IV. ENVIRONMENTAL IMPACT ANALYSIS

J. HYDROLOGY AND WATER QUALITY

INTRODUCTION

The analysis and information in this section are based primarily on the following reports (refer to Appendix IV.J):

- *Preliminary Hydrology and Hydraulic Study for Ramona Creek, JLC Engineering & Consulting, Inc., July 20, 2013.*

- *Preliminary Water Quality Management Plan, LLC Engineering and Consulting, Inc., November 21, 2012.*

ENVIRONMENTAL SETTING

Hydrologic Conditions

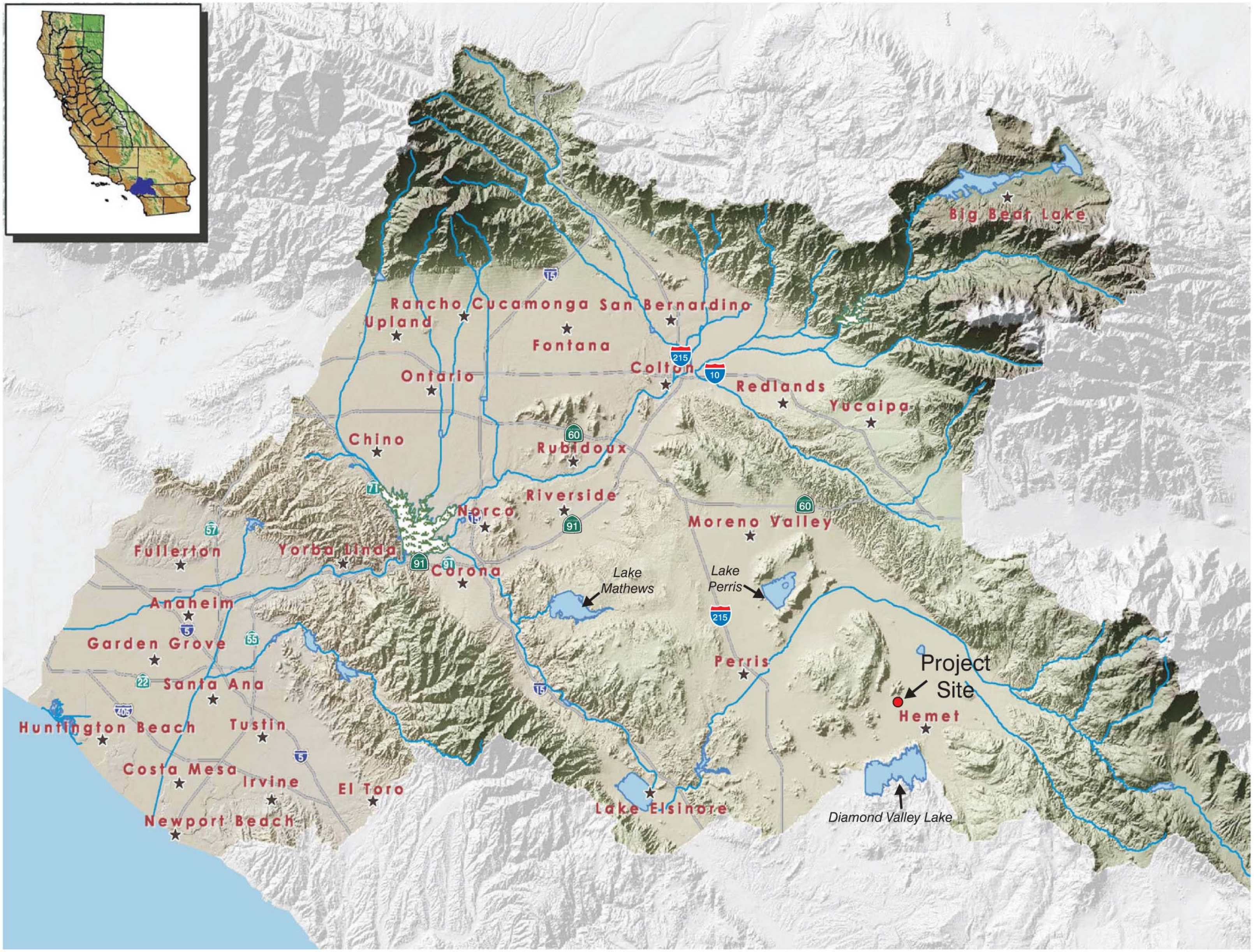
Climate and Precipitation

The climate in the region is Mediterranean with hot, dry summers and cooler, wet winters. Average annual precipitation ranges from 12 inches per year in the coastal plain to 18 inches per year in the inland alluvial valleys, reaching 40 inches or more in the San Bernardino Mountains. Most of the precipitation occurs between November to April as rain and snow. The climatological cycle of the region results in high surface water flows in the spring and early summer, followed by low flows during the dry season. Winter and spring floods generated by storms are not uncommon in wet years. During the dry season, infrequent summer storms can cause torrential flooding in local streams.

Watershed

A watershed is the geographic area draining into a river system, ocean, or other body of water through a single outlet and includes the receiving waters. Watersheds are usually bordered and separated from other watersheds by mountain ridges or other naturally elevated areas. As rainwater and melting snow run downhill through the watershed, they carry sediment and other materials into receiving bodies of water and groundwater.

Riverside County contains portions of three major watersheds: the Santa Ana River, the Santa Margarita and the Whitewater. As shown on Figure IV.J-1, the Project site is located within the boundaries of the Santa Ana River Watershed (or Santa Ana River Basin).



Source: Santa Ana Watershed Project Authority, 2013.

CAJA Environmental Services, LLC

Figure IV.J-1
Santa Ana River Watershed

The Santa Ana River watershed is south and east of the city of Los Angeles and includes much of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County, and a small portion of Los Angeles County (refer to Figure IV.J-1). It is bounded on the south by the Santa Margarita watershed, on the east by the Salton Sea and Southern Mojave watersheds, and on the north/west by the Mojave and San Gabriel watersheds. The watershed covers an area of approximately 2,800 square miles.

The watershed is located in the Peninsular Ranges and Transverse Ranges Geomorphic Provinces of Southern California. The highest elevations (upper reaches) of the watershed occur in the San Bernardino, eastern San Gabriel, and San Jacinto Mountains. Further downstream, the Santa Ana Mountains and the Chino Hills form a topographic high before the river flows into the coastal plain (in Orange County) and into the Pacific Ocean. Primary slope direction is northeast to southwest, with secondary slopes controlled by local topography.

Regional Drainage

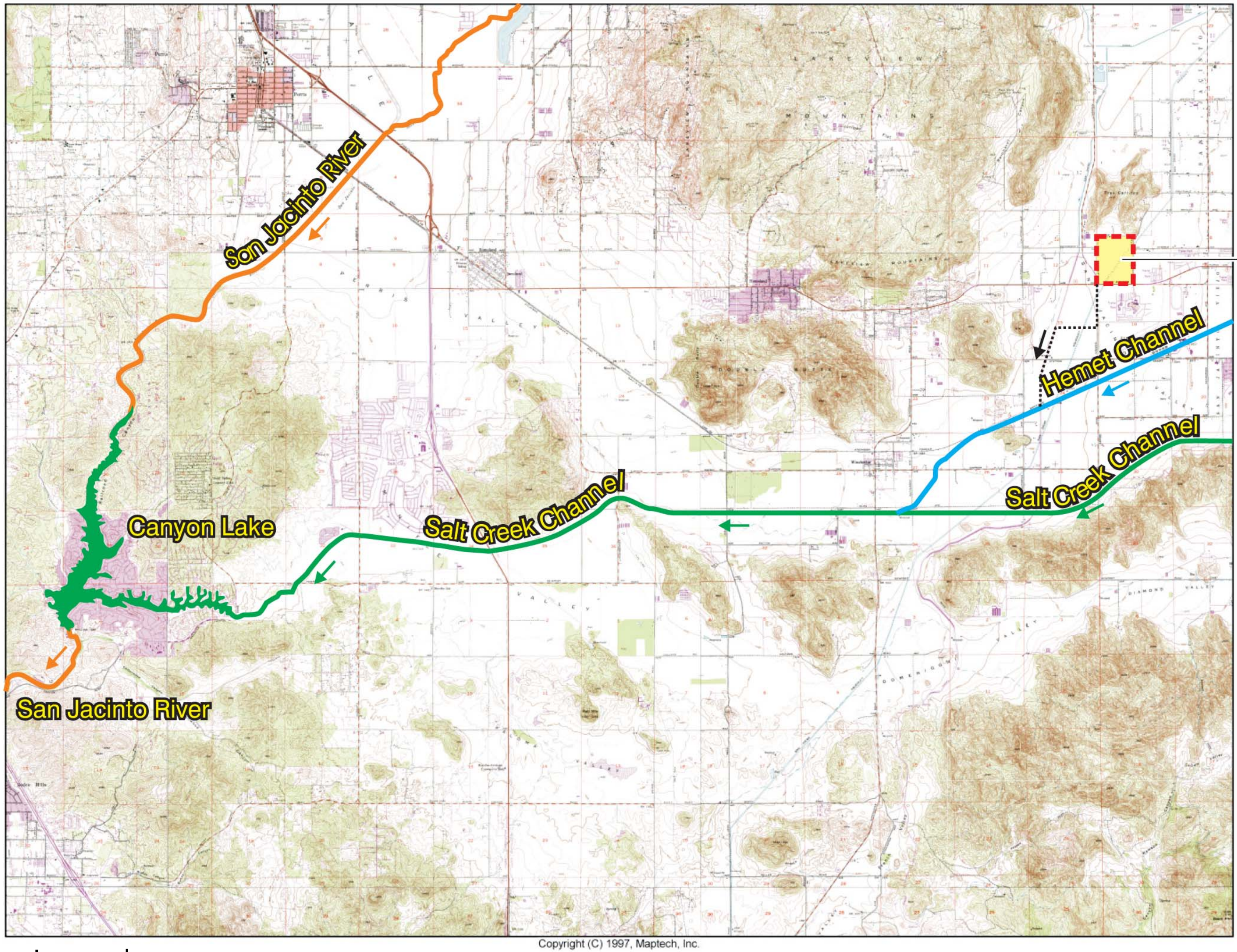
The Project area lies in the southwestern portion of the San Jacinto Valley. Regional drainage of this area is via Salt Creek, which flows east–west and passes approximately 2.5 miles south of the Project site. Salt Creek joins the San Jacinto River at Canyon Lake (refer to Figure IV.J-2*)*. The San Jacinto River then flows further westward to Lake Elsinore. These sections of the San Jacinto River Watershed are designated Reach 2 (Canyon Lake) and Reach 1 (Lake Elsinore to Canyon Lake), respectively.

The San Jacinto River Watershed usually terminates at Lake Elsinore. During times of especially heavy flood flows, Lake Elsinore overflows into Temescal Creek; Temescal Creek flows northwestward and joins the Santa Ana River, which in turn flows southwestward to the Pacific Ocean.

