III.G. HYDROLOGY & WATER QUALITY

This section summarizes the hydrology, drainage, and water quality analyses performed for the project site. Technical reports and calculations are provided in Appendix **G** of this EIR. The information in this section has been summarized from those reports, including the *Preliminary Hydrology Report*, prepared by Hall & Foreman, Inc. (May 5, 2014) and the *Preliminary Stormwater Quality Mitigation Report*, prepared by Hall & Foreman, Inc. (May 5, 2014). This section includes an evaluation of the existing conditions on the project site, a comparison of the pre-project and the post-project conditions, a determination of the potential impacts of the project, and recommended mitigation measures. The purpose of this technical evaluation is to determine the impact of the proposed project on surface water drainage, stormwater and groundwater quality in the vicinity of the project site within the Los Angeles River watershed (including the adjacent City of Los Angeles flood control channel).

EXISTING CONDITIONS

RAINFALL

Los Angeles County is dry during the late spring, summer and early fall and receives most of its rain during the winter months (November through April). Precipitation in the San Fernando Valley ranges from 15 to 23 inches per year and averages about 17 inches.[1]

SURFACE DRAINAGE HYDROLOGY

Los Angeles River Drainage[2]

The project site is tributary of the Los Angeles River watershed. The Los Angeles River begins where Arroyo Calabasas and Bell Creek converge in Canoga Park. The river travels about 51 miles, making its way east to Griffith Park and then heading south through the Glendale Narrows, past downtown Los Angeles to where it empties into Long Beach Harbor. The Los Angeles River watershed is 834 square miles (533,760 acres) and has diverse patterns of land use. The upper portion, approximately 360 square miles, is covered by open space, while the remaining watershed is highly developed with commercial, industrial, and residential uses. The river and most of its tributaries in the urbanized portions of the Los Angeles basin have been channelized. The river can be considered more of a flood damage reduction channel, as opposed to a meandering natural river system, with nearly all of its banks hardened and the river bottom lined with concrete for approximately 37 of its 51 miles.

ON-SITE HYDROLOGY AND SURFACE FLOWS AND ON- AND OFF-SITE DRAINAGE FACILITIES

The existing site is partially developed with buildings and paved parking lot areas in the northerly portion. On the southerly portion of the site is a large landscaped area. The total impervious area on site is approximately 16 acres (approximately 68%), while the total pervious area is about 7.6 acres. Drainage across the site is via sheet (surface) flow to collection points; catch basins and inlet drains. The majority of the on-site surface flow drains in a southeasterly

1 Source: California Department of Water Resources, *California's Groundwater Bulletin 18*, *San Fernando Valley Groundwater Basin*, February 27, 2004.

2 Information derived in part from: *Los Angeles River Master Plan, Programmatic Environmental Impact Report/Environmental Impact Statement, Volume 1* (April 2007), page 3-19.

direction and into the channel adjacent to the Southern Pacific Rail Road (SPRR). The existing on-site drainage area is comprised of five (5) drainage sub-areas that drain to existing on-site catch basins and a network of storm drain pipes (see **Figure III.E-1)**. These in turn drain off-site into the existing storm drain channels (City of Los Angeles drainage easements) on the project property's western (along Winnetka Avenue) and southern (adjacent to the SPRR right-of-way) property boundaries. Below is a brief discussion of the on- and off-site existing conveyance facility sizes and any known capacity issues:

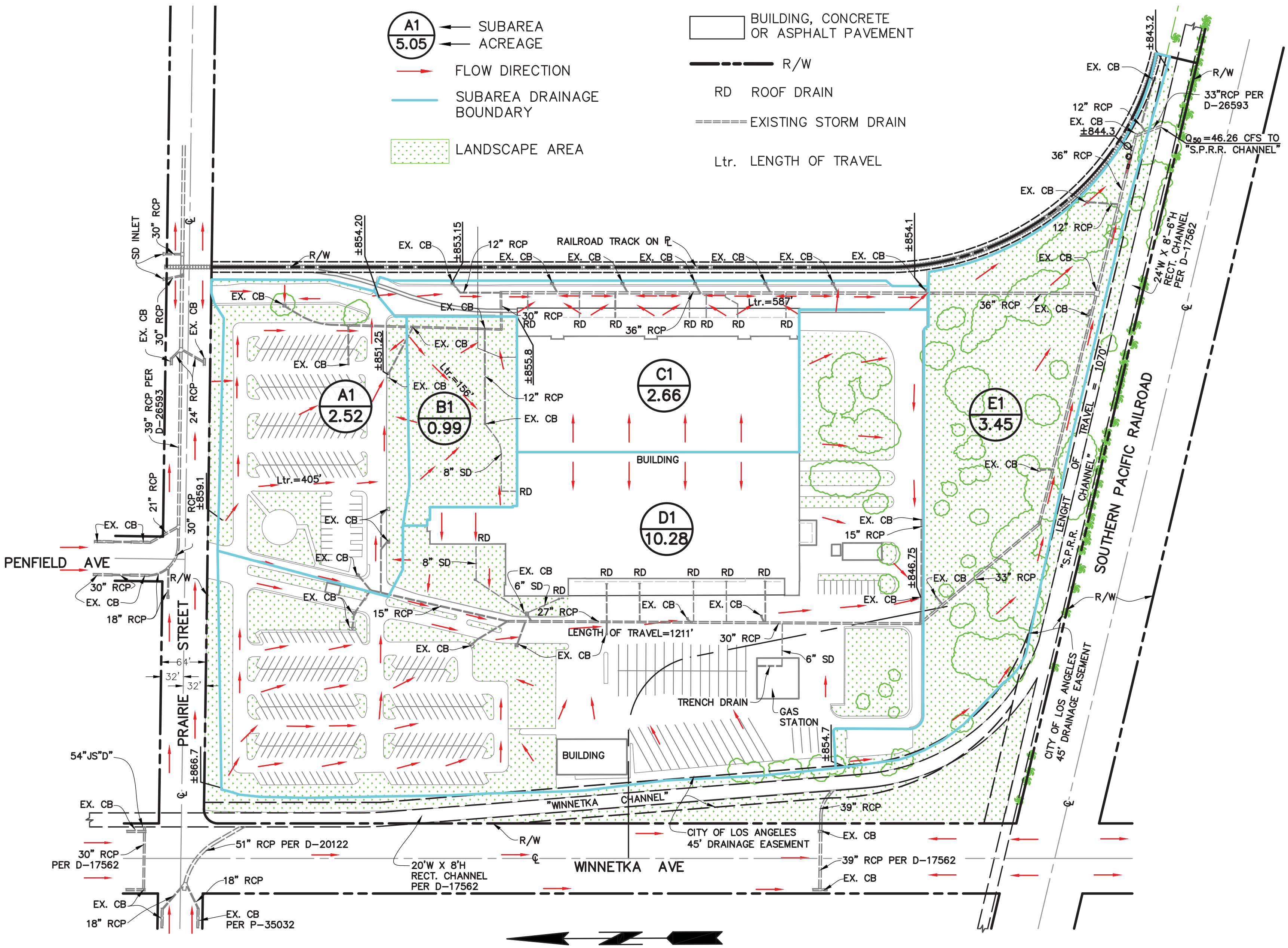
- On-site Private Drain to existing channel adjacent to SPRR rail line - The existing on-site drainage system is composed of various types and sizes of catch basins, roof drains, and a vast network of pipe sizes ranging from 6-inches to 36-inches. This system intercepts and conveys the site's storm runoff to a 33-inch reinforced concrete pipe (RCP) lateral to the SPRR Channel. There are no known capacity problems associated with this existing on-site drainage system.

