SECTION 5.7
Hydrology and Water Quality

5.7 HYDROLOGY AND WATER QUALITY

This section evaluates the hydrology and water quality impacts of the proposed project. The analysis presented in this section is based on the calculations, analysis, and conclusions contained in the *Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022,* prepared by Sikand Engineering Associates (October 2011); *Hydrology Study/SUSMP for Mancara Tentative Tract 063022*, prepared by Sikand Engineering Associates (January 2008); and the *Water Quality Assessment Report – Mancara Residential Project,* prepared by RBF Consulting (November 2010), which are included in their entirety as Appendix K, L, and M, respectively.

5.7.1 REGULATORY SETTING

Storm runoff from the project site, and discharges of runoff into and/or encroachment upon natural drainages, wetlands, and/or flood plains are subject to the Federal Clean Water Act (33 *United States Code* Section 1251 et seq.) and associated regulations, the State Porter Cologne Water Quality Control Act (*California Water Code* Section 13000 et seq.) and associated regulations, and Sections 1600-1607 of the California *Fish and Game Code*, and to requirements established by requirements the United States Army Corps of Engineers (ACOE), the California Department of Fish and Game (CDFG), the California State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs), and the Flood Control and Watershed Management Divisions of the Los Angeles County Department of Public Works (LACDPW). Each of these statutes and agencies is discussed individually below.

FEDERAL REGULATIONS

FEDERAL CLEAN WATER ACT

The project would be subject to Federal permit requirements under the Federal Clean Water Act (CWA). In 1972, the Federal Water Pollution Control Act (later referred to as the Clean Water Act) was amended to require that the discharge of pollutants to "Waters of the U.S." from any point source be effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. In 1987, the CWA was again amended to add Section 402(p), requiring that the United State Environmental Protection Agency (U.S. EPA) establish regulations for permitting of storm water discharges (as a point source) by municipal and industrial facilities and construction activities, under the NPDES permit program. The U.S. EPA published final regulations directed as MS4s serving population of 100,000 or more, and storm water discharges associated with industrial activities, including construction activities, on November 16, 1990. The regulations require that municipal separate storm sewer system (MS4) discharges to surface waters be regulated by a NPDES Permit (Phase I Final Rule, 55 Fed. Reg. 47990). The U.S. EPA published final regulations directed at storm water discharges not covered in the Phase I Final Rules, including, as applicable here, small construction projects of one to five acres, on December 8, 1999 (Phase II Final Rules, 64 Fed. Reg. 68722).

Section 404 of the CWA regulates activities that result in the location of a structure, excavation, or discharge of dredged or fill material into "Waters of the U.S.", which included wetlands along with nonwetland habitats, such as streams (including intermittent streams), rivers, lakes, ponds, etc.

UNITED STATES ARMY CORPS OF ENGINEERS

The United States Army Corps of Engineers (ACOE) has jurisdiction over certain project improvements would be subject to, through the Natural Rivers Management Plan (NRMP), and over for improvement covered by this program. Additional project improvement not covered under the NRMP but which are within the jurisdiction of the ACOE would require permits pursuant under Section 404 of the CWA. Section 404 of the CWA regulates activities that result in the location of a structure, excavation, or discharge of dredged or fill material into "Waters of the U.S.", which include wetlands along with non-wetlands habitats, such as streams (including intermittent streams) rivers, lakes, ponds, etc.

The Santa Clara River, including that portion of the river that flows through the site, is designated by the United States Geological Survey as "Waters of the U.S.". Other drainages within the Oak Springs Canyon Wash are also considered "Waters of the U.S." and fall under ACOE jurisdiction.

STATE REGULATIONS

PORTER-COLOGNE WATER QUALITY ACT

California's Porter-Cologne Water Quality Act is the basis for water quality regulation within the state. The Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state.

Dewatering discharges, or discharges of non-storm water from other sources, would require Waste Discharge Requirements from the Los Angeles Regional Water Quality Control Board for discharges to land. Generally, discharged to surface waters during construction are covered by the Construction General Permit.

STATE WATER RESOURCES CONTROL BOARD AND REGIONAL WATER QUALITY CONTROL BOARD

The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the State, while the Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities. The project area lies within the jurisdiction of the Los Angeles RWQCB (Region 4).

Beneficial Uses and Water Quality Objectives

The RWQCB is responsible for the protection of beneficial uses of water resources within its jurisdiction and uses planning, permitting, and enforcement authorities to meet this responsibility.

Every water body within the jurisdiction of RWQCB is designated with a set of beneficial uses that are protected by appropriate water quality objectives. Beneficial uses apply to the largest tributary of each affected watershed.

Following is a list of the different types of waters and their beneficial uses for the Santa Clara River, Reach 9, as described by the Water Quality Control Plan (also referred to as the Basin Plan) for the Los Angeles Basin.

- **IND –** Industrial Service Supply waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- **PROC –** Industrial Process Supply waters are used for industrial activities that depend primarily on water quality.
- **AGR –** Agricultural Supply waters are used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **GWR –** Groundwater Recharge waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality or halting saltwater intrusion into freshwater aquifers.
- **FRSH –** Freshwater Replenishment waters are used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
- **REC 1 –** Water Contact Recreation waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
- **REC 2 –** Non-contact Water Recreation waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **WARM –** Warm Freshwater Habitat waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- **WILD –** Wildlife Habitat waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.
- **RARE –** Rare, Threatened or Endangered Species waters support habitats necessary for the survival and successful maintenance of plant or animal species designated under State or Federal law as rare, threatened, or endangered.

- **WET –** Wetland Habitat waters support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

NPDES Program

The Los Angeles RWRCB has issued the NPDES MS4 Storm Water Permit (Order No. 01-182), adopted December 13, 2001, which includes the City of Santa Clarita, in addition to many others. In compliance with this permit, the County has a Storm Water Management Program to address post construction storm water pollution controls related to planning, design, construction, and maintenance activities throughout the county. The Program describes responsibilities, procedures, and practices the County uses to protect water quality by reducing or eliminating pollutants discharged from storm drainage systems owned or operated by its facilities, including the selection and implementation of post construction Best Management Practices (BMPs). The proposed project would be expected to follow the guidelines and procedures outlined in the Program. All parties working on the project would be required to implement pollution prevention, permanent treatment controls, and construction BMPs consistent with the requirements outlined in the Program.

Construction Activity Permitting

Development projects typically result in disturbance of soil that requires compliance with the NPDES General Permit, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activities (Order No. 2009-0009-DWQ, NPDES Number CAS000002). This Statewide Construction General Permit regulates discharges from construction sites that disturb one (1) or more acres of soil. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one (1) acre of total land area must comply with the provisions of this NPDES Permit, and develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). The project applicant must submit a Notice of Intent (NOI) to the SWRCB, to be covered by the NPDES General Permit, and prepare the SWPPP before beginning construction. Implementation of the plan starts with the commencement of construction and continues through the completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination (NOT) to the SWRCB to indicate that construction is completed.

CALIFORNIA DEPARTMENT OF FISH AND GAME

The California Department of Fish and Game (CFDG) has jurisdiction over the Santa Clara River and the drainages on the site under Section 1601 of the *California Fish and Game Code*. Under Sections 1600-1607 of the *Fish and Game Code*, the CDFG regulates activities that would alter the flows, beds, channels or banks of streams and lakes. The terms “stream” can include intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blueline streams and watercourses with subsurface flows.

LOCAL REGULATIONS

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

The Flood Control Division of the Los Angeles County Department of Public Works (LACPDW) also regulates storm runoff. The LACDPW issued a memorandum in 1986 entitles "Level of Flood Protection and Drainage Protection Standards" for development projects in Los Angeles County. The memorandum, established Los Angeles County policy on levels of flood protection and requires that the following facilities be designed for the capital flood:

- All facilities not under State of California jurisdiction that intercept flood waters from natural drainage courses
- All areas mapped as floodways, all facilities that are constructed to drain natural depressions or sumps, and
- All culverts under major and secondary highways.

All facilities in developed areas that are not covered by the capital flood protection conditions must be designed for the Urban Flood, or runoff from a 25-year frequency design storm. Because the project would intercept flood flows from natural areas, its storm drainage facilities that accept these flows must be sized and designed for the capital flood.

In addition to meeting the required level of flood protection, all development in the Santa Clara River watershed must: (1) meet standards adopted by the LACDPW for the Santa Clara River and its major tributaries in the County Sedimentation Manual (pp. 2-2 to 2-6), and (2) meet the ACOE and CDFG guidelines for the Santa Clara River.

LOS ANGELES COUNTY STANDARD URBAN STORM WATER MITIGATION PLAN

Los Angeles County has a Standard Urban Storm Water Mitigation Plan (SUSMP) that issues BMP design guidelines and criteria. The SUSMP outlines the necessary Best Management Practices (BMPs) that must be incorporated into design plans for single-family hillside homes (only development of one acre or more of surface area is subject to the SUSMP numerical design criteria requirement) or ten or more unit homes (includes single-family homes, multi-family homes, condominiums, and apartments).

CONSTRUCTION ACTIVITY PERMITTING

The project will result in a disturbance of soil (approximately 200 acres) that will require compliance with the NPDES General Permit, *Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activities* (2009-0009-DWQ, NPDES Number CAS000002). This Statewide Construction General Permit regulates discharges from construction sites that disturb one or more acres of soil. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation results in a soil disturbance of at least one acre of total land area must comply with the provisions of this NPDES Permit, and develop and implement an effective Stormwater Pollution Prevention Plan (SWPPP). The permit requires:

- Electronic submittal of the Permit Registration Documents (PRD) to the SWRCB at least 30 days before the start of construction, which includes submittal of a Notice of Intent (NOI), risk assessment, site map, Stormwater Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement using the SMARTS database;
- Preparation and implementation of a SWPPP;
- Electronic submittal of an Annual Report; and,
- Electronic submittal of a Notice of Termination (NOT) to the SWRCB upon completion of construction and stabilization of the site.

Based on the project's location and what water body it drains to, a risk level will be assigned to the project and indicate what level of monitoring will be required. Per the information available, this project will be a risk level 1 project, which is the lowest level and will require that minimum BMPs are installed and visual monitoring is conducted.

LOS ANGELES COUNTY CAPITAL FLOOD

In 1931, the Los Angeles County Flood Control District (LACFCD) (now the Flood Control Division of the County's Department of Public Works) began development of a comprehensive plan of flood control facilities to collect and convey flows from the mountainous canyons, the alluvial fans, and the urbanized coastal plain.

The major needs in designing the system were the reduction of damage high canyon flows, the conveyance of large volumes of water in a major storm, and the ability to meet future flood control needs. The design of the flood protection system for the County is based upon the Department of Public Works' capital flood hydrology.

The department's 50-year capital flood (or Q_{cap}) hydrology is based on a "design," or theoretical storm event that is derived from 50-year frequency rainfall values and is patterned after an actual major extra-tropical storm observed in the Los Angeles region. The 50-year frequency design storm is assumed to occur over of a period of four days, with the maximum rainfall falling on the fourth day.