Local Drainage

An area of approximately 2,200 acres in the City of Hemet drains through the Project site. Figure IV.J-3 shows the area tributary to the Project site. Approximately 1,800 acres of this area is east of the Project site, extending as far east as San Jacinto Street, approximately 3.8 miles east of the Project site, and the remaining 400 acres consist of the Project site and part of the Los Cerritos Foothills to the north.

The City of Hemet Master Drainage Plan is shown on Figure IV.J-4. Only portions of the master planned facilities have been constructed within the local watershed. As shown, the Master Drainage Plan includes a retention basin to be located on the Project site. Per the Master Plan, the on-site retention basin would discharge to a future Line A. Future Line A is planned to discharge into Hemet Channel, which in turn would discharge into Salt Creek (refer to Figure IV.J-2). Existing drainage facilities do not currently outlet into Salt Creek (via Hemet Channel) because the drainage facilities have not been constructed.



Legend

Site Boundary

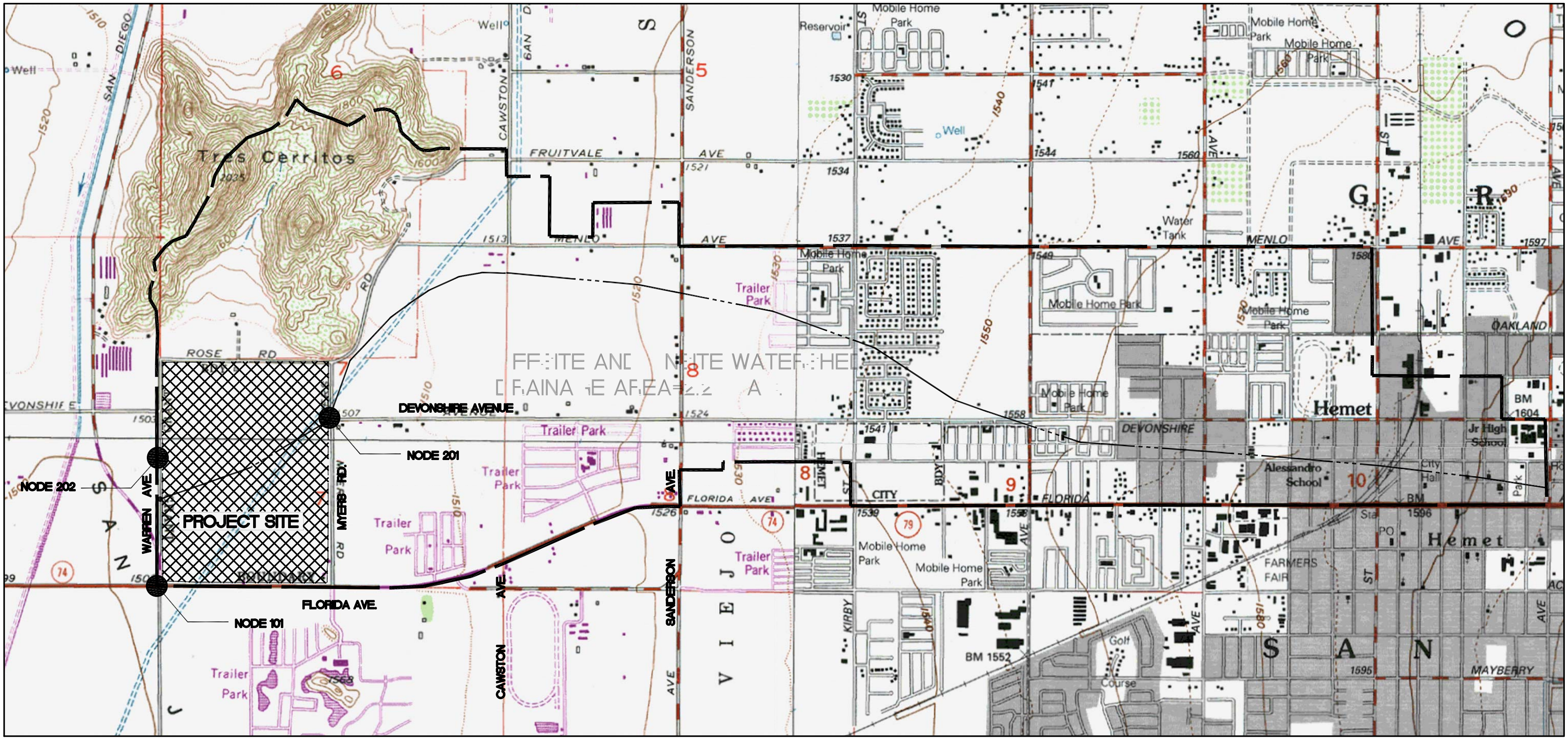
Direction of Flow

NORTH

Not to Scale

CAJA Environmental Services, LLC

Figure IV.J-2
Regional Drainage



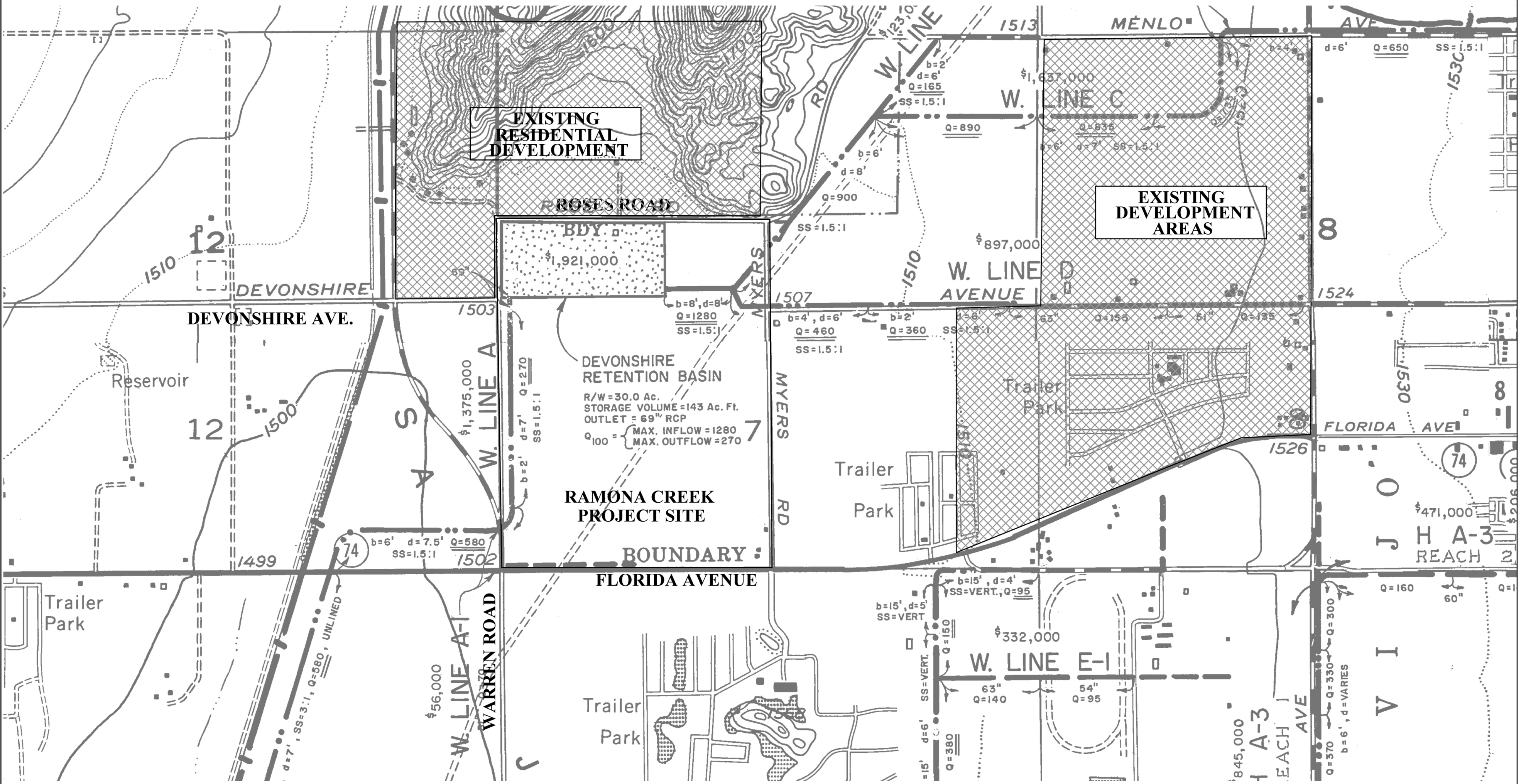
Source: JLC Engineering & Consulting, Inc., 2013

NORTH

Not to Scale

CAJA Environmental Services, LLC

Figure IV.J-3
Local Offsite and Onsite Watershed Map



0 1000 2000
Scale (Feet)

Source: JLC Engineering & Consulting, Inc., 2013

CAJA Environmental Services, LLC

Figure IV.J-4
City Master Drainage Plan

Upstream Retention

A study was performed to evaluate the total storage capabilities for existing retention basins. The following four large retention basins (shown on Figure IV.J-5) were identified upstream of the Project site (excludes several smaller retention basins located in upstream communities):

- **Seattle Basin** at the intersection of Cawston Avenue and Seattle Street. This basin has a total storage volume of 37.0 acre-feet based on Riverside County Flood Control & Water Control District (RCFC & WCD) topography maps.

- **Valley Wide Basin** approximately 800 feet west of the Cawston Avenue and Devonshire Avenue intersection. This basin has a storage volume of approximately 35.2 acre-feet.

- **Tres Cerritos North Basin** east of the Seattle Basin. The basin was graded as part of a specific plan that incorporated the use of a golf course. This basin has a total volume of 49.1 acre-feet based on 1-foot topography that was obtained from the property owner.

- **Tres Cerritos South Basin** southeast of the Seattle Basin. The basin was graded as part of a specific plan that incorporated the use of a golf course. This basin has a total volume of 49.5 acre-feet based on 1-foot topography that was obtained from the property owner.

Based on the total volume provided by the upstream retention basins, a total volume of 170.8 acre-feet of storage volume exists.