- Winnetka Avenue - Winnetka Avenue consists of two side-opening catch basins located on the east and west sides of the street, north of the SPRR crossing in a sump condition. These catch basins are connected with a 39-inch RCP to the Winnetka Channel. At the intersection of Winnetka Avenue and Prairie Street, there are four side-opening catch basins. Two are constructed on Winnetka Avenue north of the intersection and are connected with a junction structure to the Winnetka Channel. The other two catch basins on Prairie Street (west of the intersection) are connected with a 51-inch RCP to the Winnetka Channel. There are no known capacity problems associated with any of the existing catch basins discharging into the channel located along Winnetka Avenue.

- Prairie Street - At the intersection of Prairie Street and Penfield Avenue, there are five side-opening catch basins. Four of the basins are located in Penfield Avenue, and one is on the north side of Prairie Street, west of Penfield Ave. Additionally, there are two side-opening catch basins on the west of the railroad spur crossing in a sump condition on Prairie Street. All of the catch basins connect to a 39-inch and a 48-inch RCP in Prairie Street. There are no known capacity problems associated with this existing system.

- Storm Drain Channels - Two public storm drain channels are located along the west and southerly project boundaries within the City of Los Angeles drainage easements. The channel along Winnetka Avenue is a 20-foot wide by 8-foot high, rectangular reinforced concrete channel. Adjacent to the project's southerly boundary is a channel adjacent to the SPRR rail line, a 24-foot wide by 8-foot and 6-inch high rectangular reinforced concrete channel constructed. There are no known capacity problems associated with either of the existing concrete channels.

There are no Los Angeles County Department of Public Works storm drains adjacent to the project site.



SOURCE: Hall & Foreman, Inc., 2014

Figure III.G-1

Pre-Development Hydrology

Table III.G-1 shows the calculated pre-development 50-year storm event for on-site flows.

TABLE III.G-1 SUMMARY OF HYDROLOGICAL SUB-AREAS PRE-DEVELOPMENT				
Sub-Area	**Acres**	**Tc**[1]	**Q_{50} (cfs) Un-routed**[2]	**Destination**
A1	2.52	5.0	8.66	Existing grating basins in driveway north side of building.
B1	0.99	5.0	3.37	Existing grating basins in landscape area sump north of building.
C1	2.66	9.0	6.94	Existing catch basins in sumps driveway along east property line.
D1	10.28	11.0	23.88	Existing grating basin in sump in driveway south of building.
E1	3.45	12.0	7.07	Existing grating basin in sump in landscape area adjacent to SPRR Channel.
TOTAL	19.9	--	49.92	Outlet to SPRR Channel.

[1] Note: Tc refers to the linear length of travel stormwater flows across a site before entering an outlet to a receiving water (e.g., SPRR Channel) or additional conveyance facility (e.g., storm drain, etc.). It is measured from the point located farthest from the receiving water or conveyance facility.
[2] cfs = cubic feet/second
SOURCE: Preliminary Hydrology Report, Hall & Foreman, Inc., May 15, 2014

FLOODPLAIN AND FLOOD HAZARDS

A review of the Federal Emergency Management Agency (FEMA) flood insurance rate maps (FIRM) for the project site indicates that it is not located within a flood plain, flood hazard zone or regulatory floodway. In addition, per the City of Los Angeles Flood Zone Information Map, the majority of the site (outside the drainage channels and area along Winnetka Avenue west of the channel) is identified as being in Flood Zone C or X, areas of minimal flooding outside the 500-year flood plain. The area between Winnetka Avenue and the drainage channel is within the 500-year flood plain.[3]

HYDROGEOLOGY

San Fernando Valley Groundwater Basin

The project site is located within the San Fernando Valley Groundwater Basin (SFVGB). The SFVGB is bounded on the north and northwest by the Santa Susana Mountains, on the north and northeast by the San Gabriel Mountains, on the east by the San Rafael Hills, on the south by the Santa Monica Mountains and Chalk Hills, and on the west by the Simi Hills. The valley is drained by the Los Angeles River and its tributaries.

The water-bearing sediments consist of the lower Pleistocene Saugus Formation, Pleistocene and Holocene age alluvium. The ground-water in this basin is mainly unconfined with some confinement within the Saugus Formation in the western part of the basin and in the Sylmar and Eagle Rock areas. The average specific yield for deposits within the basin varies from about 14 to 22 percent. Well yield averages about 1,220 gallons per minute (gpm) with a maximum of about 3,240 gpm.

[3] Federal Emergency Management Agency, Mapping Information Platform, accessed May 25, 2014. Additional source includes *Preliminary Hydrology Report*, prepared by Hall & Foreman, Inc. (May 5, 2014).

Several structures disturb the flow of groundwater through this basin. A step in the basement resulting from movement on the Verdugo fault and/or the Eagle Rock fault causes a groundwater cascade down to the south near the mouth of Verdugo Canyon. To the north, the Verdugo fault is a partial barrier to flow that causes a change in water levels in the Hansen Spreading Grounds. Differences in rock type along the Raymond fault create a barrier to groundwater flow from the Eagle Rock area toward the Los Angeles River Narrows and may cause rising water conditions there. Other unnamed faults cause changes in levels of basement and groundwater in the Sunland, Chatsworth, and San Fernando areas and at the mouths of the Little Tujunga and Big Tujunga Canyons. The Little Tujunga syncline affects groundwater movement in the northern part of the basin and folds associated with the Northridge Hills, Mission Hills and Lopez faults also affect groundwater movement. Subsurface dams in the Pacoima Wash near Pacoima and in Verdugo Canyon are barriers to groundwater flow.

Recharge of the basin is from a variety of sources. Spreading of imported water and runoff occurs in the Pacoima, Tujunga, and Hansen Spreading Grounds. Runoff contains natural stream flow from the surrounding mountains, precipitation falling on impervious areas, reclaimed wastewater, and industrial discharges. Water flowing in surface washes infiltrates, particularly in the eastern portion of the basin.