Analysis of recorded major storms reveals that, during the 24-hour period of maximum rainfall, rainfall intensity typically increases during the first 70 to 90 percent of the period and decreases in the remaining time. Furthermore, approximately 80 percent of the amount of the 24-hour rainfall occurs within the same 70 to 90 percent of the period. In developing the capital flood (or Q_{cap}), the 50-year frequency design storm is assumed to fall on saturated soils. In converting rainfall to runoff, rainfall that is not lost due to the hydrologic processes of interception, evaporation, transpiration, depression stage, infiltration, or percolation is assumed be surface runoff. The effect of snowfall or snowmelt on rainfall-runoff relationships is a consideration in only a very limited portion of the County (i.e., the higher elevations) where snowfall accumulates in winter.

Another assumption made in developing a capital flood design flow rate is that natural portions of the watershed have been burned by fire. When a watershed burns, the soil infiltration rate decreases due the loss of vegetation and physical changes in the soils. The County has run field infiltrometer tests in order qualify the effect that burning has on the coefficient of runoff. The effect of burning the watershed can increase the design runoff rate from 10 to 20 percent.

The final factor in adjusting the capital flood design flow rate is referred as a bulking factor. In the area where a watershed is burned, the runoff would carry with a large layer of eroded topsoil. This sediment, along with the associated burned trees and brush, is referred to as debris. In order to account for these quantities of debris, the design flow rate is artificially increased using a prescribed bulking factor, which is a function of not only soil type, but also the steepness of the terrain and the size of the drainage basin. The bulking factors for large drainage basins range from about 1.2 to 1.5, or from 20 percent to 50 percent over and above the burned flow rate.

In summary, the County's Q_{cap} is based on a theoretical four-day storm event occurring right after the watershed has been burned with the resulting flow rate being increased again by bulking factor, thereby yielding a peak flow rate that is 32 to 80 percent higher than a 50-year storm over an unburned and unbulked drainage basin. The probability of all the theoretical assumptions identified in the County's capital flood happening at the same time is extremely small, and yields greater design flows than the Federal Insurance Administration's methodology for calculating the 100-year and 500-year floods. As a result, the County's Methodology is more conservative than that of the Federal Insurance Administration. The City has adopted the County's Q_{cap} requirements for projects within its jurisdiction.

CITY OF SANTA CLARITA

General Plan

Applicable goals, objectives, and policies from the *General Plan* L*and Use, Conservation and Open Space*, and *Safety Elements* are listed below.

Economic Vitality

Goal LU 4: A diverse and healthy economy.

> **Objective LU 4.5**: Ensure creation of attractive and technology-friendly business environments to attract tenants and employees.
>
> > **Policy LU 4.5.2**: Encourage the provision of usable open space that is accessible to employees and visitors, and discourage the provision of large areas of water-consuming landscaping that are not usable for accessible.

Environmentally Responsible Development

Goal LU 7: Environmentally responsible development through site planning, building design, waste reduction, and responsible stewardship of resources.

> **Objective LU 7.3**: Protect surface and ground water quality through design of development sites and drainage improvements.
>
> > **Policy LU 7.3.1**: Promote the use of permeable paving materials to allow infiltration of surface water into the water table.

Policy LU 7.3.2: Maintain stormwater runoff on site by directing drainage into rain gardens, natural landscaped swales, rain barrels, permeable areas, and use of drainage areas as design elements, where feasible and reasonable.

Policy LU 7.3.3: Seek methods to decrease impermeable site area where reasonable and feasible, in order to reduce stormwater runoff and increase groundwater infiltration, including use of shared parking and other means as appropriate.

Responsible Management of Environmental Systems

Goal CO.1: A balance between the social and economic needs of Santa Clarita Valley residents and protection of the natural environment, so that these needs can be met in the present and in the future.

Objective CO 1.1: Protect the capacity of the natural "green" infrastructure to absorb and break down pollutants, cleanse air and water, and prevent flood and storm damage.

Policy CO 1.1.1: In making land use decisions, consider the complex, dynamic, and interrelated ways that natural and human systems interact, such as the interactions between energy demand, water demand, air and water quality, and waste management.

Policy CO 1.1.2: In making land use decisions, consider the impacts of human activity within watersheds and ecosystems, to maintain the functional viability of these systems.

Objective CO 1.2: Promote more sustainable utilization of renewable resource systems.

Policy CO 1.2.1: Improve the community's understanding of renewable resource systems that occur naturally in the Santa Clarita Valley, including systems related to hydrology, energy, ecosystems, and habitats, and the interrelationships between these systems, through the following measures:

a. Through the environmental and development review processes, consider development proposals within the context of renewable resource systems and evaluate potential impacts on a system-wide basis (rather than a project-specific basis), to the extent feasible;

b. Provide information to decision-makers about the interrelationship between traffic and air quality, ecosystems and water quality, land use patterns and public health, and other similar interrelationships between renewable resource systems in order to ensure that decisions are based on an understanding of these concepts.

Objective CO 1.5: Manage urban development and human-built systems to minimize harm to ecosystems, watersheds, and other natural systems, such as urban runoff treatment trains that infiltrate, treat and remove direct connections to impervious areas.

Policy CO 1.5.1: Promote the use of environmentally-responsible building design and efficiency standards in new development, and provide examples of these standards in public facilities.

Policy CO 1.5.6: Through the development review process, consider the impacts of development on the entire watershed of the Santa Clara River and its tributaries, including hydromodification.

Policy CO 1.5.7: Consider the principles of environmental sustainability, trip reduction, walkability, stormwater management, and energy conservation at the site, neighborhood, district, city, and regional level, in land use decisions.

Policy CO 3.6.2: Reduce impervious surfaces and provide more natural vegetation to enhance microclimates and provide habitat. In implementing this policy, consider the following design concepts:

a. Consideration of reduced parking requirements, where supported by a parking study and/or through shared use of parking areas;

b. Increased use of vegetated areas around parking lot perimeters; such areas should be designed as bioswales or as otherwise determined appropriate to allow surface water infiltration;

c. Use of connected open space areas as drainage infiltration areas in lieu of curbed landscape island, minimizing the separation of natural and landscaped areas into isolated "islands"

d. Breaking up large expanses of paving with natural landscaped areas planted with shade trees to reduce the heat island effect, along with shrubs and groundcover to provide diverse vegetation for habitat.

Biological Resources

Goal CO 3: Conservation of biological resources and ecosystems, including sensitive habitats and species.

Objective CO 3.6: Minimize impacts of human activity and the built environment on natural plant and wildlife communities.

Policy CO 3.6.2: Reduce impervious surfaces and provide more natural vegetation to enhance microclimates and provide habitat. In implementing this policy, consider the following design concepts:

a. Consideration of reduced parking requirements, where supported by a parking study and/or through shared use of parking areas;

b. Increased use of vegetated areas around parking lot perimeters; such areas should be designed as bioswales or as otherwise determined appropriate to allow surface water infiltration;

c. Use of connected open space areas as drainage infiltration areas in lieu of curbed landscape island, minimizing the separation of natural and landscaped areas into isolated "islands"

d. Breaking up large expanses of paving with natural landscaped areas planted with shade trees to reduce the heat island effect, along with shrubs and groundcover to provide diverse vegetation for habitat.

Water Resources

Goal CO 4: An adequate supply of clean water to meet the needs of present and future residents and businesses, balanced with the needs of natural ecosystems.

Policy CO 4.2.3: Promote the installation of rainwater capture and gray water systems in new development for irrigation, where feasible and practicable.

Policy CO 4.2.6: Require that all new development proposals demonstrate a sufficient and sustainable water supply prior to approval.

Objective CO 4.3: Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff at the source.

Policy CO 4.3.3: Provide flexibility for design standards for street width, sidewalk width, parking, and other impervious surfaces when it can be shown that such reductions will not have negative impacts and will provide the benefits of stormwater retention, groundwater infiltration, reduction of heat islands, enhancement of habitat and biodiversity, saving of significant trees or planting of new trees, or other environmental benefit.

Policy CO 4.3.4: Encourage and promote the use of new materials and technology for improved stormwater management, such as pervious paving, green roofs, rain gardens, and vegetated swales.

Policy CO 4.3.5: Where detention and retention basins or ponds are required, seek methods to integrate these areas into the landscaping design of the site as amenity areas, such as a network of small ephemeral swales treated with attractive planting.

Policy CO 4.3.6: Discourage the use of mounded turf and lawn areas which drain onto adjacent sidewalks and parking lots, replacing these areas with landscape designs that retain runoff and allow infiltration.

Policy CO 4.3.7: Reduce the amount of pollutants entering the Santa Clara River and its tributaries by capturing and treating stormwater runoff at the source, to the extent possible.

Objective CO 4.4: Promote measures to enhance water quality by addressing sources of water pollution.

Policy CO.4.4.1: Cooperate with the Los Angeles County Sanitation District and Regional Water Quality Control Board as appropriate to achieve Total Maximum Daily Load (TMDL) standards for chlorides in the Santa Clara River.

Policy CO 4.4.3: Discourage the use of chemical fertilizers, herbicides and pesticides in landscaping to reduce water pollution by substances hazardous to human health and natural ecosystems.

Policy CO 4.4.4: Promote the extension of sanitary sewers for all urban uses and densities, to protect groundwater quality, where feasible.

Flood Hazards

Goal S 2: Protection of public safety and property from unreasonable risks due to flooding.

Objective S 2.1: Plan for flood protection as part of a multi-objective watershed management approach for the Santa Clara River and its tributaries.

Policy S 2.1.2: Promote Low Impact Development standards on development sites, including but not limited to minimizing impervious surface area and promoting infiltration, in order to reduce the flow and velocity of stormwater runoff throughout the watershed.

Policy S 2.1.3: Promote the use of vegetated drainage courses and soft-bottom channels for flood control facilities to the extent feasible, in order to achieve water quality and habitat objectives in addition to flood control.

Policy S 2.1.4: Cooperate with other agencies as appropriate regarding the related issues of flood control, watershed management, water quality, and habitat protection.

Policy S 2.1.5: Promote the joint use of flood control facilities with other beneficial uses where feasible, such as by incorporating detention basins into parks and extending trails through floodplains.

Objective S 2.4: Implement flood safety measures in new development.

Policy S 2.4.1: Require that new development comply with FEMA floodplain management requirements.

Policy S. 2.4.2: On the Land Use Map, restrict the type and intensity of land use in flood-prone areas, or require flood-proof construction, as deemed appropriate.

Objective S 2.5: Limit risks to existing developed areas from flooding.

Policy S 2.5.1: Address drainage problems that cause flooding on prominent transportation corridors by working with multi-jurisdictional agencies and stakeholders to construct needed drainage improvements.

Policy S 2.5.2: Provide for the maintenance of drainage structures and flood control facilities to avoid system malfunctions and overflows.

5.7.2 ANALYSIS METHODOLOGY

DRAINAGE ANALYSIS METHODOLOGY

The engineering term for the methods used to properly size pipes and channels is "hydraulic analysis." In order to determine the proper sizes of pipes and channels, assumptions must be made regarding the amount of rainfall to design for and the amount and type of development that would take place in a drainage basin. An estimate must be made as to how often that amount of rainfall could occur. This is referred to as the storm recurrence interval, or its reciprocal value: storm frequency. For example, a storm that has a ten-percent recurrence interval is a storm that has a ten-percent chance of occurring in any given year. The reciprocal of this number (1/10) is also shown as a ten-year frequency. The most important concept to keep in mind is that a pipe or channel is "designed" for a rate of flow (measured in cubic feet per second), not a volume of flow (measured in cubic feet or acre feet). A dam or lake is designed for storing or containing a fixed volume of water. A pipe of a fixed size on the other hand, can carry different flow rates, depending on the pressure placed on the water.

