Appendix J

Hydrology and Water Quality Analysis

DRAFT

Hydrology and Water Quality

for

North Communications Hill Development

San José, California

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

October 28, 2013

Schaaf & Wheeler
Consulting Civil Engineers

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1. Introduction

This report contains an evaluation of potential impacts resulting from construction of the proposed development of the North Communications Hill area (the "Project") with regard to the hydrology and water quality of relevant water bodies. The Project site is located within the City of San Jose in the Communications Hill Specific Plan area, north of the existing KB Home Tuscany Hills development. (see Figure 2.1-1 on the next page) The site is generally bounded by the Caltrain/Union Pacific railroad tracks on the north, Old Hillsdale Avenue to the east, the Tuscany hills development to the south, and the Milpond and Dairy Hill neighborhoods to the west.

Potentially affected water bodies include the Canoas Creek, a tributary of the Guadalupe River, and Coyote Creek. The Guadalupe River and Coyote Creek discharge to the San Francisco Bay and Pacific Ocean. All of these water bodies have been designated by the San Francisco Regional Water Quality Control Board (Regional Board) as having beneficial uses.[1] Both the quantity and quality of flows from the Project site to these water bodies should be consistent with these beneficial uses and other national, state, and local policies.

[1] *Regional Board. 2007. San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan). January 2007.*

2. Environmental Setting

2.1 Regional Setting

Located in the heart of Silicon Valley between the Santa Cruz Mountains and Diablo Range, the City of San José is approximately 40 miles southeast of San Francisco, at the lower end of San Francisco Bay, 30 miles inland from the Pacific Ocean. San José is the county seat of Santa Clara County. The Santa Cruz Mountains separate San José from the Pacific coastline. Santa Clara Valley, which stretches to the southeast from San Francisco Bay, comprises the lowlands that lie between the forested Santa Cruz Mountains and the drier grasslands, chaparral, and oak savanna of the Diablo Range, which separates the Santa Clara Valley from San Joaquin Valley to the east. The area's regional context is shown in Figure 2.1-1.

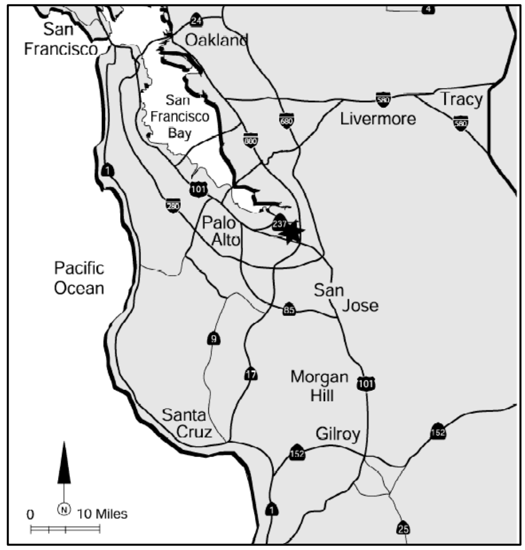

Figure 2.1-1. General Vicinity Map

San José is located on the easterly side of the Santa Clara Valley. The City's southern urban growth boundary nearly coincides with Monterey Bay's northern watershed boundary. San José is bordered by the cities of Milpitas to the north; Santa Clara, Campbell, Cupertino, Saratoga, and Los Gatos to the west; and Morgan Hill to the southeast along Highway 101. East of San José is the Diablo Range, which runs between Mount Diablo and Mount Hamilton, and bordering on the south are the Santa Cruz Mountains. Parts of San José extend into the foothills of both of these ranges. There are no other major geographical boundaries, primarily because San José has developed over time through various annexations of smaller urban areas. There are, however, several major watercourses that run through San José, including the Coyote Creek and Guadalupe River systems, which ultimately discharge into the South Bay.

Major transportation thoroughfares in and through San José include U.S. Highways 101, 280, 680, and 880; State Highways 17, 85, and 87; the Caltrain passenger train line; the Santa Clara Valley Transportation Authority (VTA) Light Rail line; and the Norman Y. Mineta San José International Airport.

San José's incorporated area is 178 square miles,[2] making it the largest city in the Bay Area. The urban area within the Urban Growth Boundary (UGB) is about 139 square miles based on Geographic Information System (GIS) data provided by the City.

2.1.1 Topography

The topography of San José varies with the lowest elevations near sea level at the South Bay in the northwestern Alviso area, downtown and airport elevations near 90 feet above sea level, and elevations reaching greater than 300 feet in the foothills at the edges of the city. The mountain ranges just outside of the city reach over 4,000 feet in elevation.

The Project site is located in central San Jose on a rocky hill between the alluvial valley floor areas along the Guadalupe River on the west and Coyote Creek on the northeast. Elevations on the site range from approximately 140 feet above sea level up to 400 feet at the top of the hill. Due to a former quarry on the site, the historic topographic conditions of the site have been significantly altered. Slopes vary from essentially zero in the flat areas to near vertical in portions of the quarry area.

[2] *City of San José's webpage. www.sanjoseca.gov/about.asp. Accessed on February 13, 2009.*

2.1.2 Climate

Due to its geographical location (i.e., latitude, longitude, and proximity to mitigating surface waters), the Los Gatos area that encompasses the Project site is considered to be a Mediterranean-type climate zone, characterized by cool, wet winters and warm, dry summers. Summer temperatures normally range from a high near 80°F to a low around 60°F. Winter temperatures normally range from a high near 60°F to a low around 40°F.[3]

The National Oceanic and Atmospheric Administration (NOAA) has a National Climatic Data Center (NCDC) that collects and analyzes data from weather stations across the nation. There are two NCDC weather stations with long-term meteorological data within a few miles of the Project site. One is an NCDC weather station #045123 in Los Gatos approximately 4 miles to the west from the Project site, and reported to be at elevation 365 (presumably feet, NGVD29).[4] The other is the NCDC's Station #047821 near the San Jose Airport station, located approximately 7 miles to the north of the Project site, and with a reported elevation of 67.

2.1.3 Precipitation

Most of the precipitation in the San Jose and Los Gatos area occurs as rainfall, with over 80 percent of all precipitation falling between the months of October and May (see Table 2.1-1 -).[5] Average annual rainfall varies across Santa Clara County, dictated largely by topography with isohyets paralleling topographic contours. Mean annual rainfall (by water year) near the Project site is reported as 21 inches.6 However, periods of both abundant rainfall and prolonged droughts are also frequent in the historical record.

Average rainfall and its seasonality can also vary due to external weather altering events, such as El Niño or periodic droughts. El Niño can produce a significant increase over normal rainfall and extend the duration of the wet season. On the other hand, several droughts of five to seven years have been documented[7] in the San Jose area over the last 100 years. Studies of tree rings indicate at least three 10- to 20-year periods of below-average precipitation since the mid-1500s.[8]

2.1.4 Evapotranspiration

Average monthly evapotranspiration is reported from the San Jose CIMIS station,[9] which is about 5 miles to the north of the Project site. This station was inactivated in 2002, but had data collected from it for 15 years. The annual average evapotranspiration for the Project area, as measured at this CIMIS station, is estimated to be just under 50 inches, of which 37 percent (18.5 inches) occurs during the non-irrigation season of October through April. The annual evapotranspiration rate indicates a potential water loss that is substantially (i.e., more than two times) higher than the mean annual precipitation.

Evaporation and evapotranspiration rise during the year in response to warmer weather, and soil moisture storage is typically depleted by mid- to late May. Growth of non-riparian native vegetation then slows or stops completely and landscape managers, where employed, commence irrigation, which is generally maintained into October, when average evaporation proceeds to fall below average precipitation.

Table 2.1-1 presents the relationship between monthly precipitation and evaporation, arranged by water year (i.e., October to September). This table tabulates the precipitation and evaporation information, as

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3 *NCDC, NOAA. 2002. Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1971-2000, 04 California, Climatography of the United States No. 81.*
4 *NCDC, NOAA. 2002. Ibid.*
5 *FEMA. 1978. Flood Insurance Study, Town of Los Gatos, California.*
6 *SCVWD. 1989. Mean Annual Precipitation Map San Francisco & Monterey Bay Region.*
7 *Santa Clara Basin Watershed Management Initiative. 2003 Watershed Management Plan. Volume One. Revised.*
8 *Ibid.*
9 *CIMIS. 2009. Data for Station #69 – San Jose. Accessed at* http://wwwcimis.water.ca.gov/cimis/. *Accessed on October 9, 2009.*

well as the monthly average temperatures. As indicated, the potential runoff or recharge, which occurs when precipitation exceeds potential evapotranspiration, is estimated as 9.68 inches a year.

