IV. ENVIRONMENTAL IMPACT ANALYSIS
H. HYDROLOGY AND WATER QUALITY

A Drainage Analysis, dated June 13, 2008, and a Debris Production Report, dated June 16, 2008 were prepared by Permco Engineering & Management for the proposed project to analyze the potential hydrology and flood hazard impacts associated with the proposed project. A summary of the Drainage Analysis and Debris Production Report with respect to the potential hydrology and flood hazard impacts is set forth below. The Drainage Analysis and Debris Production Report, which are incorporated herein by this reference, are included as Appendices J-1 and J-2, respectively, of this Draft EIR.

ENVIRONMENTAL SETTING

The irregularly shaped 58.32-acre project site is situated on the south flank of a northwest trending ridge within the northeast portion of the Verdugo Mountains. The southeast portion of the project site is characterized by a series of near-level pads with steep ascending slopes to the north and west. This relatively flat area of approximately 25 acres is currently occupied by the Verdugo Hills Golf Course. The 33.5 acres of steep onsite hillsides that surround the golf course on the north and west are undeveloped and have slopes approaching 50 percent (1:2 – vertical to horizontal).

The project site has local changes in elevation of approximately 295 feet, rising from a low of approximately 1,615 feet above sea level (ASL) near the southeast corner of the project site, to a height of approximately 1,910 feet ASL near the northwest corner of the project site. Natural slope gradients roughly range from 1:3 to as steep as 0.75:1 (vertical to horizontal). Steep "V" shaped canyons are typical of the drainages at the higher elevations of the project site, as well as in the Verdugo Mountains in general. Precipitation falling directly on the project site initially runs downslope as sheet[1] and rill[2] flows; however, the steep rocky terrain quickly causes the runoff to concentrate in narrow ravines. Other storm water sources that affect onsite hydrology include tributary sheet flow and secondary drainage courses flowing primarily southerly and southwesterly onto the site from the surrounding hillsides. The western and central portions of the project site generally drain southerly toward La Tuna Canyon Road. A small stream runs through the golf course from the northwest corner to the southeast that then empties into Las Barras Canyon on the far side of La Tunas Canyon Road. The northeasterly portion of the project site drains easterly toward the Verdugo Wash.

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[1] *Sheet flow is that portion of precipitation that moves initially as overland flow in very shallow depths before eventually reaching a stream channel.*

[2] *A "rill" is a small stream or brook.*

The existing storm drain system in La Tuna Canyon Road consists of a 72-inch reinforced concrete pipeline (RCP) constructed as part of the I-210 Freeway. The pipeline runs along the north side of La Tuna Canyon Road and joins the Los Angeles County Flood Control District's (LACFCD) Las Barras Canyon Channel which, in turn, joins the LACFCD's Verdugo Wash channel south of La Tuna Canyon Road.

There are two major points of discharge from the golf course site: (1) a 60-inch pipe that drains the eastern portion of the project site and crosses La Tuna Canyon Road approximately 500 feet west of Tujunga Canyon Boulevard; and (2) a 48-inch pipe that drains the western portion of the project site and crosses La Tuna Canyon Road approximately 1,600 feet west of Tujunga Canyon Boulevard. The 48-inch pipe ties into a 72-inch storm drain located along the northerly side of La Tuna Canyon Road. The 60-inch and the 72-inch pipes connect to the Las Barras Canyon Channel on the south side of La Tuna Canyon Rd. These pipes are shown in Figure II-5, Proposed Grading Scheme. Based on the Pre Development peak flow rate indicated in the Drainage Analysis (Appendix J-1) the existing 60-inch and 48-inch pipes are adequate to drain the existing conditions project site during a 50-year storm event. Due to the large relative flat areas at the base of the steep hillside, including the golf course draining to the 60-inch pipe, the concern for damage due to bulked (i.e., debris laden) flow is minimal. There is also substantial area for containment of sediment preceding the existing pipe entrance.

There is also an existing 36-inch storm drain that crosses Tujunga Canyon Boulevard, north of its intersection with Pali Avenue, and ties directly into Verdugo Wash Channel. A small portion of the project site west of the Verdugo Wash Channel drains overland into the channel. An even smaller portion of the project site, located between Verdugo Wash Channel and Tujunga Canyon Boulevard, drains into the 36-inch storm drain that is connected directly into the channel.

The hydrology study for the proposed project assumes the existing storm drain system serving the project site was designed for the existing golf course conditions and not for a residential development (see Drainage Analysis, dated June 13, 2008 in Appendix J-1). This is a conservative approach in order to evaluate the requirements for the proposed storm drain facilities.

Storm Water Hydrology

Flood hydrology, applied to determine storm water design quantities for major channel systems and flood regulating or detention structures, is based on a theoretical storm, created from the statistical analysis of data from past measurement records. For the proposed project, a 50-year storm frequency has been analyzed for both the undeveloped and developed conditions. A 50-year storm is a large storm that has the statistical probability of recurring once every 50 years. Because storm frequency probability is inversely related to storm intensity and flood potential, storms that have more frequent recurrence probabilities are also less intensive and have less flood potential. The hydrology calculations presented

herein are based on an analytical method adopted by the County of Los Angeles Department of Public Works known as the Modified Rational Method, or MORA.[3]

For the undeveloped site conditions (i.e., existing conditions), a "burned" scenario for stormwater runoff flows has been calculated for a 50-year storm. The "burned" condition assumes that the storm would occur shortly after a fire has burned away the hillside vegetation. Normally, vegetation helps to hold back sediment and other debris from being carried along in the runoff. Without that vegetative anchor, soil infiltration and absorption decrease and debris volumes and storm runoffs increase. Thus, the 50-year storm event following a major fire is considered to be the worst-case scenario. Although a scenario in which a 50-year storm occurs without a major fire could also be calculated, this flow has not been used in this analysis since it does not represent the worst-case flood condition. Similarly, more frequent storms could also be calculated, but again, would result in less runoff than the design storm.

Pre-Development Analysis

The 58.5-acre project site and a tributary offsite area of approximately 5.0 acres north of the project site mostly drain southerly toward La Tuna Canyon Road. The westerly portion of the project site (Subarea 20A, Figure IV.H-1) drains to a 48-inch pipe that discharges into the La Tuna Canyon Road storm drain system. The central portion of the project site (Subarea 10A, Figure IV.H-1) drains to the previously mentioned 60-inch pipe that was originally part of the LACFCD's Las Barras Canyon Channel. A relatively small part of the northerly portion of the project site (Subarea 30A, Figure IV.H-1) drains overland to the LACFCD's Verdugo Wash Channel. The remainder of the project site (Subarea 40A, Figure IV.H-1) is located between Verdugo Wash channel and Tujunga Canyon Boulevard. The runoff from this area is collected in a 36-inch storm drain that is connected to the Verdugo Wash channel. Table IV.H-1 summarizes the stormwater runoff from the site in its current condition and compares that to the projected runoff from a similar 50-year storm following completion of the proposed project.