In designing a storm drain system, the size of a pipe that would safely carry a predicted rate of flow (expressed in cubic feet per second [cfs]) must be calculated. A one-foot-square box that is one-foot deep (a cubic foot can hold approximately 7.5 gallons of water). From this fact the amount of storm water passing through a pipe or channel in one second can, very simply put, be calculated by multiplying the cross sectional area of the flow in the pipe (in square feet) by the rate of storm flows through the pipe in feet per second. The three dimensional rate of flow is referred to as "cubic feet per second."

With the above concepts in mind, the effect of development on natural ground can be considered. Buildings, driveways, patios, sidewalks, and roads all create new impervious covers to the natural ground, and prevent water from being absorbed into the ground. The water that would normally infiltrate into the ground, therefore, runs off at higher than normal flow rates, referred to as "Q." Therefore, the flow rates from developed areas may be greater than from undeveloped areas.

EXPLANATION OF DESIGN HYDROLOGY

The following provides additional discussion of the effect of soil type, imperviousness, and burning and bulking on storm runoff quantities.

EFFECTS OF SOIL TYPE AND AMOUNT OF IMPERVIOUSNESS ON RUNOFF RATES

The rate of runoff in undeveloped areas is directly related to the type of soil. Certain soil types accept water faster (are more pervious) than other soils. Therefore, the types of soils present on a site are used in the calculations of runoff. Different soil types have very different water infiltration (or absorption) rates.

If a sandy soil (highly pervious) is paved over, the coefficient of runoff (C) would greatly increase, whereas if a clay soil (not highly pervious) is paved over, runoff values would go up, but not as high as in the case of sandy soil because the sandy soil absorbs water faster. In small storms, some soils can absorb 100 percent of the rainfall. For example, soil type 015, Tujunga Fine Sandy Loam, can completely absorb a 0.5-inch per hour (in/hr) storm and almost completely absorb a 1.0 in/hr storm, thereby yielding extremely low runoff rates. For a 200-acre parcel with soil types 015 (Tujunga Fine Sandy Loam), radically different runoff quantities for the same rainfall events occur. For an intense storm, where intensity ("I") is equal to 1.0 inch per hour, and the very pervious soil type 015 (Tujunga Fine Sandy Loam), the runoff rate would be 20 cfs. For the same size parcel on a very impervious soil, such as soil type 012 (Ramona Clay Loam), the runoff rate would be 168 cfs.

EFFECTS OF BURNING AND BULKING

In an undeveloped watershed, capital flood flow rates assume a burned condition, which causes the coefficient of runoff to increase. Further, after increasing the coefficient of runoff for burning, the flow rate is then multiplied by a bulking factor, which is used to account for the amount of mud, and debris that would be contained within the flow from the burned watershed. In the case of the project, the increase in runoff, or flow rates, due to an increase in the coefficient on runoff (C) to account for burning is from ten to 20 percent. Application of the bulking factor to account for debris production would increase runoff quantities by 20 to 50 percent over and above the burned flow rate, as previously indicated.

EFFECTS OF DEVELOPMENT

As previously mentioned, development places impervious materials over soils that had previously absorbed storm water. Once the impervious materials are placed over the soil, no absorption occurs and runoff takes place. Because development does not typically completely over cover the ground surface, portions of each developed parcel (e.g., front, side, and read yards, landscaping, open space, etc.) remain pervious to infiltration by storm water. Percent imperviousness for each land use existing on or proposed for the site is presented in *Table 5.7-1*, *Percent Imperviousness for Selected Land Uses*.

Table 5.7-1
Percent Imperviousness for Selected Land Uses

Land Use	Percent Imperviousness (%)
Agricultural	1
Transportation	90
Single Family Residential	42
Multi-Family Residential	68
Commercial	92
Open Space	10

Source: *Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022,* Sikand Engineering Associates, October 2011.

5.7.3 ENVIRONMENTAL SETTING

HYDROLOGY AND DRAINAGE CONDITIONS

DRAINAGE AREAS AND WATERCOURSES

Santa Clara River

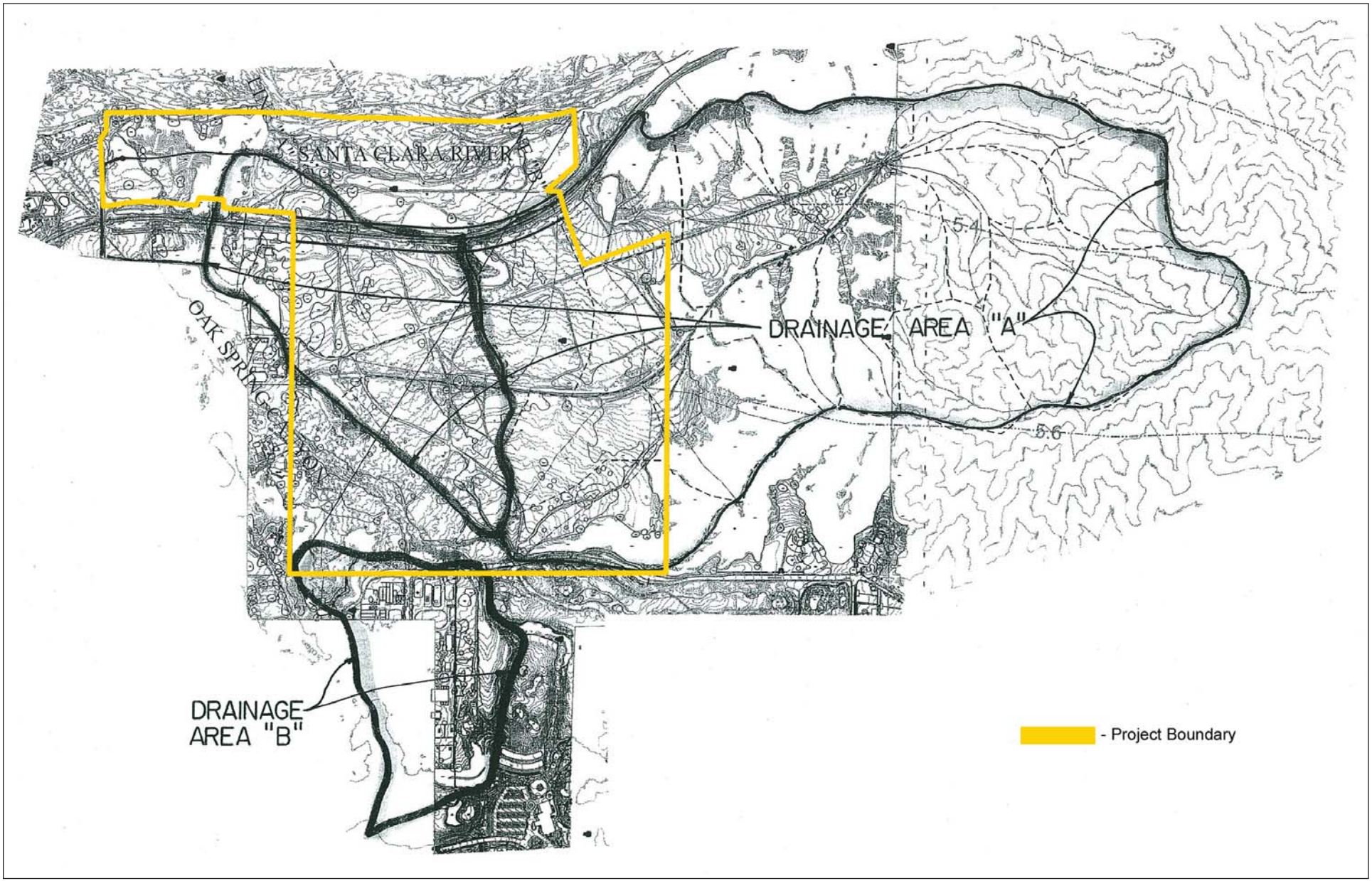
The Santa Clara River traverses the northern portion of the site, which is located within the approximately 368-acre Oak Springs Canyon Wash tributary watershed portion of the 1,634-square-mile Santa Clara River basin. The 368-acre tributary watershed represents only 0.03 percent of the overall Santa Clara River basin and consists primarily of open space and vacant land. Annual rainfall in the tributary area is typically low (an annual average of 17 inches) and generally occurs in the winter months. Completely natural flows in the river occur only in the winter due to storm runoff, and the flows vary significantly from year to year. In addition, there are short-term releases from Castaic Lake during summer months that reach the river via Castaic Creek, which joins the river several miles downstream of the project site. Surface water is typically not present on the site during summer months.

Runoff flows to and through several drainage areas on the site via sheet flows and natural concentrated flows. These flows eventually discharge to the Santa Clara River at several locations. The acreage for each of the drainage areas is provided in *Table 5.7-2*, *Existing Drainages and Runoff Volumes*. There are currently no existing drainage or erosion/sedimentation control improvements located within the project site, except for the existing drainage crossings under Oak Springs Canyon Road and the existing Metrolink railroad right-of-way, which passes through the northern portion of the site just southerly of the Santa Clara River.

Capital flood runoff quantities for each of the two drainage areas are provided in the drainage concept and are shown in *Exhibit 5.7-1*, *Existing Hydrology Map*. Under existing conditions, combined clear flows total 504.2 cubic feet per second (cfs), while burned and bulked flows total 746.8 cfs. The calculated total debris volume is 9,846.7 cubic yards (cy).

Flood Hazards

A portion of the project site lies within the 100-year floodplain of the Santa Clara River and within the Federal Emergency Management Administration (FEMA) 100-year floodplain (refer to *Exhibit 5.7-2*, *Existing Floodplain Map*).



Source: Sikand.