Table 2.1-1 - Average Climate Date by Month - Project Vicinity

Month	Temperature[a] (°F)	Monthly Precipitation[b] (in)	Monthly Reference Evaporation[c] (in)	Water Surplus or Deficit[d] (in)	Potential Runoff or Recharge[e] (in)
October	62	1.02	3.61	-2.59	--
November	54	2.47	1.80	0.67	0.67
December	48	3.23	1.36	1.87	1.87
January	49	5.11	1.35	3.76	3.76
February	52	4.77	1.87	2.90	2.90
March	54	3.93	3.45	0.48	0.48
April	58	1.19	5.03	-3.84	--
May	62	0.46	5.93	-5.47	--
June	67	0.10	6.71	-6.61	--
July	70	0.04	7.11	-7.07	--
August	70	0.08	6.29	-6.21	--
September	68	0.24	4.84	-4.60	--
Annual Total	**59**	**22.64**	**49.35**	--	**9.68**

Notes:
These values are presented to illustrate the relative monthly distribution of climate variables. Average monthly and yearly values at the Project site may differ slightly from these values.
[a] *Temperature data is based on a 29-year period, 1971-2000.*
[b] *Precipitation data is based on a 29-year period, 1971-2000.*
[c] *Mean monthly reference evapotranspiration (ETo) is based on data from CIMIS.*
[d] *Difference between precipitation and evaporation is reported, with a surplus indicating more precipitation and a deficit less.*
[e] *Dry soil recharge early in the wet season must satisfy the soil moisture deficit before rainfall reaches the water table.*

2.1.5 Regional Runoff and Infiltration

The amount of precipitation in the San Jose area that is carried away by flowing watercourses as stormwater runoff varies greatly and depends on factors such as topography, soil characteristics, depth to groundwater, and density of urban development. Influenced by the same factors, infiltration of precipitation into the underlying soils is also highly variable. As Table 2.1-1 - indicates, the precipitation available after evapotranspiration to either run off impervious surfaces or recharge groundwater from pervious surfaces is on average 9.68 inches a year, or about 43 percent of annual precipitation.

Historically, many of the creeks that pass through San Jose, such as Los Gatos Creek, were dry during the summer. As patterns of water use and water importation have changed, producing more irrigation runoff and higher groundwater tables, many creeks have experienced increased summer flow. Today some creeks are perennial in their lower reaches due to urban runoff, high groundwater, or a combination of both. To recharge the groundwater basin, stored and imported water is released from water supply reservoirs and other parts of the water distribution system during summer months into many creeks that would otherwise be dry. Although many of the creeks have historically run dry in the summer, the increased rainfall during the winter and some summer storms can cause flooding along these same watercourses, as well. Potential flooding near the Project site is discussed further later in this report.

Finally, it should be noted that effects of global warming trends are speculated to alter regular climate patterns in the San Francisco Bay Area, although the extent of these changes is not well established at this time. It is particularly difficult to speculate on any specific effects on small areas, such as the Project site.

2.2 Geology and Soils

The oldest rocks in Santa Clara County are of the Franciscan-Knoxville group of Upper Jurassic age, forming the largest single geologic unit in the area. Overlying these Jurassic rocks are marine sedimentary rocks of Cretaceous age. The valley floor is composed to a depth of about 1,500 feet of an accumulation of Quaternary clay, sand, and gravel, deposited by rivers and the Bay for perhaps 30,000 years.

The geologic structure of the area is controlled by faulting, the trend of which is northwesterly, as is common in California. San José lies in one of the most seismically-active regions of the world, with the San Andreas Fault to the west in the Santa Cruz Mountains and the Hayward and Calaveras faults in the mountainous areas to the east. The Santa Clara Valley is essentially a large trough that has been filled by gravel, sand, silt, and clay eroded from the adjacent mountains.

The earthquake faults in the area have the potential not only to cause damage from dramatic movement of the ground but also from liquefaction of particular soils. The United States Geological Survey (USGS) has recently released a report mapping liquefaction probabilities for earthquakes of different magnitudes on the San Andreas, Hayward, and Calaveras Faults. The most susceptible areas identified are around the Guadalupe River and Coyote Creek near downtown San José and north to the Bay. A magnitude 7.8 earthquake on the San Andreas Fault, similar in scale to the 1906 San Francisco earthquake, is estimated to have a 30-40 percent probability of liquefaction in these areas. Smaller magnitude earthquakes on the other two faults are estimated to have a lower probability of liquefaction throughout San José, and a 20 percent or less probability along the same areas of the two watercourses.

Based on the National Resources Conservation Service soil survey[10], Soils within the Communications Hill Specific Plan area are categorized as primarily Montara sandy loam, with slopes of 15 to 50 percent. The surface soil varies in depth from a few inches to about 20 inches. The subsoil is only a thin weathering transition zone from the surface soil to the underlying serpentine bedrock. A portion of the site in the quarry area is categorized as Montara-Santerhill complex with slopes of 15 to 30 percent. The surface soil depth varies from a few inches to about 10 inches. The surface soils are underlain by serpentine bedrock. A portion of the quarry area is categorized as a mine pit area. Finally, a portion of the quarry area along the UPRR, including the existing retention area is categorized as Hangersone clay loam with slopes of 0 to 2 percent. The soil is predominantly deep poorly drained clay with depths greater than 80 inches.

The percolation capacity of soils is characterized by Soil Conservation Service (SCS; now Natural Resources Conservation Service or NRCS) Hydrologic Soil Groups “A” through “D”, with “A” soils having the highest percolation rates. Figure 2.2-1 shows SCS soil groups in San José.[11] The low-lying areas of San José are characterized by clay loam or silty clay loam, Group “D” soils with very low infiltration rates. Outside of these low-lying areas and through south San José are located mostly loam or silt loam, Group “B” soils with moderate infiltration rates. There is also some clay loam, Group “C” soils with slow infiltration rates interspersed in parts of San José, particularly in the hilly areas. The soils within the Communications Hill Specific Plan area are categorized as Group D with very low infiltration rates.

[10] *Natural Resources Conservation Service, National Cooperative Soil Survey, Santa Clara Area, California, Western Part, Version 1, July 27, 2010.*
[11] *United States Department of Agriculture, Soil Conservation Service, 1968: Soils of Santa Clara County.*