Groundwater flows generally from the edges of the basin toward the middle of the basin, then beneath the Los Angeles River Narrows into the Central Sub-basin of the Coastal Plain of the Los Angeles Basin. In the northeastern part of the basin, groundwater moves from the La Crescenta area southward beneath the surface of Verdugo Canyon toward the Los Angeles River near Glendale, whereas the groundwater in the Tujunga area flows west following the Tujunga Wash around the Verdugo Mountains to join groundwater flowing from the west following the course of the Los Angeles River near Glendale. Flow velocity ranges from about five feet per year in the western part of the basin to 1,300 feet per year beneath the Los Angeles River Narrows.

The total storage capacity of the SFVGB is calculated at 3,670,000 acre-feet (AF) by adding values for the San Fernando, Sylmar, Verdugo and Eagle Rock Basins.[4] The primary inflows (recharge sources) to the SFVGB are imported water and natural precipitation and runoff during the rain season. Because the runoff is seasonal in nature, natural recharge is limited and can fluctuate annually. These changes in inflow rates coupled with stored water credits from Management Agencies[5] and natural outflow (into adjacent basins) can result in variations of groundwater storage capacity within the SFVGB.

During the 2011/2012 water year the SFVGB's regulatory storage requirement was 360,000 AF and the available storage capacity was 449,573 AF.[6]

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4 California Department of Water Resources, *California's Groundwater Bulletin 18, San Fernando Valley Groundwater Basin*, February 27, 2004.

5 The Upper Los Angeles River Area Watermaster has water management authority under the California Superior Court over the SFVGB. It manages groundwater on behalf of Administrative Committee Members and which include the Cities of Burbank, Glendale, Los Angeles, and San Fernando, Crescent Valley Water District, and Los Angeles County Public Works.

6 Annual Report Upper Los Angeles River Area Watermaster, May 2013, Plate 13 (Cumulative Change in Groundwater Storage, San Fernando Basin).

Groundwater Levels in the project Vicinity

Water levels in the SFVGB have been fairly stable over about the past 20 years, since adjudication of the basin.[7] The depth to groundwater in the San Fernando, Sylmar, and Verdugo basins range between 24 to 400 feet, 50 to 115 feet, and 17 to 190 feet below ground surface (BGS), respectively. Shallow groundwater conditions are encountered in the western end of the San Fernando Basin.[8]

Groundwater Levels On-site

Groundwater was not encountered on-site during exploration (conducted to a maximum depth of 50 feet below the existing site grade). The historically highest groundwater level was determined by reviewing the Canoga Park 7 ½ Minute Quadrangle Seismic Hazard Evaluation Report, Plate 1.2. Historically Highest Ground Water Contours which indicates that the historically highest groundwater level on the site ranges from 41 feet below grade at the southeastern corner, to 52 feet below grade at the northwestern corner.

Groundwater Wells and Recharge Basins

There are no groundwater wells (including extraction or recharge) or recharge basins located on-site or which are used for on-site potable water use. One water well (4726A) has been recorded off-site approximately 1,500 feet to the northwest of the site (Oso Avenue and Prairie Street).[9]

SURFACE AND GROUNDWATER POLLUTION SOURCES

Non-Point Source Pollution

Surface water quality in the Los Angeles River and drainages that are tributary exhibit degraded surface quality due to uncontrolled pollutants from non-point sources (NPS).[10] NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and even underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas.
- Oil, grease, and toxic chemicals from urban runoff and energy production.
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambank.
- Salt from irrigation practices and acid drainage from abandoned mines.

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7 Source: California Department of Water Resources, *California's Groundwater Bulletin 18, San Fernando Valley Groundwater Basin*, February 27, 2004. Note: The San Fernando Valley Groundwater Basin was adjudicated in 1979 and includes the water-bearing sediments beneath the San Fernando Valley, Tujunga Valley, Browns Canyon, and the alluvial areas surrounding the Verdugo Mountains near La Crescenta and Eagle Rock.

8 Groundwater Assessment Study, A Status Report on the Use of Groundwater in the Service Area of the Metropolitan Water District of Southern California, Report Number 1308 *(FINAL* September 2007), page IV-2-10.

9 Phase I and II Report, Converse Environmental West, August 16, 1991, page 5.

10 California Regional Water Quality Control Board – Los Angeles Region (4), *Water Quality Control Plan, Los Angeles Region. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*, June 13, 1994, page 1-19.

- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems.

Atmospheric deposition and hydro-modification are also sources of non-point source pollution.[11] Surface waters on and in the immediate area of the project site experience similar NPS effects from urbanized and agricultural land uses located both upstream and on-site. On the project site, pesticides used for landscape care, oil and grease from automobiles, etc., can contribute to degrading water quality within the Bull Canyon Hydrologic Subarea.[12]

The potential for groundwater contamination is discussed in Section III.F Hazardous Materials.

Point-Source Pollution (PSP)

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into “waters of the United States.” Point sources are discrete conveyances such as pipes or man-made ditches. Individual residences that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal and other facilities must obtain permits if their discharges go directly to surface waters. In California, the NPDES permit program is administered by the local Regional Water Quality Control Board (RWQCB).[13]

SURFACE AND GROUNDWATER WATER QUALITY

Los Angeles River Surface Water Quality

The Los Angeles River has been modified substantially for flood control purposes. With the exception of a seven mile area in the Glendale Narrows[14], the entire river has been paved with concrete. The upper reaches of the river carry urban runoff and flood flows from the San Fernando Valley. Below the Sepulveda Basin, flows are dominated by tertiary treated effluent from several municipal wastewater treatments plants. Because the watershed is highly urbanized, urban runoff and illegal dumping are major contributors to impaired water in the Los Angeles River and its tributaries.[15]

Section 303(d) of the Clean Water Act requires states to develop lists of impaired waters that do not meet established water quality standards. The law also requires the states to establish priority rankings for waters on the lists and to develop total maximum daily loads (TMDLs) for these waters. A TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards and allocates pollutant loadings among point and non-point pollutant sources. By law, the USEPA must approve or disapprove lists and TMDLs.

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11 http://www.epa.gov/owow/nps/qa.html, accessed May, 25, 2014.

12 The project site is located within the Los Angeles-San Gabriel Hydrologic Unit’s (405.00) San Fernando Hydrologic Area (405.20). Specifically, it is located within the Bull Canyon Hydrologic Subarea (5.21). Source: Regional Water Quality Control Board, Basin Plan (June 13, 1994), page 1-6.

13 Source: http://cfpub2.epa.gov/npdes/, accessed May 25, 2014.

14 Due to high groundwater levels in this portion of the Los Angeles River, the United States Army Corps of Engineers did not pave this area.