Most of the project site currently consists of undisturbed hillsides and golf course landscaping. These pervious surface areas permit rainfall to seep into the natural soils and limit the extent of runoff. According to the Drainage Analysis (see Appendix J-1), there are only 1.83 acres of impervious surface area on the project site, or 2.9 percent of the total 63.5-acre drainage area.

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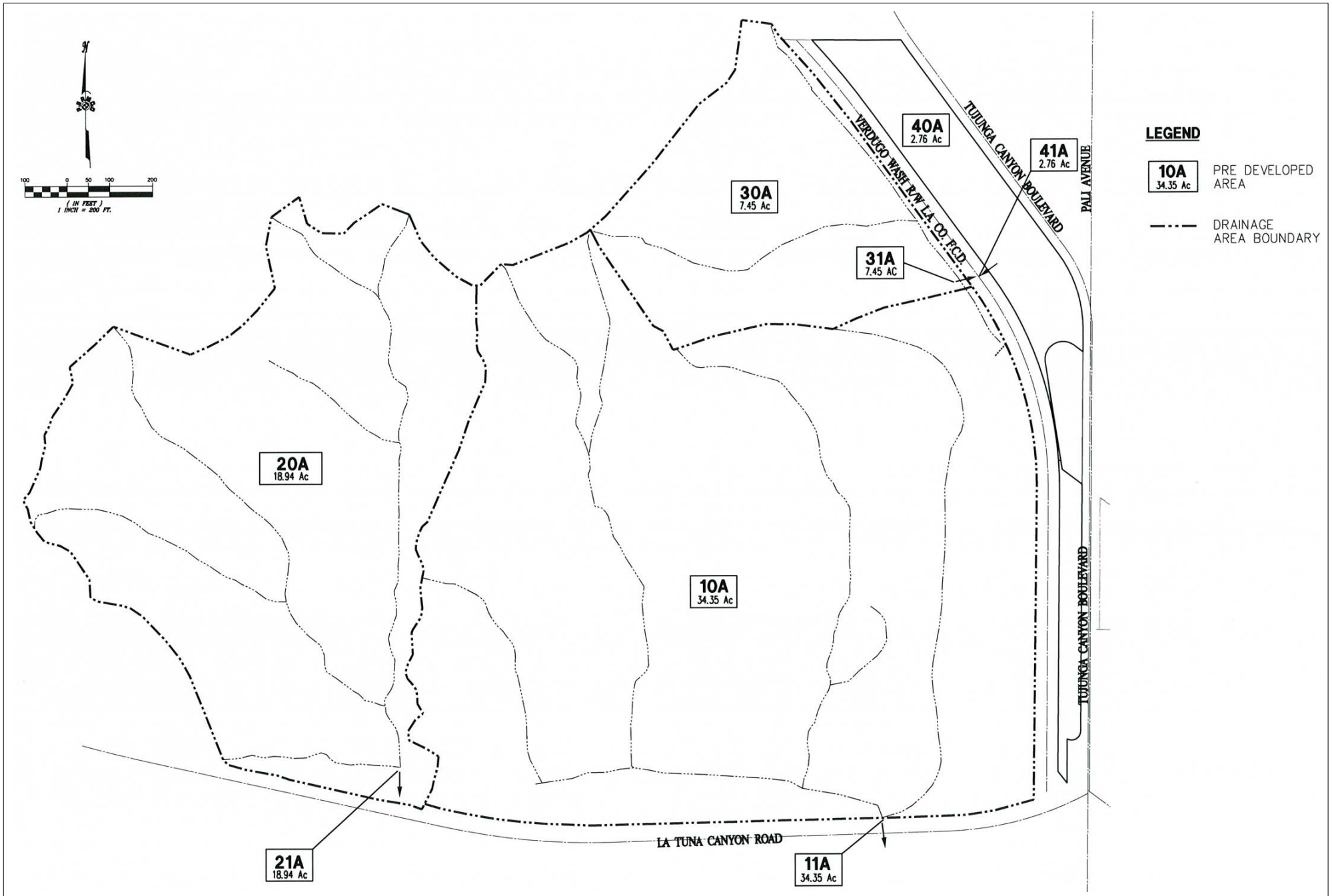
[3] *This methodology determines the runoff from drainage areas based on the average intensity for rainfall in the area according to the time passed (i.e., time of concentration) since the beginning of a given storm. The time of concentration is then followed through the contributing drainage areas of the project study site by calculating the travel time accumulated from drainage to next contributing drainage area.*

Where drainage areas meet that do not have the same time of concentration for the peak runoff flows being conveyed, the contributing flows are combined (i.e., confluenced) by adjusting the individual contributing flows based on their relative times of concentration and storm intensities. The adjusted flow is thus maximized to a new peak flow for the longest combing time of concentration. Lastly, the MORA methodology adjusts the runoff calculations to emulate a 24-hour typical storm for a 50-year storm frequency



Source: PERMCO Engineering, June 13, 2008.

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Figure IV.H-1
Pre Development Drainage Basin Map

Table IV.H-1
Summary Comparison of Existing and Proposed Hydrology Conditions

SubArea	Peak Flow Rate (CubicFeet/Second)		Net Change in Peak Flow	24-Hour Runoff Volume (Acre-Feet)		Net Change In 24-Hour Runoff Volume	Required Storage
	Existing Conditions	Proposed Conditions		Existing Conditions	Proposed Conditions		
10A	121.1 cfs	135.48 cfs	+14.38 cfs	5.71 acre feet	10.99 acre-fee	5.28 acre-feet	5.28 acre-feet
20A	79.47 cfs	79.47 cfs	0.0 cfs	2.79 acre feet	2.93 acre feet	0.14 acre-feet	0.14 acre-feet
30A	34.45 cfs	34.45 cfs	0.0 cfs	1.11 acre feet	1.11 acre feet	0.0 acre-feet	0.0 acre-feet
40A	12.76 cfs	13.39 cfs	0.63 cfs	0.41 acre feet	1.09 acre feet	0.68 acre-feet	0.68 acre-feet

Debris Production

The project site is located in Debris Potential Area 7 (DPA-7). Undeveloped hillsides within DPA-7 generate approximately 44 cubic yards of debris per acre during a 50-year storm.[4] There are currently approximately 33.5 acres of undeveloped hillside on the project site which would generate approximately 1,474 cubic yards of debris during a 50-year storm. Ongoing landscape maintenance on the 25-acre golf course has virtually eliminated debris production from that portion of the project site.

100-year Flood Hazard Areas

According to FEMA 100-year Flood Data, there are no flood hazard areas on, adjacent to, or within two miles of the project site. Consequently, the project site is not subject to flood inundation.

Regulatory Framework

The 1987 amendments to the Federal Water Pollution Control Act, or Clean Water Act (CWA), added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the National Pollution Discharge Elimination System (NPDES) program. Subsequently, the EPA published final regulations that establish requirements for applications for storm water permits for specified categories of industries and construction activities of 5 acres or more.

