SECTION 4.8

Hydrology and Water Quality

4.8 HYDROLOGY AND WATER QUALITY

The analysis presented in this section assesses impacts to surface water drainage, surface water and groundwater quality, and flooding resulting from construction and operation of the project. It is based on a preliminary hydraulic analysis conducted for the project site in 2011, a third party technical review of that analysis, the project's grading and drainage plans, and additional information from available publications and data from various regional and local sources.

A *Revised Preliminary Hydraulic Report for Willow Springs II* (MAC Design Associates, May 2011, referred to herein as the MAC Design Hydraulic Report) was prepared as a revision of a 2009 report for the project to calculate the water runoff from within the project site and describe proposed designs to meet flood control and water quality standards (this report is included in **Appendix F**). The project includes a Preliminary Grading and Drainage Plan, as shown in Figure 2-9 in Section 2.0 *Project Description*, which depicts the locations of the interior storm drains. A third party review was conducted by Wilson Geosciences, Inc. to confirm the findings of the report, which included an evaluation of the completeness and qualitative accuracy of the proposed Drainage Plan. The findings of this review are incorporated in this section.

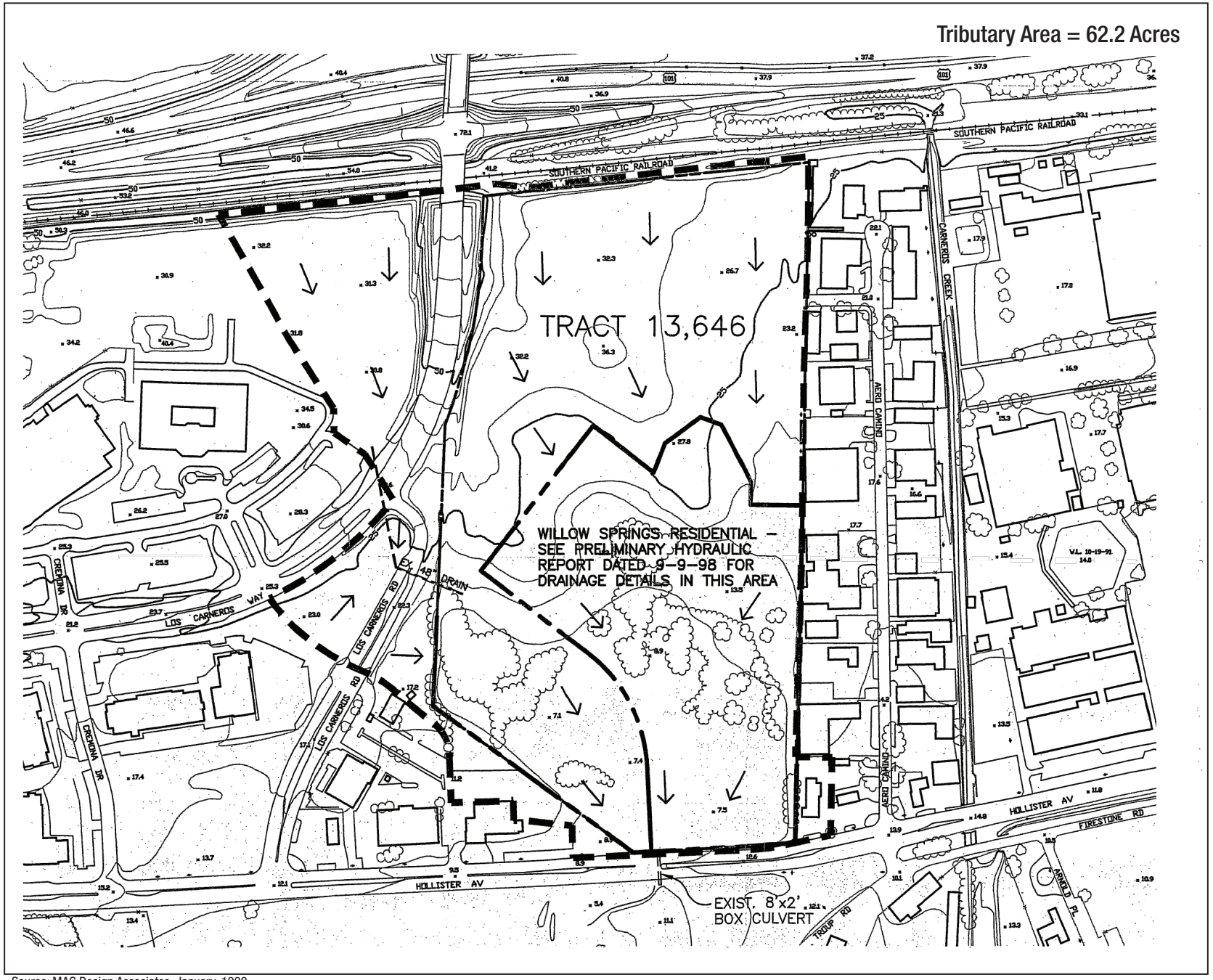
4.8.1 Existing Conditions

Environmental Setting

Regional and Local Hydrology

Santa Barbara County is divided into five major watersheds, each varying in their dominant geography and by types and quality of water supply. The project site is situated on a coastal plain and lies within the 45 square-mile Goleta Slough watershed, a coastal wetland that drains the southern flank of the Santa Ynez Mountains. This primary watershed is subdivided into five secondary watersheds, each one associated with a drainage basin. From west to east, these drainage basins are Tecolotito, Los Carneros, San Pedro, San Jose, and Atascadero. These creeks and their respective tributary systems drain portions of the Santa Ynez Mountains and the Santa Barbara coastal basin area, transporting water to the Pacific Ocean by way of the Goleta Slough.

The project site is located within a 62.2-acre tributary area of the Los Carneros Creek watershed. This tributary area is shown in **Figure 4.8-1**. The Los Carneros Creek watershed drains approximately 2,641 acres total and is capable of generating 3,500 cubic feet per second (cfs) of flood flow during a 100-year return period event. Lake Los Carneros (located north of the project site, north of US-101) is located within the watershed, but traps very little sediment in relation to the total watershed. Los Carneros Creek originates from the Santa Ynez foothills and flows generally north to south through the City of Goleta (City) toward the Goleta Slough. It runs parallel to the US-101/UPRR right-of-way, north of the project site, and south through a concrete channel in the Aero Camino industrial area, east of the site. It then runs westerly parallel to Hollister Avenue to the south of the project site. Runoff from the 62.2-acre tributary area that includes the project site, Willow Springs I, and Willow Springs North, along with other surrounding areas, runs southerly through the Los Carneros Wetland before entering a culvert under Hollister Avenue and discharging into Los Carneros Creek. The existing sediment basin located on Los Carneros Creek downstream of Hollister Avenue traps most of the sediment before runoff ultimately enters the Goleta Slough.