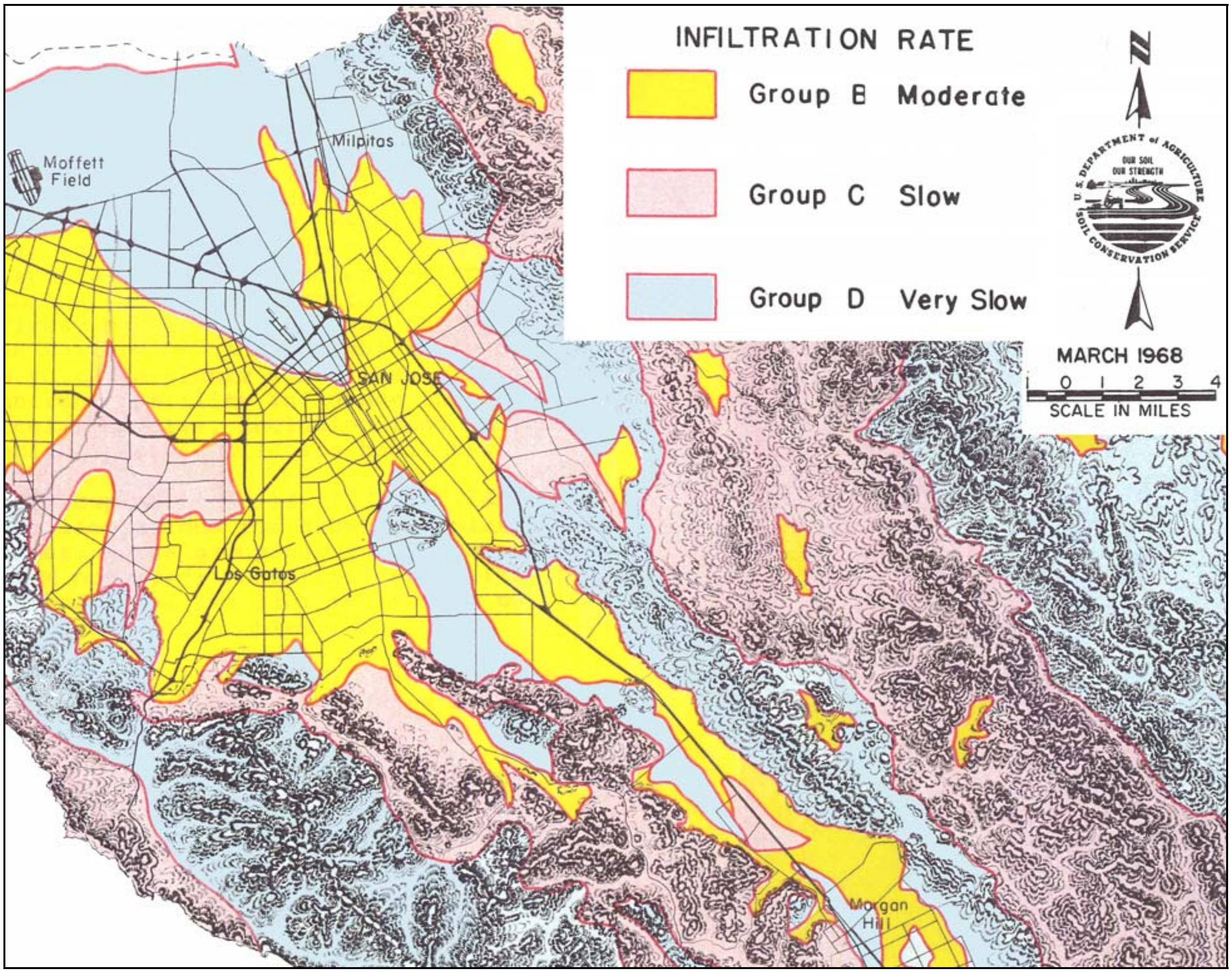

Figure 2.2-1. Soils Map of San José

2.3 Surface Water Hydrology

This section describes surface water elements and hazards, such as flood risks, in the Project area.

Within the San José there are three major watersheds: San Tomas, Guadalupe, and Coyote. Each of these watersheds is made up of its main creek, from which the watershed derives its name, as well as many smaller tributaries. Watershed elements include not only these tributaries but also dams, reservoirs, and groundwater recharge basins. Figure 2.3-1 shows an overview of the three watersheds within San José. The Project drains to the Guadalupe and Coyote watersheds and each of these watersheds and its elements is described in more detail below.

2.3.1 Guadalupe River Watershed

The Guadalupe River drains a 170 square mile area through San José, Los Gatos, Monte Sereno, Campbell, and Santa Clara. Elevations in the watershed range from mean sea level at the Bay to over 4,000 feet above sea level at its uppermost ridge. The Coyote Creek watershed borders the Guadalupe River watershed to the east and the watersheds for San Tomas Creek and Saratoga Creek border to the west.

The headwaters of the Guadalupe River and its tributaries are in the Santa Cruz Mountains. The lower reaches of the Guadalupe River are confined between levees as it flows north through the urbanized areas of San José to San Francisco Bay. The Guadalupe River historically connected to San Francisco Bay through the Guadalupe Slough in the salt marshes north of Alviso. In the late 1800s, the flow of the Guadalupe River was rerouted for navigation purposes from Guadalupe Slough into Alviso Slough, which was previously not fed by any upland streams. Within the slough area, the Guadalupe River is surrounded by salt ponds, some of which are being restored to interact tidally with the surrounding creeks and the Bay.

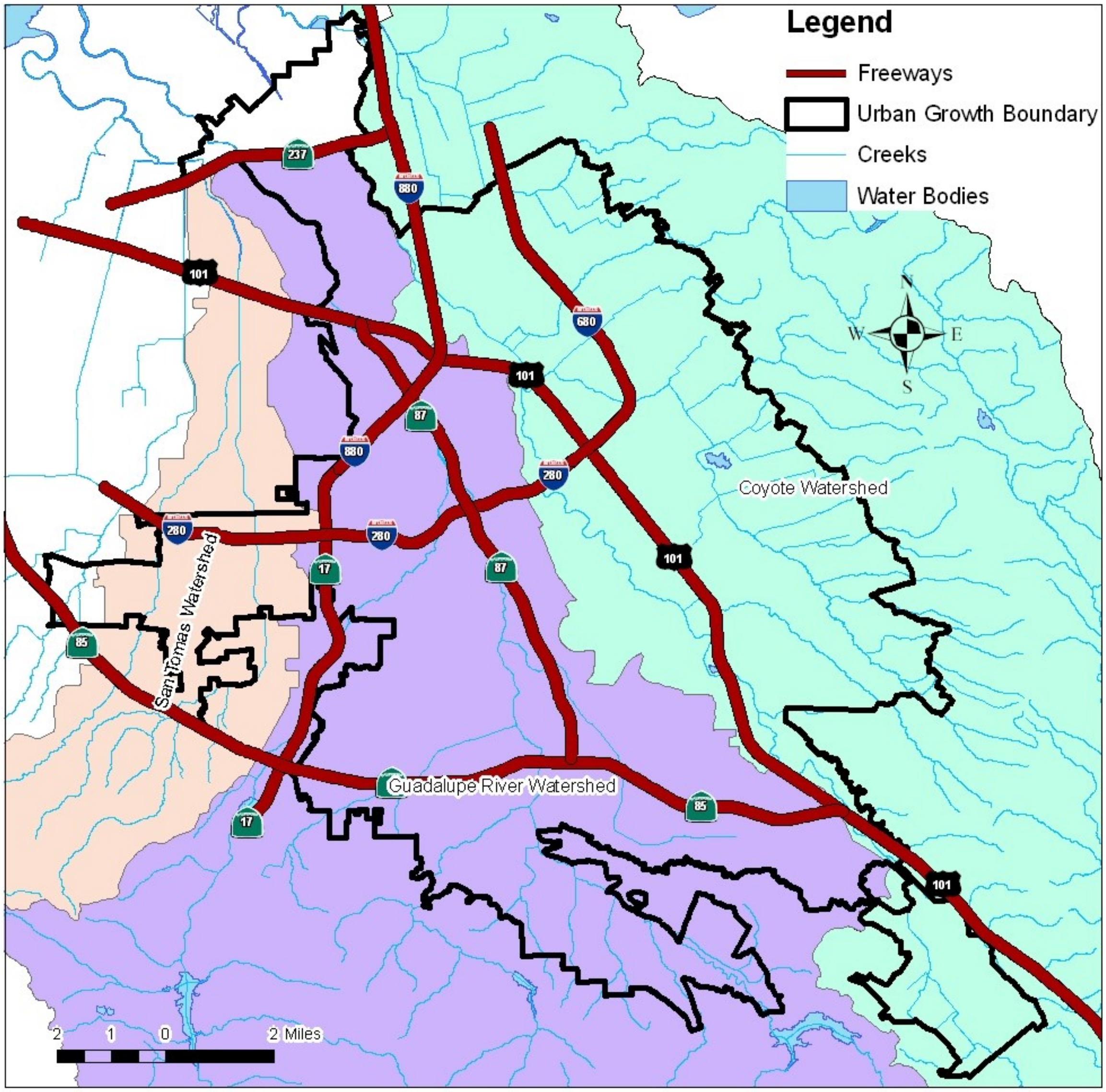

Figure 2.3-1. Watersheds within the City of San José

The Guadalupe River has one major tributary, Los Gatos Creek, upstream of which the river is known as the Upper Guadalupe River. Further upstream, it is known as Guadalupe Creek. Other connecting creeks include Alamitos, Ross, and Canoas Creeks. There are also several surface reservoirs in the Guadalupe River system and groundwater recharge (percolation) ponds that border the system. Figure 2.3-2 indicates the components and watershed limits of the Guadalupe River system, as well as the portion that is within the San José Urban Growth Boundary.

Canoas Creek is generally fed from smaller creeks in the Santa Teresa Hills and is contained within San José in the Santa Teresa and Blossom Valley areas. Canoas Creek was realigned in the 1960s, and the existing channel is now a concrete culvert, trapezoidal or U-shaped concrete channel, or excavated earth channel with a concrete bottom along its entire 7.3-mile length. Canoas Creek joins the Guadalupe River near the Almaden Expressway overcrossing, about 1,200 feet south of Curtner Avenue.