In 1992, the California State Water Resources Control Board (SWRCB) adopted the General Construction Activity Storm Water Permit (GCASWP), which was "...required for all storm water discharges associated with construction activity where clearing, grading, and excavation results in a land disturbance of 5 or more acres." However, by Modification of Water Quality Order 99-08-DWQ (approved by Motion on December 2, 2002), the SWRCB lowered the threshold acreage of soil disturbance requiring permit coverage from 5 acres to 1 acre. Since the proposed project site falls within these criteria, a permit must be obtained from the SWRCB prior to start of construction. In order to be covered under the General Permit, the project developer must submit a Notice of Intent (NOI) to the SWRCB.

The General Permit requires all owners of land where construction activities occur (dischargers) to:

- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the nation;
- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP); and
- Perform inspections of storm water pollution prevention measures (control practices).

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[4] *Based upon the Los Angeles County Department of Public Works Sedimentation Manual, 2nd Edition, dated March 2006*

The General Permit authorizes the discharge of storm water associated with construction activity from construction sites. However, it prohibits the discharge of materials other than storm water and all discharges which contain hazardous substances in excess of reportable quantities established at 40 Code of Federal Regulations 117.3 or CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges.

The General Permit requires development and implementation of a SWPPP, emphasizing Best Management Practices (BMP), which is defined as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States." The SWPPP has two major objectives:

- To help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and

- To describe and ensure the implementation of practices to reduce sediment and other pollutants in storm water discharges, both during and after construction.

In addition, dischargers are required to conduct inspections before and after storm events and to annually certify that they are in compliance with the General Permit.

Sections 64.70 et seq. of the LAMC (Ordinance No. 172,176) provide for Stormwater and Urban Runoff Pollution Control in hillside areas and requires the application of BMPs to minimize water quality degradation. In addition, Chapter IX, Division 70 of the LAMC addresses BMPs to minimize storm water pollution associated with grading, excavations and fills. All grading activities require grading permits from the Department of Building and Safety. Additional provisions are required for grading activities within "hillside" areas.

State Porter-Cologne Water Quality Control Act

In addition to the requirements of the federal CWA and associated regulations, storm runoff from the proposed project site and discharges of runoff into and/or encroachment upon natural drainages, wetlands, and/or flood plains are subject to the State Porter-Cologne Water Quality Control Act and associated regulations, and to requirements established by the Flood Control and Watershed Management Divisions of the Los Angeles County Department of Public Works (LACDPW).[5]

Section 401 of the CWA requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required by Section 401 has been granted. Further, no license or permit may be issued if certification has been

[5] *Porter-Cologne Water Quality Control Act is at California Water Code, Sec. 13000 et seq.*

denied. Section 401 water quality certification is normally provided with coverage under the General Construction Activities Stormwater Permit (GCASWP).

Water Quality Control Plan Los Angeles Region (Basin Plan)

The State Water Resources Control Board delegates to the various RWQCBs the responsibility for the protection of water quality in each major drainage basin throughout the state. As required by the federal Clean Water Act, the Los Angeles RWQCB has adopted the Water Quality Management Plan for the Los Angeles Region (Basin Plan). The Basin Plan establishes water quality objectives for surface waters and groundwater within the Los Angeles Region, including the San Fernando Groundwater Basin, which surrounds the Verdugo Mountains (see Figure IV.H-2). The California Water Code defines water quality objectives as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Therefore, the Basin Plan water quality objectives are intended to: (1) protect the public health and welfare; and (2) maintain or enhance water quality in relation to the designated existing and potential uses of the water.

The Basin Plan designates beneficial uses for surface and ground waters, sets narrative and numerical water quality objectives that must be attained (or maintained) to protect the designated beneficial uses, and describes implementation programs to protect all waters in the region. According to the Basin Plan (Page 2-1):

> *Beneficial uses form the cornerstone of water quality protection under the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses. The designated beneficial uses, together with water quality objectives (referred to as criteria in federal regulations), form water quality standards.*

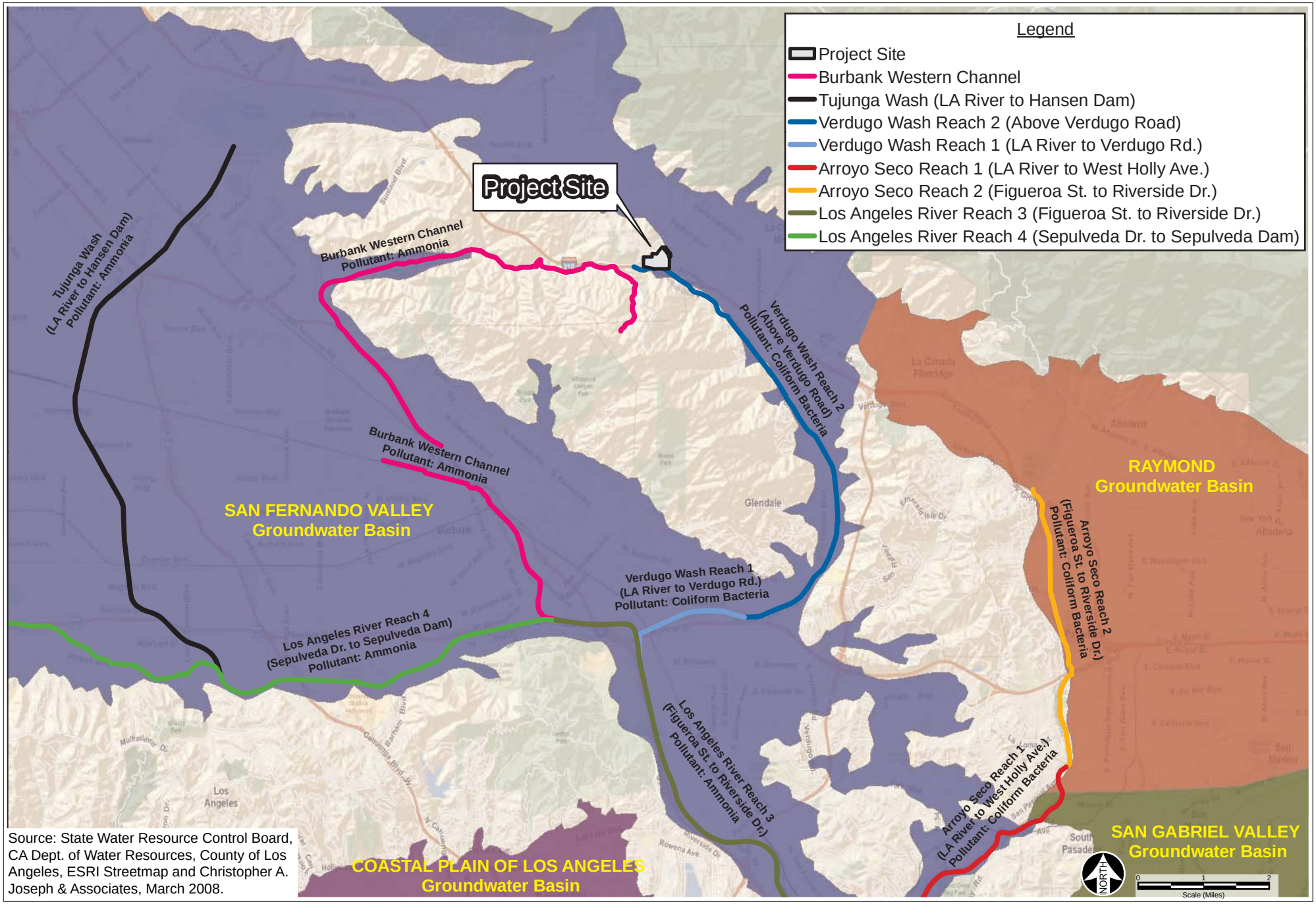
Table IV.H-2 lists the beneficial uses for the San Fernando Groundwater Basin that could be impacted by the proposed project as listed in the Basin Plan.