Source: MAC Design Associates, January, 1999.

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Post-Development Drainage Conditions

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FIGURE 4.8-1

The State Water Resources Control Board (SWRCB), through its Regional Water Quality Control Board's Basin Plan for the Central Coast Region, identifies the beneficial uses of the inland and coastal waters (surface and groundwaters) in the vicinity of the project. The beneficial uses of the inland waters of the Goleta Slough as identified by the SWRCB include, among other things: Municipal and Domestic Supply, Agricultural Supply, Groundwater Recharge, Cold and Warm Fresh Water Habitat, and Freshwater Replenishment.[1] This slough is one of the few coastal wetlands that remain in California and is designated as a California Critical Coastal Areas impaired estuary.

On-Site Surface Hydrology

The MAC Design Hydraulic Report describes the existing drainage patterns for the area that includes the project site along with the Willow Springs North and Willow Springs I properties. These properties are generally flat with some minor variation in topography due to prior grading and earthen stockpiles. Elevations on the project site range from approximately 20 (southeast portion of site) to 36 feet (northeast portion of site) above mean sea level, sloping gradually from north to south. The Willow Springs II project site does not include any major drainages or other hydrological features, such as wetlands.

Presently, stormwater runoff from the project site and surrounding area is collected by area surface drains and conveyed through previously installed underground drains (primarily two storm drains referred to as lines "A" and "C") to outlet into the Los Carneros Wetland, and ultimately to the Goleta Slough. The Los Carneros Wetland serves as a retention basin and bio-filter for stormwater flows from the project site, Willow Springs I, and limited surrounding areas. The Los Carneros Wetland is an approximately 7.25-acre wetland/stormwater retention basin located along the southwest boundary of the Willow Springs I residential community.

Project Site Surface Water Runoff Quantity

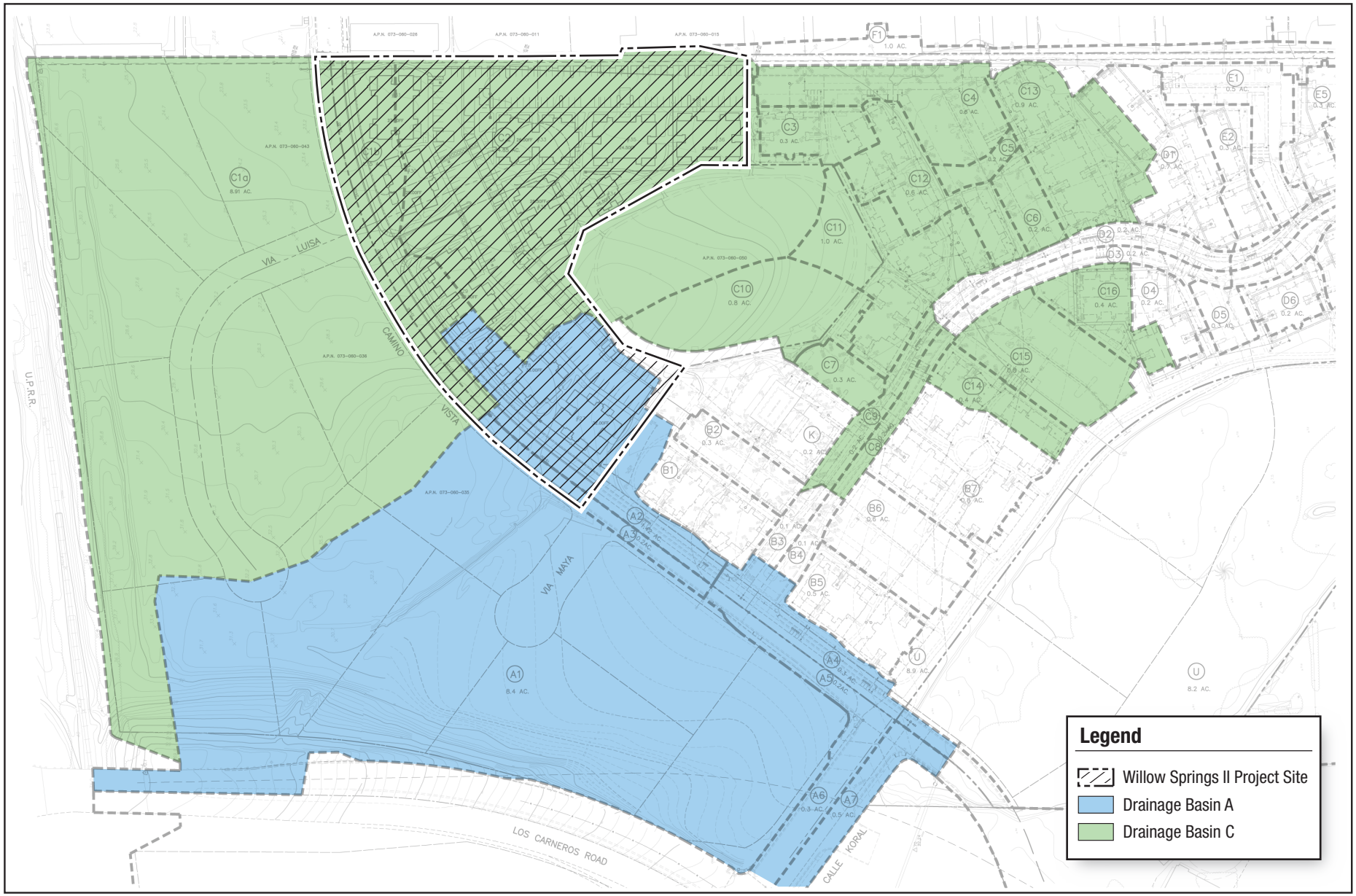
The MAC Design Hydraulic Report calculated existing surface runoff volume for the project site and surrounding tributary areas that contribute to the storm drain system affected by the project. The tributary areas are shown in the drainage plan included in this report and reproduced here as **Figure 4.8-2**. The runoff discharges into the Santa Barbara County Department of Public Works and City storm drain system in the project area and within the Los Carneros Creek watershed. As shown in **Table 4.~~7~~8-1**, the current estimated 25-year peak flow to the County's Department of Public Works and City of Goleta storm drains is 95.1 cfs.