15 California Regional Water Quality Control Board – Los Angeles Region (4), *Water Quality Control Plan, Los Angeles Region. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*, June 13, 1994, pages 1-18 and 1-19.

The Los Angeles River (including most of its tributaries) is listed as impaired for a number of pollutants: metals, ammonia, coliform, nutrients (algae), scum/foam unnatural, odors, and pesticides. Some of these constituents are of concern throughout the river, while others are of concern in only certain reaches.[16]

Los Angeles Groundwater Basin Quality

In the western part of the San Fernando Valley Groundwater Basins, calcium sulfate-bicarbonate character is dominant, and in the eastern part of basin, calcium bicarbonate character dominates. Total dissolve solids range from 326 to 615 milligrams (mg)/liter (L), and electrical conductivity ranges from 540 to 996 µmhos[17]. Data from 125 public supply wells shows an average TDS content of 499 and a range from 176 to 1,160.

A number of investigations have determined contamination of volatile organic compounds such as trichloroethylene (TCE), perchloroethylene (PCE), petroleum compounds, chloroform, nitrate, sulfate, and heavy metals. TCE, PCE and nitrate contamination occurs in the eastern part of the basin and elevated sulfate concentration occurs in the western part of the basin.[18]

The proposed project is located within the San Fernando Groundwater Basin. Each groundwater basin is replenished by deep percolation of precipitation and return water from irrigation. Individual basins may also be replenished by surface spreading of local runoff, imported water and reclaimed water; injection of imported water (for protection against saline intrusion); and subsurface inflow from other basins. The major spreading areas are generally on the higher portions of the valley floor near the mountain front, or along major streams or channels.

REGULATORY SETTING

In 1948, Congress enacted the Water Pollution Control Act, which has since been amended significantly on several occasions, and is now commonly referred to as the Clean Water Act (CWA). The CWA delineates a national permitting system for point discharges known as the National Pollutant Discharge Elimination System (NPDES). NPDES is the basic regulatory and enforcement tool available under the CWA. NPDES permits typically incorporate specific discharge limitations for point source discharges to ensure that dischargers meet permit conditions and protect state-defined water quality standards. California is authorized to administer key components of the federal water quality management program in the state.

The existing NPDES framework was expanded in 1987 to regulate stormwater runoff (discharges) originating from municipal and industrial sources. The Los Angeles Regional Water Quality Control Board (RWQCB) is authorized to implement a municipal stormwater-permitting program as part of its general NPDES authority, as an agent of the State Water Resources Control Board (State Board). Municipal permits typically require permittees to develop an areawide stormwater management plan, implement best management practices (BMPs) and perform stormwater monitoring. The City of Los Angeles is a co-permittee under the County of Los Angeles municipal permit.

[16] Information derived in part from: *Los Angeles River Master Plan, Programmatic Environmental Impact Report/Environmental Impact Statement, Volume 1* (April 2007), pages 3-25 and 3-26.

[17] The acronym µmhos is a measurement of conductivity.

[18] Source: California Department of Water Resources, *California's Groundwater Bulletin 18, San Fernando Valley Groundwater Basin*, February 27, 2004.

In general, environmental impacts to surface water quality are assessed in relation to the existing characteristics of the body of water that would receive the discharge (receiving water body), including its size, flows, designated beneficial uses, and present concentrations of pollutants. Increased concentrations of toxic metals, organic compounds, suspended solids, nutrients, pathogenic microorganisms and other pollutants, or changes in temperature may result in sedimentation, eutrophication, habitat degradation, and/or threats to public health.

For point source discharges from proposed projects, the nature of the discharge is directly related to the process that produces the discharge. Nonpoint source impacts to receiving waters during project operation are related to such factors as land use type, size, design, and intensity. Construction activities may also result in the discharge of stormwater runoff pollutants, including dissolved solids, to receiving waters. If a project includes point source discharges, the pollutants associated with the discharges may need to be identified and quantified for an NPDES permit from the RWQCB.

The Standard Urban Stormwater Mitigation Plan (SUSMP) was developed in the City of Los Angeles in 2002 as part of the municipal stormwater program to address stormwater pollution from new development and redevelopment projects. A recent stormwater management approach aimed at achieving this goal is the use of Low Impact Development (LID). LID is the widely recognized and preferred approach to stormwater management for the purpose of water quality compliance. LID is a stormwater management strategy that seeks to mitigate the impact of increases in runoff and stormwater pollutants as close to its source as possible. LID comprises a set of site design approaches and Best Management Practices (BMPs) that promote the use of natural infiltration, evapotransportation, and reuse of stormwater. With respect to urban development and redevelopment projects, it can be applied on-site to mimic the site's predevelopment drainage characteristics.

In November 2011, the City of Los Angeles adopted the Stormwater LID Ordinance (Ordinance# 181899) with the stated purpose of:

1. Requiring use of LID standards and practices in future development and redevelopment to encourage the beneficial use of rainwater and urban runoff;

2. Reducing stormwater runoff while improving water quality;

3. Promoting rainwater harvesting;

4. Reducing offsite runoff and providing increased groundwater recharge;

5. Reducing erosion and hydrologic impacts downstream; and

6. Enhancing the recreational and aesthetic values in our communities.

Major surface water bodies in the City of Los Angeles include: the Los Angeles River, Tujunga Wash, Ballona Channel, Santa Monica Bay, and San Pedro Bay. In addition, the City is served by an extensive network of storm drains which either drain directly to the Santa Monica Bay, San Pedro Bay, or to waterways that ultimately drain to Santa Monica or San Pedro Bays.

ENVIRONMENTAL IMPACT

THRESHOLDS OF SIGNFICANCE

The following thresholds of significance are based on the *City of Los Angeles CEQA Thresholds Guidelines* (2006). They were developed to evaluate potential impacts on surface water hydrology, water quality, and groundwater.

A proposed project would normally have a significant impact on surface water hydrology if it would:

- Cause flooding during the projected 50-year developed storm, which would have the potential to harm people or damage property or sensitive biological resources;
- Substantially reduce or increase the amount of surface water in a water body;
- Result in a permanent, adverse change to the movement of surface water sufficient to produce a substantial change in the current or direction of water flow;
- Create pollution, contamination, or nuisance, as defined in Section 13050 of the California Water Code;
- Cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or water quality control plan for the receiving water body;
- Change potable water levels sufficiently to:
    - Reduce the ability of a water utility to use the groundwater basin for public water supplies, conjunctive use purposes, imported water storage, summer/winter peaking, or to respond to emergencies and drought,
    - Reduce yields of adjacent wells or well fields (public or private), or
    - Adversely change the rate or direction of flow of groundwater; or
- Result in demonstrable and sustained reduction of groundwater recharge capacity.
- Affect the rate or change the direction of movement of existing contaminants;
- Expand the area affected by contaminants;
- Result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or
- Cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations (CCR), Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act.