Groundwater Quality

As shown on Figure IV.H-2, the Verdugo Mountains, in which the project site is located, is surrounded by the San Fernando Valley Groundwater Basin. According to the Basin Plan, groundwater accounts for most of the Region's local supply of fresh water. However, the general quality of groundwater in the Region has degraded substantially, a reflection of land uses.

The Basin Plan provides the following description of specific groundwater quality problems in the San Fernando Valley and San Gabriel Valley Groundwater Basins (page 1-21):

> *Volatile organic compounds from industry, and nitrates from subsurface sewage disposal and past agricultural activities, are the primary pollutants in much of the ground water throughout these*



Source: State Water Resource Control Board, CA Dept. of Water Resources, County of Los Angeles, ESRI Streetmap and Christopher A. Joseph & Associates, March 2008.

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Figure IV.H-2
2006 Clean Water Act
Section 303(d) List of Segments and Groundwater Basins

basins. These deep alluvial basins do not have continuous effective confining layers above ground water and as a result pollutants have seeped through the upper sediments into the groundwater. Approximately 20% of the groundwater production capacity for municipal uses in the San Gabriel Valley has been shut down due to this pollution.

In light of the widespread pollution in both the San Gabriel Valley and San Fernando Valley Groundwater Basins, the California Department of Toxic Substances Control has designated large areas of these basins as high priority Hazardous Substances Cleanup sites. Furthermore, the ISEPA has designated these areas as Superfund sites. The Regional Board and USEPA are overseeing investigations to further define the extent of pollution, identify the responsible parties, and begin remediation in these areas.

Table IV.H-2
Existing Beneficial Uses of San Fernando Valley Ground Water Basin

Existing Beneficial Use	Definition
Municipal and Domestic Supply (MUN)	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
Industrial Service Supply (IND)	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
Industrial Process Supply (PROC)	Uses of water for industrial activities that depend primarily on water quality.
Agricultural supply (AGR)	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Aquaculture (AQUA)	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

As indicated on Figure IV.H-2, List of Segments, the project site is located near the headwaters of Verdugo Wash Reach 2 (Above Verdugo Road). The 2006 Clean Water Act Section 303(d) List of Segments and Groundwater Basins identifies this reach of the Verdugo Wash as being polluted with coliform bacteria.

ENVIRONMENTAL IMPACTS

Thresholds of Significance

In accordance with Appendix G to the CEQA Guidelines, the proposed project would have a significant hydrology impact if: `

- The project would 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.

- The project 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.

- The project would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

- The project would 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.

- The project would place within a 100-year flood hazard area structures which would impede or redirect flood flows.

- The project would 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.

- The project would expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

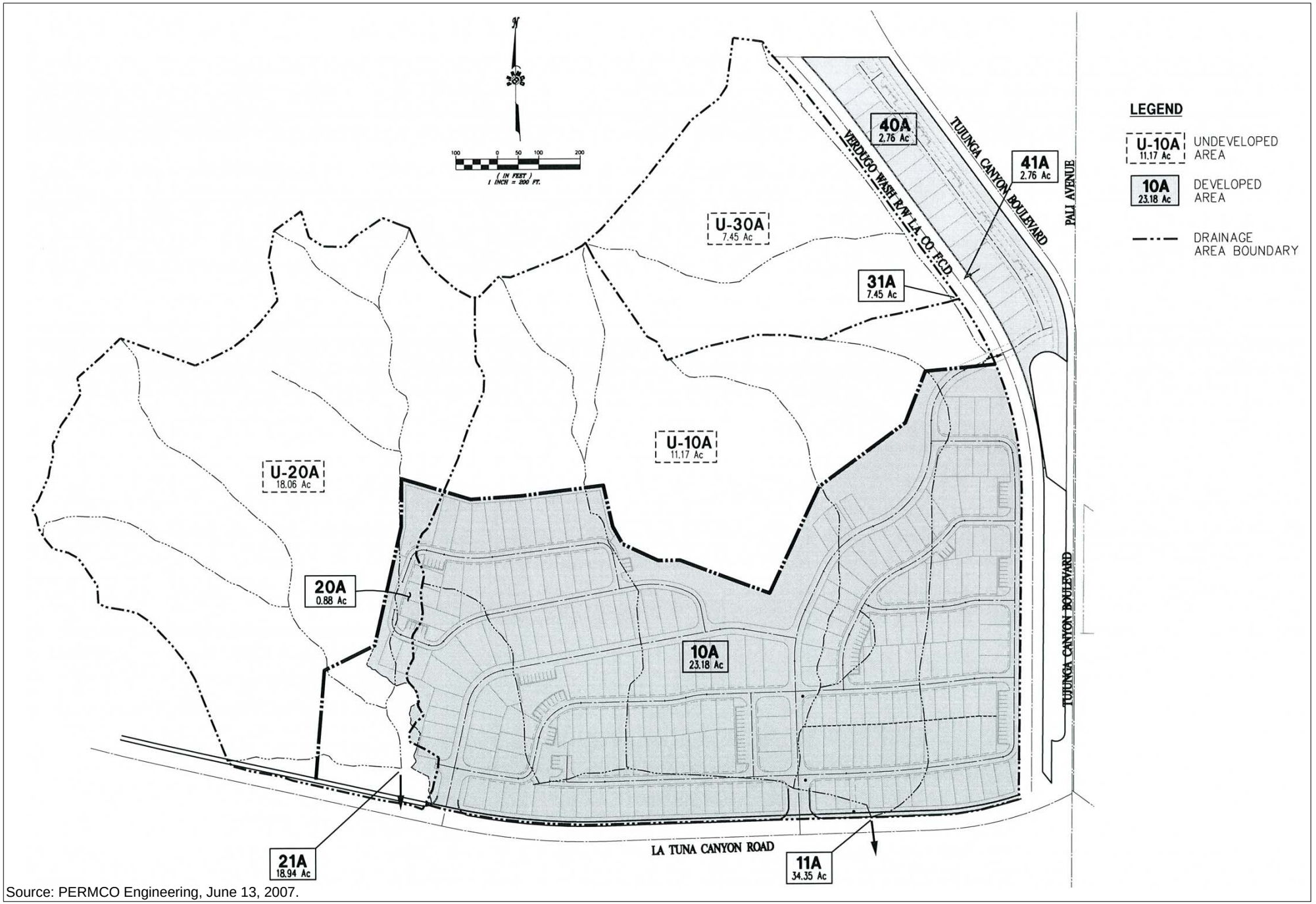
In addition, the project would have a significant water quality impact if it would cause any of the following conditions to occur:

- Violation of any water quality standards or waste discharge requirements.