Table 4.8-1
Estimated 25-Year Storm Pre-Development Peak Flow Quantities[a]

Existing Storm Drain	Drainage Area (Acres)	Peak 25-Year Storm (cfs) Pre-Development
A	23.3	45.2
C	22.01	49.9
Totals	**45.31**	**95.1**

[a] *Revised Preliminary Hydraulic Report for Willow Springs II,* MAC Design Associates, 2011.

[1] State Water Resources Control Board (SWRCB) (1994).



Source: MAC Design Associates, June 30, 2009.

Drainage Plan

FEET 0 100 200

FIGURE 4.8-2

Project Site Surface Water Runoff Quality

As described above, the Los Carneros Creek watershed is a primary surface drainage system. Water quality within the Los Carneros Creek watershed is affected by a number of proximal sources, both point and non-point, including surface water runoff, septic system seepage, and effluent discharges.

Tecolotito (Glen Annie) Creek and Los Carneros Creek are perennial waterways. An October 2006 update to the 303(d) List of Water Quality Limited Segments indicates both creeks are now considered impaired.[2] Los Carneros Creek is now impaired from ammonia (unionized) with an unknown source and Glen Annie Canyon is now impaired from nitrate (NO_3) with an unknown source. Both creeks drain into Goleta Slough, which is designated as impaired by the Central Coast Regional Water Quality Control Board (CCRWQCB), but the Basin Plan does not identify any specific pollutant point sources contributing to conditions in Goleta Slough (CCRWQCB, 2002). The designation of Goleta Slough is due to either the potential for long-term loss of the designated beneficial use, short-term impairment of the designated beneficial use, or general degradation of water quality. The 303(d) pollutants/stressors for Goleta Slough include contamination from priority organics (non-point sources) and pathogens (urban runoff and storm sewers).

The Los Carneros Creek watershed supplies most of the fresh water flow into the Goleta Slough wetland, and thus has the greatest influence on water quality. There are limited agriculture uses and limited areas of commercial or residential areas in its watershed, particularly north of Highway 101. In addition to dissolved metals (copper, mercury, zinc) and pesticides (chlorpyrifos and diazinon), other contaminants can be detected in multiple storm events, some at concentrations below minimum standards. Specifically, sediment is one of the primary sources of pollutants since bacteria, metals, hydrocarbons, and organic matter can adhere to sand, silt, and clay particles. If these sediment particles are transported downstream, the pollutants are transported as well. An estimate of sediment transported from the site under undeveloped conditions will approximate post-development conditions of sediment transport, with some exceptions. However, it is important to consider that these contaminants (including dissolved metals) typically migrate substantially faster than transported sediments since not all pollutants are carried in this manner.

In general, urban stormwater runoff occurs during and shortly following precipitation events. In addition to sediment, stormwater from developed areas may include such contaminants as trash, bacteria, metals, organic pollutants, and pesticides. The source of contaminants is more diffuse and includes all areas where precipitation falls, as well as the air it falls through. Therefore, contaminants on roads, maintenance areas, parking lots, and building tops, which do not usually contribute to dry weather urban runoff, may be carried with stormwater into the surface water system.

Groundwater Hydrology and Quality

The Goleta Groundwater Basin (GGWB) is bounded on the north by the Santa Ynez Mountains and on the south by the More Ranch fault. It is approximately eight miles long and three miles wide. The Basin is subdivided into “North-Central Basin” and the “West Basin”, which underlies the project site **(Figure 4.8-3)**. Water that contains high levels of total dissolved solids is

[2] State Water Resources Control Board: http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r3_06_303d_reqtmdls.pdf, accessed July 2011.

Source: City of Goleta, September, 2006.

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Goleta Groundwater Basin and Subbasins

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FIGURE 4.8-3

present in the shallow aquifers above the confining layers. The majority of useable groundwater in storage in the GGWB is present within the Central Sub basin, which is about 4 miles long and 2 miles wide. The North and Central sub-basins are believed to have a combined total of about 30,000 to 60,000 acre-feet of operational storage. Data obtained from wells located throughout the GGWB indicate that groundwater levels have been increasing throughout the basin since 1991, but remained at depths below sea level as of 2004.

Basin groundwater quality is characterized as being of a calcium bicarbonate nature with total dissolved solid (TDS) concentrations ranging from 700 to 800 milligrams per liter (mg/L). Specifically, in the GGWB, TDS concentrations range from 617 to 929 mg/L. Average TDS for the basin is about 755 mg/L (SBCDPW, 2004).

Recharge in the basin is from infiltration of precipitation, seepage from streams, and subsurface inflow, as well as from water imported from Lake Cachuma. Groundwater levels decline and/or rise from year to year depending upon recharge and pumping. Several wells, both private and municipal, are scattered throughout the GGWB. The Santa Barbara County Water Agency estimated available usable storage in the West Basin at approximately 10,000 acre-feet for water years 1999 through 2000 and safe yield (gross pumpage) at about 500 acre-feet per year. In past years, private wells extracted approximately 232 acre-feet per year from the West Basin.

Flood Hazards

Los Carneros Creek may be periodically subject to flooding. According to FEMA Flood Insurance Maps, sites located in the Los Carneros Creek watershed are primarily located within FEMA Map Zone AE, consisting of areas where the "floodway is the channel of a stream plus any adjacent floodplain areas which must be kept free of encroachment so that the 1 percent annual chance flood can be carried without substantial increases in flood heights." The project site is not within a flood protection district as designated by Santa Barbara County, or an area of special flood hazard as designated in the City Fire, Flood and Tsunami Hazards Map (General Plan Figure 5-2). Therefore, the project site is not subject to inundation from 100-year floodwaters. The project site may be susceptible to local sheet flooding or rill flooding[3] during particularly heavy rainfall, but not overland flooding.

Hollister Avenue, immediately south of the project site is subject to periodic flooding, primarily as a result of insufficient capacity of channels on the airport property to accommodate peak stormwater flows.

The project site is not located within the City's Potential Tsunami Run-Up area, based on new mapping information developed by California Emergency Management Agency.[4] A City-wide General Plan Amendment (11-GP-081) will update Figure 5-2 of the City's General Plan to reflect the most up to date tsunami run-up mapping information provided by the California Emergency Management Agency.

[3] Rill flooding occurs when runoff is concentrated in small-scale downhill grooves.

[4] State of California, 2009, *Tsunami Inundation Map for Emergency Planning*, Goleta Quadrangle, Santa Barbara County; produced by California Emergency Management Agency, California Geological Survey, and University of Southern California – Tsunami Research Center; dated January 31, 2009.