Project Site Drainage

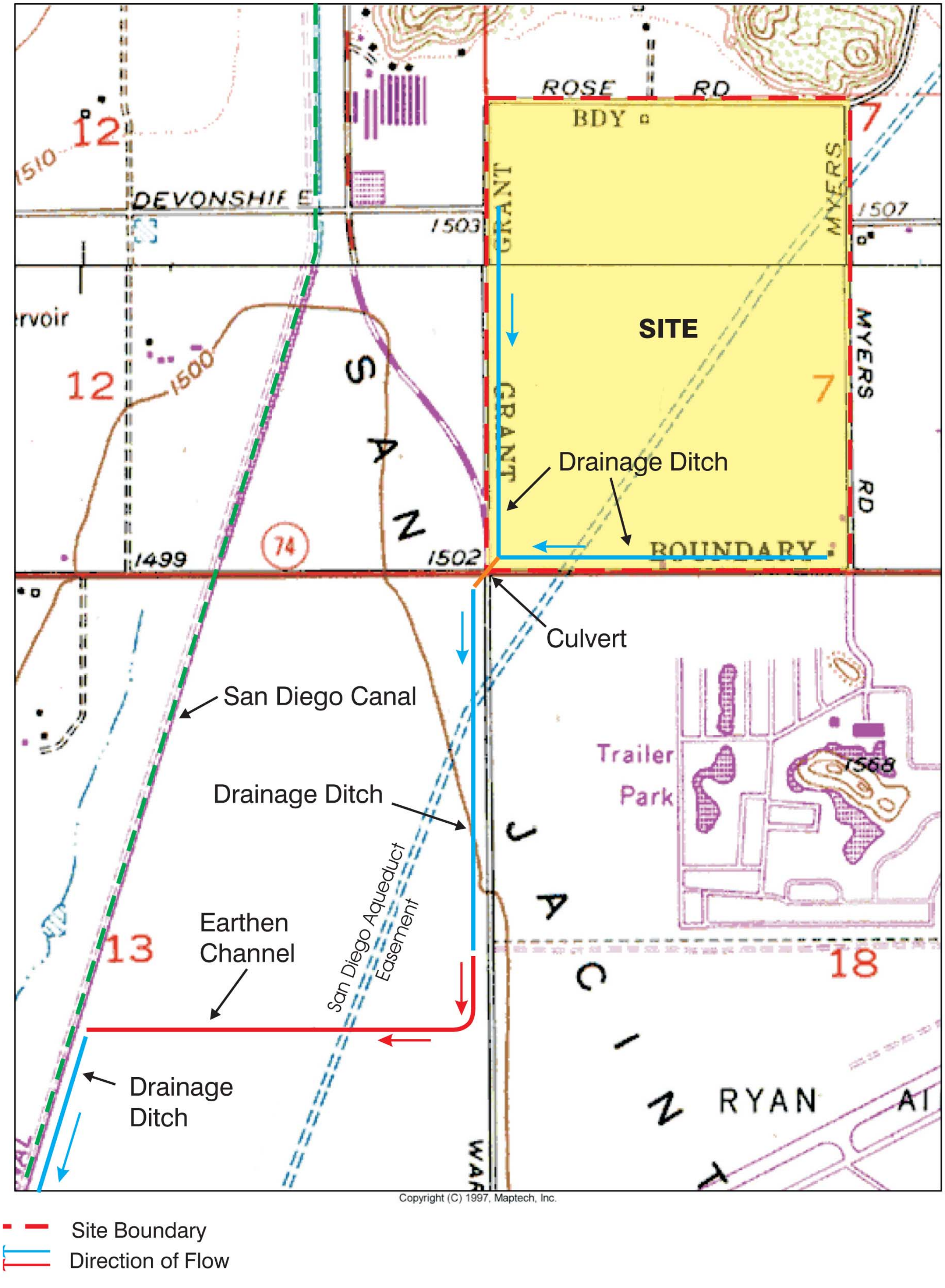
The Project site is generally bounded by Celeste Avenue to the north, Florida Avenue to the south, Myers Street to the east, and Warren Road to the west. The topography slopes in a northeasterly to southwesterly direction at an approximate 0.2 percent gradient. Drainage across the site is via sheet flow toward the west and southwest. When runoff reaches the western and southern boundaries of the site, the runoff enters two drainage ditches along the site perimeter. From the confluence of these two ditches adjacent to the northeast corner of Florida Avenue and Warren Avenue, runoff enters an 18-inch-diameter corrugated metal pipe, which discharges southwest of the Florida Avenue/Warren Road intersection. As shown on Figures IV.V-4 and IV.J-6, the water is then carried to Hemet Channel via unimproved ditches and an earthen channel.

Flow rates across the Project site were evaluated based on three points - Nodes 101, 201, and 202 - on the east and west boundaries of the Project site as shown, in Figure IV.J-3. The nodes are at the intersections of Florida Avenue and Warren Road (Node 101), Myers Street and Devonshire Avenue (Node 201), and Warren Road approximately 600 feet north of Florida Avenue (202). These three points were selected in

Source: JLC Engineering & Consulting, Inc., 2013.

CAJA Environmental Services, LLC

Figure IV.J-5
Aerial Image of Existing Basins



Source: JLC Engineering, Inc., 2007.

CAJA Environmental Services, LLC

Figure IV.J-6
Existing On Site Drainage

order to determine flow rate prior to entering the Project site and the flow rate exiting the Project site. The unit hydrograph, as outlined in the RCFC & WCD Hydrology Manual, was used to perform the analyses. Based on a watershed field reconnaissance evaluation, approximately 80 percent of the watershed east of the Project site is developed based on the ultimate land use patterns. The hydrology analyses for the watershed areas resulted in the peak flow rates shown on Table IV.J-1 for the 100-year, 3-hour storm.

Table IV.J-1
Hydrologic Analysis for Existing Conditions
100-year, 3-hour storm

Node 101				Node 201				Node 202			
Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow
100.3	14.2	0	100.3	1317.4	147.6	170.8	0	1462.2	165.7	170.8	0

Source: JLC Engineering & Consulting, Inc., 2013.

Metropolitan Water District Aqueduct

As shown on Figure IV.J-6, the San Diego Aqueduct traverses the Project site approximately 14 feet below ground in a southwesterly–northeasterly direction along a 160-foot easement for public utilities. The aqueduct is owned and operated by the Metropolitan Water District of Southern California (MWD). There are no other drainage improvements within or along the perimeter of the Project site.

Water Resources

Groundwater

The area of valleys and hills that is bounded by the San Jacinto Mountains to the east, the Santa Ana Mountains to the west, Palomar Mountain to the south, and the Santa Ana River to the north is referred to as the San Jacinto Basin. Four large groundwater basins underlie the San Jacinto Basin: the San Jacinto, Elsinore, Upper Santa Ana Valley, and Temecula Valley Groundwater basins. The Project site is situated over the San Jacinto Groundwater Basin (refer to Figure IV.J-7).

Groundwater in the San Jacinto Groundwater Basin is controlled by subsurface bedrock and the extensive faulting. Groundwater exists in geologic formations called aquifers, which contain significant quantities of water. Most groundwater basins are unconfined, where the water level is free to rise and fall with changes in water volume. However, the variable depth to bedrock and the presence of faults cause pressure zones where water flows toward the ground surface. In general, groundwater flows in the same direction as surface water—from the mountains in the east and north to the Pacific Ocean in the west.

Groundwater Management

Several local water agencies and private water producers in the San Jacinto Valley developed the Hemet/San Jacinto Water Management Plan to manage groundwater pumping and recharge and ensure that a reliable and adequate source of water is provided in the Hemet/San Jacinto Area. The Hemet/San Jacinto Water Management Plan area encompasses the entire San Jacinto Valley, including the cities of Hemet and San Jacinto, from Diamond Valley Lake on the south to a portion of the San Jacinto Mountains on the north. The water management plan area overlies four management zones: the Canyon, San Jacinto Upper Pressure, Hemet South, and a portion of the Lakeview/Hemet North. As shown on Figure IV.J-7, the Project site is located within the Hemet South management zone.

Local Groundwater

As a part of the Preliminary Geotechnical Investigation, 15 exploratory borings were performed at a maximum depth of 51.5 feet. Groundwater was encountered below ground surface (bgs) in 4 of the 15 borings, at depths from 40 to 49.5 feet bgs. In all four boring excavations, groundwater was likely encountered near the alluvium/bedrock contact. Based on the variable depth to groundwater, the relatively dry soil intervals encountered below the final measured groundwater depths, and the absence of groundwater in some borings, the groundwater encountered is considered to be in a "perched" condition, that is, bodies of groundwater above and isolated from the main aquifer.

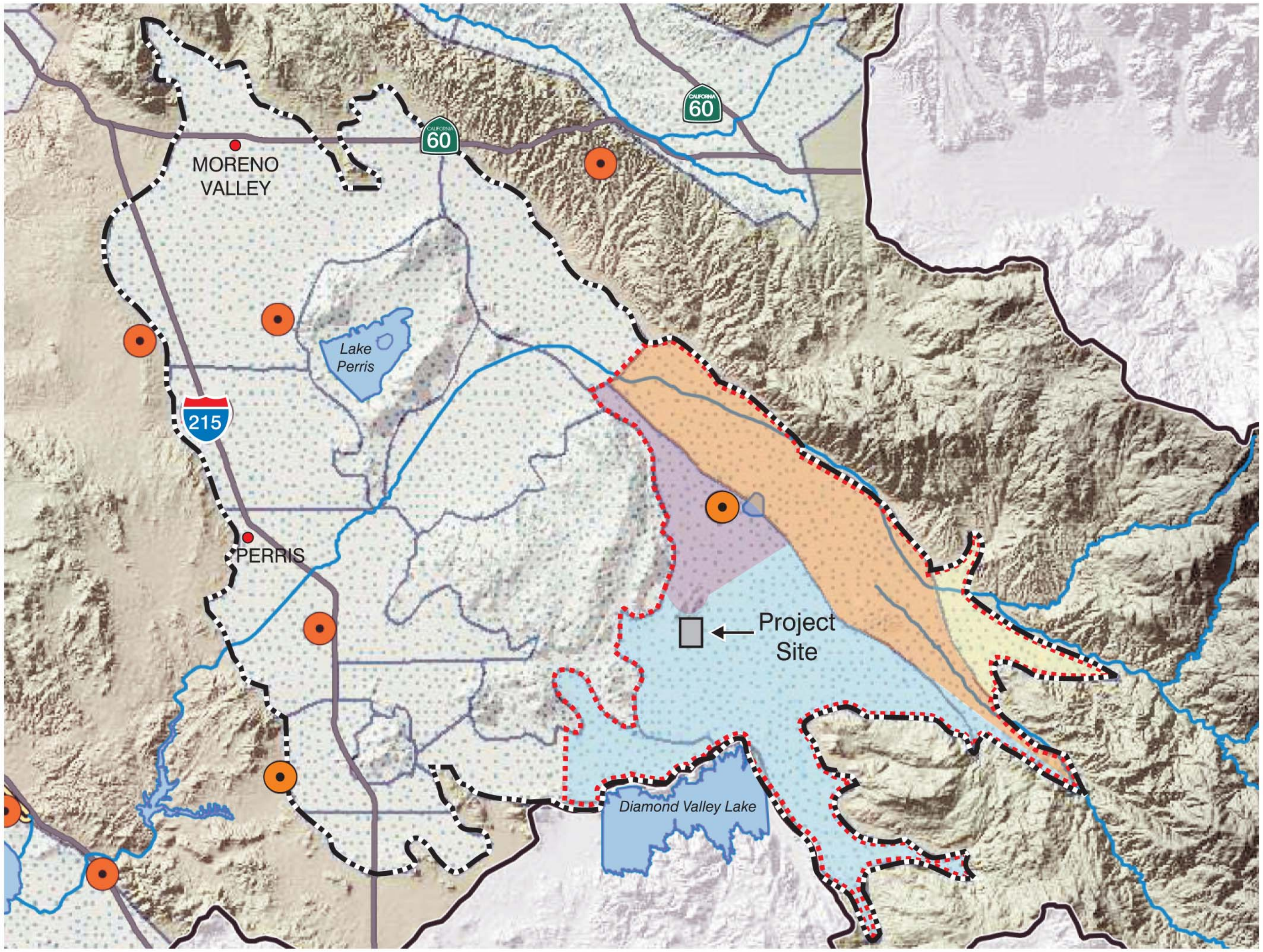
Water Quality

Groundwater Quality

High-quality groundwater has long been a source of water for local customers in the Hemet/San Jacinto area. As noted in the Water Quality Control Plan for the Santa Ana River Basin (the "Basin Plan"), beneficial uses of groundwater within the Hemet South management zone include the following:

- AGR – Agriculture Water Supply
- MUN – Municipal and Domestic Water Supply
- IND – Industrial Service Supply
- PROC – Industrial Process Supply

Specific water quality objectives have been established in the Basin Plan for the Hemet South management zone to maintain its four beneficial uses. Additionally, as noted in the water quality objectives of the Basin Plan, nutrient Total Maximum Daily Loads (TMDLs) have been established for the Hemet South management zone. In compliance with the TMDL requirements, routine monitoring programs have been developed to determine compliance with the water quality objectives and the TMDL requirements.