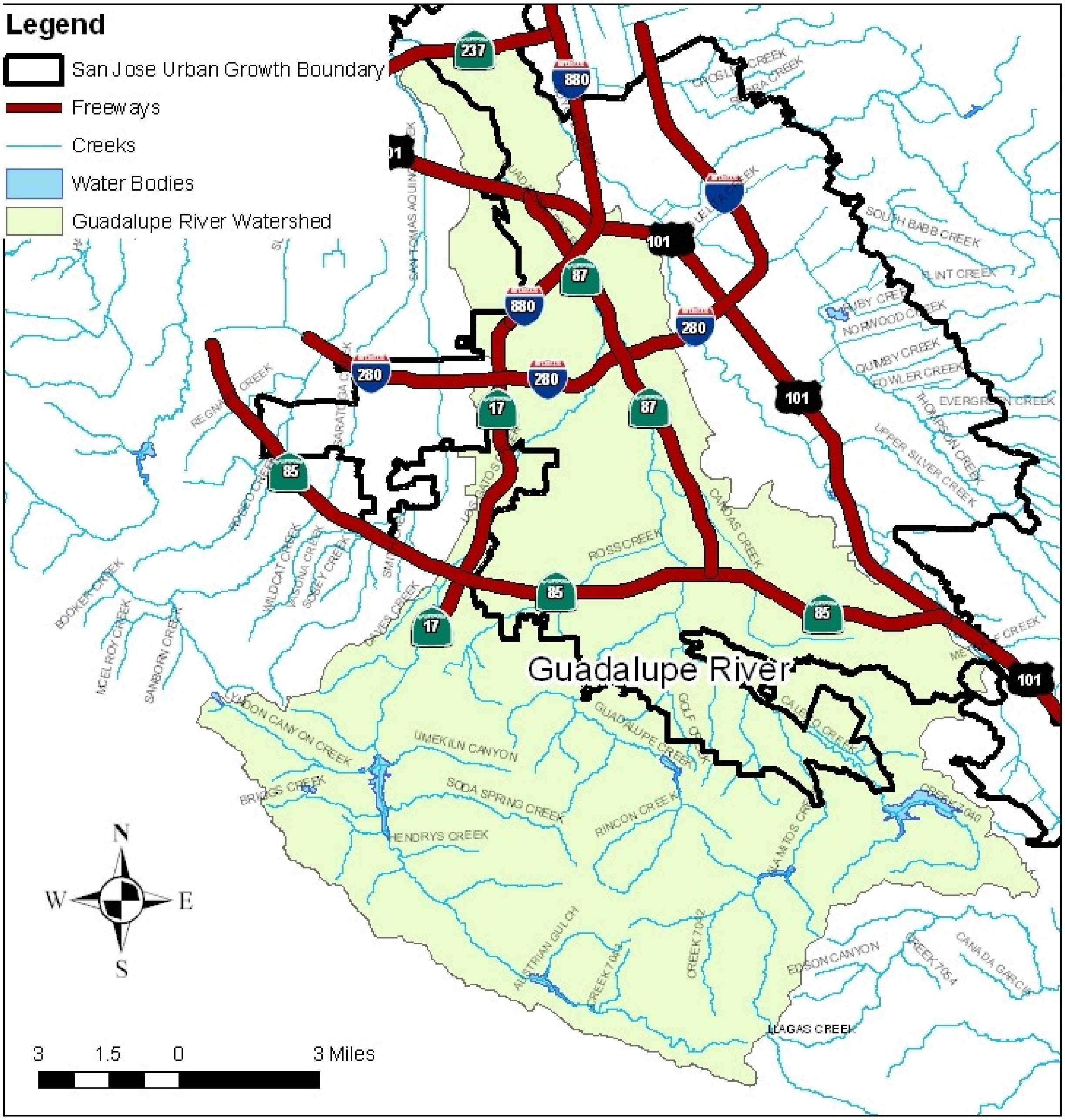

Figure 2.3-4. Guadalupe Watershed

Table 2.3-1 - Reservoirs within Guadalupe River Watershed

Reservoir/Dam	Creek	Owner	Yr Built	Type	Height (ft)	Volume (ac-ft)	Drainage Area (sq. mi.)
Almaden	Alamitos	SCVWD	1935	Earth	105	1,586	12.5
Almaden Valley	Tributary Alamitos	SJWC	1965	Earth	38	27	N/A
Lake Elsman/ Austrian	Los Gatos	SJWC	1950	Earth	185	6,200	9.8
Calero	Arroyo Calero	SCVWD	1935	Earth	98	9,934	7.1
Guadalupe	Guadalupe	SCVWD	1935	Earth	129	3,415	6.0
Lexington/ James J. Lenihan	Los Gatos	SCVWD	1952	Earth	195	19,044	27.7
Vasona	Los Gatos	SCVWD	1935	Earth / Rock	30	400	44.2
Williams	Los Gatos	SJWC	1895	Gravity	69	160	5.7

Land Use

Of the Guadalupe River's total watershed, 63 square miles (37%) are estimated to be impervious from urban development. The Guadalupe River watershed is largely undeveloped in its upstream region with a large proportion legally protected against further development. These protected areas comprise over 75% of the headwaters of Los Gatos Creek and about 50% of the headwaters of Alamitos Creek, a smaller tributary. Almost 48 square miles of the total watershed is protected by public agencies, property easements, or private land trusts.

Most of the headwaters drain from permeable, protected areas, although there are also small pockets of high-density residential development in this upstream region. Land use in the downstream region is comprised of mostly high-density residential use with commercial and public/quasi-public uses interspersed. Some industrial development and the San José International Airport are also located in the northern, downstream portion of the watershed near the Bay. Unique to the watersheds in the area, the Guadalupe River watershed has some agriculture in its downstream region in San José.

In terms of the whole watershed (as of 1995) 30% is used for residential development most of which is high-density of four or more dwelling units per acre. Another 35% of the watershed is forested and undeveloped, and rangeland accounts for 15% of the watershed. The land uses on the remaining 20% of the watershed vary widely from industrial to agricultural, with none of these other uses individually comprising more than 5% of the watershed.[12]

Improvements

Modification of the Guadalupe River and its tributaries is recorded as early as 1866, when a canal was dug to alleviate flooding and improve conditions for rapidly expanding orchards near the river. Other improvements have continued through the present. Many of the existing modifications to the channels are detailed above.

The most significant recent improvements to the Guadalupe River system, especially in San José, are part of the Guadalupe Park and Gardens projects. Trails, parks, gardens, and flood control enhancements were constructed over 12 years between Interstates 280 and 880.

The SCVWD installed new gates for Vasona Dam in 1997, and the San José Water Company also completed construction of a replacement raw water pipeline in Lexington Reservoir in 2006. The outlet

[12] *Watershed Management Initiative, Watershed Characteristics Report, August 2003.*

pipe of the Lenihan Dam that creates the Lexington Reservoir is also currently being replaced by the SCVWD. Construction began in the fall of 2007 and is scheduled to be completed in the winter of 2008/09. The new outlet will be contained within a tunnel dug through the hillside east of the dam. To accommodate the construction of the new outlet pipe, the water levels of the reservoir have been noticeably lowered during construction; these water levels are scheduled to be returned to normal levels following the rainy winter of 2008/09. The SCVWD also has a planned Almaden Dam restoration project that is a 10-year program to replace the intake structure, install seepage monitoring system, and perform routine maintenance.

Drainage and Flooding

Several urban storm drainage systems ultimately drain into the Guadalupe River system. Direct storm runoff in the drainage basin is extremely variable and has been modified by dam construction and urbanization.

Historically, the Guadalupe River and its tributaries have been known to flood areas of San José, including portions of low-lying freeways in 1995 (see Figure 2.3-3 below). A 100-year flood is estimated to inundate 2,310 acres in San José, as depicted in Figure 2.3-4, which also shows the Upper Guadalupe River Flood Protection Project reaches. Severe flooding along the Guadalupe River has also occurred in 1862, 1895, 1911 (also shown in Figure 2.3-3 below), 1955, 1958, 1963, 1969, 1982, and 1986. Alamitos and Calero Creek are also reported to have had major flooding in 1931, 1937, 1940, 1941, 1943, 1945, 1952, 1955, 1958, 1962, 1967, and 1968. Other flooding on the Guadalupe River system is reported for Ross Creek and Canoas Creek.