Regulatory Setting

Federal Regulations

Title 33 of the United States Code, Sections 1251 *et seq.* (Clean Water Act)

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. As such, the CWA forms the basic national framework for the management of water quality and the control of pollutant discharges. The CWA sets forth a number of objectives in order to achieve the above-mentioned goals. The CWA objectives include regulating pollutant and toxic pollutant discharges; providing for water quality which protects and fosters the propagation of fish, shellfish and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of non-point sources of pollution.[5]

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.

Section 303(d) of the CWA requires identification and listing of water-quality limited or "impaired" water bodies where water quality standards or receiving water beneficial uses are not met. Once a water body is listed as "impaired," total maximum daily loads (TMDLs) must be established for the pollutants or flows causing the impairment.[6] Once established, the TMDL allocates the loads among current and future pollutant sources to the water body. In general, where urban runoff is identified as a significant source of pollutants causing an impairment and is subject to load allocating, the implementation of, and compliance with, the TMDL requirements are administered through a combination of individual Industrial Stormwater Permits, the General Industrial and General Construction Stormwater Permits, and the County of Santa Barbara's municipal stormwater NPDES program. The Environmental Protection Agency has delegated the responsibility for administration of portions of the CWA to state and regional agencies, including the State of California; therefore, the primary regulations resulting from the CWA (i.e., NPDES program) are discussed in the state and local regulation discussions that follow.

Federal Anti-Degradation Policy

The Federal Anti-degradation Policy (Section 303(d) of the CWA, and further detailed in Title 40 of the Code of Fedral Regulations, Section 131.12) requires states to develop statewide anti-degradation policies and identify methods for implementing them.[7] Pursuant to the Code of Federal Regulations, state anti-degradation policies and implementation methods shall, at a minimum, protect and maintain: (1) existing in-stream water uses; (2) existing water quality where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding

[5] Non-point sources of pollution are carried through the environment via elements such as wind, rain, or stormwater and are generated by diffuse land use activities (such as runoff from streets and sidewalks or agricultural activities) rather than from an identifiable or discrete facility.

[6] 33 United States Code §1313(d)(c).

[7] 40 Code of Federal Regulations §131.12.

national resource. State permitting actions must be consistent with the federal Anti-degradation Policy.

State Regulations

California Water Code, Sections 13000 *et seq.* (Porter-Cologne Water Quality Control Act)

The State of California is authorized to administer federal law or state-enacted laws regulating water pollution within the state. The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) was enacted in 1969 by the State of California. The Porter-Cologne Act includes provisions to address requirements of the CWA. These provisions include NPDES permitting, dredge and fill programs, and civil and administrative penalties. The Porter-Cologne Act is broad in scope and addresses issues relating to the conservation, control, and utilization of the water resources of the state. Additionally, the Porter-Cologne Act states that the quality of all the waters of the state (including groundwater and surface water) shall be protected for the use and enjoyment by the people of the state.

The State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) are agencies within the umbrella structure of the California Environmental Protection Agency. The SWRCB has the principle 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 regional board that oversees water quality permitting in the City of Goleta (City) where the proposed development is located. 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. It has been amended, but not updated since 1994.

Section 13050 of the California Water Code defines what is considered pollution, contamination, or nuisance. Briefly defined, pollution means an alteration of water quality such that it unreasonably affects the beneficial uses of water (which may be for drinking, agricultural supply, or industrial uses). Contamination means an impairment of water quality to the degree that it creates a hazard to the public health. Nuisance is defined as anything that is injurious to health, is offensive to the senses, or is an obstruction to property use, and which affects a considerable number of people.

Discharge Permits

The SWRCB has issued a statewide NPDES General Permit for stormwater discharges associated with construction activities (known as the Construction General Permit [SWRCB Order No. 99-08-DWQ]). Any project that disturbs an area more than 1 acre requires a Notice of Intent (NOI) to discharge under the Construction General Permit. The Construction General Permit includes measures to eliminate or reduce pollutant discharges through implementation of a Stormwater Pollution Prevention Plan (SWPPP), which describes the implementation and maintenance of best management practices (BMPs) to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction. The Construction General Permit contains receiving water limitations that require stormwater discharges to not cause or contribute to a violation of any applicable water quality standard. The permit also requires implementation of programs for visual inspections and

sampling for specified constituents (e.g., non-visible pollutants). Any construction activities under the proposed project that disturb more than one acre would be covered under the Construction General Permit.

To minimize the impact of stormwater discharges from industrial facilities, the NPDES stormwater program also includes an industrial stormwater permitting component. Operators of industrial facilities are required to have authorization under an NPDES industrial stormwater permit.

The CCRWQCB issues combined NPDES Permits under the CWA and California Water Code to all point source dischargers of waste to surface waters.[8] 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 stormwater discharges.

State Antidegradation Policy

The SWRCB adopted Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (more commonly referred to as the state Antidegradation Policy), which restricts the degradation of surface waters of the state and protects bodies of water where the existing water quality is higher than necessary for the protection of present and anticipated designated beneficial uses. This state policy is generally consistent with the subsequently adopted federal Antidegradation Policy discussed previously. The state Antidegradation Policy is implemented by the CCRWQCB.

City of Goleta Regulations

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's Storm Water Management Plan (SWMP). The Goleta SWMP was created pursuant to SWRCB General Permit No. CAS000004 for NPDES Phase II.[9]

The SWMP outlines the means by which the City will: (a) protect the health of the recreational public and the environment, (b) meet CWA mandates through compliance with Phase II NPDES Permit requirements and applicable regulations, and (c) foster increased public involvement and awareness. Water quality monitoring has been conducted to define pollutants in many watersheds resulting in identification of bacteria, nutrients, pesticides, sediment, and heavy metals as pollutants of concern in certain drainages. Storm drains may empty into drainages having already passed through land uses such as natural open space, residential, agricultural, commercial, and industrial.

The purpose of the SWMP is to implement and enforce a program designed to reduce the discharge of pollutants to the "maximum extent practicable" (MEP) to protect water quality. According to the General Permit, the MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. Since knowledge about controlling urban runoff continues to evolve, so does the mitigation, which constitutes the MEP. Reducing the discharge of storm water pollutants to the MEP in order to protect beneficial uses requires

[8] *"Point dischargers" indicate individual, identifiable sources of waste.*
[9] City of Goleta Storm Water Management Plan, February 2010.

review and improvement, which includes seeking new opportunities. To do this, the City must conduct and document an evaluation and assessment of each relevant element of its program and revise, as necessary, activities, control measures, BMPs, and measurable goals to meet the MEP.

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. Project Clean Water is managed and staffed by the Santa Barbara County Water Agency (Public Works Department) and the Environmental Health Services Division of the Public Health Department, who are available to work closely with the City as needed for access to water quality information.