- Otherwise substantially degrade water quality.

Project Impacts

Development of the proposed project would increase the extent of impervious surface area on the project site by introducing homes and appurtenant structures, road and driveway pavement, patios and hardscape and so forth, onto a site that currently has little impervious surface area. According to the Drainage Analysis (see Appendix J-1), the proposed project would increase the extent of impervious surface area on the project site from 1.83 to 12.46 acres, or 19.6 percent of the total drainage area. As a consequence of this increase in impervious surface area, runoff from the developed site is expected to increase. Table IV.H-1 indicates the peak runoff rate and 24-hour volume of runoff from a 50-year storm and compares the developed site to the existing conditions. Figure IV.H-3 presents the proposed conditions hydrologic map of the developed project site.



Source: PERMCO Engineering, June 13, 2007.

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Figure IV.H-3
Post Development Drainage Basin Map

The project proposes to utilize a network of storm drains, drainage benches and street flows to convey storm water runoff through the development area. A new storm drain that collects the runoff from western portion of the development area (Subarea 20A, Figure IV.H-3) will discharge into the existing 72-inch storm drain in La Tuna Canyon Road. Another new storm drain that collects the runoff from the majority of the development area (Subarea 10A, Figure IV.H-3) will discharge into the 60-inch Las Barras Canyon Channel. Both the La Tuna Canyon Road storm drain and the Las Barras Canyon Channel drain into LACFCD's Verdugo Wash Channel south of La Tuna Canyon Road. A portion of the development area in the northeast portion of the project site (Subarea 40A, Figure IV.H-3) will drain into the existing 36-inch storm drain that crosses Tujunga Canyon Boulevard and ties directly into Verdugo Wash Channel. A small portion of Subarea 40A will flow along Street "M" to drain directly into the channel. See Figure II-10, Parking/Circulation Plan, for the location of "M" Street in the northeast corner of the development area.

The City of Los Angeles does not have any design calculations for either the storm drain in La Tuna Canyon Road or the 36-inch line connected to the Verdugo Wash channel. Therefore, the Drainage Analysis makes the conservative assumption that the storm drains were designed to only convey the storm runoff from existing conditions. Since it is the project's goal that post-development runoff will not exceed that generated by the project site in its existing condition, the project will capture and store the excess runoff within each subarea in underground tanks. These underground tanks will allow infiltration into the native soils in order to satisfy the stormwater treatment requirements of the City's General Stormwater Discharge Permit issued by the Regional Water Quality Control Board. See Appendix J-1 for a description of the proposed tanks and their installation requirements.

Storage Tank Locations/Sizing

The following discussion identifies the location and capacity of the proposed storage tanks. This information is summarized in Table IV.H-3; see Appendix J-1 for additional information on the proposed storage tanks.

Table IV.H-3
Summary of Proposed Storm Water Storage Tanks

Subarea	Required Runoff Storage	Provided Runoff Storage	Excess Runoff Storage Capacity
10A	5.28 acre-feet (229,997 cubic feet)	230,156 cubic feet	159 cubic feet
20A	0.14 acre-feet (6,099 cubic feet)	6,112.5 cubic feet	13.5 cubic feet
30A	None Required	None Provided	N/A
40A	0.68 acre-feet (29,621 cubic feet	29,829 cubic feet	208
TOTAL	**265,717 cubic feet**	**266,097.5 cubic feet**	**380.5 cubic feet**

Source: Permco Engineering & Management, June 13, 2008

Subarea 10A

As indicated in Table IV.H-3, Subarea 10A will require the onsite storage of 5.28 acre-feet (229,997 cubic feet) of runoff. This runoff storage capacity will be provided by the installation of three storage tanks: one will be under proposed Streets "D"/"I", one under Streets "C"/"G", and one under Parcel "A" between La Tuna Canyon Road and Lots 1 through 12. The three tanks will provide a combined storage capacity of 230,156 cubic feet, or 159 cubic feet more than required.

Subarea 20A

Subarea 20A will require the onsite storage of 0.14 acre-feet (6,099 cubic feet) of runoff. This runoff storage capacity will be provided by the installation of one storage tank under proposed Street "K". This tank will provide storage capacity of 6,112.5 cubic feet, or 13.5 cubic feet more than required.

Subarea 30A

No development is proposed in Subarea 30A. Therefore, no storage is required.

Subarea 40A

Subarea 40A will require the onsite storage of 0.68 acre-feet (29,621 cubic feet) of runoff. This runoff storage capacity will be provided by the installation of one storage tank under proposed Street "M". This tank will provide storage capacity of 29,829 cubic feet, or 208 cubic feet more than required.

Debris Production

To prevent debris and sediment from accumulating in the storage tanks, which would negate both the storage capacity and the infiltration ability of those structures, the project would use desilting inlet structures located in six drainages upstream from the development area. A holding basin will be constructed at the lower reach of each drainage in association with each desilting inlet structure. See Appendix J-2 for additional information regarding the desilting inlet structures.

Table IV.H-4 provides a summary of the debris production calculations and the required holding basin dimensions. Figure IV.H-4 indicates the proposed locations of each desilting inlet structure.

As indicated in Table IV.H-4, during a 50-year storm event, these debris basins will reduce the amount of debris conveyed to the storm drainage system serving the project site by approximately 906 cubic yards. In the absence of these improvements this volume of debris would otherwise reach the Verdugo Wash Channel adding to debris deposition in the channel, and increasing the potential for downstream flooding, sedimentation and stream bank erosion. Also, these debris basins will reduce the quantity of sediment and other debris that would otherwise collect in the project's onsite storage tanks and reduce the flood control effectiveness of those facilities.

Table IV.H-4
Debris Production Calculations

DS & Desilting Inlet No.	Desilting Inlet Location	Drainage Area (Acres)	Debris Production Rate (CY/Ac.)	Debris Production Quantity (CY)	Basin Capacity (CY)
1	Lot 101	1.75	44	77	79
2	Lot 106	5.05	44	222	284
3	Lot 96	4.92	44	216	232
4	Lot 164	2.91	44	128	130
5	Lot 94	3.85	44	169	179
6	Lot 93	2.14	44	94	94
Total		**20.62**		**906**	**998**

Source: Permco Engineering & Management, June 16, 2008

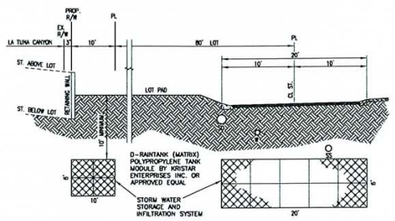
Water Quality - Construction-Related Impacts

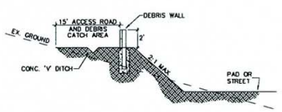
Construction of the proposed project has the potential to affect the quality of storm water runoff entering the Verdugo Wash Channel. There are three general sources of short-term construction-related storm water pollution associated with the proposed project: (1) the handling, storage, and disposal of construction materials containing pollutants; (2) the maintenance and operation of construction equipment; and (3) earth moving activities which, when not controlled, may generate soil erosion.