METHODOLOGY

The assessment of impacts to hydrology and water quality was based on information and/or requirements contained in applicable state and federal regulations, the City of Los Angeles' CEQA Thresholds Guide, RWQCB – Los Angeles' Basin Plan and on-site review of existing conditions. These resources in addition to the thresholds of significance formed the basis for the impact assessment.

Drainage Calculation Methodology

Detailed hydrology calculations are contained in the Preliminary Hydrology Report contained in **Appendix G**. Below is a brief description of the calculations.

Hydrology calculations were performed using the Los Angeles County Department of Public Works' MODRAT method, revised in 2006. This method includes new Isohyetal Maps and a new Tc Calculator "Tc_Calc_depth.xls" program. Drainage sub-areas were created and graphically illustrated. Sub-areas were established utilizing the existing and proposed topography and the existing storm drain network. The proportion impervious values were obtained from the "Proportion Impervious Data" table (see "Attachments" section of the Preliminary Hydrology Report). A composite impervious value was determined for each sub-area. The area of impervious surfaces would be approximately 74% (as compared to 68% under existing conditions).

The volume flow rates were determined for both the pre-development and post-development conditions. For the pre-development volume rate calculations, the site was divided into sub-areas (5 in total) by examining the site and the locations of the existing on-site points of runoff interception. For the post-development calculations, the site area was divided into sub-areas (3 in total) by the remaining, existing, and the proposed catch basin locations within the new parking areas. To determine the peak mitigated flow rate (Qpm) for the Stormwater Treatment Quality Control Calculations, the Los Angeles County Department of Public Works program "LACoWQFlow.xls" was utilized. Each subarea was analyzed to determine the treatment measure required for that sub-area. For the purposes of routing, and to be conservative, the pre and post-development hydrology was calculated as un-routed areas. Each runoff was determined for each area and added together to determine the cumulative runoff from the project site. The flow discharge was performed from all sub-areas to the existing outlet to the SPRR Channel for a 50-year storm event.

Mitigated flow rates (Qpm) and volumes (Vpm) were calculated according to sample design calculations and worksheets provided in the Appendix "F" of the Low Impact Development (LID) Handbook. The County of Los Angeles Department of Public Works program "LACoWQFlow.xls" was utilized for the mitigated flow rate calculations. Dry well sizing calculations were performed based on the requirements and formulas in "Calculating Size Requirements for Infiltration BMPs" in the LID Handbook.

PROJECT IMPACTS

Construction

Construction activities would require the use of machinery and materials handling and storage (e.g., gravel, asphalt) during all phases of the proposed project. These activities would entail the use of graders and other earthmoving equipment during initial site preparation. The use of this machinery and other vehicles would generate dust and would require the use of water trucks to meet South Coast Air Quality Management District (SCAQMD) fugitive dust requirements. Increased erosion and siltation may also occur due to construction activities and the modification of existing drainage patterns.

The use of water trucks to reduce dust may increase the potential for urban pollutants and silt to enter the SPRR Channel and Winnetka Channel, which are tributary to the Los Angeles River.

Accidental on-site spills of hazardous materials (e.g., fuels, solvents, paint) may also enter ground and/or surface waters, if not properly addressed.

Under the Federal Clean Water Act, each municipality throughout the nation is issued an NPDES Permit. The goal of the permit is to stop polluted discharges from entering the storm drain system and local coastal waters. The current NPDES Permit (Permit No. CA004001) was issued to Los Angeles County and 84 cities, including the City of Los Angeles, by the RWQCB – Los Angeles on December 13, 2001. One component of the Permit is the requirement for Los Angeles County and co-Permittees (i.e., City of Los Angeles) to implement the Development Construction Program, which consists of the following:

A. Implement the following minimum requirements at all construction sites;

- Sediments generated on the project site shall be retained using adequate Treatment Control or Structural BMPs;

- Construction-related materials, wastes, spills, or residues shall be retained at the project site to avoid discharge to streets, drainage facilities, receiving waters, or adjacent properties by wind or runoff;

- Non-storm water runoff from equipment and vehicle washing and any other activity shall be contained at the project site; and

- Erosion from slopes and channels shall be controlled by implementing an effective combination of BMPs (as approved in Regional Board Resolution No. 99-03), such as the limiting of grading scheduled during the wet season; inspecting graded areas during rain events; planting and maintenance of vegetation on slopes; and covering erosion susceptible slopes.

B. Construction sites with one acre and greater of soil disturbance shall comply with all above conditions in addition to obtaining coverage under the General Construction Activity Stormwater Permit (General Permit).

For the City of Los Angeles, the General Permit is administered by the State Water Resources Control Board (SWRCB) through the Los Angeles Regional Water Quality Control Board (RWQCB). The General Permit requires all dischargers where construction activity disturbs one acre or more to:

- Develop and implement a State Stormwater Pollution and Prevention Plan (SWPPP) which specifies BMPs to prevent pollution associated with construction activities from moving off site into receiving waters.

- Eliminate or reduce non-storm water discharges to storm drains and other waters of the nation.

- Perform maintenance and inspections of all BMPs.[19]

The proposed project would be subject to a General Permit because it would disturb more than one acre of soil and as such, the Applicant and/or its contractor would be required to prepare and implement a SWPPP which meets the requirements of the General Permit.

All construction activities would be required to implement storm water prevention measures identified in the SWPPP during all phases of construction. Adherence to the SWPPP and the implementation of standard BMPs during construction would reduce the potential for increased siltation, erosion and hazardous materials spills. With the implementation of these standard regulatory compliance requirements, construction impacts associated with surface and groundwater water quality would be less than significant.

Operation

Surface Drainage Hydrology -- Los Angeles River Drainage

The proposed project does not include modifications to the Los Angeles River. However, the SPRR Channel and Winnetka Channel are tributary to the Los Angeles River and could be affected by implementation of the proposed project. Impacts to these drainages are discussed below.

The proposed project includes the implementation of mechanisms to reduce surface flow velocity and quantities originating on-site. The purpose of these improvements is to ensure that flooding, scour or erosion associated flows originating on-site do not affect either on-site or downstream areas. To address these issues, drywells and other infiltration systems (e.g., infiltration basins, infiltration trenches, bio-retention areas, and permeable pavements) would be installed. In addition, to capture and convey excess surface flows, a conveyance system would be utilized. As noted in **Table III.G-2**, flows within subareas A2, B2, and C2 would be conveyed via a new catch basin and storm drain conveyance system out-letting to the existing SPRR Chanel. The flows from the subareas would be conveyed via a new 36-inch conveyance system connection to the SPPR Channel.[20] The retention capacity of these facilities would be capable of capturing, retaining and then conveying on-site flows to off-site receiving waters (i.e., SPRR and Winnetka Channels). **Figure III.G-2** shows the location of the proposed conveyance and detention facilities for the project site.