Legend

- San Jacinto Groundwater Basin
- Hemet/San Jacinto Water Management Plan Area
- Hemet South
- Lakeview/Hemet North(Partial)
- San Jacinto Upper Pressure
- Canyon
- Wastewater Treatment Plants

NORTH

Not to Scale

Source: Santa Ana Watershed Project Authority, 2007.

CAJA Environmental Services, LLC

Figure IV.J-6
Groundwater Basin

Water quality samples were obtained from 24 wells in the Hemet South management zone in 2006. The Eastern Municipal Water District (EMWD) collected the samples on all available private, inactive, or agricultural municipal wells and the wells owned by EMWD. EMWD and the cities of Hemet and San Jacinto collected the samples on their drinking water wells and forwarded them to EMWD for analysis. Levels of total dissolved solids (TDS) in the samples ranged from 230 to 1,390 parts per million (ppm), whereas the Maximum Contaminant Level (MCL) set by the U.S. Environmental Protection Agency (EPA) for TDS is 1,000 ppm. Nitrates (NO3-N) were found in concentrations of 0.6 to 31 milligrams per liter (mg/L); the MCL for nitrates is 45 mg/L.

The City of Hemet is located within EMWD's East Valley Service area. Groundwater pumped from this service area is corrosive; in response, EMWD adds a sequestering agent to the wells in this service area to control the corrososivity of the water. This water is otherwise of potable quality when it is pumped from the ground. Additionally, high turbidity or cloudiness in the water can hinder the effectiveness of disinfectants. All groundwater sample levels within the EMWD service area were below the required turbidity level.

Surface Water Quality

As previously stated, the Project site is located within the San Jacinto Valley area of the San Ana River Watershed. Regional drainage of this area is via Salt Creek, which flows east–west and passes approximately 2.5 miles south of the Project site. Salt Creek flows westward till it joins the San Jacinto River at Canyon Lake (refer to Figure IV.J-2). The San Jacinto River then flows farther west to Lake Elsinore. As such, the proposed Project would indirectly discharge into these receiving waters.

The San Jacinto River Watershed usually terminates at Lake Elsinore. However, during times of especially heavy flood flows, Lake Elsinore overflows into Temescal Creek; Temescal Creek flows northwestward and joins the Santa Ana River, which in turn flows southwestward to the Pacific Ocean. The beneficial uses of the downstream receiving waters (Canyon Lake, San Jacinto River, Lake Elsinore) of the Project include but are not limited to noncontact water recreation, human contact recreation, and warm freshwater aquatic habitat. Brief summaries of the receiving waters of the Project, their impairment status, and their beneficiary uses are provided on Table IV.J-2.

As shown in Table IV.J-2, Canyon Lake is listed as an impaired water body for nutrients and pathogens, and Lake Elsinore is listed as an impaired water body for nutrients, organic enrichment-low dissolved oxygen, sediment/siltation, and unknown toxicity. The sources of these pollutant stressors include but are not limited to urban runoff, agriculture, and unknown sources. General water quality objectives have also been prescribed in the Basin Plan for inland surface waters (streams, rivers, lakes, and wetlands) within the basin.

Table IV.J-2
Receiving Waters of the Project

Receiving Waters	303(d) List Impairments	Designated Beneficial Uses
Hemet Channel	None	None
Salt Creek Channel HSA	None	None
Canyon Lake (Reach 2)	Nutrients, Pathogens	MUN, ARG1, GWR1, REC1, REC2, WARM, WILD
San Jacinto River (Reach 1)	None	MUN, AGR, GWR, REC1, REC2, WARM, WILD
Lake Elsinore (Reach 1)	Nutrients, Organic Enrichment – Low Dissolved Oxygen, Pesticides, Sediment/Siltation, Unknown Toxicity	MUN, REC1, REC2, WARM, WILD

AGR = Agriculture Water Supply *GWR = Groundwater Recharge* *MUN = Municipal and Domestic Water Supply*
REC1 = Body Contact Recreation *REC2 = Nonbody Contact Recreation* *WARM = Warm Freshwater Aquatic Habitat*
WILD = Wildlife Habitat

Source: JLC Engineering, Inc, 2013.

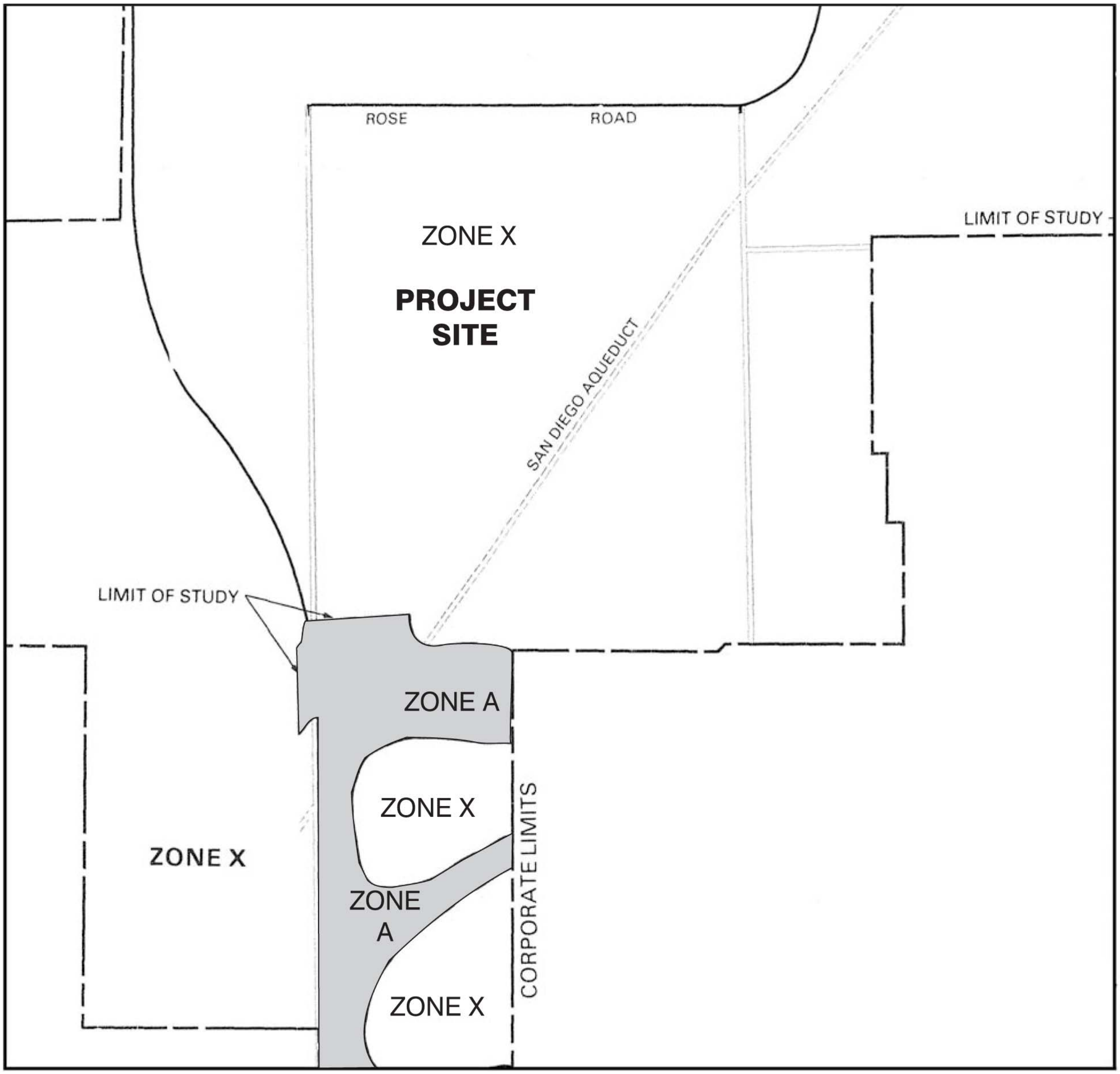
Flood Hazards

Designated Flood Zones

As shown on Figure IV.J-8, a small portion of the southwestern part of the Project site lies within a 100-year flood zone as designated by the Federal Emergency Management Agency (FEMA).

Seismically Induced Dam Inundation

The Project site is within the dam inundation area of the Diamond Valley Lake East Dam. Diamond Valley Lake is a water storage reservoir approximately 3.5 miles south of the Project site. The lake was constructed in 1999 and is operated and maintained by the MWD. The lake covers approximately seven square miles, has a capacity of approximately 243,900 acre-feet, and is the largest water-storage reservoir in southern California. The lake is impounded behind three earth/rock dams: West Dam, East Dam, and Saddle Dam. East Dam is 180 feet high and 2.0 miles long, and is approximately 4.2 miles southeast of the Project site.



Legend

Site Boundary

Zone A (corresponds to 100-year floodplain.)

Zone X

Note: Zone X - Areas determined to be outside the 100-year floodplain, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing draining area is less than 1 square mile, or areas protected from the 100-year flood by levees.

NORTH

0 1000
Scale (Feet)

Source: FEMA Flood Insurance Rate Map, August 1997.

CAJA Environmental Services, LLC

Figure IV.J-8
Flood Hazard Zone

REGULATORY SETTING

Federal

Safe Drinking Water Act

The Federal Safe Drinking Water Act (SDWA) provides regulations on drinking water quality in Hemet. The SDWA gives the EPA the authority to set drinking water standards, such as the National Primary Drinking Water Regulations (NPDWRs or primary standards). The NPDWRs protect drinking water quality by limiting the levels of specific contaminants that are known to occur or have the potential to occur in water and can adversely affect public health. The California Department of Health Services, Division of Drinking Water and Environmental Management, is responsible for implementation of the SDWA in California.