Goleta's General Plan addresses water resource issues and conditions within the City. The Conservation Element of the City's General Plan established policies that the City will implement with regard to its operations, including regulation of new development. These Conservation Element policies and the objectives that relate to water resources are as follows:

CE 2: Protection of Creeks and Riparian Areas
Objective: Enhance, maintain, and restore the biological integrity of creek courses and their associated wetlands and riparian habitats as important natural features of Goleta's landscape.

CE 3: Protection of Wetlands
Objective: To preserve, protect, and enhance the functions and values of Goleta's wetlands.

CE 10: Watershed Management and Water Quality
Objective: To prevent the degradation of the quality of groundwater basins and surface waters in and adjacent to Goleta.

CE 15: Water Conservation and Materials Recycling
Objective: To conserve scarce water supply resources and to encourage reduction in the generation of waste materials at the source and recycling of waste materials.

The General Plan policies meet the intent of the Santa Barbara County Flood Control and Water Conservation District Ordinance 3095 Chapter 15B Development Along Watercourses (watercourse setback ordinance), which is to: (a) prevent undue damage or destruction of development by flood waters; (b) prevent development on one parcel from causing undue detrimental impact on adjacent or downstream properties in the event of flood waters; and (c) protect the public health, safety and welfare. During a project's permitting stage it is necessary for the City and the Santa Barbara County Flood Control and Water Conservation District to coordinate on flood related issues that may impact areas and properties downstream, (e.g. City requirements relative to project stormwater runoff and detention for the design storms).

4.8.3 Thresholds of Significance

CEQA's Appendix G and the City of Goleta's *Environmental Thresholds and Guidelines Manual* specify the following significance thresholds (these thresholds have been organized according to the topics addressed in this section).

Hydrology and Drainage

The project would result in a significant impact related to surface drainage if it would:

- a. 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 of amount of surface runoff in a manner that would result in flooding, increased erosion, or increased sedimentation onsite or offsite; or
- b. Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or increase runoff into naturally drained areas without storm drains.

Surface and Groundwater Quality

The project would result in a significant water quality impact if its construction or operation results in:

- c. Disturbance of one (1) or more acres of land if the project is located within an urbanized area of the County and the project construction or redevelopment individually or as a part of a larger common plan of development;
- d. An increase in the amount of impervious surfaces on a site by 25 percent or more;
- e. Channelization or relocation of a natural drainage channel;
- f. Discharge of pollutants that exceed the water quality standards set forth in the applicable NPDES permit, the Basin Plan or otherwise impairs the beneficial uses of a receiving waterbody;
- g. Results 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 Federal Water Pollution Prevention and Control Act (i.e., the CWA);
- h. Results in a discharge of pollutants of concern to a receiving water body, as identified in by the RWQCB; and
- i. Substantial degradation of groundwater quality.

4.8.4 Project Impacts

The project would include construction and operation of 100 multi-family residences and associated facilities. These facilities include access roads, driveways, surface parking lots, and landscape and hardscape areas, as well as drainage structures necessary to convey surface water across the project site to points-of-concentration along or outside the project site boundaries. More detailed discussion of these and other project elements, including landscaped areas, are discussed in Section 2.0 *Project Description*.

MAC Design Associates prepared a Preliminary Grading and Drainage Plan detailing proposed locations for site improvements including residences, access roads, driveways, landscape and hardscape areas, and drainage structures (See Section 2.0 *Project Description*).

Construction period and operational impacts related to hydrology and drainage, surface water and groundwater quality are described below.

Hydrology and Drainage[10]

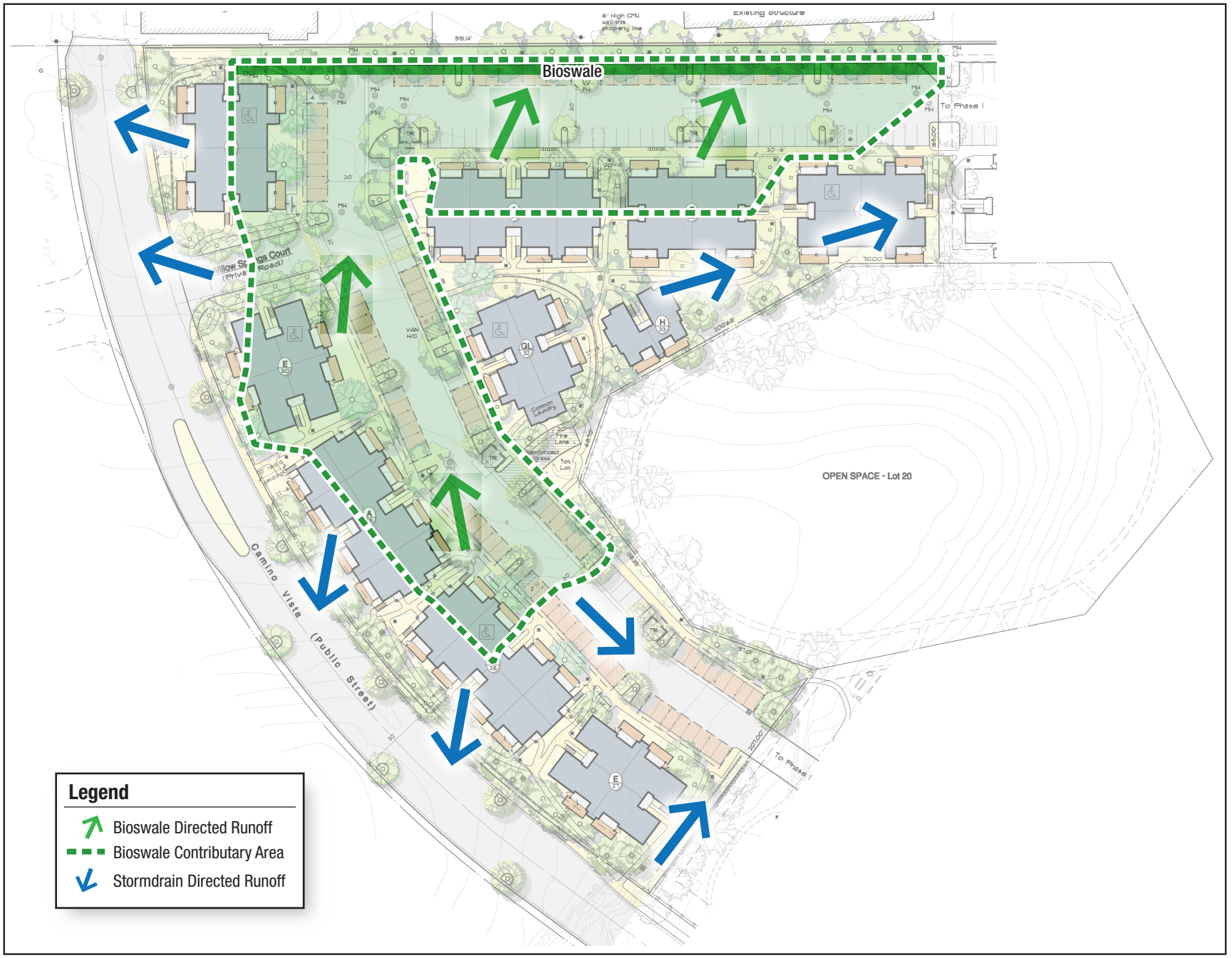
The project would require changes and/or modifications to existing on-site drainage patterns. The primary modification would be the re-direction of portions of the stormwater runoff that drains directly south toward the Willow Springs I development. Although this is a change to the on-site movement of surface water, new storm drain lines would be constructed to City Community Services requirements to adequately handle the change in project site drainage patterns.