The construction of these devices would eliminate the potential for flooding either on-site or off-site, including downstream areas. In addition, they would also reduce the amount of surface water entering the SPRR Channel and Winnetka Channel. As noted in **Table III.E-2**, and discussed below the flows originating from the project site would be reduced (compared to existing conditions). This reduction in on-site flows to receiving waters would not result in a

[19] Source: City of Los Angeles' *Development Best Management Practices Handbook (Part B) Construction Activities* (Third Edition) (September 29, 2004), page 5.

[20] The location of the new outlet connection within the Winnetka Channel will be determined in consultation with the City of Los Angeles prior to construction.

permanent, adverse change to the movement of surface water sufficient to produce a substantial change in the current or direction of water flow.

TABLE III.G-2
SUMMARY OF HYDROLOGICAL SUB-AREAS POST-DEVELOPMENT

Sub-Area	Acres	Tc[1]	Q_{50} (cfs)[2] Un-routed	Q_{50} (cfs)[2] Adjusted[3]	Destination
A2	5.53	9	14.11	13.29[4]	To proposed catch basin in driveway north of building.
B2	7.33	9	18.71	17.55[4]	To proposed catch basin in driveway at southeast corner of parking area.
C2	8.43	12	18.77	17.89[4]	To proposed sump catch basin in driveway
TOTAL	21.26[3]	--	51.59	48.73[4]	To proposed water quality unit, the dry well, and to the SPRR Channel.

1 Note: Tc refers to the linear length of travel stormwater flows across a site before entering an outlet to a receiving water (e.g., SPRR Channel) or additional conveyance facility (e.g., storm drain, etc.). It is measured from the point located farthest from the receiving water or conveyance facility.
2 cfs = cubic feet/second
3 Peak flow rate adjusted with drywells (infiltration rate of Qpm Total = 2.86 cfs)
4 A slight increase in the area from the total pre-development drainage area due to the 0.44-acre increase in the additional parking and driveway access.

SOURCE: Preliminary Hydrology Report, Hall & Foreman, Inc., May 15, 2014

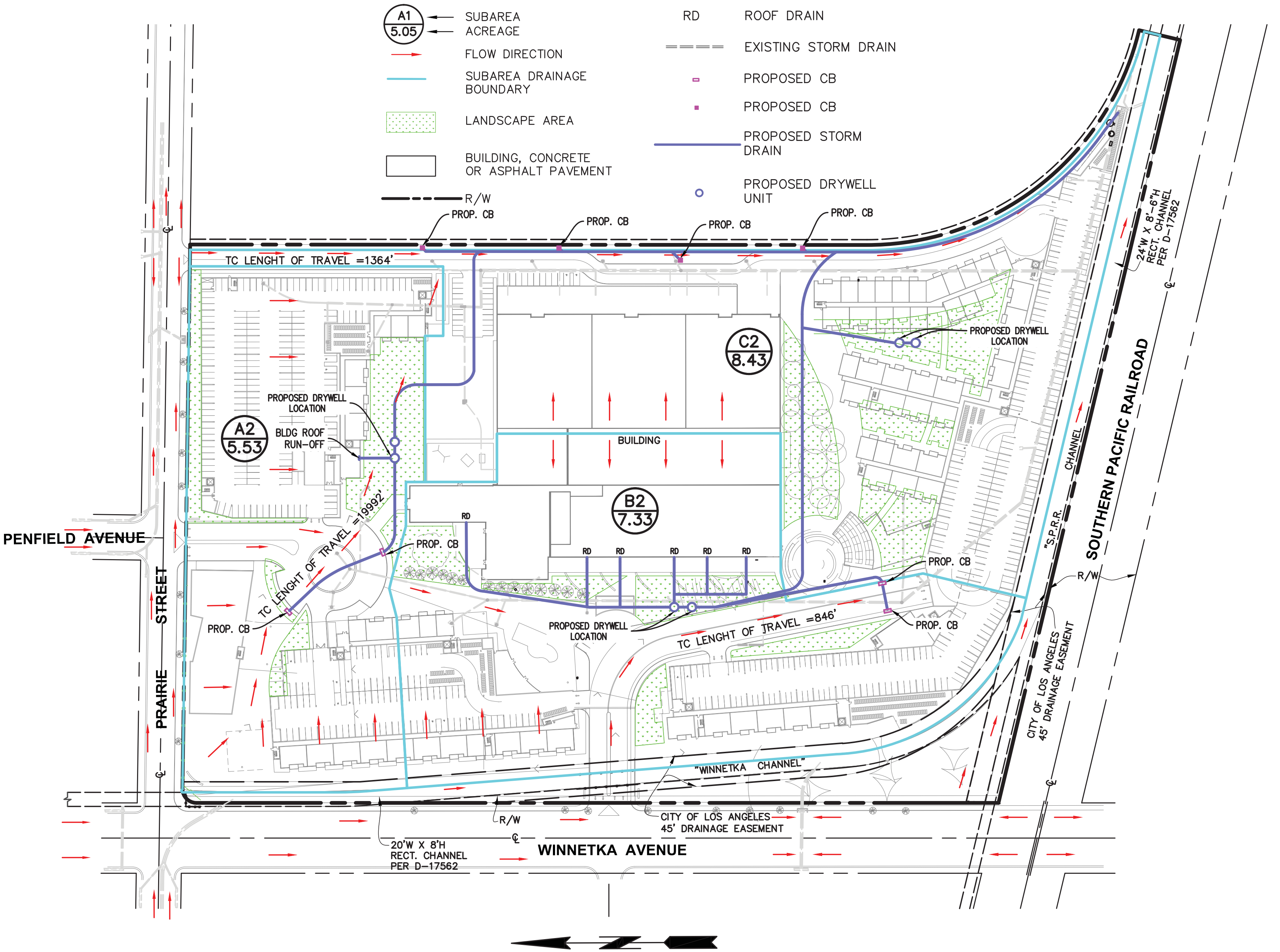
On-Site Hydrology and Surface Flows and Drainage Facilities

The project site would be graded to create building pads for the on-site land uses. In addition, the grading plan has been designed to ensure that during rain events precipitation falling on-site is directed towards the storm drain system (described above).

As noted in **Figure III.G-2**, on-site surface flows would be directed to the on-site storm drain system and then off-site to the channel along the southern property line adjacent to the SPRR line. Once completed, the project site would be comprised of approximately 74% impervious surfaces. All piping from project rooftops would be directed to a drywell or landscape bio swale for infiltration.