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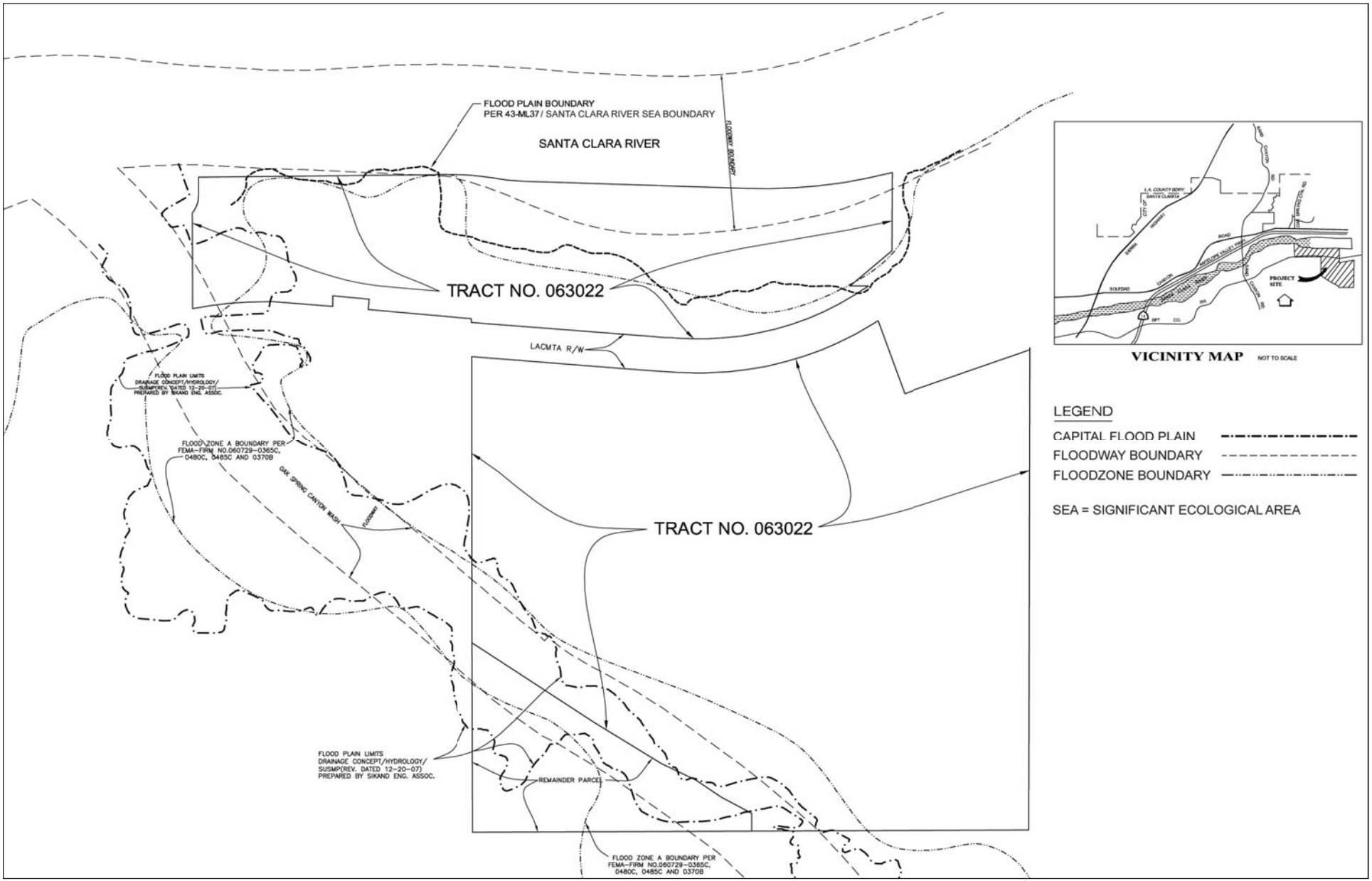
Existing Hydrology Map

Exhibit 5.7-1



Source: Sikand, November 2, 2011.

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Existing Floodplain Map

Exhibit 5.7-2

Table 5.7-2
Existing Drainages and Runoff Volumes

Drainage Area	Acreage	Q50c[1] (cfs)	Q50b[2] (cfs)	Q50bb[3] (cfs)	Debris Volume (cy)	Q2[4]
North of Oak Spring Canyon Wash						
A	266.8	391.0	449.6	634.8	7,868.0	90.3
B	21.7	24.3	28.6	39.7	560.0	4.7
C	44.7	36.9	42.4	58.8	1,153.0	6.8
F	10.3	27.0	31.0	43.5	265.7	8.0
Subtotal	*343.5*	*479.2*	*551.6*	*771.8*	*9,846.7*	*109.9*
South of Oak Spring Canyon Wash						
1D	11.1	25.0	-	-	-	7.0
			-			
			-			
Subtotal	*911.1*	*25.0*	-	-	-	*7.-*
Total	354.6	504.2	551.6	771.8	9,846.7	116.9

Notes:
1 Q50c – 50-year rainfall intensity clear flow.
2 Q50b – 50-year rainfall intensity burned flow.
3 Q50bb – 50-year rainfall intensity burned and bulked flow.
4 Q^2 – 2-year rainfall intensity burned and bulked flow.
Cfs = cubic feet per second.

Source: *Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022,* Sikand Engineering Associates, October 2011.

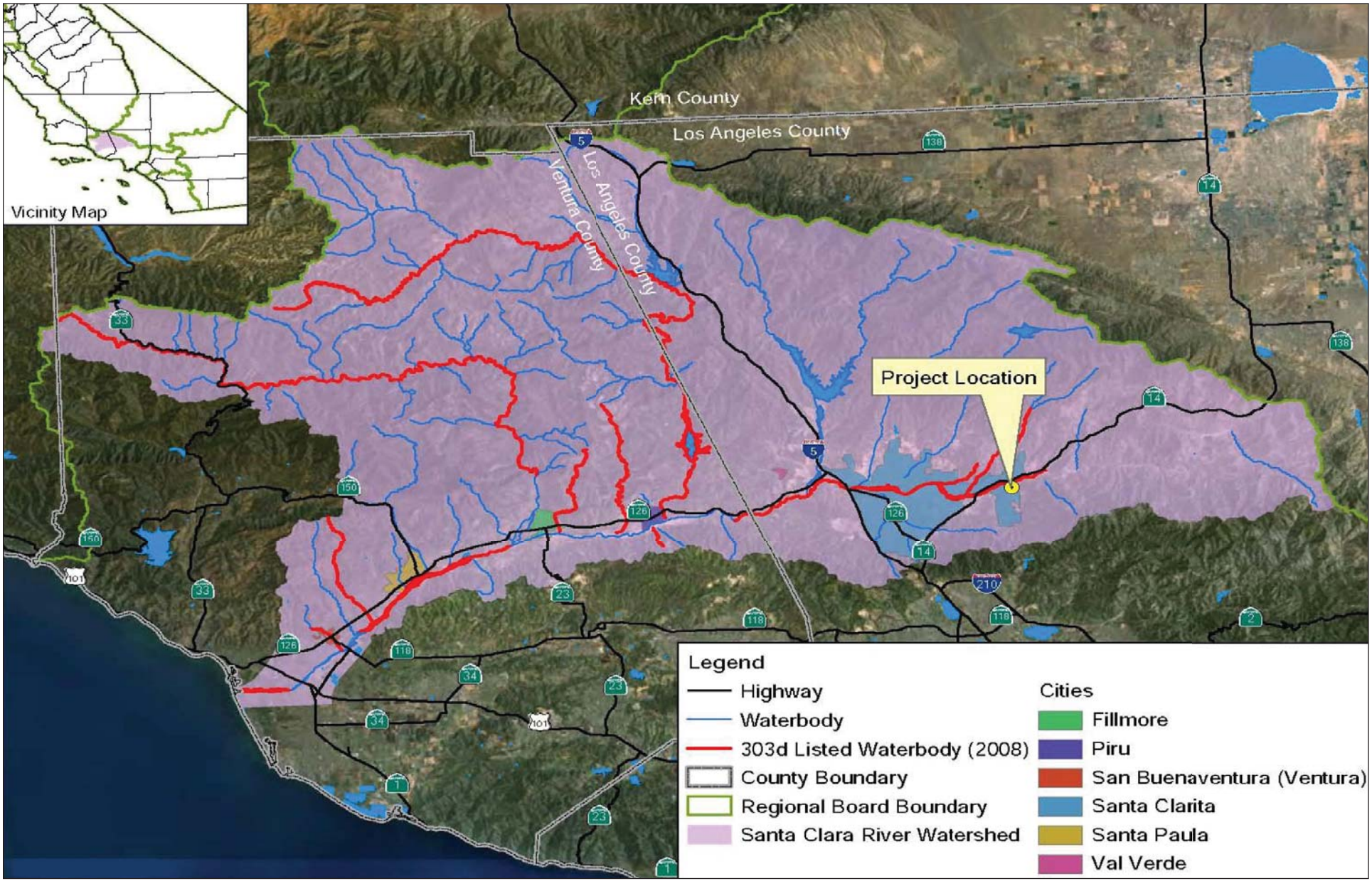
WATER QUALITY CONDITIONS

The project site is located in a rural area and bounded by the Santa Clara River. The project limits are within an urban MS4 (NPDES Permit #CAS004001) NPDES permitted area. Annual rainfall in the project area is 13 inches. The rainy season as defined by the Los Angeles Regional Water Quality Control Board (RWQCB) is November through March.

WATERSHED

The project site would drain to either Reach 7 of the Santa Clara River or the Oak Springs Canyon Wash, which confluences with the Santa Clara River just downstream of the project site. Both water bodies are located within the Santa Clara River Watershed.

The Santa Clara River is the largest river system in southern California that remains in a relatively natural state; this is a high-quality natural resource for much of its length. The river originates in the northern slope of the San Gabriel Mountains in Los Angeles County, traverses Ventura County, and flows into the Pacific Ocean halfway between the cities of San Buenaventura and Oxnard. The watershed drains an area of approximately 1,600 square miles. *Exhibit 5.7-3*, *Santa Clara River Watershed* shows the project site in the context of regional watersheds. Portions of the Santa Clara River are listed on the Los Angeles Regional Water Quality Control Board's (Los Angeles RWQCB) 2008 303 (d) impaired water body priority list of pollutants being addressed by a Total Maximum Daily Load; refer to *Table 5.7-3*, *Santa Clara River Impairments* and TMDLs have been established for the Santa Clara River reached identified in *Table 5.7-4*, *TMDLs Established for Santa Clara River Impairments*.



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Regional Watersheds

Exhibit 5.7-3

Portions of the Santa Clara River are on the 2010 303(d) list for impairments. These impairments, along with the area of the river that is affected, are listed in *Table 5.7-3*, *Santa Clara River Impairments*.

HYDROMODIFICATION

The project site drains to the Santa Clara River, and to one of its tributaries, the Oak Spring Canyon Wash. Currently, the project site is undeveloped and thus, is pervious.

Uses surrounding the project site include:

- Open Space – vacant land that does not contain man-made fabricated impervious surfaces
- Residential Land – occupied land that includes single-family homes,
- Vacant Land – unoccupied land that may contain structures or other man-made impervious surfaces
- Robinson Ranch Golf Club.

These surrounding land uses also contribute stormwater discharges to the Santa Clara River.

Table 5.7-3
Santa Clara River Impairments

Pollutant	303(d) Listed Water Body/Reach
Ammonia	Reach 3 (Freeman Diversion to A Street)
Benthic-Macroinvertebrate Bioassessments	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
ChemA*	Santa Clara River Estuary
Chloride	Reach 3 (Freeman Diversion to A Street)
	Reach 5 (Blue Cut Gaging Station to West Pier Highway 99 Bridge)
	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
Chlorpyrifos	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
Coliform Bacteria	Santa Clara River Estuary
	Reach 5 (Blue Cut Gaging Station to West Pier Highway 99 Bridge)
	Reach 6 (West Pier Hwy 99 to Bouquet Canyon Road)
	Reach 7 (Bouquet Canyon Road to above Lang Gaging Station)
Copper	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
Diazinon	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
Iron	Reach 5 (Blue Cut Gaging Station to West Pier Highway 99 Bridge)
Nitrogen, Nitrate	Santa Clara River Estuary

Table 5.7-3 (continued)
Santa Clara River Impairments

Pollutant	303(d) Listed Water Body/Reach
Total Dissolved Solids	Reach 3 (Freeman Diversion to A Street)
Toxaphene	Santa Clara River Estuary
Toxicity	Santa Clara River Estuary
	Reach 1 (Estuary to Highway 101 Bridge)
	Reach 3 (Freeman Diversion to A Street)
	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
*Note: ChemA refers to the sum of the pesticides aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexane (including lindane), endosulfan, and toxaphene.	
Source: *Mancara Residential Project Water Quality Assessment*, RBF Consulting, November 2010.	