Figure 2.3-3. Historic Flooding along Guadalupe River (Source: SCVWD Archives)

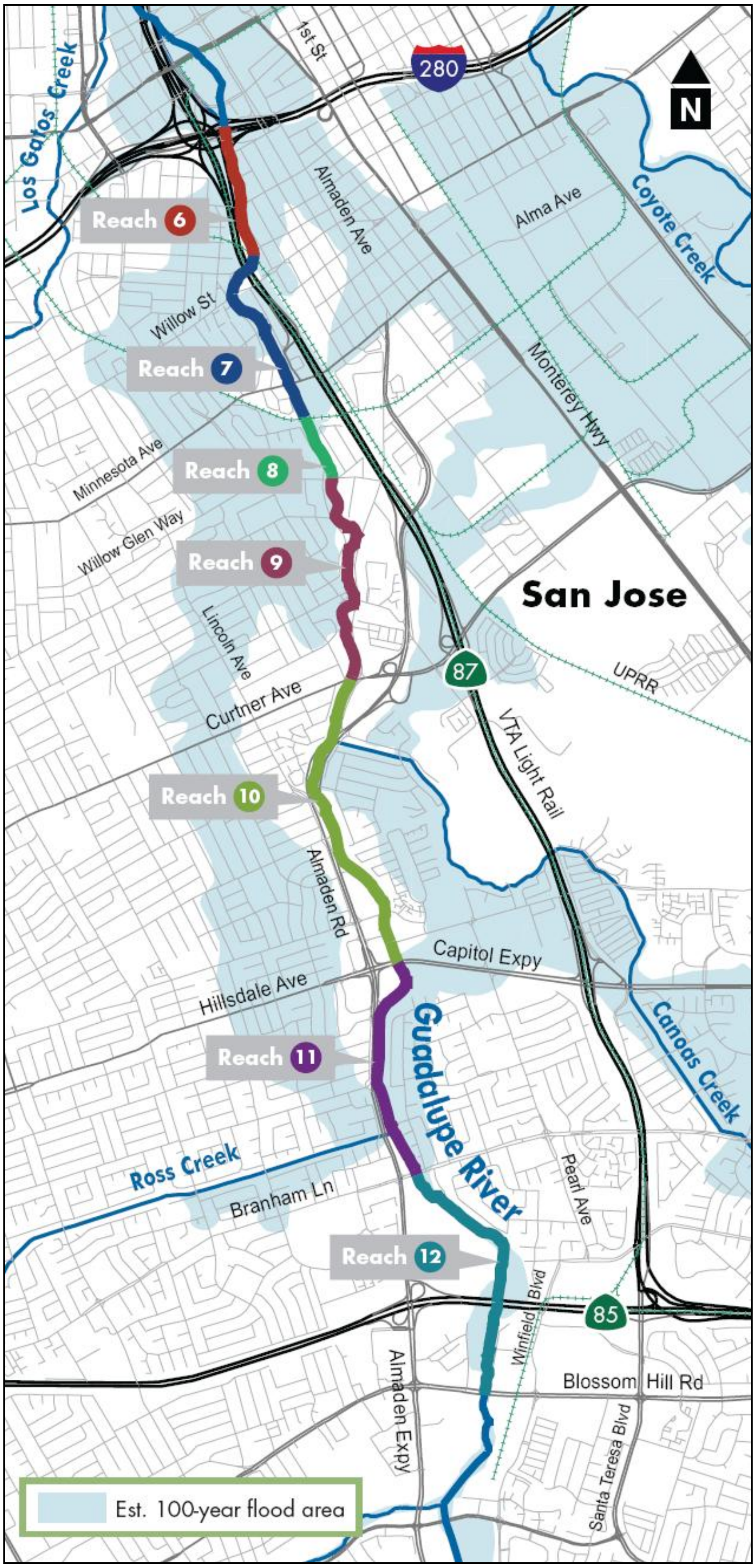

Figure 2.3-4. Upper Guadalupe River Flood Protection Project Reaches and 100-Year Floodplain

Flood control projects have been fairly extensive on the Guadalupe River. The Santa Clara Valley Water District has improved portions of the river and still has plans for more improvements. The design and constructions of these improvements is part of developing the Guadalupe River Park & Gardens in downtown San José. The last part of this project, improvements along six miles of the river from I-280 south to Blossom Hill Road near Highway 85, will improve a stretch of river that has flooded five times since 1982. Improvements include removing nine concrete barriers, planting of thousands of native trees and other vegetation, widening of the river in some places, and raising of levees. This flood protection work is scheduled to be completed by 2016 and provide 100-year flood protection, versus the existing 25-year flood protection, as well as raise the levees to meet FEMA's freeboard standards.[13]

Erosion/Sedimentation

Both erosion and sedimentation are ongoing problems in natural portions of the Guadalupe River system. Erosion and sedimentation are caused by unstable banks and the natural geomorphic processes of watercourses. The most severe erosion problems are reported to be within Reaches 7 and 9, from Willow Street to Curtner Avenue, with much of the resulting sediment load washing downstream and depositing between I-880 and Highway 101. Sediment deposition is also reported to occur within Reach 12. Average annual sediment yield of the Guadalupe River basin has been estimated from 1,800 to 2,000 tons per year per square mile of watershed. This is equivalent to between 300,000 and 350,000 tons per year, if the whole watershed were to contribute at this rate. However, modeling results of the Guadalupe River have suggested that dams and urbanization have significantly reduced the natural runoff sediment load of the watershed.[14]

Hydromodification, change in a watersheds runoff characteristics caused by changes in land use conditions, has recently become a concern of the San Francisco Regional Water Quality Control Board for the Guadalupe River and other watercourses throughout the San Francisco Bay Area. Development patterns increase the imperviousness of land and conveyance of stormwater runoff, thereby increase stormwater runoff and durations at all storm levels, particularly for smaller (<10-year) storms. The increased runoff and duration of flows tends to cause greater erosion in receiving drainage channels if they are unprotected. Hydromodification basins and other measures are being required to mitigate the effects of the increased erosion by keeping site runoff to pre-development levels for various small, storm levels.

Development or redevelopment within the watershed of the Guadalupe River's tidal waters is exempt from implementing hydromodification controls due to the natural sediment movement during tidal fluctuations. Development or redevelopment within most of the downtown San José area is also exempt from implementing hydromodification controls because it is already highly urbanized and nearly completely built-out.

303(d) Impaired Water Bodies

Several water bodies within the Guadalupe River system are listed as impaired in the 303(d) list of water quality limited segments.15 The main listed contaminant for these water bodies is mercury, whose potential source is listed as mine tailings and surface mining. Those water bodies listed as impaired by mercury include 7.1 miles of Alamitos Creek, 334 acres of Calero Reservoir, 8.1 miles of Guadalupe Creek, 63 acres of Guadalupe Reservoir, and 18 miles of Guadalupe River. These water bodies did not have a TMDL for mercury developed at the printing of the list in 2006, but TMDLs are scheduled to be developed as part of the Santa Clara Basin Watershed Management Initiative. The 18 miles of Guadalupe River is also listed as being impaired from and having an approved TMDL for diazinon, whose potential source is urban runoff and storm sewers carrying pesticide residue. Los Gatos Creek is also listed as being impaired

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[13] Santa Clara Valley Water District. Upper Guadalupe River Flood Protection Project pamphlet. December 1, 2008.
[14] U.S. Army Corps of Engineers, 1991: General design memorandum: Guadalupe River, California. Sacramento District. Sacramento, CA.
[15] State Water Resources Control Board. Final 2010 Integrated Report (CWA Section 303(d) List/305(b) Report).

from and having an approved TMDL for diazinon along 19 miles of the creek. The only other water body within the Guadalupe River watershed on the 303(d) List is 10 miles of Rincon Creek, which is listed as being impaired from and requiring TMDLs for Boron and Toxicity, both of which have unknown sources. The proposed TMDL completion date for Rincon Creek is 2019. The Final 2010 303(d) Integrated Report identifies Guadalupe River and Lower San Francisco Bay, to which the Guadalupe River system drains, as being required to have a TMDL for trash. Almaden Lake and Almaden Reservoir are also identified in this report as requiring TMDLs for mercury (in tissue).

2.3.2 Coyote Creek Watershed

The Coyote Creek watershed is the largest watershed in Santa Clara County. Elevations in the watershed range from mean sea level to over 4,000 feet above sea level. Over 320 square miles of land area drains to San Francisco Bay via Coyote Creek and its tributaries, which are located within unincorporated areas of the county, the City of San José, and the City of Milpitas. Coyote Creek originates in the mountains of the Diablo Range northeast of Morgan Hill and drains most of the west-facing slope of the Range as it flows northwest approximately 42 miles before entering the South Bay.

Two major reservoirs lie in the upper watershed: Coyote, the upper reservoir, built in 1936, and Anderson Reservoir, built in 1950. Nine major tributaries to Coyote Creek lie within the drainage area to these two reservoirs. Below Anderson Reservoir, Coyote Creek flow is diverted for groundwater recharge via the Metcalf Pond and the Ford Road ponds. Downstream of the recharge basins Coyote Creek flows through unincorporated, predominately agricultural land between Morgan Hill and San José. Continuing northwest Coyote Creek flows through the urbanized areas of San José and connects with the watershed's major tributaries: Upper and Lower Silver Creeks, Miguelita Creek, and Upper and Lower Penitencia Creeks. The lower reaches of Coyote Creek have been partially modified for flood protection including levees and bypasses. The creek transitions from a freshwater creek to an estuarine environment as it approaches the Bay.

Figure 2.3-5 below indicates Coyote Creek's watershed limits and tributaries within the Urban Growth Boundary of San José.

