stormwater inlet/catch basin to be connected to the storm drain system serving the Shelby property. Catch basin filter inserts must be specified for installation in all Project stormwater inlets/catch basins shown on the final grading/drainage plan.

3. Regular maintenance and cleaning must be performed on catch basins and detention basins.

4. Routine cleaning must be performed on streets, parking lots, and storm drains.

5. All storm drain inlets must be stenciled to discourage dumping by informing the public that water flows to the ocean.

6. An integrated pest management program must be developed for landscaped areas of the Project, emphasizing the use of biological, physical, and cultural controls, rather than chemical controls.

7. Educational flyers must be provided to residents regarding proper disposal of hazardous water and automotive waste.

8. Trash storage/material storage areas for maintenance of common areas must be provided that are covered by a roof and protected from surface runoff.

9. Drainage improvements associated with the Project must route as much roof, parking areas, and surface drainage as possible through onsite landscaped areas and bioswales before drainage enters the drop inlets.

All BMPs will be installed as identified on the final drainage/stormwater quality protection plan and grading/drainage plan before issuance of any Certificate of Occupancy.

Maintenance Agreement. To ensure that all improvements associated with stormwater quality protection and BMPs described in the Final Drainage/Stormwater Quality Protection Plan are adequately maintained, the applicant is required to prepare and implement a maintenance agreement. The maintenance agreement must be in a form approved by the City Attorney.

At a minimum, the maintenance agreement must include requirements that all inline storm drain filters must be inspected, repaired, and cleaned per manufacturer specifications and before September 30 of each year. Additional inspections, repairs, and maintenance must be performed after storm events, as needed, throughout the rainy season (November 1 to April 15) and/or per manufacturer specifications. Any necessary major repairs must be completed prior to the next rainy season. Before September 30 of each year, the permittee, or designee, must submit to the Public Works Director, or designee, for review and approval a report summarizing all inspections, repairs, and maintenance work done during the previous year.

The applicant must also submit the required maintenance agreement to the Public Works Director, or designee, for review, approval, and execution before issuance of any Certificate of Occupancy. The City must periodically verify compliance with the provisions of the agreement and respond to instances of noncompliance with the agreement.

City of Goleta Stormwater Management and Discharge Control Ordinance. The City's Stormwater Management And Discharge Control regulations (Goleta Municipal Code, Chapter 13.04) implements the CWA and Porter-Cologne Act "by reducing pollutants and non-stormwater discharges to the maximum extent practicable by prohibiting non-stormwater discharges into the storm drain system and improving stormwater management." It includes regulations regarding point and nonpoint source discharges of pollutants, and also codifies the City's implementation and enforcement of the Central Coast Post Construction Requirements.

5.7.3 Thresholds of Significance

Both the City's Initial Study Checklist (CEQA Guidelines, Appendix G) and the City's *Environmental Thresholds and Guidelines Manual* specify the following significance thresholds. These thresholds have been organized according to the topics evaluated in this section.

Surface and Groundwater Quality. A significant impact on surface and groundwater water quality could occur if project-related construction or operations would:

a. Violate any water quality standards or waste discharge requirements.

b. Discharge pollutants that exceed the water quality standards set forth in the applicable NPDES Permit, the RWQCB's Basin Plan, or otherwise impair the beneficial uses of a receiving water body.

c. Result in a discharge of pollutants into an impaired waterbody that has been designated as such by the SWRCB or the RWQCB under Section 303(d) of the Clean Water Act.

d. Result in a discharge of pollutants of concern to a receiving water body, as identified by the RWQCB.

e. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

f. Be located within an urbanized area of the City and project construction would disturb one (1) or more acres of land.

g. Result in the removal or reduction of riparian vegetation or other vegetation (excluding non-native vegetation removed for restoration projects) from the buffer zone of any streams, creeks, or wetlands.

h. Result in channelization or relocation of a natural drainage channel.

i. Otherwise substantially degrade water quality.

Storm Water Flows and Drainage. A significant impact on stormwater flows and drainage could occur if construction or operation of the project would:

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

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

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

m. Increase the amount of impervious surfaces by 25 percent or more.

Flooding. A significant impact on storm water flows and flooding could occur if construction or operation of the project would:

n. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

o. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

The Scoping Document prepared for the Project (EIR Appendix A) concluded that the Project would not be affected by mudslides or a future failure of any upstream levee or dam.

Therefore, those impacts would be less than significant and are not discussed further in this section.

5.7.4 Impact Evaluation

The Project would result in the construction and occupancy of 60 residential units, including 13 single-family residences, 20 duplexes 27 triplexes, and various other accessory uses and structures. Impacts related to water quality, storm water flows and drainage, and flooding are evaluated below.