Table 5.7-4
TMDLs Established for Santa Clara River Impairments

Pollutant	303(d) Listed Water Body/Reach
Ammonia	Reach 3 (Freeman Diversion to A Street)
Chloride	Reach 3 (Freeman Diversion to A Street)
	Reach 5 (Blue Cut Gaging Station to West Pier Highway 99 Bridge)
	Reach 6 (West Pier Highway 99 to Bouquet Canyon Road)
Source: *Mancara Residential Project Water Quality Assessment*, RBF Consulting, November 2010.	

5.7.4 SIGNIFICANCE THRESHOLD CRITERIA

The *City of Santa Clarita Local CEQA Guidelines* (Resolution 05-38) adopted on April 26, 2005 and the Initial Study Environmental Checklist form in *CEQA Guidelines* Appendix G serve as the thresholds for determining the significance of impacts relating to hydrology and water quality. As such, a project would be considered to have a significant environmental impact if it would result in the following:

- Violate any water quality standards or waste discharge requirements.
- 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).
- 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.

- 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 result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- 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.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Inundation by seiche, tsunami, or mudflow.
- Changes in the rate of flow, currents, or the course and direction of surface water and/or groundwater.
- Other modification of a wash, channel, creek, or river.
- Impact stormwater management in any of the following ways:
    - Potential impact of project construction and project post-construction activity on storm water runoff
    - Potential discharges from areas for materials storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas;
    - Significant environmentally harmful increase in the flow velocity or volume of storm water runoff;
    - Significant and environmentally harmful increases in erosion of the project site or surrounding areas;
    - Storm water discharges that would significantly impair or contribute to the impairment of the beneficial uses of receiving waters or areas that provide water quality benefits (e.g. riparian corridors, wetlands, etc.);
    - Cause harm to the biological integrity of drainage systems, watersheds, and/or water bodies; or
    - The proposed project does not include provisions for the separation, recycling, and reuse of materials both during construction and after project occupancy.

Based on these standards, the effects of the proposed project have been categorized as either a “less than significant impact” or a “potentially significant impact.” Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact.

5.7.5 PROJECT IMPACTS AND MITIGATION MEASURES

CONSTRUCTION-RELATED SURFACE WATER QUALITY IMPACTS

- ***CONSTRUCTION ACTIVITIES ASSOCIATED WITH DEVELOPMENT OF THE PROPOSED PROJECT COULD RESULT IN ADVERSE IMPACTS TO SURFACE WATER QUALITY.***

***Level of Significance Before Analysis and Mitigation*:** Potentially Significant Impact.

Impact Analysis: Construction controls are separated from other water quality management measures, because they are temporary and specific to the type of construction. The potential impacts of construction activities on water quality generally involve construction materials, and non-stormwater runoff and focus primarily on sediment. Construction-related activities that are primarily responsible for sediment releases are related to exposing soils to potential mobilization by rainfall/runoff and wind. Such activities include vegetation removal, grading, and excavation. Environmental factors that affect erosion include topography, soil, and rainfall characteristics. Non sediment-related pollutants that are also of concern during construction relate to construction materials and non-stormwater flows, and include waste construction materials such as chemicals, liquid products, petroleum hydrocarbon products used in building construction or the maintenance of heavy equipment, as well as concrete-related waste streams.

Construction impacts due to the proposed project would be minimized through compliance with the Construction General Permit. This permit requires the preparation 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 the other potential construction-related pollutants.

Erosion Prevention

A SWPPP would be developed as required by, and in compliance with, the Construction General Permit and the County of Los Angeles Standard Conditions. Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. The Construction General Permit for Stormwater requires the SWPPP to include a menu of BMPs to be selected and implemented based on the project Risk Level to effectively control erosion and sediment to the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology.

Water Quality Standards

The significance criteria for the construction phase of the proposed project is implementation of BMPs consistent with Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology, as required by the Construction General Permit and the general waste discharge requirements in the Dewatering General Permit.

The proposed project would reduce or prevent erosion and sediment transport and transport of other potential pollutants from the project site during the construction phase through implementation of BMPs meeting Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology. This would prevent or minimize environmental

impacts and to ensure that discharges during the construction phase would not cause or contribute to any exceedance of water quality standards in the receiving waters. These BMPs would assure effective control of not only sediment discharge, but also of pollutants associated with sediments and construction, such as and not limited to nutrients, heavy metals, and certain legacy pesticides.

Discharges of turbid runoff are primarily of concern during the construction phase of development. The SWPPP must contain sediment and erosion control BMPs pursuant to the Construction General Permit, and those BMPs must effectively control erosion and discharge of sediment, along with other pollutants, per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. Additionally, fertilizer control and non-visible pollutant monitoring and trash control BMPs in the SWPPP would combine to help control turbidity during the construction phase.

Construction Runoff

Transport of legacy pesticides adsorbed to existing site sediments may be a concern during the construction phase of development. The SWPPP must contain sediment and erosion control BMPs pursuant to the Construction General Permit, and those BMPs must effectively control erosion and the discharge of sediment along with other pollutants per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards. Based on these sediment controls construction-related impacts associated with pesticides are expected to be less than significant.

During the construction phase, hydrocarbons in site runoff could result from construction equipment/vehicle fueling or spills. Construction-related impacts are addressed below. However, pursuant to the Construction General Permit, the Construction SWPPP would include BMPs that address proper handling of petroleum products on the construction site, such as proper petroleum product storage and spill response practices, and those BMPs must effectively prevent the release of hydrocarbons to runoff per the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology standards.

Polynuclear Aromatic Hydrocarbons that are adsorbed to sediment during the construction phase would be effectively controlled via the erosion and sediment control BMPs. For these reasons, construction-related impacts related to hydrocarbons on water quality are considered less than significant.

During the construction phase, trash and debris have the potential for buildup due to lack of proper Contractor maintenance. Per the Construction General Permit, the SWPPP for the site must contain BMPs for trash control good housekeeping practices, etc.). Compliance with the Permit Requirements and inclusion of these BMPs, meeting Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology, included in the SWPPP would mitigate impacts from trash and debris to a level less than significant.

Mitigation Measures:

HWQ-1 All on- and off-site flood control improvements necessary to serve the project site are to be constructed to the satisfaction of the City of Santa Clarita and/or County of Los Angeles Department of Public Works Flood Control Division.

HWQ-2 Prior to start of soil-disturbing activities at the site, a Risk Determination, Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) shall be prepared in accordance with and in order to partially fulfill the California State Water Resources Control Board Order No. 2009-0009-DWQ NPDES General Permit No. CAS000002 (Construction General Permit). The SWPPP shall meet the applicable provisions of Sections 301 and 402 of the CWA by requiring controls of pollutant discharges that utilize best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) to reduce pollutants. The SWPPP shall be certified by the Legally Responsible Person (the owner of the project) according to the requirements of the Construction General Permit and implemented concurrently with commencement of the soil disturbing activity.

HWQ-3 Per the General Construction Permit, a contingency "Sampling and Analysis Plan" shall be developed in the event that the BMPs implemented at the construction site fail to prevent non-visible pollutants from discharging from the site. BMPs shall be inspected weekly, 48 hours prior to storm events, every 24 hours during extended events, and within 48 hours after the storm events to ensure proper function of the BMPs and to identify necessary repairs in a timely manner. A record of the inspections and repairs shall be documented in the SWPPP. All inspections shall be summarized in the Annual Report as required by the Construction General Permit. Additional measures, as required by the project Risk Level, shall be followed.

HWQ-4 Following the completion of the construction and when the project site has been stabilized, a Notice of Termination shall be filed with the RWCQB.

HWQ-5 During all construction phases, temporary erosion control provisions to retain soil and sediment on the site shall be implemented, including:

- Re-vegetating exposed areas as quickly as possible;
- Minimizing disturbed areas;
- Diverting runoff from downstream drainages with earth dikes, temporary drains, slope drains, etc.;
- Velocity reduction through outlet protection, check dams, and slope roughening/terracing;
- Dust control measures, such as sand fences, watering, etc.;
- Stabilizing all disturbed areas with blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, and/or other erosion resistant soil coverings or treatments;
- Stabilizing the construction entrance/exits with aggregate underdrain with filter cloth or other comparable method;
- Placing sediment control BMPs at appropriate locations along the site perimeter and all operational internal inlets to the storm drain system at all times during the rainy season (sediment control BMPs may include filtration devices and barriers, such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters, and/or with setting devices, such as sediment traps or basins; and/or

- Eliminating or reducing, to the extent feasible, non-storm water discharges (e.g., pipe flushing, and fire hydrant flushing, over-watering during dust control, vehicle and equipment wash down) from the construction site through the use of appropriate sediment control BMPs.
- Communicating with the Los Angeles Regional Board prior to discharge of non-storm water to determine the need for additional permits, including Waste Discharge Requirements.

HWQ-6 All necessary permits, agreements, letters of exemption or a Verification Request Letter from the Army Corps of Engineers, Los Angeles Regional Water Quality Control Board, and/or the California Department of Fish and Game for project-related development are to be obtained prior to issuance of grading permits.

HWQ-7 By October 1st of each year, a separate erosion control plan for construction activities shall be submitted to the City of Santa Clarita Public Works Department describing the erosion control measures that would be implemented during the rainy season (October 1 through April 15).

HWQ-8 The project applicant shall comply with post-construction Best Management Practices requirements as detailed in the Los Angeles County Standard Urban Stormwater Mitigation Plan.

Level of Significance After Analysis and Mitigation: Less Than Significant Impact.

SURFACE WATER HYDROLOGY AND DRAINAGE IMPACTS

- ***DEVELOPMENT OF THE PROPOSED PROJECT COULD RESULT IN ADVERSE IMPACTS RELATED TO EXCEEDANCE OF STORM DRAINAGE CAPACITY AND FLOODING ON- AND OFF-SITE.***

Level of Significance Before Analysis and Mitigation: Potentially Significant Impact.

Impact Analysis:

PROJECT SITE HYDROMODIFICATION

The project site drains to the Santa Clara River, and to one of its tributaries, the Oak Spring Canyon Wash. Currently, the project site is undeveloped and thus, is pervious. After the proposed project is built, the impervious area would be approximately 127 acres. It encompasses an area that is 0.0002 percent of the Santa Clara River watershed. Peak discharge from the proposed project is not anticipated to create a major change in the Santa Clara River peak discharge due to the hydrologic timing of the peak discharge from the tributary occurring much earlier than the timing of the peak discharge from the larger Santa Clara River watershed. The Santa Clara River and the Oak Spring Canyon Wash are soft bottom stream beds. *Table 5.7-5*, *Flow Rate Comparison (Existing and Proposed Conditions)* identifies the percent change in flow for the Santa Clara River and Oak Spring Canyon Wash from the existing condition to the proposed project condition within the project site.

Table 5.7-5
Flow Rate Comparison (Existing and Proposed Conditions)

Drainage System (Storm Intensity)	Flow Rate in Existing Condition (cubic feet per second)	Flow Rate in Proposed Condition (cubic feet per second)	Percent Change
Line A (2 year storm)	90	102	+13%
Line B (2 year storm)	5	6	+20%
Line C (2 year storm)	7	5	-29%
Line A (50 year storm)	450	470	+4%

Source: Sikand Engineering Associates, *Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022*, November 2006.