Coyote Creek begins at the confluence of several small tributaries within its headwaters in the Diablo Range. Ten miles downstream it enters Coyote Reservoir. Two miles downstream of Coyote Reservoir the Creek enters *Anderson Reservoir*. Downstream of Anderson Reservoir, water is diverted into a 6-mile canal and discharged for groundwater recharge in Metcalf Pond and the Ford Road ponds. Consequently, the reach between Anderson Reservoir and Metcalf Pond runs dry in all but the wettest years. Downstream of the percolation ponds, the stream channel runs dry or intermittently most summers. Six miles downstream from Metcalf Pond, Upper Silver Creek joins Coyote Creek. After another 5 miles, Lower Silver Creek joins Coyote Creek with Upper Penitencia Creek joining a mile downstream of that. Continuing downstream another 8 miles, Coyote Creek confluences with Lower Penitencia Creek and becomes marshy for about 2 miles before discharging to San Francisco Bay.

Land Use

The Coyote Creek watershed contains the largest contiguous agricultural areas in the Basin and a large proportion of undeveloped land in its upper zone. The upper zone is mainly rangeland and forest, about one-third legally protected from substantial development as open space. Urbanized land use is confined to the downstream region of the lower zone and several small areas in the lower zone near the main stem of Coyote Creek. In terms of the whole watershed (as of 1995) 9% is used for residential development, with essentially all of that residential development classified as high-density of four or more dwelling units per acre. Another 51% of the watershed is forested and undeveloped; rangeland uses account for 30% of the watershed; and 6% is used for agriculture. The land uses on the remaining 4% of the watershed vary widely from industrial to public facilities.[16]

[16] *Watershed Management Initiative, Watershed Characteristics Report, August 2003.*

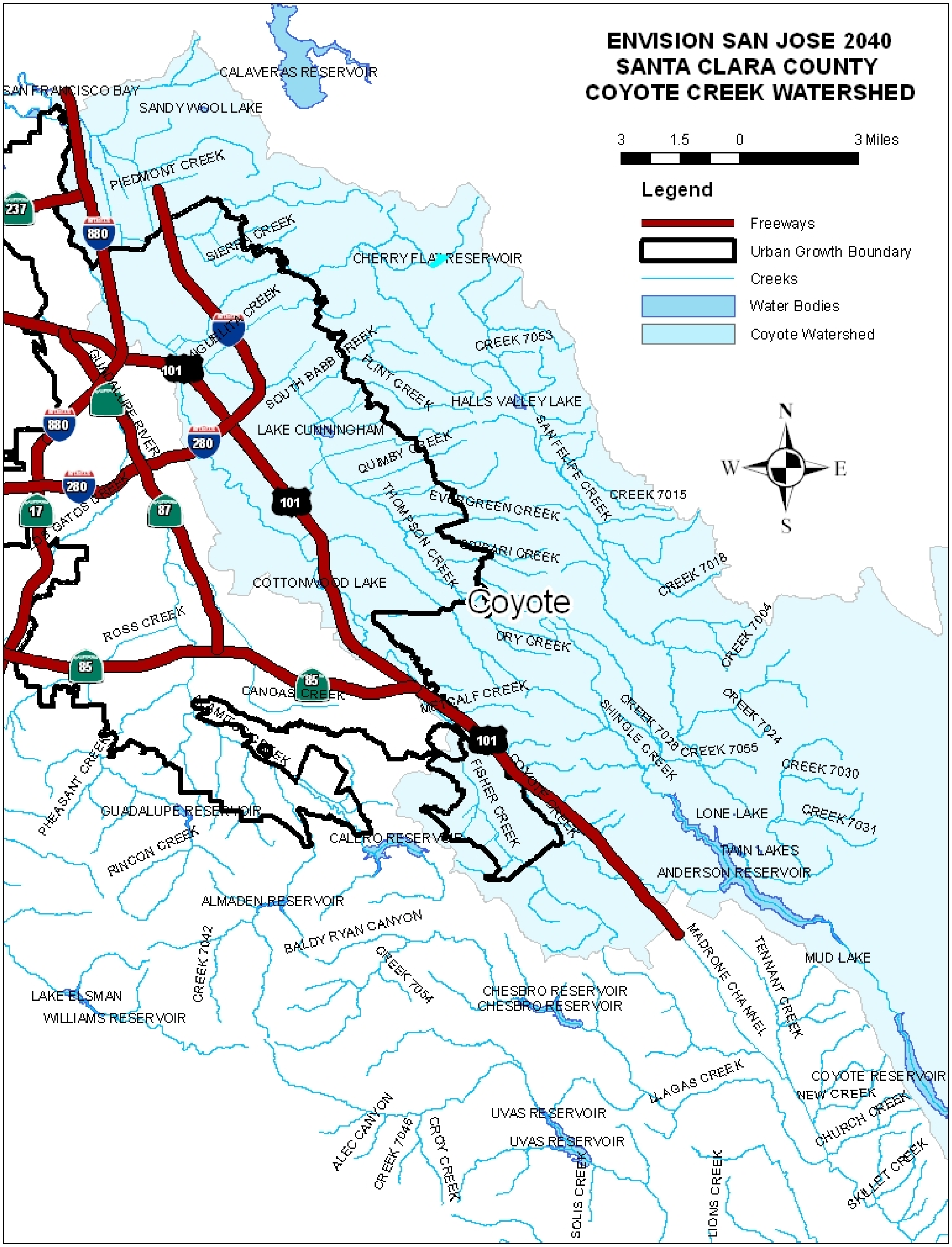

Figure 2.3-5. Coyote Creek Watershed and Tributaries

Improvements

Historically the drainage network of creeks and tributaries of the Coyote Creek watershed was highly discontinuous. Most of the tributaries ended in alluvial fans, spreading the runoff across the valley floor. With development came the necessity to channelize and divert seasonal flooding. Over the years, drainage ditches, channels, and levees have been constructed to carry the water directly to Coyote Creek to prevent flooding. Thompson and Lower Silver Creeks in particular intercept the majority of runoff from the Diablo Range which historically spread out over alluvial fans and flooded the valley.

Erosion/Sedimentation

Coyote Creek watershed's South Babb Creek was used as the example for the Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP) Hydromodification Plan Manual due to its sensitivity to low flow erosion in its upper reaches. Hydromodification basins and other measures are generally required to mitigate the effects of the increased erosion by keeping site runoff to pre-development levels for various storm levels. Development or redevelopment within the watershed of the Coyote Creek's tidal waters is exempt from implementing hydromodification controls due to the natural sediment movement during tidal fluctuations. Development or redevelopment within most of the downtown San José area is also exempt from implementing hydromodification controls because it is already highly urbanized and nearly completely built-out. Any channel within the Coyote Creek watershed that is not hardened or tidal could potentially be susceptible to erosion. Certain reaches (like South Babb Creek) are known to be particularly susceptible to erosion, but erosion studies have not been completed for all water courses.

303(d) Impaired Water Bodies

The Coyote Creek watershed has only Coyote Creek listed on the 303(d) Impaired Water Bodies watch list. Coyote Creek is listed as having a 2007, USEPA-approved TMDL for diazinon along 55 miles, whose potential sources are urban runoff and storm sewers that carry pesticide residues. The Final 2010 303(d) Integrated Report identifies Coyote Creek, (Upper) Silver Creek, and Lower San Francisco Bay as being required to have a TMDL for trash.

2.3.3 Project Surface Water Drainage

The Communications Hill Specific Plan area is divided into two major watersheds and several local drainage areas within the two watersheds. The south side of Communications Hill drains to the Guadalupe River watershed. The south side of the hill is divided into four separate drainage areas which drain to storm drain separate storm drain systems.

The western end of the project site area drains down the hill toward the Mill Pond area and the mobile home park drainage system. The Mill Pond area is served by a City of San Jose stormdrain system connection to the Canoas Garden Avenue stormdrain which discharges to the Guadalupe River upstream of Malone Road. The Canoas Garden system also drains the existing Dairy Hill development which is within the Specific Plan area. The Canoas Garden system does not have capacity for the city standard 10-year design storm. The Dairy Hill development includes a detention basin to reduce peak flows into the Mill Pond and Canoas Garden drainage system to mitigate for potential induced flood effects. The Dairy Hill detention system was designed to mitigate for additional later development within the project site based on the specific plan.

The northern portion of the existing Tuscany Hills development is served by a drainage system which also drains the Helzer Ranch development that discharges to Canoas Creek at Helzer Road. Canoas Creek is a tributary to the Guadalupe River and discharges to the river near Almaden Expressway. The Helzer Road drainage system includes a detention basin at Canoas Creek to mitigate for potential increased peak flows due to the Helzer Ranch and Tuscany Hills developments. The existing system also includes a temporary detention basin and stormwater pump station which serves approximately three development blocks within the Tuscany Hills development which are on the north side of the watershed divide and would historically drained to the north. The area was planned to be connected to a future drainage system as part of the development of the north side of the hill.