The project construction site would contain a variety of construction materials that are potential sources of storm water pollution, including the following: adhesives; cleaning agents; landscaping materials; plumbing, painting, heating/cooling, and masonry materials; floor and wall coverings; and demolition debris. Construction material spills can be a source of storm water pollution and/or soil contamination.

According to the Los Angeles City Bureau of Engineering, routine safety precautions for handling and storing toxic and hazardous materials, and maintaining construction equipment in proper working condition, may effectively control the potential pollution of storm water by these materials. These same types of common sense, "good housekeeping" procedures can also be extended to non-hazardous storm water pollutants such as sawdust and other solid wastes.

Soil erosion is the process by which soil particles are removed from the land surface by wind, water and/or gravity. Soil particles removed by storm water runoff are pollutants that, when deposited in local watercourses, can have negative impacts on downstream conditions. Grading and brush clearing activities can greatly increase erosion processes. Two general strategies are typically required to prevent construction silt from entering drainage courses. First, the amount of exposed soil is typically limited and erosion control procedures implemented for those areas that must be exposed. Appropriate dust suppression techniques, such as watering or tarping, are used in areas that must be exposed. The City





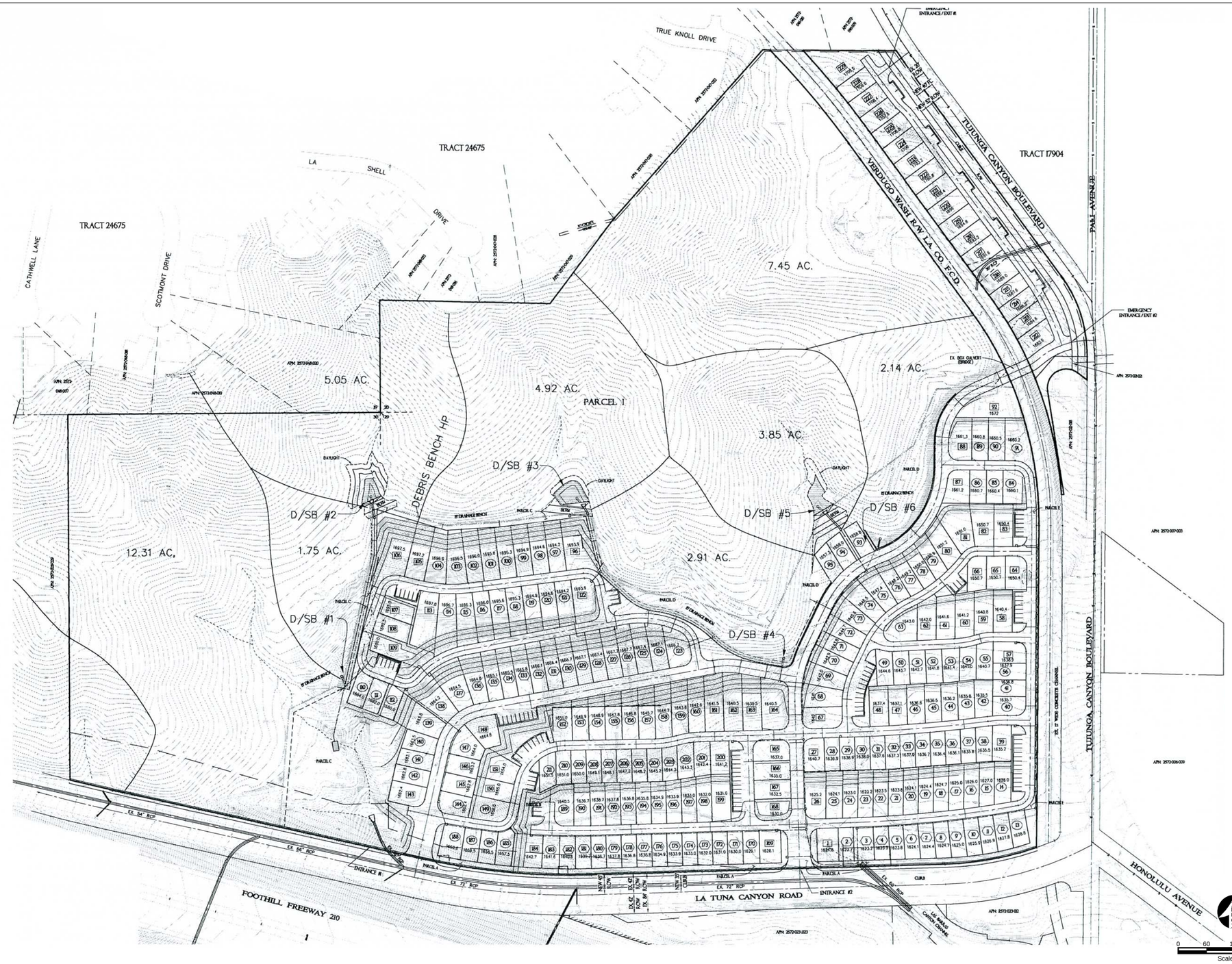
LEGEND

D/SB #2 DEBRIS / SEDIMENT BASIN & DESILTING INLET

9.72 AC. DRAINAGE AREA TO DESILTING INLET

ABBREVIATIONS

AC	ASPHALT CONCRETE	INV	INVERT
A.E.	ACCESS EASEMENT	PP	POWER POLE
BW	BOTTOM OF WALL	P.S.D.E.	PRIVATE STORM DRAIN EASEMENT
CB	CATCH BASIN	P.U.E.	PUBLIC UTILITY EASEMENT
CL	CENTERLINE	R	RADIUS
D/SB	DEBRIS/SEDIMENT BASIN	R/W	RIGHT-OF-WAY
EP	EDGE OF PAVEMENT	SD	STORM DRAIN
EMT.	EASEMENT	SDMH	STORM DRAIN MANHOLE
EX.	EXISTING	ST.	STREET
F/C	FACE-OF-CURB	STD.	STANDARD
FF	FINISH FLOOR	(T)	TOTAL
FG	FINISH GRADE	TC	TOP-OF-CURB
FH	FIRE HYDRANT	TW	TOP OF WALL
FL	FLOW LINE	TYP.	TYPICAL
GF	GARAGE FLOOR	SF	SQUARE FEET
HP	HIGH POINT	VC	VERTICAL CURB



Source: Permco Engineering & Management, June 26, 2008.

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Environmental Planning and Research

Figure IV.H-4
Debris Basin Map

Bureau of Engineering indicates that many of the common mitigation measures for controlling fugitive dust emissions, such as covering truck loads and street sweeping, are also effective in controlling storm water. Second, the construction area is secured to control off-site migration of pollutants. Erosion control devices, including temporary diversion dikes/berms, drainage swales, and siltation basins, are typically required around construction areas to insure that sediment is trapped and properly removed.

Implementation of the BMPs in the project's SWPPP and compliance with the discharge requirements of the GCASWP would ensure that the project construction would not violate any water quality standards or discharge requirements, or otherwise substantially degrade water quality. Therefore, the project's short-term, construction-related water quality impacts would be less than significant.