Clean Water Act

The federal Water Pollution Control Act (also known as the Clean Water Act [CWA]) is the principal statute governing water quality. The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and gives the EPA the authority to implement pollution control programs, such as setting wastewater standards for industry. The statute's goal is to end all discharges entirely and to restore, maintain, and preserve the integrity of the nation's waters. The CWA regulates both the direct and indirect discharge of pollutants into the nation's waters. It sets water quality standards for all contaminants in surface waters and makes it unlawful for any person to discharge any pollutant from a point source (a discernible, confined, and discrete conveyance, such as a pipe, ditch, or channel) into navigable waters, unless a permit is obtained under its provisions. The CWA mandates permits for wastewater and stormwater discharges, requires states to establish site-specific water quality standards for navigable bodies of water, and regulates other activities that affect water quality, such as the dredging and filling of wetlands. The CWA also funded the construction of sewage treatment plants and recognized the need for planning to address nonpoint sources of pollution. Section 402 of the CWA requires a permit for all point-source discharges of any pollutant (except dredge or fill material) into waters of the U.S.

National Pollutant Discharge Elimination System

In 1972, the federal CWA was amended to effectively prohibit the discharge of pollutants to waters of the United States from any point source, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. In 1990, the EPA published final regulations regarding stormwater discharges that require municipal separate storm sewer system (MS4) discharges to surface waters be regulated by a NPDES permit. In the State of California, the NPDES permit program is administered by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB). NPDES permits typically incorporate specific limitations for point source discharges to ensure that discharges meet permit conditions and protect state-defined water quality standards. The Santa Ana Regional Water Quality Control Board (SARWQCB) is the RWQCB for the Lower Santa Ana Watershed. In 1995, SARWQCB approved the Santa Ana River Basin Water Quality Control Plan (Basin Plan), which established water quality objectives for surface and ground waters in the Santa Ana Region. The Basin Plan has been updated in 2008 and 2011.

State

General Construction Permit

According to the EPA, construction sites without proper sediment and erosion controls can discharge 10 to 20 times the sediment load than agricultural lands and 1,000 to 2,000 times the load from forest lands (USEPA 1999b). The General Construction Permit (GCP), Waste Discharge Requirements (WDRs) Order 2009-0009-DWQ, NPDES Permit No. CAS000002, regulates stormwater discharges associated with construction activities disturbing one acre or greater of soil. Construction sites that qualify must submit a Notice of Intent (NOI) to file for permit coverage or otherwise be in violation of the CWA.

The General Construction Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s), which shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the Project site. The SWPPP must perform a Risk Assessment for the Project site to determine the Risk Level associated with the construction of the Project. A list of Best Management Practices (BMPs) and a concept plan must be developed by the discharger to demonstrate how to protect stormwater runoff. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Construction General Permit Fact Sheet Section M and the Construction General Permit Section XIV describe the elements that must be contained in a SWPPP.

The Project is subject to the stormwater discharge requirements of the GCP and would require NPDES permit coverage prior to the commencement of soil-disturbing activities. In the Santa Ana Region, where the Project resides, the SWRCB is the permitting authority, while the SARWQCB provides local oversight and enforcement of the GCP.

Regional

Municipal Separate Storm Sewer System NPDES MS4 Permits

Municipal Separate Storm Sewer System (MS4) NPDES Permits govern public storm drain system discharges. The County of Riverside is the Principal Permittee for the MS4 permits issued by the Santa Ana RWQCB to the County of Riverside and incorporated Cities, including the City, which is a co-

Permittee. The SARWQCB Order R8-2010-0033 NPDES, No CAS 618033 is the most current MS4 Permit that provides the policies and requirements regulating stormwater runoff. This permit regulates stormwater and urban runoff discharges from new developments and natural storm drain systems in the City of Hemet. Among other requirements, the NPDES permit specifies requirements for managing runoff water quality from new development and significant redevelopment projects, including specific sizing criteria for treatment BMPs.

Local

City of Hemet General Plan

The Hemet General Plan includes policies aimed at providing adequate hydrological conditions and water quality in the City of Hemet. The following are policies contained within the City's General Plan that are relevant to the Project:

> *Public Services and Facilities Element*
>
> Drainage Facilities Performance Standard: Facilities shall be provided concurrent with development to protect structures for human occupancy and major roadways from 100-year flood.
>
> *Public Health and Safety Element (Flooding)*
>
> Strategy 2: Ensure that no structure designed for human occupancy is constructed within the 100-year flood plain without being raised, at a minimum, one foot above the flood plain, and provided with an all-weather access.
>
> Strategy 4: Require, as a prerequisite to development approval, that drainage studies be completed to identify the facilities, which are required to adequately protect downstream properties.
>
> Strategy 5: Encourage the use of pervious paving materials in hardscape areas, swale designs in landscape, and grassy areas, which are able to slow runoff and maximize recharge of the groundwater table.

City of Hemet Storm Drainage Facilities Development Impact Fees (City Council Resolution No. 3981)

The City of Hemet assesses a Storm Drainage Facilities Development Impact Fee (DIF) to new developments. DIF rates are reviewed periodically, with the most recent update occurring in August 2006. In accordance with City Council Resolution No. 3981, the current DIF for Storm Drainage Facilities is $1,405 per single-family residence and $1,103 per condominium or duplex.

ENVIRONMENTAL IMPACT ANALYSIS

Threshold of Significance

In accordance with Appendix G of the CEQA Guidelines, a project could have a significant environmental impact if the project would do any of the following:

a) Violate any water quality standards or waste discharge requirements;

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

c) 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;

d) 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;

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

f) Otherwise substantially degrade water quality;

g) 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;

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

i) 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; or

j) Be inundated by seiche, tsunami, or mudflow.

As discussed in Section IV.A (Impacts Found to be Less Than Significant), the Project would not result in significant impacts related to issues “a,” “b,” “g,” “i,” and “j.” Thus, no further analysis of these issues is required.

Project Impacts

Impact IV.J-1: The Project would not 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, and impacts related to this issue would be less than significant.

Construction

The greatest potential for erosion and siltation to occur at the Project would occur during the construction phase (e.g., grading, clearing, and excavating) of the Project. During construction, the Project site would be cleared of vegetation in preparation for grading, which would expose soil to potential wind and water erosion. If not controlled, the transport of these materials to local waterways could temporarily increase suspended sediment concentrations and release pollutants attached to sediment particles into local waterways. The project Applicant would be required to prepare and submit a NOI and SWPPP prior to the commencement of construction activities in compliance with General Construction Permit requirements. The SWPPP would describe the BMPs to be implemented during the Project's construction activities. Through compliance with the General Construction Permit requirements, no significant impacts related to erosion and sedimentation would occur as a result of Project construction activities.

Operation

The ultimate Project condition would contain a number of features to reduce the amount of runoff that would occur within the Project site, and would limit the amount and rate of surface water flow downstream from the Project site, including extensive landscaping, pervious surface coverage, and other Project-related water quality design features (refer to the discussion of water quality impacts, below). Collectively, implementation of the BMPs outlined in a Water Quality Management Plan (WQMP) (refer to the Preliminary WQMP for the Project in Appendix IV.J) and would address potential erosion and siltation impacts during the operational phases of the Project to ensure that runoff from the Project site flows to impervious areas, landscaping, and other drainage features and would not encounter bare ground. Therefore, Project impacts related to erosion and sedimentation would be less than significant.

Impacts IV.J-2 and IV.J-3: The Project would not 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, and the Project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. Project impacts related to these issues would be less than significant.

A watershed hydrology analysis was performed for the pre-Project condition and the developed post-Project condition in order to evaluate the storm drain sizes for the Project and to determine the required volume to be stored within the Project's open space park area (refer to Table IV.J-3). The onsite area was divided into two subwatersheds, designated as Areas A and B: Area A is the northerly portion of the Project site that is tributary to the onsite basin, and Area B is the southerly portion of the Project site that is tributary to Florida Avenue. The onsite Area A is tributary to Node 202 for the ultimate condition hydrology, and the onsite Area B is tributary to Node 101 for the ultimate condition hydrology.

Table IV.J-3
Hydrologic Analysis for Post-Project Conditions
100-year, 3-hour storm

EXISTING CONDITION											
Node 101				Node 201				Node 202			
Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow
100.3	14.2	0	100.3	1317.4	147.6	170.8	0	1462.2	165.7	170.8	0
EXISTING-WITH-PROJECT CONDITION											
Node 101				Node 201				Node 202			
Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow
99.4	14.0	0	99.4	1317.4	147.6	170.8	0	1485.8	171.6	482.6[1]	0
GENERAL-PLAN-BUILDOUT CONDITION[2]											
Node 101				Node 201				Node 202			
Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow	Inflow	Runoff Vol.	Storage Vol.	Outflow
104.0	15.1	0	104.0[3]	1400.0	157.3	72.2	1400.0	1571.8	186.6	311.8[4]	0

[1] *The hydrology and hydraulic analysis assumes that the Project's onsite detention basin would be constructed and provide an additional 311.8 acre-feet of volume.*

[2] *Ultimate flow rates are based on General Plan buildout and buildout of currently approved Specific Plans. The hydrology and hydraulic analysis assumes that the Tres Cerritos North Basin and the Tres Cerritos South Basin are eliminated due to development.*

[3] *A low-flow system would be provided in order to convey the required water quality volume to the onsite basin to be treated for water quality purposes. These flows will be in excess of pf 4 feet^3/second and therefore will provide the required mitigation to the existing condition flow rate of 100 3 feet^3/second.*

[4] *The hydrology and hydraulic analysis assumes that the Project's onsite detention basin would be constructed and provide an additional 311.8 acre-feet of volume.*

Source: JLC Engineering & Consulting, Inc., 2013.

To determine the appropriate sizing of the proposed onsite detention basin, a rational method hydrology analysis was prepared for the Project site based on the Project's ultimate buildout condition. Table IV.J-4 provides corresponding runoff index numbers and impervious percentages for the land use proposed as part of the Project.

Unit hydrographs were prepared for the pre- post-Project conditions for the onsite area. The 2-year, 24-hour and 10-year, 24-hour storm durations were calculated in order to determine the required mitigation for the onsite area. The pre-Project unit hydrograph parameters were determined by calculating the flow length, centroidal length, and difference in elevation. The post-Project condition utilized 80 percent of the rational method time of concentration as the lag time, and entered the lag time manually, using the runoff index number and impervious fraction indicated at the end of the onsite rational method calculations. Tables IV.J-5 and IV.J-6 summarize the results for the pre- and post-Project onsite unit hydrograph calculations.