Water Quality

Short-Term Water Quality Impacts. Project-related grading would result in approximately 41,000 cubic yards of cut and 50,000 cubic yards of fill. The proposed grading would remove vegetation and expose soil to erosion, which would have the potential to result in significant sedimentation impacts to downstream receiving waters, including El Encanto Creek. The use of hazardous materials during grading and construction, such as fuel, paint and solvents, and the washout of construction equipment would also have the potential to result in significant impacts to surface and ground water resources in the unlikely event of a major release.

Potential short-term water quality impacts would be minimized during all phases of construction through compliance with the Construction General Permit, as described above in Section 5.7.2. The Construction General Permit requires the development and implementation of a SWPPP, which must include erosion and sediment control BMPs that meet or exceed measures required by the Construction General Permit. The SWPPP would also be required to comply with the City's Grading Ordinance and to identify BMPs that reduce the potential for a release of construction-related pollutants from the project site. With the required implementation of approved BMPs for erosion, sediment and construction material control, the potential for short-term construction-related water quality impacts would be **less than significant (Class III)**.

Long-Term Water Quality Impacts. Pollutants often associated with residential development and that may be released during the long-term occupancy of the Project include oil, grease, and other materials deposited on the paved surfaces; discharges of household hazardous wastes such as cleaners, solvents, paint and automotive products; and runoff from landscaped areas, which may contain pesticides, herbicides and nutrients in fertilizers. In addition, heavy metals such as lead, zinc and copper are often found in urban storm water runoff.

To minimize the potential for long-term pollutant discharges, the Project includes a variety of Low Impact Development LID design features that are intended to reduce surface water quality pollutants through storm water treatment and hydro-modification control. The proposed LID design components include:

- A storm water bio-retention basin that would retain project site runoff water for infiltration to reduce post-development runoff discharges and to improve runoff water

quality. The majority of the post-development storm water runoff from the project site would be directed by storm drains to the bio-retention pond.

- A system of bioswales located throughout the project site. Approximately 70 percent of the runoff from project site's impervious surfaces would be directed to the vegetated swales.

- Mechanical filtration devices, such as catch basin inserts, incorporated in the on-site storm drain systems.

- Strategic placement of curbs adjacent to bioswales and the El Encanto Creek Streamside Protection Area to provide curb cuts to vegetated areas, where possible, to reduce concentrated runoff and allow additional soil contact time and infiltration.

- Retaining open space and vegetation along El Encanto Creek, and using permeable pavers and ground surfaces where appropriate, which minimizes runoff volumes and peak flows, and facilitates water percolation into the ground and filtration.

Clean Water Act Section 303(d) does not identify El Encanto Creek as being a water body with impaired water quality, however, El Encanto Creek is a tributary of Devereux Creek, which is listed as a water quality limited segment due to pathogens (fecal coliform) and nutrients (low dissolved oxygen). The Project would be connected to a public sewer system, therefore, the Project would not be a substantial source of pathogens. In addition, proposed mitigation measure HWQ-1a requires the Project to provide "mutt mitt" dispensers and trash receptacles along the proposed on-site trails, which would be an effective source control of pathogen discharges by limiting pet waste accumulations on the project site. Off-site discharges of nutrients would be controlled by the proposed bio-retention basin and bioswales, which promote the removal of sediment-bound nutrients (fertilizers), as well as trace metals, some pesticides, and other pollutants. The bio-retention basin and catch basin inserts, which would be installed on the project site, are also effective at removing organic debris such as leaves and other vegetation that can create a high biochemical oxygen demand in water bodies when the organic matter decays.

The preliminary drainage plan prepared for the Project identifies various LID measures that with appropriate design and maintenance would substantially reduce the potential for the Project to result in significant water quality impacts. As described in Section 5.7.2 above, the Project would be required to implement an approved project-specific Storm Water Quality Protection Plan and the applicant would be required to enter into a storm water facility maintenance agreement with the City. In addition, proposed mitigation measure HWQ-1a requires that the Storm Water Quality Protection Plan include the installation of "mutt mitt" dispensers and trash receptacles along the proposed on-site trails, which would reduce the potential for downstream pathogen-related impacts to Devereux Creek. With the implementation of an approved Storm Water Quality Protection Plan and identified mitigation requirements, the Project would not impair the beneficial uses of a receiving water body; would not result in a discharge of pollutants into an impaired waterbody; result in a discharge of pollutants of concern

to a receiving water body; or otherwise substantially degrade water quality. Therefore, the water quality impacts of the Project are **potentially significant and mitigable (Class II)**.