The southern portion of the existing Tuscany Hills development is served by a drainage system at Communications Hill Boulevard which drains to Hillsdale Boulevard. The Hillsdale Boulevard system drains to the west to Canoas Creek. The Tuscany Hills development includes an existing detention basin on the north side of Communications Hill Boulevard to serve the southern portion of the development and proposed specific plan development on the hillside above the detention basin. The existing detention basin was designed to mitigate for increased peak flows to the Hillsdale drainage system and Canoas Creek for the existing Tuscany Hills development and the proposed development on the project site.

The last portion of the south side of the project area is an existing undeveloped area on the south side of Communications Hill Boulevard, which fronts on Hillsdale Boulevard east of the existing development. The area is a low-lying open space area below the elevation of Hillsdale Boulevard with no direct connection to the Hillsdale Boulevard storm drain system. Runoff from the hillside area below Communications Hill Boulevard collects on the north side of Hillsdale Boulevard either evaporates by evapotranspiration or infiltrates into the ground.

The north side of the project site from the hill crest down to the UPRR is historically part of the Coyote Creek watershed. The area has been extensively disturbed by quarry operations on the site. Prior to the quarry operation, there were several cross culverts under the UPRR tracks which would drain the site into the private lands to the north. As part of the quarry operation, railroad frontage area has been excavated into a relatively flat lower area and the hill slope has been steepened to extract rock for the quarry. The existing quarry site area does not have a low flow connection to a drainage system. The site runoff collects in a number of low lying areas within the quarry site and an approximately three acre retention basin area. After the quarry operations were ended, the past and current asphalt and concrete recycling operations have drained to a ditch system which connects to the retention basin. However, there are a number of low areas within the site which are not connected to the retention basin which collect local and hillside runoff and act as retention areas. The retention basin has been used as a source of dust control water for the quarry and concrete recycling operations on the site.

A portion of the hillside area west of the retention basin, which was not part of the quarry area, drains to the UPRR right of way and then west along the railroad toward the Mill Pond drainage system.

Although the quarry site had been separated from the downstream drainage systems for low flow conditions, the area has overflowed in particularly wet years when the onsite retention capacity was exceed. The overflows have discharged along the railroad toward the Mill Pond to the west and through an access underpass under the railroad near Pulman Way toward Monterey Road to the north.

There are City of San Jose stormdrain systems which serve the area north of the UPRR along Monterey Road. Both systems drain directly to Coyote Creek. The Lewis Road/Southside Drive system drains the area southeast of the project site including the development east of Old Hillsdale Avenue and portions of the development south of Hillsdale Boulevard east of Communications Hill Boulevard. The Lewis Road system also drains the area on the south side of Monterey Road from Southside Drive westerly to the Goble Lane development area. Existing mobile home park south of Monterey Road at Umbarger Road drains to a parallel stormdrain system in Umbarger Road.

Based on the Communications Hill Specific Plan and stormdrain analyses for Monterey Road, the project site was intended to drain to the Lewis/Southside and Umbarger drainage systems. However, no direct connection was designed or constructed to serve the site west of the existing Old Hillsdale Ave stormdrain at the east end of the site. Due to the existing slope of the site, the drainage pattern is toward the west and away from Old Hillsdale Avenue. Similarly, the UPRR and Monterey Road slope toward the west and northwest.

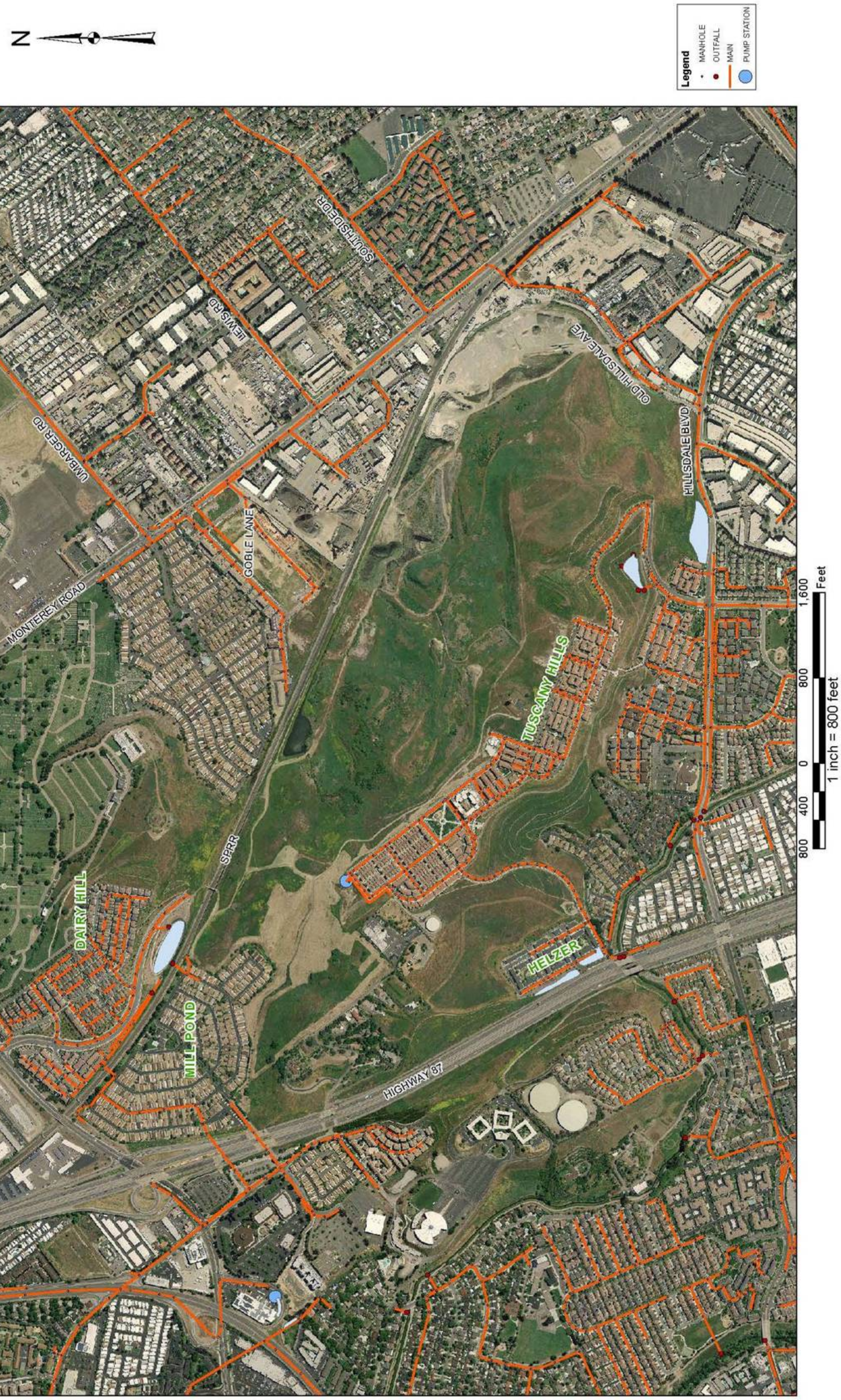

Figure 2.3-6. San Jose Stormdrain Map

2.3.4 Flooding

Flood hazards are due to the location of development near coastal or inland waters that swell beyond their normal elevations or otherwise exceed their normal boundaries. Floods are generally caused by high levels of precipitation, rapid snowmelt, dam failures, on or off-shore land disturbances – e.g., earthquakes – that rapidly energize and mobilize surface waters, or a combination of any of these. This section discusses flooding caused by high levels of rainfall. Other types of flood hazards are discussed in the next section.

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs) for communities participating in the National Flood Insurance Program (NFIP). The FIS that includes the Project area[17] discusses flooding along the Guadalupe River, Canoas Creek, and Coyote Creek, which are local to the streams and not noted as directly affecting the Project site. Figure 2.4-1 shows the portions of the effective FIRM[18] floodplains that are nearest the Project area. The floodplain depicted in the FIRM nearest the Project area is within the existing Mill Pond area and is listed as an AE Zone, with calculated water surface elevations. The proposed project would not encroach into the existing FEMA floodplain areas.

2.3.5 Other Surface Water Hazards

Tsunami

The Association of Bay Area Governments (ABAG) produces Tsunami Evacuation Maps for the Bay Area. There are no tsunami hazard areas shown within or near San José. Therefore, it is assumed that tsunamis would not impact the area.