The analysis contained in the Preliminary Hydrology Report indicates that surface flows from on-site sources could be properly contained through the use of drywells and other infiltration systems (e.g., infiltration basins, infiltration trenches, bio-retention areas, and permeable pavements) with any excess surface flows able to be conveyed via a new conveyance system (new on-site drainage system) and which would drain to the existing channel adjacent to the SPRR rail line and via a new 36-inch drainage connection within the channel adjacent to Winnetka Avenue.[21]

21 The location of the new outlet connection within the Winnetka Channel will be determined in consultation with the City of Los Angeles prior to construction.



SOURCE: Hall & Foreman, Inc., 2014

Figure III.G-2

Post-Development Hydrology

The post-development condition would result in a slight increase in the total drainage area due to the additional driveway entrance from Winnetka Avenue and the expansion of the new residential buildings and retail area. However, as noted previously, flows would be contained on-site or would be conveyed to the channel adjacent to the SPRR rail line. The increased flows would be minor compared to pre-project conditions and would not result in flows that could substantially increase or decrease the amount of surface water in a water body, such as the Los Angeles River. In addition, the required on-site water retention would decrease flow rate off the site reducing impacts on off-site drainage systems since these systems would temporarily retain flows and allow for increased percolation into the existing groundwater basin.

The implementation of the proposed project would result in the following: (1) a beneficial impact related to reducing surface flow and flow rates compared to existing conditions and therefore, eliminating the site's potential contribution to downstream flooding; (2) a beneficial impact related to decreased levels of on-site surface flow rates to off-site receiving waters due to the implementation of BMPs; (3) a less than significant impact related to potential changes in the movement of surface water sufficient to produce a substantial change in the current or direction of water flow; and (4) less than significant impacts related to flooding during a 50-year developed storm event and which could have the potential to harm people or damage property or sensitive biological resources.

Floodplain and Flood Hazards

Floodplain

The Preliminary Hydrology Report indicates that the proposed project is not located within a flood plain, flood hazard zone or regulatory floodway, per FEMA's FIRM. Therefore, impacts associated with locating the proposed project within a designated floodplain would be less than significant.

Flood Hazard

The Preliminary Hydrology Report indicates that proposed project is in an area of minimal flooding outside the 500-year flood plain. Therefore, impacts associated with flooding would be less than significant.

Hydrogeology

San Fernando Valley Groundwater Basins

The proposed project would utilize potable water supplies available from the Los Angeles Department of Water & Power. No groundwater wells would be required. In addition, as noted in Section III.L Utilities and Service Systems, sufficient potable water supplies are available to meet project demand. Therefore, implementation of the proposed project would not result in a change in potable water levels sufficiently to either: (1) reduce the ability of a water utility to use the groundwater basin for public water supplies, conjunctive use purposes, imported water storage, summer/winter peaking, or to respond to emergencies and drought; or (2) reduce yields of adjacent wells or well fields (public or private). Based on the analysis above, impacts related to groundwater supplies or well yields are less than significant.

Groundwater Levels in the Project Vicinity

Implementation of the proposed project would entail the recycling of existing urban land uses. It would not convert natural lands that provide or substantially contribute to groundwater recharge. In addition, it does not include facilities or mechanisms capable of changing the rate or direction of flow of groundwater. Similarly, it would not result in demonstrable and sustained reduction of groundwater recharge capacity. The total amount of impervious surfaces (compared to existing conditions) would be incrementally increased. However, groundwater recharge would continue via the drywell, infiltration systems, and landscaping. Changes in recharge levels would be minimal when compared to existing recharge areas contained within the San Fernando Valley Groundwater Basins. Impacts associated with implementation of the proposed project on groundwater supplies, yield of public or private wells or impediments to groundwater recharge would be less than significant.

Surface and Groundwater Pollution Sources

Non-Point Source & Point-Source Pollution

As co-permittees of the NPDES Permit the City of Los Angeles has developed programs to address the following:

- Implementation of controls to reduce pollution from commercial, industrial and residential areas.
- Implementation of structural/non-structural controls on land development and construction sites.
- Implementation of controls to reduce pollution from maintenance activities.
- Elimination of illegal connections, including discouragement of improper disposal.
- Encouragement of spill prevention and containment, and implementation of appropriate spill response.
- Inspection monitoring and control programs for industrial facilities.
- Implementation of public awareness and training programs

Surface and Groundwater Water Quality

Los Angeles River Surface Water Quality & San Fernando Valley Groundwater Basins Quality

Water quality for both surface and groundwater resources could be affected by implementation of the proposed project. As noted above, storm water runoff contains urban pollutants that degrade surface and groundwater quality in the Los Angeles River and associated tributaries (i.e., SPRR Channel and Winnetka Channel).

Standard Urban Stormwater Mitigation Plan

In addition to the City of Los Angeles programs noted above, a Standard Urban Stormwater Mitigation Plan (SUSMP) is required for the project site by the City of Los Angeles. The storm water management elements and improvements that would be used to form the on-site flood control system can be either classified as conveyance-oriented or storage-oriented. The proposed system would be composed of drywells and infiltration and conveyance system. Where possible, the storm water management system has been designed to include multiple-use facilities (e.g., landscaping) to result in the most economical storm water management system while obtaining optimum performance with regard to flood control and water quality parameters.

One-hundred percent of on-site storm water from the project site would be treated for pollutants before being discharged into the SPRR Channel. City of Los Angeles SUSMP requirements require pre-treatment of runoff from vehicular areas and infiltrate/retain the first 0.75-inch rain event for all impervious surfaces. This retention requirement results in a volume of water equivalent to four percent of the total impervious area for a depth of 30 inches.

Adherence to NPDES requirements and the implementation of standard BMPs during operation of the proposed project would reduce the incidence and quantities of urban pollutants potentially affecting surface and groundwater. Therefore, impacts related to the proposed project resulting in the violation of a water quality standard would be less than significant.

PROJECT DESIGN FEATURES

The project would be designed to accommodate regulatory requirements, see below.

REGULATORY COMPLIANCE MEASURES

RC-III.E-1 The project shall comply with the City of Los Angeles Low Impact Development (LID) Ordinance. Construction contractors of individual projects are required to control erosion and runoff as necessary through the use of site appropriate grading practices. Specifically, the construction contractor shall plan for and implement Best Management Practices (BMPs) during construction to the satisfaction of the Department of Public Works, Bureau of Engineering, Stormwater Management Division City of Los Angeles, and/or other designated responsible agencies/departments.

RC-III.G-2 Sufficient area shall be available so that runoff can be collected in bio swales as appropriate and directed to existing curb and gutter or storm drains. Swale design shall be coordinated with on-site hazardous materials issues as necessary.