The proposed project's hydromodification conditions were assessed based on the requirements of the Los Angeles County MS4 permit. Consistent with Los Angeles County's requirements, the proposed project was evaluated for its potential to cause erosion to a downstream channel as a result of a hydrologic change that could impact the downstream Santa Clara River. Based on limited available information at the time of this report's release, the hydrologic analysis indicates that the proposed project would result in a slight increase in peak runoff as a result of the increase in impervious area proposed within the project site.

Although the project area is a small percentage of the Santa Clara River watershed (0.0002 percent) and is unlikely to have a regional hydromodification effect, additional studies, such as the local effects of hydromodification, and analysis of the project's design are necessary to ensure that the proposed project would not cause erosion downstream of the project site (refer to Mitigation Measures HWQ-13 and HWQ-14). Based on the data available, it cannot be determined whether or not the proposed project would cause a hydromodification to downstream channels.

Expected Pollutants

When the proposed project is ultimately developed, the residential and open space development would replace the existing vacant land and open space. Typical pollutants that are generated by project category are summarized in *Table 5.7-6*, *Anticipated and Potential Pollutants Generated by Land Use Type*. The proposed project is anticipated to generate the following pollutants: Bacteria; Nutrients; Pesticides; Sediments; Trash and Debris; Oxygen Demanding Substances; and Oil and Grease.

Table 5.7-6
Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories	General Pollutant Categories								
	Pathogens	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediments	Trash and Debris	Oxygen Demanding Substances	Oil & Grease
Detached Residential Development	X		X	X		X	X	X	X
Hillside Development > 5,000 ft^2			X	X		X	X	X	X
Parking Lots		X	P (1)	P (2)		P (1)	X	P (5)	X
Streets, Highways, and Freeways		X	P (1)		X (4)	X	X	P (5)	X

X = anticipated
P = potential
(1) A potential pollutant if landscaping or open area exist on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

Source: RBF Consulting, *Mancara Residential Project Water Quality Assessment*, November 2010.

Flood and Erosion Control

There are no proposed improvements on the project site that would provide flood and erosion control and that would occur in or adjacent to the Santa Clara River other than extension of existing and/or upsized facilities under the railroad and the most northerly and southerly bridge over Oak Springs Canyon Wash.

At buildout of the proposed project, runoff from the drainage areas would continue to flow through the site, but would be channeled through a storm system that would be constructed from the developed upland areas of the site down to the Santa Clara River. As required in the LACDPW memorandum entitled, "Level of Flood Protection and Drainage Protection Standards," all on-site systems carrying runoff from developed areas would be designed from the 25-Year Design Storm (Urban Flood), while storm drains under major and secondary highways, open channels (main channels), debris carrying systems, and sumps would be designed for the 50-year capital flood. The City of Santa Clarita conforms to these Los Angeles County guidelines.

Runoff through the site would be controlled through a combination of grading, storm drain pipes, channels, catch basins, outlet structures, and bank stabilization along a portion of the Oak Springs Canyon Wash. The proposed drainage improvements are described below.

Storm Drains

Storm drains (pipes and reinforced concrete boxes) designed for either the 25-year or 50-year capital storm would consist of both privately (Homeowner's Association, Assessment Districts, etc.) and publicly (City of Santa Clarita and/or County of Los Angeles) maintained systems. The

minimum publicly maintained mainline pipe size would be 18-inch connector pipes for clear flows.

Open Channels

Small open channels would consist of rectangular and trapezoidal concrete channels and would be designed for either the 25-year or 50-year capital storm, depending on the source of the runoff. The channels sized for the 50-year capital storm would have greater capacity than those sized for the 25-year storm.

Low Flow Pipes and Outlets

To reduce pollution impacts from the low flow runoff, a series of pipes and outlets would be provided to intercept first flush runoff from paved project areas.

Catch Basins

Catch basins would be provided to intercept flows beyond the 10- and 25-year storms and at strategic locations to minimize flooding at street intersections and at sump locations.

Debris Basins

To reduce debris being discharged through and from the site, debris basins are proposed to intercept flows from undeveloped upland areas prior to their discharge into the on-site storm system.

Energy Dissipaters

To reduce storm flow velocities and to prevent erosion at storm water discharge points into the river, energy dissipaters consisting of either rip-rap or larger standard impact type energy dissipaters would be constructed wherever necessary at storm system outlets into the river. These energy dissipaters would slow the rate of flow of runoff into the river in order to prevent erosion of the stream channel.

Bank Stabilization

Since the residential development proposed is located outside the flood plain of the Santa Clara River, bank stabilization would not be constructed. However, buried bank stabilization (all four alternatives described below) would be constructed along portions of the Oak Springs Canyon Wash with a connection to two bridges over the Wash. There are four alternatives proposed for the buried bank stabilization, which are depicted on *Exhibit 5.7-5*: Colored Concrete Alternative #1, Rock Riprap Alternative #2, Gabions Alternative #3, Soil Cement Alternative #4

Project Impacts

Substantial Alteration of Drainage Patterns

The proposed project would result in a significant impact if it would 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 result in flooding on- or off-site; modify a wash, channel creek or river; and/or change the rate of flow, currents, or the course and direction of surface water.

The Santa Clara River would not be altered with the proposed project, since all grading activities are located outside of the flood plain. However, the Oak Springs floodplain would be altered by the construction of buried bank stabilization on a portion adjacent the floodway along with two bridge crossings.

Runoff Volumes in Excess of Existing or Planned Drainage System Capacity

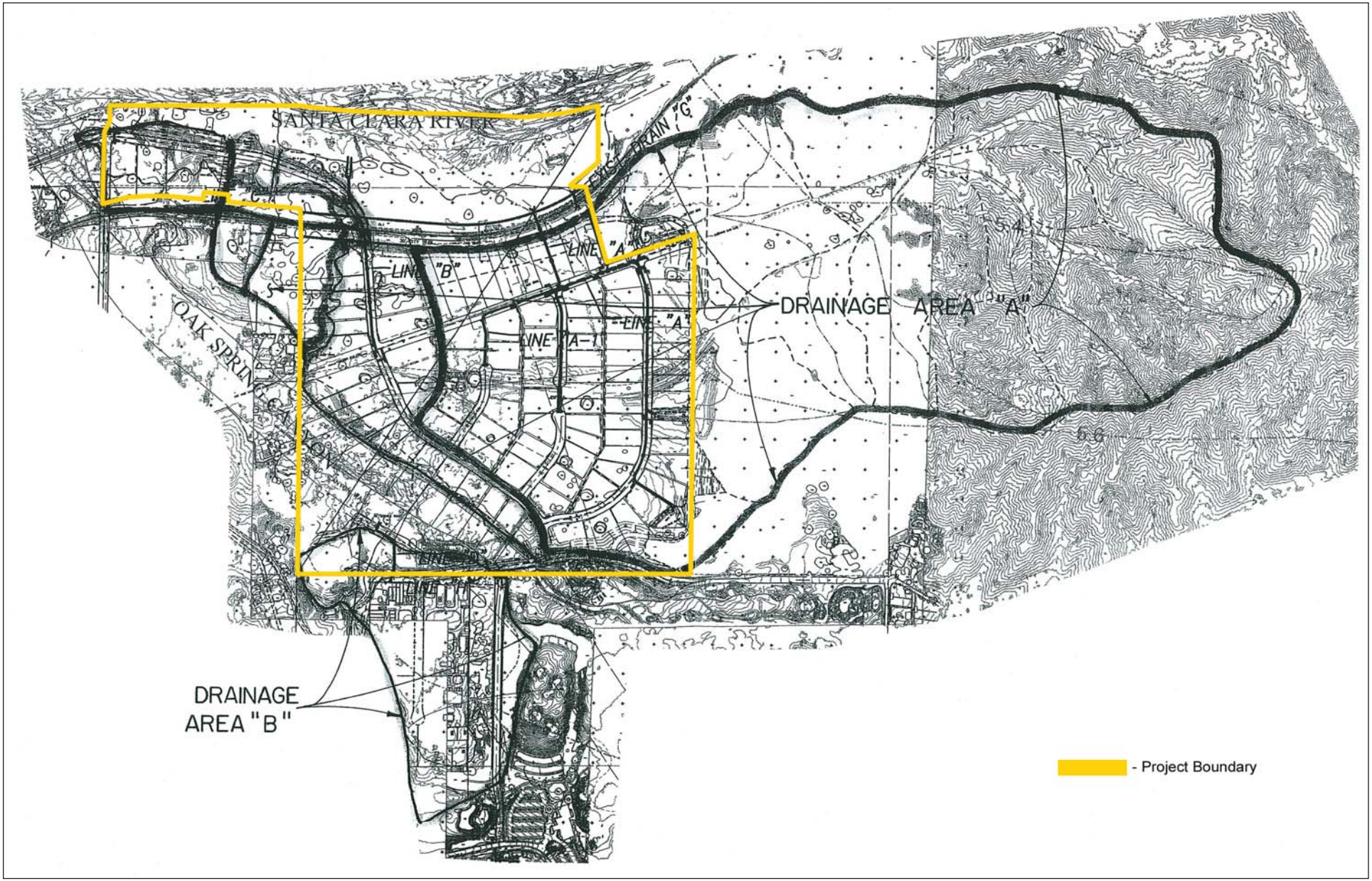
The proposed project would increase the amount of runoff from those areas of the site that would be covered by roads, buildings, paved parking areas, and other relatively impermeable or impervious features (see *Table 5.7-1*, *Percent Imperviousness for Selected Land Uses,* for the assumed percent imperviousness for each land use proposed for the site). Specifically, impervious surfaces on the site would increase the amount of clear flow runoff from the site, while burned and bulked runoff and debris volumes would be reduced because the developed portions of the site would be over-covered with impervious surfaces and non-erodable vegetation, and because debris basins that would reduce the amount of debris and sediment in the runoff are proposed at upstream locations.

The post-development runoff quantities for the northern watershed (north of Oak Springs Canyon Wash) provided in *Table 5.7-7*, *Post-Development Runoff Volumes*, and shown on *Exhibit 5.7-4*, *Proposed Hydrology Map*, would total 537.5 Q50c cfs for the 335.1-acre tributary area during a 50-year storm. A comparison of this table with *Table 5.7.2* demonstrates that clear flows would increase by 6.6 percent over existing conditions .

The post-development runoff quantities for the southern watershed (south of Oak Springs Canyon Wash) provided in *Table 5.7-7* and shown on *Exhibit 5.7-4* would total 7.8 cfs for the 33.1-acre tributary area during a 25-year storm. A comparison of this table with *Table 5.7.2* demonstrates that clear flows would decrease by 69 percent over existing conditions.

Burned and bulked flows being discharged from the site would total 532.9 cfs, which is a 31 percent reduction in capital flood flows from the site when compared to pre-development conditions. This reduction in burned and bulked flows is largely the proposed upstream debris basins that would capture upstream bulk flows and allow debris to settle out from the runoff before it enters the storm system through the developed portion of the site. As a result, there would be a net decrease in runoff and the proposed project would not result in downstream flooding. Furthermore, since storm flows from upstream areas would be channeled through the site in facilities designed for the 50-year capital storm, and since on-site runoff would be accommodated in facilities designed for the 25-year Urban Design Storm, pursuant to LACDPW requirements, no-site or upstream flooding inadequately designed storm drainage facilities would occur.

Therefore, site runoff from the proposed project would not cause an exceedance of river capacity and as such, impacts would be less than significant in this regard.



Source: Sikand.