Conservation Element Policy CE 2.2, Streamside Protection Areas, indicates that a 100-foot buffer along El Encanto Creek is to be provided on the project site. The Policy also indicates that a reduction in the width of the buffer may considered if the reduction is consistent with specified criteria. As allowed by the Policy, the Project application includes a request to reduce the width of the buffer to 50 feet on portions of the project site. Certain uses are allowed in Stream Protection Areas, and the proposed bio-retention basin, a proposed decomposed granite pathway, and proposed habitat restoration activities that would include planting native vegetation, are uses that may be allowed in the on-site SPA. The proposed bio-retention basin would not result in the removal of riparian vegetation, and discharges of water from the basin in excess of the 95th percentile 24-hour storm to El Encanto Creek would occur in a controlled manner over a rip rap energy dissipater. With the implementation of existing city regulations and development standards described above, the Project's potential long-term water quality impacts would be reduced to a less than significant level, and the operation of the proposed bio-retention basin would not result in long-term water quality (erosion and sedimentation) impacts to El Encanto Creek. Therefore, the requested reduction of the on-site SPA along El Encanto Creek would result in **less than significant (Class III)** water quality impacts.

Storm Water Flows and Drainage

On-Site Drainage. The Project would increase the amount of impervious surface on the project site by more than 25 percent (significance threshold 'm"), and would have the potential to result in potentially significant increases in the volume and rate of flow of storm water runoff from the project site. The Project is categorized as a "large development" under the CCRWQCB Post Construction Requirements (Table 5.7-1). Large development projects are subject to the requirements of Performance Requirement 3, which requires the retention of storm water runoff from rain events up to the 95th percentile event. This equals 2.17 inches of rainfall within a 24-hour period, and a detention volume of approximately 12,340 cubic feet would be required for the Project. The proposed bio-detention basin would be designed to accommodate up 17,965 cubic feet, with the outlet pipes raised to an elevation that provides for 12,340 cubic feet of detention capacity. The Project would also implement other LID measures in compliance with Performance Requirements 1, 2, and 4, which are also required for large development projects and would minimize the impacts of runoff and peak flows. The expected post-development storm water runoff drainage patterns along with the proposed water quality treatment and detention facilities are shown on EIR Figure 3.5-6 (Proposed Drainage Plan).

Storm water runoff from on-site paved surfaces and driveways would be conveyed to openings in curbs and gutters, and then to the vegetated bioswales where practicable, or to on-site storm drain systems. Roof runoff would outlet to the surface and where feasible be directed to proposed vegetated areas. Roof runoff in the eastern and southern portions of the project site would be directed to on-site storm drain systems. Should the proposed on-site storm drainage systems fail, the proposed site grades would provide safe overland flow release routes via the

swales and the streets that would convey the 100-year post-development runoff on the surface, away from structures to the bio-detention basin or to the southeast corner of the project site.

Off-Site Drainage. An existing drainage ditch is located south of the project site and adjacent to Calle Real. In the area where the project site entrance road would be located, the ditch is approximately 13 feet deep. To construct the required parkway and sidewalk in the Calle Real right-of-way, the portion of the ditch located between the Project's entrance driveway and the southeastern corner of the project site would be filled and replaced with an underground storm drain and catch basins.

Off-site runoff flowing onto the project site would be conveyed through the site and exit at its historical locations. Storm water runoff from the properties to the north would be intercepted and conveyed west in its historical direction of flow towards El Encanto Creek in a concrete swale behind a retaining wall along the northern perimeter of the project site. Roadside drainage from Puerto Drive would be conveyed southerly to the on-site streets and bioswales, and through the bio-detention basin. A portion of the storm water runoff from the developed properties to the east would be intercepted in a graded swale behind a retaining wall along the eastern project site perimeter and directed to the southeastern corner of the project site.

A hydrology analysis was conducted to estimate the project-related runoff rates for the 5-, 10-, 25-, 50-, and 100-year storm events for pre- and post-development conditions. Estimated pre- and post-development peak runoff rates for each of the on-site drainage watersheds during the design (25-year) storm and the 100-year storm are shown in Table 5.7-2.