Drainage from the proposed project site is tributary to the previously constructed Willow Springs I development situated immediately south of the project site. Storm drains that are constructed as a part of the proposed project would tie-in to the existing storm drains. According to the MAC Design Associates Hydraulic Report (2009), Willow Springs I accounted for the future development of the proposed Phase II project in the design of its storm drains and improvements to the Los Carneros wetland/retention basin.

As part of the approval process for Willow Springs I, the Los Carneros Wetland is approved for dual functions as a wetland habitat and as a retention basin, with sufficient capacity to retain stormwater runoff for both Willow Springs I and Willow Springs II behind a trapezoidal shaped dam called a Cipoletti weir. To allow for increased runoff from the 6-acre Willow Springs II development, the height of the weir for the retention basin would be raised 3 inches to ensure adequate runoff storage to accommodate additional flows from the project area as required by the City Community Services Director.[11] Furthermore, the project entails the creation of a vegetated on-site bio-swale along the eastern property line to filter stormwater runoff from the surface parking lots and other developed areas. The bio-swale would intercept runoff from within approximately 2.40 acres of the project area (40 percent), and direct it along the vegetated swale before entering the storm drain inlet at the southeast portion of the site. **Figure 4.8-4** illustrates the portion of runoff that would be directed to the bioswale at the eastern boundary before entering the storm drain system and the portions that would be flow directly to the storm drain system.

The stormwater drains and retention basin that serves the existing Willow Springs I community, were designed based on the hydraulic report for the entire Willow Springs development water basin area, inclusive of development of the Willow Springs II site. That previous hydraulic report for the site, that was used in developing Willow Springs I (included in Appendix F as the basis for the 2011 revised report for Willow Springs II), calculated the anticipated storm water runoff from development of the Willow Springs II site assuming commercial development would take place on the project site, which generates higher estimates of runoff compared to residential projects. However, since the project is now planned to be a residential development, it can be assumed that the first phase Willow Springs hydraulic report over-estimated the runoff that the Willow Springs II area would contribute to the Willow Springs I development storm drains and retention basin that were designed to accommodate it. Therefore, the Willow Springs I storm drains and retention basin have more than adequate capacity to accept drainage from the project.[12]

[10] Addresses Thresholds “a” and “b”.
[11] Personal communication to Mac Design Associates from City of Goleta Community Services Director. May 23, 2011.
[12] Mac Design Associates, *Revised Preliminary Hydraulic Report for Willow Springs II*, May 2011.



Source: Lenvik & Minor Architects, July 21, 2011.

WILLOW SPRINGS II

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Surface Runoff Distribution

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FIGURE 4.8-4

A hydrology analysis was conducted to estimate the project related increase in storm water runoff and its potential effects on existing surface drainage and storm drains. Estimated pre- and post-development peak runoff rates for each of the on-site drainage watersheds during the design (25-year) storm are shown in **Table 4.8-2**. Water quality calculations for the project are in accordance with the City Draft Hydromodification Control Standards.

Table 4.8-2
Estimated Future Stormwater Runoff Quantities

EXISTING STORM DRAIN[a]	DRAINAGE AREA (acres)			Q_{25} (cfs)		
	2002	*2009 (with project)*	*Change*	*2002*	*2009 (with project)*	*Change*
"A"	22.1	23.3	1.2+	42.6	45.2	2.6+
"C"	21.9	22.01	0.11+	47.1	49.9	2.8+
Total	**44.0**	**45.31**	**1.31+**	**89.7**	**95.1**	**5.4+**

[a] Location of Existing Storm Drains "A" and "C" are shown in Figure 4.8-2.

These estimates indicate that post development storm flow would result in relatively small increases over what exists currently at the project site. Per the Mac Design Hydraulic Report and Wilson Geosciences' review, the estimated increased flow generated by the project (5.4 cfs increase) would not result in total flow volumes that exceed the 48 cfs capacities of existing storm drains "A" and "C."[13]

The project would not result in the need for construction of new storm water drainage facilities off-site. Therefore, impacts associated with an increase in stormwater runoff volumes would be considered less than significant.

Surface and Groundwater Quality[14]

Potential water quality impacts include construction-related impacts (due to vegetation removal, use of construction materials on the site, and construction staging activities) and post-development impacts (including introduction of urban pollutants into stormwater runoff which is conveyed to the Los Carneros Wetland and the Goleta Slough). The project would involve site disturbance during construction of building, sidewalks, roadways, patios, landscaping, and associated facilities. For post-development impacts, the primary source of pollutants in stormwater runoff would be driveways and parking areas that carry oil, grease, and other materials deposited on the pavement surfaces, as well as discharge of liquid contaminants accumulating in uncovered or corroded trash enclosures. In addition, runoff from landscaped areas may contain pesticides, herbicides, and other chemical compounds. Therefore, the project has the potential to result in significant impacts to water quality in both the construction and post-development stages.

[13] Mac Design Associates, *Revised Preliminary Hydraulic Report for Willow Springs II*, May 2011.
[14] Addresses Thresholds "c", "d", and "f"-"h"

Construction[15]

Construction would involve grading of approximately 25,900 cubic yards of earthmoving and over 6 acres of disturbance on-site and well as stockpile removal from Willow Springs North involving 4.7 acres of potential surface disturbance in addition to the project site. This grading activity would involve vegetation removal and expose soil to erosion and potential for sedimentation of surface water bodies. Also, during on-site grading and building construction, hazardous materials such as fuels, paints, solvents, and concrete additives could be used. These hazardous materials require proper management and disposal. Improper management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into soils, surface water runoff and to the underlying groundwater.