RC-III.G-3 The project shall comply with applicable NPDES permit requirements, including preparation and implementation of a Stormwater Pollution Prevention Plan in accordance with the Los Angeles Municipal Storm Water permit and compliance with LID requirements. The project shall identify post development peak runoff, conserve natural areas, minimize storm water pollutants, protect slopes and channels, and post construction BMPs and other items as required by the permit.

RC-III.G-4 Runoff shall be treated, as required by LID regulations, prior to discharging into existing storm drain systems.

RC-III.G-5 All wastes from construction shall be disposed of properly. Appropriately labeled recycling bins shall be used to recycle construction materials including: solvents, water-based paints, vehicle fluids, broken asphalt and concrete; wood, and vegetation. Non-recyclable materials/wastes shall be taken to an appropriate landfill. Toxic wastes shall be discarded at a licensed regulated disposal site.

RC-III.G-6 Leaks, drips, and spills shall be cleaned up immediately to prevent contaminated soil on paved surfaces that can be washed away into the storm drains.

RC-III.G-7 Material spills shall not be hosed down at the pavement if alternative clean-up methods are available, such as dry cleanup methods.

RC-III.G-8 Dumpsters shall be covered and maintained. Uncovered dumpsters shall be required to be placed under a roof or covered with tarps or plastic sheeting.

RC-III.G-9 Gravel approaches and dirt-tracking devices shall be used to reduce soil compaction and limit the tracking of sediment into streets.

RC-III.G-10 All vehicle/equipment maintenance, repair, and washing shall be conducted away from storm drains. All major repairs shall be required to be conducted at an appropriate location. Drip pans or drop cloths shall be required to catch drips and spills.

RC-III.G-11 Project construction shall comply with the General Construction Activity Stormwater Permit (General Permit) and the City's Development Construction Program pursuant to the NPDES Permit (Permit No. CA00401).

RC-III.G-12 Article 4.4 of Chapter IV of the Los Angeles Municipal Code (LAMC) specifies Stormwater and Urban Runoff Pollution Control requirements, including the application of Best Management Practices (BMPs). Chapter IX, Division 70 of the LAMC addresses grading, excavations, and fills. Applicants must meet the requirements of the Standard Urban Stormwater Mitigation Plan (SUSMP) approved by the Los Angeles RWQCB, including the following, where applicable:

- The project applicant shall implement storm water BMPs to treat and infiltrate the runoff from a storm event producing 3/4 inch of rainfall in a 24-hour period. The design of structural BMPs shall be in accordance with the Development Best Management Practices Handbook Part B Planning Activities. A signed certificate from a California licensed civil engineer or licensed architect that the proposed BMPs meet this numerical threshold standard is required.

- Post development peak storm water runoff discharge rates shall not exceed the estimated predevelopment rate for developments where the increase peak storm water discharge rate will result in increased potential for downstream erosion.

- Clearing and grading of native vegetation at the project Site shall be limited to the minimum needed to construct the project, allow access, and provide fire protection.

- Trees and other vegetation shall be maximized by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.

- Natural vegetation shall be promoted in landscaped areas.

- Any identified riparian areas shall be preserved.

- Appropriate erosion control and drainage devices, such as interceptor terraces, berms, vee-channels, and inlet and outlet structures, as specified by Section 91.7013 of the Building Code will be incorporated.

- Outlets of culverts, conduits or channels from erosion by discharge velocities shall be protected by installing a rock outlet protection. Rock outlet protection is physical devise composed of rock, grouted riprap, or concrete rubble placed at the outlet of a pipe. Sediment traps shall be installed below the pipe-outlet. Inspect, repair, and maintain the outlet protection after each significant rain.

- Any connection to the sanitary sewer will have authorization from the Bureau of Sanitation.

- Impervious surface area will be reduced by using permeable pavement materials where appropriate. These include pervious concrete/asphalt; unit pavers, i.e. turf block; and granular materials, i.e. crushed aggregates, cobbles.

- Roof runoff systems will be installed where site is suitable for installation.

- Messages that prohibit the dumping of improper materials into the storm drain system adjacent to storm drain inlets shall be painted.

- All storm drain inlets and catch basins within the project area shall be stenciled with prohibitive language (such as NO DUMPING - DRAINS TO OCEAN) and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.

- Legibility of stencils and signs must be maintained.

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area will be paved and sufficiently impervious to contain leaks and spills.

- The storage area shall have a roof or awning to minimize collection of storm water within the secondary containment area.

- An efficient irrigation system shall be designed to minimize runoff including: drip irrigation for shrubs to limit excessive spray; shutoff devices to prevent irrigation after significant precipitation; and flow reducers.

- Cleaning of oily vents and equipment will be performed within designated covered area, sloped for wash water collection, and with a pretreatment facility for wash water before discharging to properly connected sanitary sewer with a

CPI type oil/water separator. The separator unit must be: designed to handle the quantity of flows; removed for cleaning on a regular basis to remove any solids; and the oil absorbent pads must be replaced regularly according to manufacturer's specifications.

- Trash dumpsters will be stored both under cover and with drains routed to the sanitary sewer or use non-leaking and water tight dumpsters with lids. Containers will be washed in an area with properly connected sanitary sewer.

- Wastes, including paper, glass, aluminum, oil and grease will be reduced and recycled.

- Liquid storage tanks (drums and dumpsters) will be stored in designated paved areas with impervious surfaces in order to contain leaks and spills. A secondary containment system such as berms, curbs, or dikes shall be installed. Drip pans or absorbent materials whenever grease containers are emptied will be used.

- The owner(s) of the property will prepare and execute a covenant and agreement (Planning Department General form CP-6770) satisfactory to the City of Los Angeles Planning Department binding the owners to post construction maintenance on the structural BMPs in accordance with the SUSMP/LID and or per manufacturer's instructions.

Preliminary Storm Water Quality Mitigation Report, documenting proposed BMPs and proposed project compliance with LID requirements is included in **Appendix G**.

MITIGATION MEASURES

There are no mitigation measures needed beyond meeting regulatory requirements.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would remain less than significant, and the project would result in improvements related to downstream flooding and water quality.

CUMULATIVE IMPACTS

The majority of projects occurring within this portion of the Los Angeles region are largely infill projects (similar to the proposed project). These projects would be required to implement a Development Construction Program (per requirements of the County-wide Permit (see previous discussion above)). In addition, they would also generally subject to a General Construction Permit because they would disturb more than one acre of soil and as such, the Applicant and/or its contractor of these projects would be required to prepare and implement a SWPPP which meets the requirements of the General Construction Permit. The adherence to the SWPPP requirements and the implementation of standard BMPs would reduce cumulative impacts related to surface and groundwater water quality to less than significant levels.