Table 5.7-2
Pre-Project and Post-Project Peak Flows

Drainage Areas		Storm Event and Runoff (cubic feet per second)		Storm Event and Runoff (cubic feet per second)	
		25-year storm Pre-Development	25-year Post-Development	100-year Pre-Development	100-year Post-Development
Creek	1A	5.11	2.6	6.17	3.14
	1B	0.86	1.54	1.06	1.89
Ditch & Storm Drain	2A	29.1	5.99	35.13	7.15
	2B	1.18	1.18	1.39	1.39
	2C	4.38	4.38	5.35	5.35
	2D	1.02	0.12	1.24	0.15
Basin	3	X	27.65	X	32.99
Totals		**41.65**	**43.46**	**50.34**	**52.06**

Source: Triad/Holmes, 2010

Table 5.7-2 indicates that the Project would result in relatively small increases post-development storm flow when compared to existing conditions at the project site. As proposed, however, approximately 95 percent of the storm water runoff from the project site would be

conveyed to the proposed bio-retention basin. The water release rate from the basin would be metered through the use of an appropriately sized outlet structure, such as a drain pipe, orifice, or weir so that discharges from the project site are similar to the pre-development runoff discharge rates. Water from the basin would be discharged to El Encanto Creek over a rip-rap energy dissipater, which would minimize the potential for discharge-related erosion impacts, and the basin would be designed to completely empty within 48 to 72 hours of the commencement of a storm event.

As described above, the preliminary drainage plan prepared for the Project would substantially reduce the potential for the Project to result in significant storm water flow and drainage-related impacts. With the implementation of existing regulation and the City's development standards, the Project would not substantially alter existing drainage patterns or result in substantial erosion or siltation; substantially increase the rate or amount of surface runoff that would result in flooding on- or off-site; and runoff from the site would not exceed the capacity of existing or planned storm water drainage systems. Therefore, the drainage impacts of the Project would be **less than significant (Class III)**.

Groundwater Recharge. The surface and subsurface soils at the project site consist of clayey sands and sandy clays that do not percolate well. Therefore, groundwater recharge on the portion of the project site that would be used for structural development appears to be minimal. Groundwater recharge that does occur at the site would generally be along El Encanto Creek. The Project would retain El Encanto Creek in its existing condition and storm water flows to the creek through the proposed bio-retention basin would be similar to existing conditions. Therefore, the Project would not substantially interfere with regional groundwater recharge and impacts to groundwater levels in the project area would be **less than significant (Class III).**

Flooding

The project site is outside of the 100-year floodplain and not subject to inundation from 100-year floodwaters. Runoff from the project site would be released from the proposed bio-detention basin at a rate that is similar to existing conditions. Therefore, the Project would not place housing in a 100-year flood hazard area, and would not impede or redirect flood flows, and the Project would result in **less than significant (Class III)** flooding impacts.

5.7.5 Cumulative Impacts

Cumulative projects in the Goleta area could result in the development of 2,368 additional residential units and more than 1.68 million square feet of non-residential uses. This cumulative development would have the potential to result in additional new sources of water pollution, would increase the amount of impervious surface area, and would have the potential to increase runoff water volume and peak flows. In addition, cumulative development in the western areas of Goleta would have the potential to contribute to the impaired water quality conditions of Devereux Creek.

Similar to the Project, other future development projects would be required to implement best management practices in accordance with City, State and Federal requirements. These requirements include the preparation and implementation of a SWPPP for projects located on sites greater than one acre in size, and compliance with the CCRWQCB post-construction storm water management requirements. With the implementation of these requirements by the Project and other cumulative development, cumulative water quality and drainage impacts would be minimized and the Project's contribution to short- and long-term water quality and drainage impacts would not be cumulatively considerable. The Project would not be located in a 100-year flood area, and since the Project would not increase peak storm water flows leaving the site, it would not contribute to downstream flooding-related impacts. Therefore, the Project would have **less than significant (Class III)** cumulative impacts related to water quality, drainage and flooding.

5.7.6 Mitigation Measures

Impact HWQ-1 The use of pedestrian trails and open space areas on the project site by dog owners would have the potential to result in downstream pathogen-related water quality impacts to Devereux Creek.

HWQ-1a. Pet Waste Source Control Measure. The Storm Water Quality Protection Plan and Maintenance Agreement prepared for the Project must include provisions for the Project's Homeowner's Association to provide and maintain "mutt mitt" dispensers and trash receptacles on the project site. At minimum, dispensers and trash receptacles are to be provided at each of the three public path entrance/exit points on the project site.

Timing: The permittee must secure approval of a Storm Water Quality Protection Plan from the Public Works Director, or designee, and execute a maintenance agreement before the City issues any grading permit. All requirements of the Storm Water Quality Protection Plan shall be installed and operational prior to occupancy clearance.

Monitoring: City staff will verify that required dispensers are installed on the project site consistent with the approved Storm Water Quality Protection Plan prior to occupancy clearance.

Residual Impact. The Project's water quality impacts would be substantially reduced by proposed LID design features, such as the bio-retention basin, bioswales, and storm water catch basin inserts. The potential for the Project to contribute to downstream pathogen-related water quality impacts in Devereux Creek would be reduced to a less than significant level with the installation and maintenance of facilities that promote pet waste collection and proper disposal.