Water Quality - Long-Term Operational Impacts

If not properly designed and constructed, the proposed project could increase the rate of urban pollutant introduction into storm water runoff, and increase erosion, transport of sediment load and downstream siltation, all of which constitute avoidable impacts to surface water quality. In order to prevent these potential impacts, the project would be designed in compliance with (1) Section 402(p) of the Federal Water Pollution Control Act, or Clean Water Act (CWA), and (2) Order No. 90-079 of the Regional Water Quality Control Board, Los Angeles Region, which regulates the issuance of waste discharge requirements to Los Angeles County and Cities tributary to the County under NPDES Permit No. CA0061654.

Two basic areas of concern related to the long-term operation of the proposed project are storm water quality and quantity. BMPs such as regular sweeping of paved areas, can be used to address quality concerns. BMPs that address design considerations, such as channeling runoff from paved areas into landscaped areas, can effectively address both quality and quantity considerations. In general, it is desirable to minimize the amount of paved area, use permeable types of paving materials whenever possible, design onsite drainage to move water into landscaped areas, and grade landscaped areas to maximize the retention of runoff. BMPs to be implemented as a part of the proposed project are listed below in the Mitigation Measures section. BMPs that limit the runoff generation from a project site often provide mitigation with respect to quality concerns as well. As previously discussed, the project has been designed to limit runoff such that post-development runoff will not exceed the runoff rate generated by the project site in its existing condition. This is accomplished by utilizing onsite underground storage tanks within the storm drainage system. . By temporarily retaining the excess runoff in the storage tanks and then slowly releasing the retained runoff after the peak flows have past, the project will avoid overloading to existing storm drainage system. In addition, with the installation of velocity reducers the erosive power of runoff discharged from the developed project site will be no greater than that realized from the existing site conditions. Also, the utilization of debris basins will reduce the volume of debris and sediment currently generated by the project site during a 50-year frequency storm by approximately 906 cubic yards. Furthermore, these underground tanks will also allow the infiltration of the stored runoff into the native soils in order to satisfy the stormwater treatment requirements of the City's General Stormwater Discharge Permit issued by the Regional Water Quality Control Board. See Appendix J-1 for a description of the proposed tanks and their installation requirements.

Compliance with LAMC Sections 64.70 et seq., which provide for Stormwater and Urban Runoff Pollution Control in hillside areas, would ensure that long-term operational aspects of the project would not violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality. Therefore, the project's long-term, operational-related water quality impacts would be less than significant.

Evaluation of Impacts

Will the project 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?

Project site development would result in minor alterations of drainage patterns, due to the construction of a storm drain system. However, no substantial alteration of the existing drainage pattern would occur. All site runoff would continue to flow to the storm drain in La Tuna Canyon Road or to the Verdugo Wash, in approximately the same locations as it does currently. Therefore, the project would have a less-than-significant impact with respect to alteration of existing drainage patterns.

According to the Preliminary Geologic and Soils Engineering Investigation prepared for the proposed project (see Section IV.G, Geology and Soils), the graded and natural areas of the proposed project will be subject to erosion and sedimentation during and following grading of the development areas. The Grading Code, as well as the provisions of the Federal Clean Water Act regulations, requires that erosion be controlled and minimized through the use of Best Management Practices, and appropriate flood and storm drainage control systems. The proposed project's response to these regulations is the provision of the underground runoff storage tanks and debris basins. The storage tanks will permit the release of runoff at a rate that does not exceed that generated by the project site in its existing condition, while the debris basins will reduce the quantity of sediment conveyed offsite. Thus the project would not increase the potential for downstream erosion or sedimentation. Therefore, the project's impacts with respect to erosion and/or siltation on-or off-site would be less than significant.

Will the project 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?

As discussed above, the proposed project would result in minor alterations of drainage patterns, due to the construction of a storm drain system. However, no substantial alteration of the existing drainage pattern would occur. All site runoff would continue to flow to the storm drain in La Tuna Canyon Road or to the Verdugo Wash, in approximately the same locations as it does currently. Therefore, the project would have a less-than-significant impact with respect to alteration of existing drainage patterns.

Through the use of on-site storm water storage, the proposed project will return post development runoff rates to pre-development levels. Therefore, the proposed project will not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site; hence, there is no

need for further improvements to the existing storm drainage system serving the project site. Project impacts with respect to flooding will be less than significant.

By constructing the debris/sediment basins and the desilting inlets at the base of the hillside above the development, the potential for damage due to bulked flow to the proposed development and downstream channels is mitigated. The addition of the underground storage tanks for control of increased runoff due to development provides additional capacity to store debris, should a storm greater than the 50-year design storm occur. With properly maintained drainage facilities on-site, impacts to existing storm drain facilities down stream of the development would also be mitigated to a less than significant level.

Will the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage system.

As discussed above, the design of the project's on-site storm water storage system assumes that the existing storm drainage system serving the project site was designed to only convey the storm runoff from existing conditions. To handle the increase in on-site runoff due to site development, the project design provides for the storage of runoff in excess of existing conditions during periods of peak flow and the slow release of the excess runoff at a rate that will not exceed the design capacity of the existing storm drainage system. Therefore, the proposed project will not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage system and impacts in this regard will be less than significant.

Will the project 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?

The project would not place any housing within a designated 100-year flood hazard area. Therefore, no impact would occur with respect to 100-year flood hazard areas.

Will the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The project would not place any structures within a 100-year flood hazard area that would impede or redirect flood flows. Therefore, no impact would occur with respect to 100-year flood hazard areas.

Will the project 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?

There are no levees or dams upstream from the project site. Therefore, the project would not 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. Therefore, no impact due to flooding caused by a dam or levee failure would occur.

Will the project expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?

A tsunami is a sea wave caused by a submarine earthquake, landslide, or volcanic eruption. Tsunami can cause catastrophic damage to shallow and or exposed coastlines. The project site is located approximately 40 miles inland from the Pacific Ocean, and is at an elevation sufficiently above sea level to preclude affects of tsunami. Therefore, the potential for tsunami to affect the project site is considered non-existent.

Seiches are changes or oscillations of water levels within a confined body of water due to fluctuations in the atmosphere, tidal currents, or earthquakes. The effect of this phenomenon is a "standing wave" that would occur in a body of water that would occur when influenced by the external stimulus. No lakes, reservoirs, or other large confined bodies of water are in close proximity of the project site. Therefore, the potential for seiches to affect the project is considered non-existent.

Will the project result in a violation of any water quality standards or waste discharge requirements?

Because the proposed project is a residential development, rather than an industrial one, the quality of its runoff would not be expected to be contaminated with the types of industrial pollutants that currently cause most of the groundwater quality problems in the San Fernando Groundwater Basin. Rather, the quality of its runoff would be comparable to that of other residential uses in the area. Furthermore, existing federal, state and local water quality control programs, with which the project is required to comply, are specifically designed to ensure that new projects will not result in a violation of any water quality standards or waste discharge requirements. For example, the installation and regular maintenance of the BMPs required by the General Construction Activity Storm Water Permit, including a Storm Water Pollution Prevention Plan, would ensure that construction-related contamination of surface runoff would be retained and treated onsite before it is released to the public storm drainage system. Similarly, Los Angeles Municipal Code Sections 64.70 et seq., provides for the installation and regular maintenance of the BMPs to control stormwater and urban runoff pollution from activities associated with the long term occupancy of hillside developments. Therefore, the project would not be expected to result in a violation of any water quality standards or waste discharge requirements.