Table IV.J-4
Project Runoff Index and Impervious Surface Percentages

Land Use Designations	Corresponding Hydrology Manual Cover	Runoff Index Soil B	Runoff Index Soil C	Impervious Fraction
Low-Density Residential	0.25 acre residential	56	69	0.5
Medium-Density Residential	Condominiums	56	NA	0.65
Village Residential	Apartments	56	NA	0.8
Mixed Use	Commercial	56	NA	0.9
Street Area	Commercial	56	69	0.9
MWD ROW	Turf – Fair Cover	65	NA	0
Park/Open Space	Turf – Fair Cover	65	NA	0

MWD = Metropolitan Water District *ROW = Right of way*
Source: JLC Engineering and Consulting, Inc., 2013.

Table IV.J-5
Flow Rate Summary Table

Storm Event	Pre-Project	Post-Project		
		Area A	Area B	Total
2-Year, 24-Hour	4.75 ft^3/s	17.60 ft^3/s	6.24 ft^3/s	23.84 ft^3/s
10-Year, 24-Hour	31.19 ft^3/s	22.60 ft^3/s	15.00 ft^3/s	37.60 ft^3/s

ft^3/s = *cubic feet/second*
Source: JLC Engineering and Consulting, Inc., 2013.

Table IV.J-6
Volume Summary Table

Storm Event	Pre-Project	Post-Project		
		Area A	Area B	Total
2-Year, 24-Hour	2.95 ft^3/s	11.28 ft^3/s	4.70 ft^3/s	15.98 ft^3/s
10-Year, 24-Hour	7.95 ft^3/s	14.93 ft^3/s	8.13 ft^3/s	23.06 ft^3/s

ft^3/s = *cubic feet/second*
Source: JLC Engineering and Consulting, Inc., 2013.

Based on the calculations shown on Tables IV.J-5 and IV.J-6, the Project would be required to mitigate flows for the 2-year, 24-hour and 10-year, 24-hour storm events.

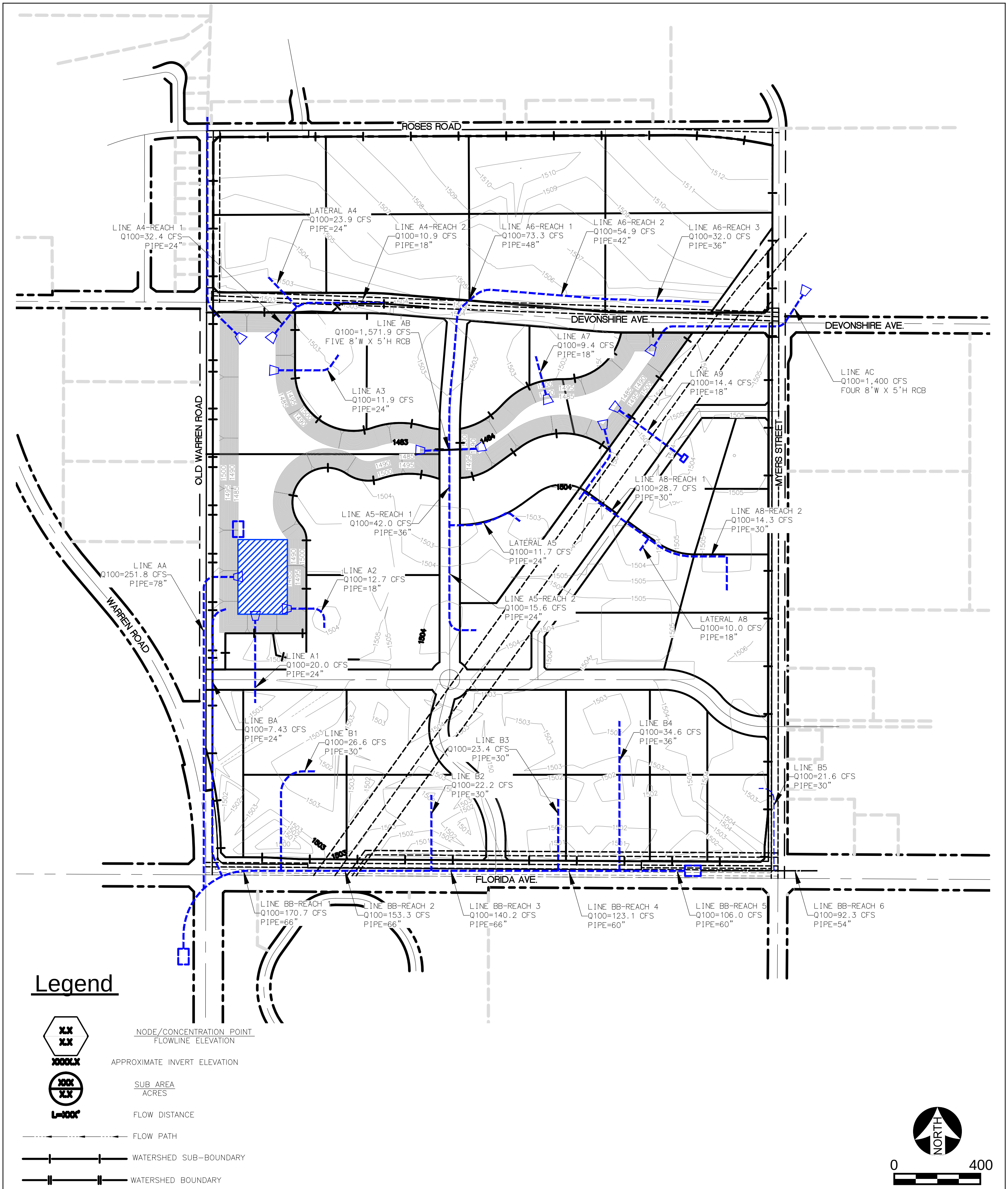
The Project's proposed buildout drainage facilities are shown on Figure IV.J-9, which incorporates the following regional drainage facilities and is consistent to the regional drainage facilities identified in the City's Master Drainage Plan:

1. Ramona Creek Retention Basin
2. Line AA (located along Old Warren Road)
3. Line AC (located at the intersection of Devonshire Avenue and Myers Street)
4. Line BB (located along Florida Avenue)

An earthen channel would be developed within a 10-acre area in the northern portion of Planning Area 5 as part of the Tres Cerritos Project. It is anticipated that this phase of the Project, referred to as "West of Myers and East of Recreational Spine" would not be developed until after the Tres Cerritos Project is constructed. In the event the Tres Cerritos Project is delayed or the Project wishes to develop this phase earlier, Figure IV.J-10 depicts the drainage facilities required to serve the Project until an earthen channel (proposed as part of the approved Tres Cerritos East Project) is constructed from Devonshire Avenue and Myers Street to the Seattle Basin.

Offsite flows emanating from the east would be collected via a multiple reinforced concrete box (RCB) structure at Devonshire Avenue and Meyers Street. The offsite flows would be conveyed to the onsite retention area, which has been designed to handle the total tributary volume for the 100-year, 3-hour storm duration (refer to Table IV.J-3). Flows would be pumped out at a rate such that it mimics the existing flow patterns. The onsite flows would be collected and conveyed via subsurface storm drain to the onsite retention area where the flows would be collected for Harvest and Use as a mechanism for water quality treatment (water quality impacts are discussed later in this section). Flows from the southerly portion of the Project site that are tributary to Florida Avenue would be conveyed to the onsite retention area via a low-flow system designed for the water quality flow rate. Additionally, the onsite retention basin would serve to mitigate the onsite flows for increased runoff associated with the 2-year, 24-hour and 10-year, 24-hour storm events. All flows would ultimately discharge at the southwest corner of Florida Avenue and Warren Road, which is the existing downstream terminus for the watershed.

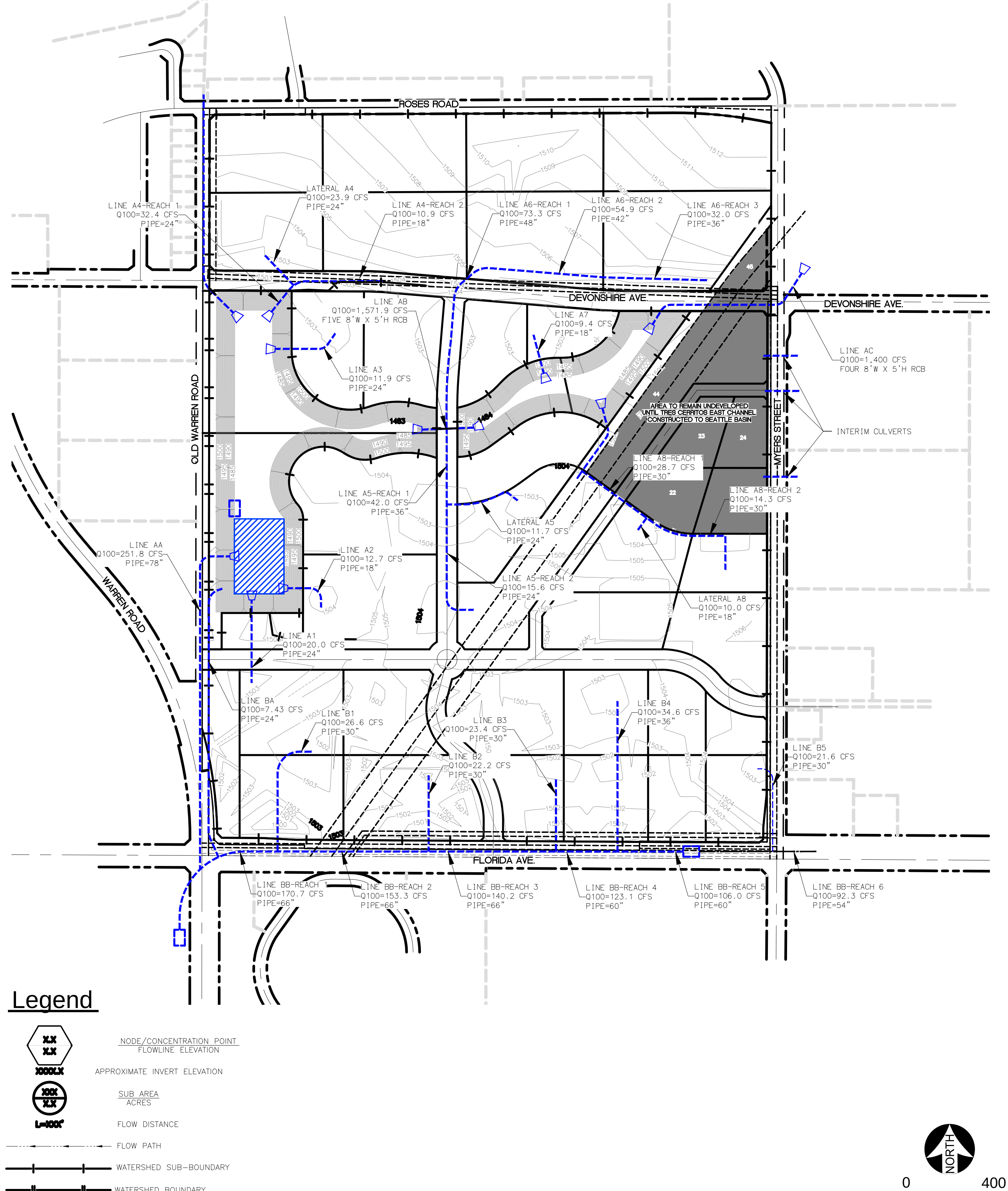
Based on this, although the Project would alter drainage patterns on the Project site, all runoff associated with the Project would be accommodated via appropriately sized storm drain facilities and would control rate and volume of runoff from the Project site to pre-Project conditions. Thus, no onsite or offsite flooding would occur, and the Project would not exceed storm drain capacity. Therefore, impacts related to this issue would be less than significant.