Impacts would be minimized during all phases of project construction through compliance with the Construction General Permit (this permit is described above in the Existing Conditions section, under the headings Regulatory Setting, State Regulations, and Discharge Permits). This permit requires the development and implementation of a SWPPP, which must include erosion and sediment control BMPs that would meet or exceed measures required by the Construction General Permit, as well as BMPs that control other potential construction-related pollutants. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. A SWPPP would be developed as required by, and in compliance with, the Construction General Permit and City ordinances, including grading ordinances. The Construction General Permit requires the SWPPP include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment using the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT) and to protect water quality. These construction site management BMPs would be implemented for the project during the dry season and wet season as necessary depending upon the phase of construction and weather conditions. These BMPs could assure effective control of not only sediment discharge, but also of pollutants associated with sediments, including but not limited to nutrients, heavy metals, and certain pesticides or herbicides. The project is also expected to be subject to an NPDES permit from the Central Coast Regional Water Quality Control Board (CCRWQCB).

Until final plans are reviewed for adequacy of BMPs, including review of how CCRWQCB permit measures fit together with City BMP requirements, ~~I~~impacts to surface and groundwater quality as a result of construction activity are considered **potentially significant (WQ 1)**.

Operations[16]

Surface water quality impacts could occur as a result of project implementation under both dry weather and wet weather conditions. As a residential development, hazardous materials used and stored on the project site are limited to those typically associated with residential uses. Pool chemicals associated with the common area in Willow Springs I are under regulation of the County Environmental Health Services. Residential developments also generate waste in the forms of leftover paints, solvents, pesticides, herbicides, and cleaning and automotive products, which have the potential to be spilled or dumped into the storm drain system. In addition, the project would result in impermeable surfaces (buildings, driveways, parking lots, walkways, etc.)

[15] Addresses Thresholds "c"-"i"
[16] Addresses Thresholds "a" – "i"

covering a total of 3.5 acres of the development area, along with 1.08 acres of paved road surface for the extension of Camino Vista.

As planned, surface runoff would generally be directed into proposed storm drains within the project site, which would then distribute the water southwesterly with direct connections to the storm drain system in Willow Springs I. A portion of the runoff from the driveway and parking lots in the eastern portion of the site would initially flow east to the bio-swale running north-south to provide a cleanse of the water before it would enter the storm drain system of Willow Springs I. As described earlier in this section, runoff from the project site would be conveyed to the 7.25 acre Los Carneros Wetland via the storm drain connections within Willow Springs I. Specifically, runoff exiting from storm drain line "A" would drain through more than 500 feet of vegetated ~~open space~~area within the wetland, and runoff exiting from storm drain line "C" would drain through more than 950 feet of vegetated ~~open space~~area within the wetland, before being discharged into the Goleta Slough. This draining through the wetland would help to ensure runoff volumes meet LID standards for runoff retention within the established water basin, as well as secondarily providing additional water quality cleansing functions. The retention of peak stormwater runoff in this wetland ensures that the project would not result in significant flooding impacts from peak stormwater runoff events.

If untreated, pollutants from the project could be discharged into receiving waters. As stated previously, both the Goleta Slough and the Los Carneros Creek are "impaired" based on the CCRWQCB criteria. To address the potential for pollutant discharges into these impaired water bodies during project operations, the project includes a preliminary set of Low Impact Development (LID) design components described in the project hydraulic report to reduce surface water quality pollutants. These include:

- Fossil Fuel Filters would be installed on the drainage inlets;
- Runoff from a portion of the parking lots would be drained through an on-site vegetated bio-swale located along the east property line;
- Runoff would flow across a vegetated bio-swale for more than the City of Goleta minimum of 100 feet. Runoff would flow across the on-site vegetated bio-swale for over 500 feet and/or over 950 feet through Los Carneros Wetland/retention basin; and
- Runoff from the Los Carneros Wetland/retention basin is metered off-site with a Cipoletti Weir so that post-development flows are at or below pre-development flows.

In addition to these Low Impact Design (LID) components, the project includes a preliminary set of BMPs, such as planted and semi permeable hardscape areas that would assist with absorption of storm runoff from the site. Also, runoff from hardscape, roofs, permeable and non-permeable landscape, and other surfaces would pass through insert filters in drop inlets before passing to the Los Carneros Wetland/retention basin via the storm drain. As a result, according to the MAC Design Hydraulic Report, contact times that exceed the minimum requirements of 10 minutes during the occurrence of a 4-hour time period (BMP storm) would be achieved. The required flow rate for flow-through based storm water quality treatment facilities was calculated using the guidelines in the City's Draft Hydromodification Control Standards for new development projects. Prior to implementation of BMPs and LID components, the contact time for a water quality flow rate in Drainage Area "A" of 4.75 cfs through a bio-swale 10-feet wide by 1-foot deep by 950 feet long at an average slope of 0.58-percent is 86.3 minutes. For Drainage Area "C", it was calculated at 75.3 minutes. This exceeds the minimum requirements of 10 minutes established by the City. Based on the

Revised Preliminary Hydraulic Report[17] for the project, City of Goleta, Community Services has determined that the project can meet the City's Draft Interim LID standards.

Until final plans are reviewed for adequacy, long-term operation of the project is considered to result in **potentially significant** surface water quality impacts (**Impact WQ 2**).

4.8.5 Cumulative Impacts[18]

Several projects are proposed for development within the general vicinity of the proposed project, as described in Section 3.0 *Related Projects.* These related projects represent a mix of residential and commercial developments, which will result in various changes in the amount of impervious surfaces and the degree of potential surface water quality degradation that could occur. The Los Carneros Wetland serves dual functions of a biological habitat and a stormwater retention basin. Because peak stormwater runoff from the project will be retained within the wetland/stormwater treatment area, the project's contribution to increased runoff and flooding from cumulative development will be less than considerable and will not result in significant flooding related impacts. The project in combination with continued growth including redevelopment, infill, and urbanization of the South Coast Hydrologic Unit may have significant cumulative water quality impacts to the Los Carneros Creek watershed and the Goleta Slough. Given that these water resources are impacted currently, the project's contribution to cumulative impacts to surface water and groundwater quality would be **potentially significant (WQ 3)**.

4.8.6 Mitigation Measures

Water Quality Impacts During Construction (Impact WQ 1)

WQ 1-1 The permittee shall prepare a Storm Water Pollution Prevention Plan (SWPPP) covering all phases of grading operations.