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ENVIRONMENTAL IMPACT REPORT

Proposed Hydrology Map

Exhibit 5.7-4

Table 5.7-7
Post-Development Runoff Volumes

Drainage Area	Acreage	Q50c[1] (cfs)	Q50bb[2] (cfs)	Debris Volume (cy)	Q2[3] (cfs)
North of Oak Spring Canyon Wash					
A	298.2	470.4	473.6	275	101.9
B	13.7	19.7	-	-	5.6
C	17.7	28.3	59.3	457	6.0
F	5.5	11.3	-	-	2.9
Subtotal	*335.1*	*5529.7*	*532.9*	*732*	*116.4*
South of Oak Spring Canyon Wash					
H	3.1	7.8	-	-	4.5
Subtotal	*3.1*	*7.8*	-	-	*4.5*
Total	338.2	537.5	532.9	732	160

Notes:
[1] Q50c – 50-year rainfall intensity clear flow.
[2] Q50bb – 50-year capital flood burned and bulked flow.
[3] Q^2 – Two-year intensity burned and bulked flow.
Cfs = cubic feet per second.

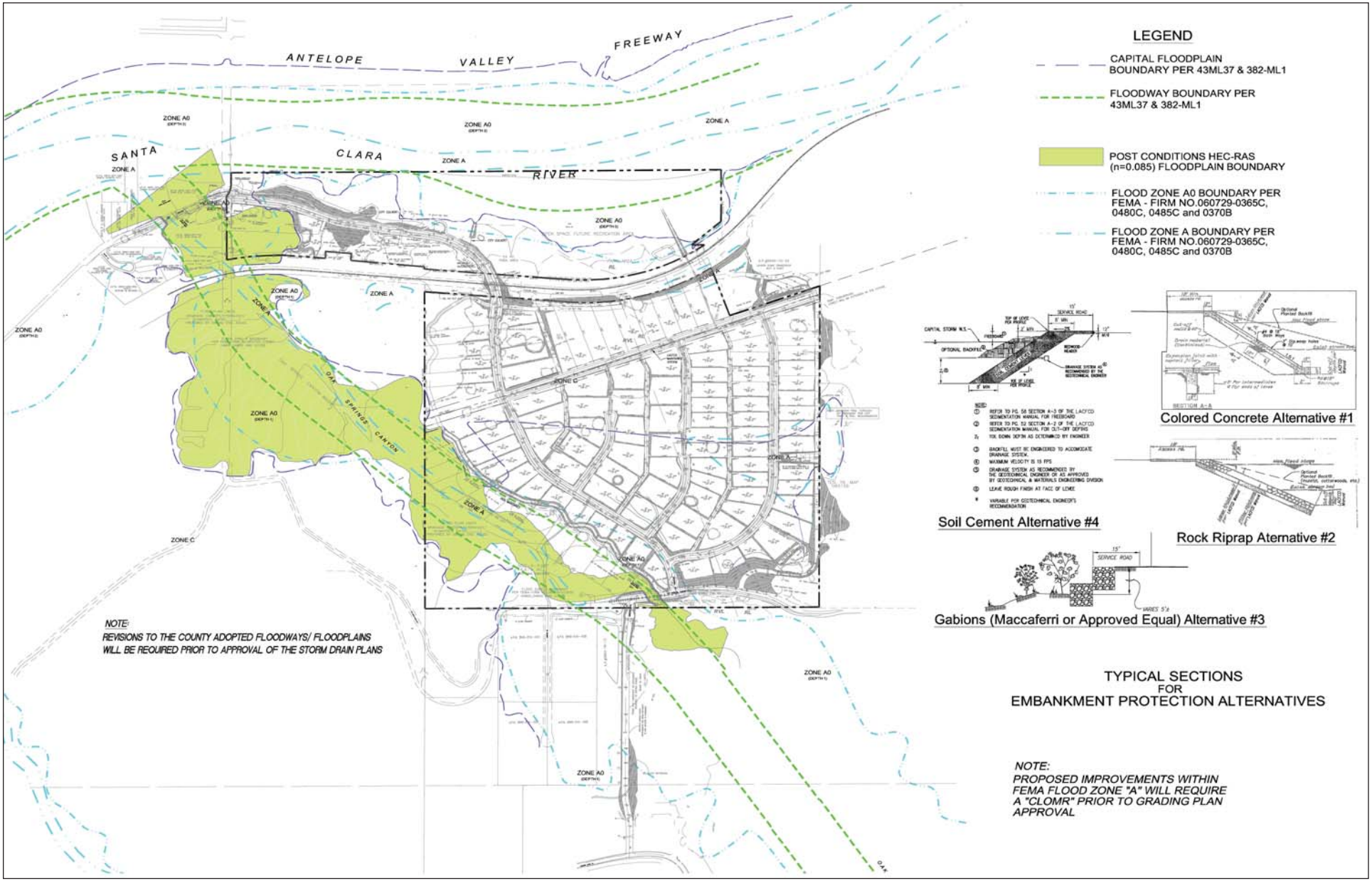
Source: *Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022,* Sikand Engineering Associates, November 2006.

Substantial Alteration of Drainage Patterns Resulting in Substantial Erosion or Siltation or Harmful Increases in Erosion

The total debris volume from proposed project in the tributary watershed, which represents 0.3 percent of the Santa Clara River watershed, would decrease from 9,846.7 cy to 732 cy (a 92.6 percent decrease). Burned and bulked flows would also decrease from 749.2 cfs to 501.1 cfs (a 33.1 percent decrease). Two-year storm flows would increase from 110 cfs to 118.6 cfs. The reduction in sedimentation and debris production is a result of reduced erosion of the site due to the development area being covered with pavement, roofs, vegetation, and other non-erosive surfaces. In addition, the proposed debris basins would capture sediment and debris in upstream runoff. Therefore, proposed project impacts to erosion would be less than significant.

Floodplain Hazards

The proposed project does not encroach upon the existing FEMA flood hazard area adjacent to the Santa Clara River. But the proposed project does encroach upon the existing FEMA flood hazard area, adjacent to the Oak Springs Canyon wash. However, the existing FEMA flood hazard area that would be encroached upon by the proposed project would be protected by construction of buried bank stabilization (refer to *Exhibit 5.7-5*, *Floodplain Map – Post Developed Conditions*). Therefore, proposed project impacts to flood flows within the Santa Clara River and Oak Springs Canyon wash would be mitigated to a less than significant level by securing from FEMA a conditional letter of map revision and a letter of map revision (refer to Mitigation Measure HWQ-16).



Source: Sikand, November 2, 2011.

NOT TO SCALE

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ENVIRONMENTAL IMPACT REPORT

Floodplain Map – Post Developed Condition

Exhibit 5.7-5

Seiche, Tsunami, Mudflow, Debris Flow, and Dam/Levee Failure

The project site is located inland from the Pacific Ocean and not in proximity to any large, continuously filled bodies of surface water; therefore, it is not subject to seiche or tsunamis. There are no dams that occur upstream of the project site. There is no indication that the proposed project, or other existing or planned projects in the project area, would be at risk a failure of the dam. Furthermore, the site is subject to some debris flows; however, adequate building setbacks from natural slopes and debris control facilities proposed in upstream areas of the site would protect the project development from mudflow hazard. Impacts would be less than significant in this regard.

IMPACT CONCLUSION

Development of the proposed project would not substantially alter existing drainage patterns within and through the project site such that it would increase on- or off-site flooding; significantly modify a drainage channel, or change the rate flow, currents, or the course and direction of surface waters. As a result, the proposed project impacts would be less than significant in this regard.

Proposed project impacts would not result in runoff volumes in excess of existing or planned drainage systems because the proposed development would include on-site improvements consistent with LACDPW requirements and sized for either the 25-year Urban or the 50-year capital storm events, depending on the source of runoff. As a result, it would not create or contribute runoff in quantities that would exceed the capacity of existing of planned storm water drainage systems.

The proposed project would not expose people or structures to a significant risk of loss, injury or death as a result of the failure of a levee or dam, or by inundation by seiche, tsunami, or mudflow.

Mitigation Measures:

HWQ-9 The on-site storm drain (pipes and reinforced concrete boxes) and open channels shall be designed and constructed for either the 25-year of 50-year capital storm.

HWQ-10 Debris basins shall be constructed pursuant to Los Angeles County Department of Public Works requirements to intercept flows from undeveloped areas entering into the developed portions of the site.

HWQ-11 Energy dissipaters consisting of either rip-rap or larger standard impact type energy dissipaters shall be installed as required by LACDPW at outlet locations to reduce velocities of runoff into the channel where necessary to prevent erosion.

HWQ-12 The project is required to comply with the RWQCB Municipal Permit (General MS4 Permit) Order NO. 01-187, NPDES No. CAS004001, and with the California State Water Resources Control Board Order No. 2009-009-DWQ NPDES General Permit No. CAS000002 (Construction General Plan Permit).

HWQ-13 A final developed condition hydrology analysis shall be prepared in conjunction with final project design when precise engineering occurs. This final analysis would be done to confirm that the final project design is consistent with the analysis. Those final calculations shall establish design features for the project that satisfy the criterion that post development peak storm water runoff discharge rates, velocities, and duration in natural drainage systems mimic pre-development conditions. All elements of the storm drain system shall conform to the policies and standards of the City of Santa Clarita and/or the Los Angeles County Department of Public Works, Flood Control Division, as applicable.

HWQ-14 Ultimate project hydrology and debris production calculations shall be prepared by the project engineer in conjunction with final project design when precise engineering occurs to verify the requirements for debris basins and/or desilting debris.

HWQ-15 In conjunction with the final project design when precise engineering occurs, debris basins shall be designed and constructed to reduce debris being discharged from the site pursuant to the City of Santa Clarita and/or LACDPW Flood Control requirements to intercept flows from undeveloped areas entering into the developed portions of the site.

HWQ-16 Prior to certificate of occupancy, the project applicant shall secure from FEMA: 1) conditional letter of map revision and 2) letter of map revision.

Level of Significance After Analysis and Mitigation: Less Than Significant Impact.

OPERATIONAL SURFACE WATER QUALITY IMPACTS

- ***OPERATION OF THE PROPOSED PROJECT COULD RESULT IN ADVERSE SURFACE WATER QUALITY IMPACTS.***

Level of Significance Before Analysis and Mitigation: Potentially Significant Impact.

Impact Analysis: This section assesses the water quality in the project area, and identifies the beneficial uses and applicable water quality standards of the surface receiving water and the adjacent groundwater basin. This section also compares the water quality standards to the typical residential runoff and identifies the pollutants of concern that might exceed the applicable water quality standards.

Receiving Surface Water Bodies

As previously mentioned, the proposed project would directly drain into the Santa Clara River. *Table 5.7-8*, *Project Impervious Area Comparison to Watershed Area*, compares the size of the proposed project to that of the watershed area.

Table 5.7-8
Project Impervious Area Comparison to Watershed Area

Estimated Existing Conditions Impervious Area	Existing Project Conditions Impervious Area (Percentage of Total Project)	Total Project Area (Percentage of Total Watershed)	Estimated Total Watershed Area
0 acres	127 acres (75%)	170 acres (0.0002%)	1,037,000 acres

Source: *Mancara Residential Project Water Quality Assessment*, RBF Consulting, November 2010.

As summarized in *Table 5.7-8*, although the proposed project would increase the impervious area by approximately 127 acres, 75 percent, the overall impact this represents to the Santa Clara River watershed (approximately 1,037,174 acres) is less than significant.