Source: JLC Engineering & Consulting, Inc. January 16, 2013.

CAJA Environmental Services, LLC

Figure IV.J-9
Project Drainage Facilities



Source: JLC Engineering & Consulting, Inc. February 13, 2013.

CAJA Environmental Services, LLC

Figure IV.J-10
Project Drainage Facilities
Interim Condition

Impact IV.J-4: The Project would not otherwise substantially degrade water quality, and impacts would be less than significant.

Construction

Project construction activities potentially could discharge sediment and pollutants to the nearest receiving waters (i.e., Canyon Lake, San Jacinto River, and Lake Elsinore). Clearing, grading, excavation, and construction activities associated with the Project could affect water quality due to sheet flow over exposed soils and subsequent deposition of particles and pollutants in drainage areas. Grading activities in particular could lead to exposed areas of loose soil, as well as sediment stockpiles that are susceptible to water erosion via uncontrolled sheet flow and also wind erosion. The storage and use of hazardous materials on-site, such as fuels, solvents, and paints, also present a risk to surface-water quality due to an increased potential for nonvisible pollutants entering the storm drain system.

If uncontrolled, these materials could lead to water quality impacts, including the discharge of sediment-laden runoff, prohibited non-stormwater discharges, and ultimately the degradation of downstream receiving water bodies, such as Canyon Lake, which is listed as impaired for nutrients and pathogens, and Lake Elsinore, which is listed as impaired for nutrients and sediment/siltation. Typical pollutants of concern produced from construction activities include the following:

- Sediment from erosion
- Hydrocarbons
- Heavy metals from equipment and machinery
- Fertilizers and pesticides from previous agriculture uses
- Construction materials and compounds such as asphalt, sealants, and concrete wastes
- Products such as paints, solvents, sawdust, and cleaning agents that may contain hazardous substances
- Soil amendments
- Stucco
- Wastewater as a result of dewatering activities
- Grease, oil, and gasoline from equipment maintenance and fueling
- Tracking of soils off-site when vehicles leave the site

- Sanitary and septic waste facilities

The soil-disturbing activities associated with the Project would necessitate the implementation of a SWPPP and related construction BMPs that would achieve best conventional pollutant control technology (BCT) and best available technology economically achievable (BAT) performance standards.

Under the General Construction Permit, the Project Applicant is required to submit an NOI to the SWRCB prior to the commencement of construction activities. In addition, a SWPPP must be prepared and implemented at the Project site, and revised as administrative or physical conditions change. Prior to the issuance of a grading permit by the City, Project proponents would be required to prepare a SWPPP describing the BMPs to be implemented during the construction activities. The SWPPP is required to be submitted to the City for review and approval. Construction contractors are required to maintain a copy of the SWPPP at the site at all times and implement all construction BMPs identified in the SWPPP during construction activities.

Various components of a SWPPP are listed as follows:

- Requires implementation of BMPs designed with the goal of preventing a net increase in sediment load in stormwater discharges relative to preconstruction levels;
- During the construction period, discharges of stormwater or non-stormwater at levels that would cause or contribute to an exceedance of applicable water quality standards contained in the Basin Plan are prohibited;
- Discusses in detail the BMPs planned for the project related to control of sediment and erosion, non-sediment pollutants, and potential pollutants in non-stormwater discharges;
- Describes post-construction BMPs for the Project;
- Explains the maintenance program for the Project's BMPs;
- During construction, requires reporting of violations to the RWQCB; and
- Lists the parties responsible for SWPPP implementation and BMP maintenance during and after grading. The Project Applicant shall implement the SWPPP and shall modify the SWPPP as directed by the Construction General Permit.

The SWPPP is required to identify construction BMPs necessary to mitigate project impacts, including but not limited to the following.

- Sediment from areas disturbed by construction shall be retained on-site using structural controls (erosion and sediment controls) and sediment debris basins (first flush basin will serve this function during construction activities) to the maximum extent practicable. Streets adjacent to the site entrance and exits shall be free of sediment and debris from the project site and shall be swept as directed by the City.

- Stockpiles of soil shall be properly contained to minimize sediment transport from the site to streets, drainage facilities, or adjacent properties via runoff, vehicle tracking, wind, or water.

- Appropriate BMPs for construction-related materials, wastes, and spills shall be implemented to minimize transport from the site to streets, drainage facilities, or adjoining properties by wind or runoff.

- Runoff from equipment and vehicle washing shall be contained at construction sites unless treated to reduce or remove sediment and other pollutants.

- All construction contractor and subcontractor personnel are to be made aware of the required best management practices and good housekeeping measures for the project site and any associated construction staging areas.

- At the end of each day of construction activity, all construction debris and waste materials shall be collected and properly disposed in trash or recycle bins.

- Construction sites shall be maintained in such a condition that an anticipated storm does not carry wastes or pollutants off the site. Discharges of material other than stormwater can occur only when necessary for performance and completion of construction practices and where they do not cause or contribute to a violation of any water quality standard; cause or threaten to cause pollution, contamination, or nuisance; or contain a hazardous substance in a quantity reportable under federal regulations 40 CFR Parts 117 and 302.

- Potential pollutants include but are not limited to: solid or liquid chemical spills; wastes from paints, stains, sealants, glues, limes, pesticides, herbicides, wood preservatives, and solvents; asbestos fibers, paint flakes, or stucco fragments; fuels, oils, and lubricants; hydraulic, radiator, or battery fluids; fertilizers, vehicle/equipment wash water, and concrete wash water; concrete, detergent or floatable wastes; wastes from any engine/equipment steam cleaning or chemical degreasing; and super-chlorinated potable water line flushing. During construction, the permittee shall dispose of such materials in a specified and controlled temporary area on-site, physically separated from potential stormwater runoff, with ultimate disposal in accordance with local, state, and federal requirements.

- Dewatering of contaminated groundwater or discharging contaminated soils via surface erosion is prohibited. Dewatering of non-contaminated groundwater requires an NPDES permit from the local RWQCB.

- The permittee and contractor shall inspect the erosion control work to ensure that the work is in accordance with the approved plans.

- The permittee shall notify all general contractors, subcontractors, material suppliers, lessees, and property owners that dumping of chemicals into the storm drain system is prohibited.

- Equipment and workers for emergency work shall be made available at all times during the rainy season. Necessary materials shall be available on-site and stockpiled at convenient locations to facilitate rapid construction of temporary devices when rain is imminent.

Additionally, prior to the issuance of a grading permit by the City, Project developer for projects of one or more acres of soil disturbance are required to provide the City with evidence that a NOI has been filed with SWRCB. Such evidence consists of a copy of the NOI stamped by SWRCB or the RWQCB, or a letter from either agency stating that the NOI has been filed.

Submittal of an NOI and implementation of the SWPPP and its associated BMPs throughout the construction phase of the proposed project would address anticipated and expected pollutants of concern as a result of construction activities. Compliance with the General Construction Permit requirements would ensure that water quality standards are met/exceeded during the Project's construction. Therefore, Project construction-related water quality impacts would be less than significant.

Operation

The operational phase of the Project could result in long-term impacts to the quality of stormwater and urban runoff, subsequently impacting downstream water quality of receiving waters—San Jacinto River, Canyon Lake, and Lake Elsinore. Although the existing drainage system and facilities within the Project area would be substantially improved as a result of the Project, the proposed land uses could create new pollutant sources for runoff.

The long-term operation of the Project necessitates the implementation of post-construction BMPs that would achieve BCT and BAT performance standards, in order to mitigate and abate pollutants that may compromise the San Jacinto River, Canyon Lake, and Lake Elsinore beneficial uses and water quality. Primary pollutants of concern are those that have been identified as causing impairment of receiving waters. Table IV.J-7 summarizes the categories of land use or Project features of concern and the general pollutant categories associated with them. A description of each pollutant type described on Table IV.J-7 is provided as follows:

Table IV.J-7
Potential Pollutants Created by Land Use Type

Pollutant Category	Residential	Commercial/ Industrial/ Business	Parking Lots	Roads
Sediment/Turbidity	P	P	P	P
Nutrients	P	P	P	P
Organic Compounds	N	N	E	E
Trash and Debris	P	P	P	P
Oxygen Demanding Substances	N	P	P	P
Bacteria and Viruses	P	P	P	P
Oil and Grease	P	P	P	P
Pesticides	P	P	P	P
Metals	N	P	P	P

P = Potential N = Not Potential

Source: Exhibit B, Riverside County Water Quality Management Plan for Urban Runoff, July 24, 2006

- ***Sediment/turbidity.*** Soils or other surface materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms' survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

- ***Nutrients.*** Inorganic substances such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth, which may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.

- ***Trash and debris.*** General waste products on the landscape (such as paper, plastic, polystyrene packing foam, aluminum materials, leaves, grass cuttings, and food waste). The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions, resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

- ***Oxygen-demanding substances.*** Include biodegradable organic material such as proteins, fats, and carbohydrates; and chemicals such as ammonia and hydrogen sulfide that react with dissolved oxygen in water. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

- ***Pathogens such as bacteria and viruses.*** Ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

- ***Oil and grease.*** High-molecular-weight organic compounds. The primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

- ***Pesticides.*** Chemical compounds commonly used to control nuisance growth of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

- ***Organic compounds.*** Commercially available or naturally occurring hydrocarbons such as those found in pesticides and solvents. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.

- ***Metals.*** Raw material components in nonmetal products such as fuels, adhesives, paints, and other coatings. The primary sources of metal pollution in stormwater are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources and bioaccumulation of metals in fish and shellfish. Environmental concerns regarding the potential for release of metals to the environment have already led to restricted metal usage in certain applications.

As required by the City, at the time of submittal of an application for a new development, Project proponents shall be required to submit a Water Quality Management Plan (WQMP), using the Riverside County Stormwater Quality Best Management Practice Design Handbook, to the City that outlines approved post-construction BMPs including site-design and source and treatment control BMPs selected for the particular development to reduce pollutants in post-development runoff to meet the BAT/BCT performance standard.

Below is a discussion of proposed site-design, source control, and treatment control BMPs as documented in the Preliminary WQMP prepared for the Project (refer to Appendix IV.J).

Site Design BMPs

Site-design considerations to reduce the potential impacts on surface and groundwater quality would be incorporated into the Project. These include, but are not limited to, maximizing pervious areas, minimizing directly connected impervious areas, constructing hardscape with permeable materials, and implementing on-lot hydrologically functional landscape design. Specific details and guidelines for the implementation of site design BMPs are provided in the Riverside County Stormwater Quality Best Management Practice Design Handbook.