Will the project otherwise substantially degrade water quality?

As discussed above, the project would not be expected to result in a violation of any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.

CUMULATIVE IMPACTS

Development of the proposed project in conjunction with the related projects listed in Table II-3 would cumulatively increase the amount of impervious surface area, runoff, and landform and drainage pattern alternation in the general Sunland-Tujunga area. However, the project will not increase peak runoff flows and, therefore, it will not combine with any of the related projects to create cumulative runoff impacts.

The proposed project also has the potential to combine with the related projects to create cumulative water quality impacts. However, these impacts are expected to be less than significant because new projects are subject to stringent federal, state and local requirements to control stormwater and urban runoff pollution.

MITIGATION MEASURES

Storm Water Runoff

The proposed project will be required to submit site drainage plans to the City Engineer and other responsible agencies for review and approval prior to development of any drainage improvements. As discussed above, the proposed debris/sediment basins will provide permanent protection, where previously no formal basin facilities exist. The design and maintenance of the facilities will meet the requirements of the Los Angles County Department of Public Works "Sedimentation Manual", Water Resources Division. The underground storage tanks will provide the capacity to retain the increased runoff due to development in accordance with the Los Angles County Department of Public Works "Hydrology Manual", Water Resources Division. As a result, post-development runoff rates will not exceed the calculated runoff rates for the project site in its pre-development condition. The tanks will also remove pollutants from the storm water by infiltration into subsurface soils. Therefore, with the implementation of the approved drainage plans, no significant long-term operational impact from storm water runoff would be expected. Therefore, mitigation measures are not required under CEQA. Notwithstanding the above, the following measures are required to reduce the project's impacts from storm water runoff:

H-1 Post-development runoff rates shall not exceed the calculated runoff rates for the project site in its pre-development condition.

H-2 Building pads shall have sufficient height above the curb to drain toward the street on a slope of two percent. Pad drainage may be conveyed to the street via side lot swales, as required.

H-3 Permanent drainage and debris control facilities shall be constructed to the satisfaction of the City Engineer. As proposed, such facilities shall include:

- Underground storm drains with capacity for a 50-year frequency peak storm-flow.
- Underground stormwater storage tanks sized in accordance with the recommendations of the project's Drainage Analysis as approved by the City Engineer/Department of Building and Safety

H-4 Where the tributary area is deemed sufficient by the City Engineer and approved by the decision-maker, paved drainage terraces shall be provided along terraces, at the top of cuts, and behind retaining structures.

H-5 Slopes shall be graded so that runoff of surface water is minimized.

H-6 Semi-permeable pavement shall be utilized for hardscape areas.

H-7 Project shall adhere to applicable provisions of the LAMC, Flood Hazard Management Specific Plan and the recommendations of the City Engineer/Department of Building and Safety.

Water Quality

Implementation of the proposed project in compliance with the established water quality control programs listed below would ensure that the project's short-term construction-related water quality impacts, as well as the long-term operational water quality impacts, would be less than significant. The following are standard water quality control programs with which the project would be required to comply:

- Order No. 90-079 of the Regional Water Quality Control Board, Los Angeles Region, which regulates the issuance of waste discharge requirements to Los Angeles County and cities tributary to the County under NPDES Permit No. CA0061654.
- Section 402 (p) of the Federal Water Pollution Control Act, or Clean Water Act.
- National Pollution Discharge Elimination System (NPDES), including all provisions of the General Construction Activity Storm Water Permit which requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP) that emphasizes the use of Best Management Practices (BMPs).
- LAMC Sections 64.70 et seq., which provide for Stormwater and Urban Runoff Pollution Control in hillside areas.

While mitigation measures are not required under CEQA, the following measures are required to reduce water quality-related impacts to less than-significant levels:

H-8 Newly-excavated sites tend to contribute significant amounts of sediments and toxic materials to the drainage systems. The following steps shall be taken to minimize this process:

- Where feasible, phase construction to limit activity during the wettest months of the year (i.e., December, January and February).
- Stabilize exposed surfaces immediately after construction is complete, and ensure that permanent stabilization is successful, through implementation of the following:
    - Minimization of stripped areas;
    - Use of straw bale filters and sand bagging;
    - Temporary seeding and mulching of all stripped areas;
    - Conservation cultivation practices on steep slopes;

- Traffic control on construction sites;
- Berms and crushed stone on construction roads;
- Reduction of effective slope length in critical areas with benches or terraces; and
- Slopes shall be planted with protective vegetation and a suitable watering system (in conformance with City requirements) installed as soon as practical after completion of grading.

- Use of accepted materials storage procedures, spill prevention and other "housekeeping" practices to prevent runoff contamination by toxic chemicals such as paints, solvents, pesticides, metals from building materials, or fuels.

H-9 The project developer shall be responsible for obtaining the necessary NPDES Construction Permit for the project site from the Regional Water Resources Control Board, Wastewater Division. The project developer shall obtain a Notice of Intent (NOI) for compliance with the State's NPDES General Construction Permit prior to issuance of a grading permit. The Construction Permit NOI shall include a SWPPP to address construction sediment and erosion control. The project developer would also be required to address long-term monitoring and the implementation of BMPs to the "maximum extent practicable". Maximum extent practicable means to the maximum extent possible, taking into account the latest available technology and economic feasibility.

H-10 Temporary erosion control measures, such as landscaping, berms, etc., shall be implemented following grading to minimize sedimentation impacts to onsite drainages. Available measures include introduction of rapid developing, soil-anchoring groundcover (of native plant species), and strategic placement of runoff-detaining structures. These runoff-detaining structures and all remaining construction sediment and debris shall be removed at the time of project completion.

H-11 Cleaning of wastes and debris from all project area debris retention and water detention basins shall be completed by the homeowners' association(s) on a quarterly basis (or more frequently if reasonably required). Special importance shall be given to the cleaning of debris retention and water detention basins prior to the first rainstorm of the year, in order to reduce "first flush" effects on the area watershed and to prevent unnecessary sediment and waste load transport.

H-12 The project developer and homeowners' association(s) shall work with the City to make residents aware of used motor oil recycling facilities and household hazardous waste drop-off centers in the area. Availability of centers can reduce the amount of toxic contaminants found in urban runoff.

H-13 Signage shall be installed on all project storm drain inlets to read: "NO DUMPING OF WASTE-DRAINS TO OCEAN," or other similar signage consistent with forthcoming City policies.

H-14 Reducing pesticide and fertilizer use at the source can remove these pollutants from urban runoff. The project developer and homeowners' association(s) shall adopt Integrated Pest Management (IPM) programs for use on their own public grounds in addition to promoting their use to project residents.

H-15 "Pooper-scooper" regulations shall be included in CC&Rs to require proper disposal of animal waste and to prevent additional nutrient loading of storm drains.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Project hydrology and water quality impacts would be less-than-significant. With implementation of the mitigation measures, impacts would be further reduced.