Plan Requirements: The SWPPP shall be prepared by a licensed civil engineer and incorporate all appropriate Best Management Practices (BMPs) necessary to mitigate short-term construction impacts. The plan ~~may~~ shall include~~, but is not limited to,~~ the following BMPs:

a. Temporary berms and sedimentation traps (such as silt fencing, straw bales, and sand bags); the BMPs shall be placed at the base of all cut/fill slopes and soil stockpile areas where potential erosion may occur and shall be maintained to ensure effectiveness; the sedimentation basins and traps shall be cleaned periodically and the silt shall be removed and disposed of in a location approved by the City;

b. Non-paved areas shall be revegetated or restored (i.e., geotextile binding fabrics) immediately after grading and installation of utilities, to minimize erosion and to re-establish soil structure and fertility; revegetation shall include non-invasive, drought-resistant, fast-growing vegetation that would quickly stabilize exposed ground surfaces; alternative materials rather than reseeding (e.g., gravel) may be used, subject to review and approval by the Planning and Environmental Services and Community Services Departments.

[17] Mac Design Associates, *Revised Preliminary Hydraulic Report for Willow Springs II*, May 2011.
[18] Addresses Thresholds "a" – "i"

c. Runoff shall not be directed across exposed slopes; all surface runoff shall be conveyed in accordance with the approved drainage plans;

d. Energy dissipaters or similar devices shall be installed at the end of drainpipe outlets to minimize erosion during storm events;

e. Grading shall occur during the dry season (April 15th to November 1st) unless a City approved erosion control plan is in place and all erosion control measures are in effect; erosion control measures shall be identified on an erosion control plan and shall prevent runoff, erosion, and siltation; all exposed graded surfaces shall be reseeded with ground cover vegetation to minimize erosion; graded surface shall be reseeded within four (4) weeks of grading completion, with the exception of surfaces graded for the placement of structures; these surfaces shall be reseeded if construction of structures does not commence within four (4) weeks of grading completion.

f. Site grading shall be completed such that permanent drainage away from foundations and slabs is provided and so that water shall not pond near proposed structures or pavements.

Timing: The final drainage and stormwater quality protection plan shall be submitted to City staff for review and approval prior to any LUP issuance for grading. BMPs shall be installed prior to initiation of grading as appropriate and throughout the construction period.

Monitoring: City staff shall verify that the SWPPP has been implemented per the approved final plan and prior to commencement of grading. BMPs shall be monitored throughout the construction period in consultation with the Community Services Department.

Water Quality Impacts During Operation (Impact WQ 2 and WQ 3)

WQ 2-1 The permittee shall ~~obtain proof of exemption or proof that~~ submit a NPDES Storm Water Permit from the CCRWQCB, including the required conditions of the NPDES permit, to ensure any NPDES permit requirements are consistent with the final drainage/stormwater quality protection plan~~has been obtained~~. Alternatively, if no NPDES permit is required by CCRWQCB, the permittee shall submit written documentation of an exemption.

Plan Requirements and Timing: The permittee shall submit written documentation to the City ~~proof~~ and City staff shall review and approve documentation prior to any LUP issuance for grading.

Monitoring: City staff shall review the documentation prior to any LUP issuance for grading.

WQ 2-2 The permittee shall prepare a final drainage/stormwater quality protection plan consistent with the City's Storm Water Management Plan that identifies all BMPs.

Plan Requirements: The final drainage/stormwater quality protection plan BMPs shall be prepared by a licensed civil engineer. The plan ~~may~~ shall include~~, but is not limited to,~~ the following BMPs:

a. A final drainage analysis that provides final calculations on pre/post development stormwater runoff volumes, required storage capacity, specification on all elements of the drainage control system, and complies with the City's Interim LID Strategies for a Tier 3 project over 20,000 square feet.
b. Catch basin filter inserts capable of capturing sediment, trash, debris, and petroleum products from low flow (first flush) stormwater runoff shall be installed in each stormwater inlet/catch basin to be connected to the storm drain system serving the project site. Catch basin filter inserts shall be specified for installation in all project stormwater inlets/catch basins shown on the final grading/drainage plan.
c. Regular maintenance and cleaning of catch basins and detention basins.
d. Routine cleaning of streets, parking lots, and storm drains.
e. Stenciling of all storm drain inlets to discourage dumping by information the public that water flows to the ocean.
f. Development of an integrated pest management program for landscaped areas of the project, emphasizing the use of biological, physical, and cultural controls rather than chemical controls.
g. Provision of educational flyers to residents/commercial tenants regarding proper disposal of hazardous water and automotive waste.
h. Provision of trash storage/material storage areas that are covered by a roof and protected from surface runoff.
i. Drainage improvements associated with the ~~proposed~~ project would route as much roof, parking areas and surface drainage as possible through the ~~proposed~~ on-site landscape areas and bio-swale before it enters the drop inlets. An example of an area that may be used for biofiltration/temporary detention is the grass open space near the northwest portion of Willow Springs I. This area could be used to filter runoff that is not currently proposed to drain through the on-site bio-swale along the eastern boundary.

Timing: The final drainage/stormwater quality protection plan shall be submitted to City staff for review and approval prior to any LUP issuance for grading. All BMPs shall be installed as identified on the final drainage/stormwater quality protection plan and grading and drainage plans prior to occupancy clearance.

Monitoring: City staff shall verify that drainage/stormwater quality protection plan has been constructed/installed per the approved final grading and drainage plans prior to occupancy clearance ~~final inspection~~.

WQ 2-3 The permittee shall prepare an Operations and Maintenance Plan (Plan) that addresses maintenance requirements for all improvements associated with the stormwater quality protection/BMPs described in the final drainage/stormwater quality protection plan.

Plan Requirements: At a minimum, the Operations and Maintenance Plan shall include requirements that all inline storm drain filters shall be inspected, repaired, and cleaned per manufacturer specifications and these requirements shall, at a

minimum, occur prior to September 30th of each year. Additional inspections, repairs, and maintenance shall be performed after storm events as needed throughout the rainy season (November 1st to April 15th) and/or per manufacturer specifications. Any necessary minor repairs shall be completed prior to the next rainy season. Prior to September 30th of each year, the permittee shall submit to the City for its review and approval a report summarizing all inspections, repairs, and maintenance work done during the prior year.

Timing: The permittee shall submit the required Operations and Maintenance Plan to City staff for review, approval, and execution prior to any LUP issuance for construction.

Monitoring: Community Services staff shall annually verify compliance with the provisions of the Operations and Maintenance Plan and shall respond to instances of non-compliance with the ~~agreement~~Plan.

4.8.7 Residual Impacts

With implementation of the mitigation measures identified above, residual project and cumulative impacts to hydrology and drainage, surface and groundwater water quality, and flood hazards would be **less than significant (Class II)**.