Water Quality Objectives

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area."

There are two forms of water quality objectives:

- **Narrative** objectives present a general description of water quality that must be attained through pollutant control measures and watershed management. They also serve as the basis for the development of detailed numerical objectives. Narrative objectives apply for all water bodies. They are listed in Appendix A of the *Water Quality Report* (Appendix M)
- **Numerical** objectives typically describe pollutant concentrations, physical and chemical conditions of the water, and toxicity of the water to aquatic organisms. Places where numerical limits are specified represent the maximum levels that would allow the beneficial use to continue unimpaired. In other cases, an objective may prohibit the discharge of specific substances, tolerate natural or "background" levels of certain substances or characteristics (but not increases over those values), or may express a limit, in terms of not impacting other beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use. No numerical objectives have been established for Oak Spring Canyon Wash.

Federal water quality objectives are dictated by Section 303(d) of the CWA and U.S. EPA water quality planning and management regulations, which require states to identify waters that do not meet, or are not expected to meet, water quality standards, even after technology-based or other required controls are in place. These water bodies are considered water quality-limited and are reported by states in their 303(d) List. As previously discussed, the Santa Clara River is 303(d)-listed for chloride, ammonia, nitrate and nitrite, coliform, total dissolved solids (TDS), ChemA, and toxaphene.

Water Quality Best Management Practices

Several BMP devices can be implemented within the proposed project. Of those approved for implementation, the following BMPs are being considered for the proposed project: biofiltration strips or swales, sand filters and extended detention basins. The BMPs that would minimize the storm water pollutants of concern for residential projects include:

- Trash and debris;
- Nutrients;
- Pesticides;
- Oil and grease;
- Sediments; and
- Oxygen-demanding substances.

The type, selection, location, and sizing of the biofiltration strips and swales, sand filters and detention basins would be determined during the next design phase of the project.

The Los Angeles County Department of Public Works has a Standard Urban Storm Water Mitigation Plan to address stormwater quality and development projects. The following is a description of BMPs applicable to single-family residential projects:

- Storm drain system stenciling and signage.
- Diverting roof runoff to vegetated areas before discharge unless the diversion would result in slope instability.

Directing surface flow to vegetated areas before discharge unless the diversion would result in slope instability.

In January 2008, the County of Los Angeles Department of Public Works completed their review of the *Hydrology Study/SUSMP* and concluded that the Hydrology Study/SUSMP and Off-Site Hydraulics are recommended for City approval for Area and Q only subject to the comments and conditions in the January 9, 2008 letter and on the map returned to the project applicant. The January 9, 2008 letter from the County of Los Angeles Department of Public Works in included in Appendix L.

In conclusion, impacts associated with the proposed project can be mitigated to a less than significant level with implementation of Mitigation Measure HWQ-17.

Mitigation Measures:

HWQ-17 The project applicant shall implement all of the conditions imposed on the SUSMP by the County of Los Angeles Department of Public Works and the City of Santa Clarita to each agency's satisfaction during the grading and building process.

Level of Significance After Analysis and Mitigation: Less Than Significant Impact.

GROUNDWATER QUALITY IMPACTS

- ***DEVELOPMENT OF THE PROPOSED PROJECT COULD RESULT IN ADVERSE GROUNDWATER QUALITY IMPACTS.***

***Level of Significance Before Analysis and Mitigation*:** Potentially Significant Impact.

Impact Analysis: Typically, discharge from the proposed project's developed areas to groundwater would occur at three locations: (1) through general infiltration of irrigation water, (2) through incidental infiltration of urban runoff in the proposed treatment control project design features after treatment, and (3) infiltration of urban runoff, after treatment in the project design features. Groundwater quality would be fully protected through implementation of the project's site design, source control, and treatment control project design features prior to discharge of project runoff to groundwater. On this basis, the potential for adversely affecting groundwater quality is considered less than significant.

***Mitigation Measures**:* Refer to Mitigation Measure HWQ-8. No additional mitigation measures are required.

***Level of Significance After Analysis and Mitigation*:** Less Than Significant Impact.

5.7.6 CUMULATIVE IMPACTS AND MITIGATION MEASURES

- ***DEVELOPMENT ASSOCIATED WITH THE PROPOSED PROJECT AND OTHER RELATED CUMULATIVE PROJECTS COULD CONTRIBUTE TO CUMULATIVE HYDROLOGY AND WATER QUALITY IMPACTS.***

Level of Significance Before Analysis and Mitigation: Less Than Significant Impact.

Impact Analysis: It has been estimated that approximately four percent of that portion of the Santa Clara River watershed found in Los Angeles County would be developed and approximately 2.5 percent of the portion of the watershed found in Ventura County would be developed. Each development project in the Santa Clara River watershed (1,634 square miles) would be of varying intensity and size, would have its own unique topographic and geologic characteristics, and would be subject to the development criteria of the jurisdiction in which it is located.

All development within the portion of the watershed of the Santa Clara River located in Los Angeles County, including that within the City of Santa Clarita, is required to comply with the LACFWD Q_{cap} requirements to ensure that upstream of downstream flooding does not occur. Compliance with these requirements ensures consistency with the County's Q_{cap} model. Pursuant to LACDPW requirements, all drainage systems in developments that carry runoff from developed areas must be designed for the 25-year Urban Design storm, while storm drains under major and secondary highways, open channels (main channels), debris carrying systems, and sumps must be designed for the 50-year capital flood storm. LACDPW also prohibits significant increases in off-site post-development storm flows and significant increases in storm flow velocities. Development in the Los Angeles County portion of the watershed must also

comply with LACDPW design criteria. As a result of compliance, overall storm runoff discharge quantities from the watershed under post-development runoff conditions would be less than or equal to existing conditions largely because the runoff would be free of the debris that is typical of undeveloped watershed and flow velocities would not increase significantly. Because on-site facilities would already have been built for burned and bulked flows from undeveloped areas, they would have more than adequate capacity to accommodate off-site flows as the off-site portions of the drainage areas develop.

As the analysis of proposed project demonstrates, development in minor drainage courses within the portion of the watershed located in Los Angeles County that are in compliance with these requirements would experience a decrease in burned and bulked runoff as the hillsides of the watershed develop. Discharge quantities into the Santa Clara River from these minor drainages under post-development conditions would be less than under existing conditions because the runoff would be free of the debris that is typical of undeveloped watersheds. As a policy, both the City of Santa Clarita and the LACDPW prohibit significant increases in flow velocity from a project site; therefore, adherence to this policy would result in no significant cumulative increases in velocity or erosion/sedimentation impacts along this portion of the Santa Clara River.

Other projects within the City of Santa Clarita and Los Angeles County would be subject not only to the same general requirements as the proposed project, but also to such other requirements as the City of Santa Clarita (as applicable) and LACDPW would specifically identity for them based on their unique topographic and geologic characteristics.

The analysis of the proposed project conditions demonstrates that the proposed project, which must comply with all these City and County requirements, would not create any significant impacts. Compliance with applicable regulations results in the less discharges from the project post-development as compared to pre-development levels, and thus runoff from the proposed project causes no incremental increase in the cumulative impact of watershed-wide development.

Because the cumulative project drainage improvements in the City of Santa Clarita and Los Angeles County would be required to conform to the requirements of the City of Santa Clarita Department of Engineering Services and the LACDPW in order to handle the capital flood from the affected watershed, no potentially significant cumulative project flooding impacts are expected to occur from the incremental impacts of the project. The development criteria of each jurisdiction would ensure that no potentially significant cumulative impacts would occur.

Pursuant to LACDPW requirements, all drainage systems in developments that carry runoff from development areas would be designed for the 25-year Urban Design Storm, while storm drains under major and secondary highways, open channels (main channels), debris carrying systems, and sumps would be designed for the 50-year capital flood storm. LACDPW also prohibits significant increases in off-site post development storm flows and significant increases in storm flow velocities. Development elsewhere in the watershed must also comply with LACDPW design criteria. As a result of compliance, overall storm runoff discharge quantities from the watershed under post-development runoff conditions would be less than or equal to existing conditions largely because the runoff would be free of the debris that is typical of undeveloped watersheds and flow velocities would not increase significantly. Because on-site facilities would already have been built for burned and bulked flows from undeveloped areas,

they would have more than adequate capacity to accommodate off-site flows and off-site portions of the drainage areas development.

Because on-site drainage would have adequate capacity to capture and convey off-site flows from developed upstream areas and because the storm drainage improvements in the remainder of the watershed would be required to comply with LACDPW design criteria, no significant increases in velocity and related scouring, and no significant cumulative project flooding impacts are expected to occur downstream of the site (including the Santa Clara River) as the watershed is built out with urban development.

Other projects within Santa Clarita and Los Angles County would not only be subject to the same general requirements as the proposed project, but to other requirements that the City of Santa Clarita (as applicable) and LACDPW Flood Control Division would specifically identify for them. All development within the watershed of the Santa Clara River within the City of Santa Clarita is already required to comply with the City of Santa Clarita Department of Engineering Services requirements and locations within the unincorporated Los Angeles County would comply with the Los Angeles County Department of Public Works Flood Control Division requirements have been established to ensure that upstream or downstream flooding does not occur and to ensure that downstream erosion and sedimentation do not occur. Therefore, no unavoidable significant cumulative flooding, erosion and sedimentation impacts would be created. Compliance with these requirements ensures consistency with the County's Q_{cap} model.

As previously discussed, the proposed project is required to incorporate into its design, and to implement, all mitigation measures, and, to comply with all applicable regulations. Thus, the anticipated quality of effluent expected from the proposed project would not contribute loads or concentrations of pollutants of concern that would be expected to cause or contribute to a violation of the water quality standards in the project's receiving waters. Therefore, the proposed project's incremental effects on surface water quality would be less than significant.

The proposed project's surface runoff water quality, after inclusion of all required project design features, both during construction and post-development, is predicted to comply with adopted regulatory requirements that are designed by the Los Angeles Regional Quality Control Board (LARWQCB) to assure that regional development does not adversely affect water quality, including:

- Municipal Separate Storm Sewer Systems Permit requirements;
- Standard Urban Stormwater Mitigation Plan requirements;
- Construction General Permit requirements;
- General Dewatering Permit requirements;
- Benchmark Basin Plan water quality objectives;
- California Toxics Rule criteria; and
- Total Maximum Daily Loads.

All of these are intended to be protective of beneficial uses of the receiving waters. Based on compliance with these requirements, which are designed to protect downstream beneficial uses, cumulative water quality impacts would be considered less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Analysis and Mitigation: Less Than Significant Impact.

5.7.7 SIGNIFICANT UNAVOIDABLE IMPACTS

All potentially significant impacts related to hydrology, flooding, drainage, and water quality are at less than significant levels or can be reduced to a level less than significant with implementation of applicable mitigation measures. As such, implementation of the proposed project would not result in any significant unavoidable hydrology and water quality impacts.

5.7.8 SOURCES CITED

Santa Clarita General Plan, adopted June 14, 2011.

Draft Program Environmental Impact Report for the City of Santa Clarita's Proposed One Valley One Vision General Plan, Impact Sciences, Inc., September 2010.

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Technical Report for Drainage Concept/Hydrology for Mancara Tentative Tract 063022, Sikand Engineering Associates, May 2006.

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Water Quality Assessment Report – Mancara Residential Project, RBF Consulting, November 2010.