The site design BMPs for the Project would comply with existing regulations. The anticipated and potential effectiveness of these features with regard to specific pollutants in urban runoff would be outlined in the final WQMP and SWPPP submitted to the City for review and approval prior to the issuance of grading permits. Project proponents would be required to implement site design concepts that would achieve each of the following:

- Minimize urban runoff
- Minimize impervious footprint
- Minimize directly connected impervious areas (DCIAs)

At a minimum, the Project Applicant would incorporate the following site-design BMPs outlined in the Preliminary WQMP (refer to Appendix IV.J), where feasible.

Minimize Urban Runoff

- Maximize permeable areas.
- Incorporate landscaped buffer areas between sidewalks and streets.
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planning additional native or drought tolerant trees and large shrubs.
- Use natural drainage systems.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low-flow infiltration.
- Construct on-site ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.

Minimize Impervious Footprint

- Maximize permeable areas.

- Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low -traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.

- Reduce widths of street where off-street parking is available.

- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.

Conserve Natural Areas

- Conserve natural areas.

- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.

- Use natural drainage systems.

Minimize Directly Connected Impervious Areas

- Residential and commercial sites must be designed to contain and infiltrate roof runoff, or to direct roof runoff to vegetative swales or buffer areas, where feasible.

- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.

- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.

- Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.

- Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.

Source Control BMPs

Nonstructural and structural source control BMPs effectively minimize the potential for typical urban pollutants to come into contact with stormwater, thereby limiting water quality impacts downstream. Numerous nonstructural and structural source control BMPs would be incorporated into the Project and would be carried out through the operation phase of the Project, including the following:

Nonstructural

- Educational materials related to urban runoff would be provided to all employees, tenants, occupants, and employees upon occupancy.

- Activity restrictions would be developed project's Covenants, Conditions and Restrictions (CC&Rs) to prevent additional pollutants to stormwater.

- The irrigation system and landscape maintenance shall be maintained by the homeowners association.

- Common-area landscape management that includes minimizing fertilizer and pesticide application, maintenance activities, and proper education and training for employees.

- Regular litter control for the entire Project area, including trash pick-up and sweeping of littered common areas, as performed by the maintenance crew.

- Routine maintenance of all catch basins, grate inlets, etc., for debris and litter removal.

- Street sweeping of all impervious streets and parking lots performed at a frequency that reduces or prevents sediment and debris from entering receiving waters and prior to the rainy season.

- The sand filter basin would be inspected and maintained by the homeowners association.

Structural

- Proper landscaping design incorporating native drought-tolerant species, protection of slopes, and efficient irrigation design.

- Properly designed trash enclosures and loading docks to minimize contact with stormwater.

Treatment-Control BMPs

In addition to site design source-control BMPs, the Project would be required to implement treatment-control BMPs (single or in combination) to remove anticipated pollutants of concern from on-site runoff. Treatment-control BMPs can range from natural treatment systems such as vegetated swales, detention basins, and constructed wetlands, to proprietary control measures. Since no single treatment BMP can effectively remove all contaminants that can pollute stormwater runoff, the treatment-control BMP(s) required for the proposed project would be high to moderately efficient in removing the target pollutants. Table IV.J-8 demonstrates the variation in pollutant-removal efficiencies of several treatment-control BMPs.

The Project would use harvest and use BMPs to treat the onsite flows for water quality purposes. Additionally, the Project would incorporate Low-Impact Development (LID) measures such as minimizing the directly connected impervious areas where feasible.

Harvest and use BMPs collect and temporarily store runoff for later non-potable uses including irrigation, toilet flushing, and other non-potable uses such as industrial processes. The Project site would incorporate a collection area in the south westerly portion of the onsite retention basin and flows would be pumped from this area into irrigation systems and pipes for toilet flushing.

The collection area would be designed to store the required water quality volume as determined by the BMP Design Volume Spreadsheet for the Santa Ana Watershed. In the preliminary stage, the effective impervious fraction calculations assumed that the impervious percent indicated at the end of the rational method calculations represents the percentage of roof, sidewalk, and other paved areas. The remaining pervious areas are assumed to be turf and landscaped areas.

The water quality volume for Areas A and B are 4.27 acre-feet and 2.35 acre-feet, respectively. The collection area within the onsite retention area would be designed with a minimum volume of 6.62 acre-feet. The flows from Area B would be conveyed via a 24-inch low-flow pipe. The required water quality flow to be conveyed through the low-flow system was determined using the rational method formula, as follows:

$$Q = C\ I\ A$$

…where "Q" is the water quality flow rate in cubic feet per second, "C" is the runoff coefficient, "I" is the rainfall intensity in inches per hour, and "A" is the area in acres. The intensity associated with the water quality flow rate is 0.2 inch per hour. The "C" value is determined using the following equation:

Table IV.J-8
Treatment Control BMPs

Pollutant of Concern	BMP Pollutant Effectiveness[1]						
	Harvest and Use[2]	Infiltration Basins and Trenches/Porous Pavement[3]	Bioretention	Extended Detention Basins[4]	Sand Filter or Filtration[5]	Hydrodynamic Separator Systems[6]	Manufactured/Proprietary Devices[7]
Sediment/Turbidity	H	H	H	M	H	H/M (L for turbidity)	U
Nutrients	H	H	[8]	M[9]	L[10]	L	U
Trash and Debris	H	H	H	H	H	L	U
Metals	H	H	H	M	M	H/M	U
Bacteria and Viruses	H	H	H	M	M	L	U
Oils and Grease	H	H	H	M	H	L	U
Organic Compounds	H	H	H	M	H	L/M	U
Pesticides	H	H	H	U	U	L	U

H = High removal efficiency M = Medium removal efficiency L = Low removal efficiency
U = Unknown removal efficiency

[1] *Periodic performance assessment and updating of the guidance provided by this table may be performed based on updated information from studies from RCFC & WCD, CASQA, Caltrans, or others. These effectiveness ratings are based on the specific BMP designs incorporated into the Riverside County – Low Impact Development BMP Design Handbook.*

[2] *Cisterns, when associated with an adequate and reliable (year-round) demand for non-potable use of captured storm water (see applicable WQMP for any specific requirements), have a High effectiveness at removing all pollutants from stormwater runoff. If there is inadequate demand to reliably drain the cistern through a non-potable use throughout the year, pollutant removal effectiveness will be Low.*

[3] *Includes infiltration basins, infiltration trenches, and porous pavements.*

[4] *Effectiveness based upon total 72-hour drawdown time.*

[5] *Considered to be a Treatment Control BMP. See the WQMP to determine if this BMP can be used.*

[6] *Medium where sand filter layer is increased to 36”.*

[7] *Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.*

[8] *Removal rating is dependent on the soil media depth. L=Min. 18” deep, M=Min. 24” deep, H=Max. 30”-36” deep.*

[9] *Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.*

[10] *Medium for soil types A & B only. Low for soil types C & D.*

Source: JLC Engineering and Consulting, Inc., 2013.

$C = 0.858i^3 – 0.78i^2 + 0.774i + 0.04$

…where “I” is the impervious percentage. Using i = 0.875, the equation becomes:

$C = 0.858*(0.875^3) – 0.78*(0.875^2) + 0.774*(0.875) + 0.04 = 0.695$

Using the C value of 0.695, the intensity of 0.2 inch per hour, and the area of 52.17 acres, the resulting flow rate is 7.25 cubic feet per second. Using an 18-inch pipe with 0.5 percent slope, the maximum capacity for the pipe is 7.43 cubic feet per second, which is sufficient to convey the required 7.25 cubic feet per second for treatment.

For the 2-year, 24-hour storm duration for Area B, the entire 6.24 cubic feet per second would be conveyed to the onsite retention basin and into the harvest and use collection area. For the 10-year, 24-hour storm duration for Area B, 7.43 cubic feet per second would be conveyed to the onsite retention basin, and 7.57 cubic feet per second would bypass the low-flow system. Since the pre-Project 10-year, 24-hour storm duration flow rate is 31.19 cubic feet per second for the entire site, the 7.57 cubic feet per second being released is less than the pre-Project flow rate. For the 2-year, 24-hour, all flows would be retained.

Collectively, the site-design, source, and treatment-control BMPs would address the anticipated and expected pollutants of concern from the operational phase of the Project and ensure that water quality standards are met. Therefore, Project impacts related to water quality would be less than significant.

Impact IV.J-5: The Project does not include placement of structures within a 100-year flood hazard area that would impede or redirect flood flows, and impacts would be less than significant.

As stated previously, a small portion of the southwestern part of the Project site lies within a 100-year flood zone as designated by FEMA. However, the only Project development that would occur within this area includes surface parking and landscaping, neither of which would impede any flood flows within the flood zone. Additionally, the Project’s Line BB storm drain would collect runoff and eliminate flooding along Florida Avenue and Myers Street. These flows would be collected and conveyed to the existing storm drain culvert at the intersection of Warren Road and Florida Avenue. Therefore, Project impacts related to this issue would be less than significant.

CUMULATIVE IMPACTS

Drainage

The hydrology analysis included in this section addresses cumulative development within the Western Hemet Master Drainage Plan area. As demonstrated above, Project improvements have been designed to provide on-site storage for buildout conditions of the tributary area. The on-site retention basin would accommodate storm flows for the 100-year, 3-hour design storm even assuming that existing upstream storage basins are eliminated by future development. Moreover, the drainage solution eliminates existing flooding issues associated with flows emanating from areas upgradient of the Project site. Project improvements would eliminate existing inundation and flooding conditions at Florida Avenue and Warren Road. Additionally, a pump system would regulate the outflow of the on-site retention basin to ensure that runoff does not exceed the capacity of the existing 18-inch storm drain culvert at the intersection. The project storm drain system would replicate existing flow patterns by discharging runoff into the existing storm drain culvert at the Warren Road and Florida Avenue intersection. Therefore, the Project's contribution to any cumulative hydrology impacts would be less than significant.

Water Quality

Implementation of the Project, in conjunction with related projects located within the San Jacinto River watershed, would result in increased flows that ultimately discharge to the Pacific Ocean. Related projects that would direct stormwater flows to channels that drain to the San Jacinto River include projects located within several jurisdictions, including within the 700-square-mile San Jacinto River Watershed area within the County of Riverside. The future land use in the general vicinity of the Project site includes the development of urban land uses. Ultimate development of the Project and other development within the area could potentially impact surface water quality. Without controls, both short-term construction-related impacts and long-term operational impacts could substantially impact water quality. However, as with the Project, related projects would be required to mitigate impacts through implementation of project-specific construction and post-construction BMPs and the installation of permanent drainage improvements to ensure that water quality standards are met. Therefore, the Project's contribution to any cumulative water quality impacts would be less than significant.

MITIGATION MEASURES

Because no significant impacts related to hydrology and water quality have been identified, no mitigation measures are required.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts related to hydrology and water quality would be less than significant.