Dam Failure

Based on the Association of Bay Area Governments (ABAG) Dam Failure Inundation Maps for the area, much of San José has the potential to be inundated if a reservoir fails. Figure 2.3-6 shows a compilation of the Dam Failure Inundation Maps for San José. Any colored area stands to be inundated should an upstream reservoir fail. All of the dams potentially affecting San José fall under the jurisdiction of the California Division of Safety of Dams (DSOD) and some also fall under Federal Energy Regulatory Commission (FERC) jurisdiction. The DSOD inspects each dam on an annual basis to ensure the dam is safe, performing as intended, and is not developing problems. All of the dams are classified as high hazard dams, because their failure would result in a significant loss of life and property damage.

As part of its comprehensive dam safety program, the Santa Clara Valley Water District routinely monitors and studies the condition of each of its ten dams to ensure public safety. Although all of their dams have withstood earthquakes in the past, the District continues to analyze their seismic safety as new technology and geologic information becomes available. The stored capacity of Coyote Reservoir, for instance, has been reduced in the past due to concerns for seismic safety. More recently the District completed a preliminary evaluation that suggests Anderson Dam could be adversely affected by soil liquefaction if a major earthquake were to hit the Calaveras or Coyote Creek faults. Consequently the District will maintain a reservoir surface at least 30 feet below the crest of the dam (about 87% capacity) until further engineering studies conclude that such a restriction is no longer necessary.[19]

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[17] *FEMA. 2009. Flood Insurance Study. Santa Clara County, California and Incorporated Areas. Volume 1 of 4.*

[18] *Federal Emergency Management Agency (FEMA), National Flood Insurance Program (NFIP). 2009. Flood Insurance Rate Map (FIRM), Santa Clara County, California and Incorporated Areas, Panel 06085C 0239H.*

[19] *Santa Clara Valley Water District, January 6, 2009: Seismic Stability studied as part of Santa Clara Valley Water District's Comprehensive Dam Safety Program. Press Release.*

2.4 Surface Water Quality

Water quality is regulated to protect aquatic life and human health. For analyzing water quality, waters in the Bay Area can be broken into three categories: groundwater, imported water, and local surface waters. Groundwater is the most significant local source of water supply, and its quality is discussed in detail in the groundwater quality section of this report. Imported water quality is controlled by those wholesalers providing the water to the retailers or SCVWD, and it is treated to appropriate levels at one of the SCVWD's water treatment facilities prior to delivery to customers. Surface waters, while also treated prior to delivery, originates more locally, and thus water quality can be assessed and mitigated locally. The most commonly regulated surface water pollutants in the Bay Area and associated mitigation activities are discussed below. Those pollutants most likely to be generated by the construction and operation of the proposed Project are indicated accordingly.

2.4.1 Mercury

Mercury, also called quicksilver, can be toxic in soluble forms, when inhaled as a vapor, or ingested with contaminated fish. Mercury poisoning causes damage to the central nervous system and various body organs and can be fatal.

The Guadalupe River receives runoff, contaminated with mercury from the decommissioned mines in the upper Guadalupe River watershed. The SCVWD's Jacques Gulch Restoration Project,[20] originally scheduled to start in the summer of 2009 along Jacques Gulch, is planned to reduce the amount of mercury transported into the Guadalupe River watershed. However, historic mercury discharges to the Guadalupe River system and the San Francisco Bay have led to existing problems with mercury contamination of Bay Area sediments and aquatic life. Although most of the major mercury sources (i.e., mercury mines) are not along the Los Gatos Creek portion of the watershed, one recent study discusses potential mercury leaching from Limekiln Canyon, just upstream of Lexington Dam. The same study also found measurable mercury loading to Los Gatos Creek. The mercury contributed by Los Gatos Creek is noted as being less than that contributed by the other Guadalupe River tributaries. Sediment loading along Los Gatos Creek can also affect mercury transport via effects downstream of the confluence with the Guadalupe River.[21]

Observed mercury concentrations in Coyote Creek have been much lower than found in the Guadalupe River. Small mercury mines have a minor influence on Coyote Creek mercury concentration, with the major mercury sources coming from industrial and urban uses and atmospheric deposition[22].

2.4.2 Pharmaceuticals and Personal Care Products (PPCPs)

Pharmaceuticals and personal care products (PPCPs) comprise a diverse set of chemicals increasingly found in treated wastewater as advances in analytical chemistry methods allow detection of pollutants in progressively smaller concentrations. Compounds commonly detected in wastewater effluent or receiving waters downstream of wastewater treatment plants include: cholesterol, estrogens (e.g., coprostanol), insect repellents (e.g., DEET), caffeine, triclosan, analgesics (e.g., salicylic acid, ibuprofen, acetaminophen), antibiotics (e.g., amoxicillin, erythromycin), tranquilizers, synthetic fragrances, and soaps and surfactants.

Urban runoff from local watersheds is a significant source of PPCP entry in the Bay. PPCPs are introduced into the wastewater system through a variety of pathways, including: excretion following human use; expired and unused products flushed down sinks or toilets; and release of unabsorbed externally-applied products during washing or bathing.

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20 *Santa Clara Valley Water District. 2008. Jacques Gulch Restoration Project FAQ, April 2008.*

21 *Tetra Tech, Inc. 2005. Guadalupe River Watershed Mercury TMDL Project. Final Conceptual Model Report. Prepared for the Regional Board. May 2005.*

22 *S McKee, L., Leatherbarrow, J. 2005. Characterization of mercury concentrations in sediment loads in Guadalupe River and Coyote Creek, San Jose, CA. 2008. San Francisco Estuary Institute.*

Figure 2.4-1. FEMA Flood Plain Map

PPCPs are an emerging issue, and the potential effects of many of these biologically active chemicals on humans and aquatic ecosystems are poorly understood due to the number of potential constituents involved (the compounds and their breakdown products and/or metabolites); the low concentrations present; and the lack of information on additive and synergistic effects of mixtures of PPCPs, effects of sub-therapeutic doses or continual long-term exposure to low concentrations, and the environmental fate and degradation characteristics. Concentrations of PPCPs in wastewater, surface water, and ground water are typically very low, which limits the potential for human exposure. For humans, the primary routes of exposure to PPCPs include consumption of potable water or fish that contain PPCPs and their derivatives. While extensive mammalian and human toxicity data are available for pharmaceuticals subject to the drug development and approval process, the amount of monitoring data available on the prevalence and concentrations of other PPCPs in the environment and the resulting risks to humans and wildlife is currently very limited. Some types of PPCPs are referred to as endocrine disrupting compounds (EDCs) because they can mimic natural endocrine hormones of animals. Most evidence for adverse effects of EDCs on animals focuses on resident aquatic organisms (fish, invertebrates) immediately downstream of urbanized areas, livestock production facilities, or direct wastewater discharges into receiving waters.

At present, there are no federal regulations specific to pharmaceuticals in drinking or natural waters and concentrations of PPCPs, and EDCs in wastewater are typically not monitored. The most applicable state regulation is the Regional Board's Basin Plan narrative water quality objective for toxicity, which states that all waters should be free of substances that produce detrimental effects in living organisms.

2.4.3 303(d) List of Water Quality Impaired Limited Segments

Section 303(d) of the 1972 Federal Clean Water Act requires that states develop a list of water bodies that do not meet water quality standards, establish priority rankings for waters on the list, and develop action plans – based on the TMDLs – to improve water quality. The list of impaired water bodies is typically revised every two years.

Several water bodies within the Guadalupe River system are listed as impaired in the 303(d) list of water quality limited segments.[23] The main contaminant for which these water bodies are listed is mercury, whose potential source is listed as mine tailings and surface mining. The water bodies listed as mercury impaired include 18 miles of Guadalupe River. These water bodies did not have a TMDL for mercury developed at the printing of the list in 2006, but TMDLs are scheduled to be developed as part of the Santa Clara Basin Watershed Management Initiative. The 18 miles of Guadalupe River is also listed as being impaired from and having an approved TMDL for diazinon, whose potential source is urban runoff and storm sewers carrying pesticide residue. Los Gatos Creek is also listed as being impaired from and having an approved TMDL for diazinon along 19 miles of the creek.

The Draft 2008 303(d) Integrated Report identifies Guadalupe River and Lower San Francisco Bay, to which the Guadalupe River system drains, as being required to have a TMDL for trash.

Coyote Creek is also listed as requiring a TMDL for trash, as a result from illegal dumping and urban runoff and storm sewers. Diazinon, sourced from urban runoff and storm sewers is also listed for Coyote Creek as having an USEPA-approved TMDL. An estimated 55 miles along the creek were assessed for both pollutants.

[23] *State Board. 2007. 2006 CWA Section 303(d) List of Water Quality Limited Segments. June 2007.*

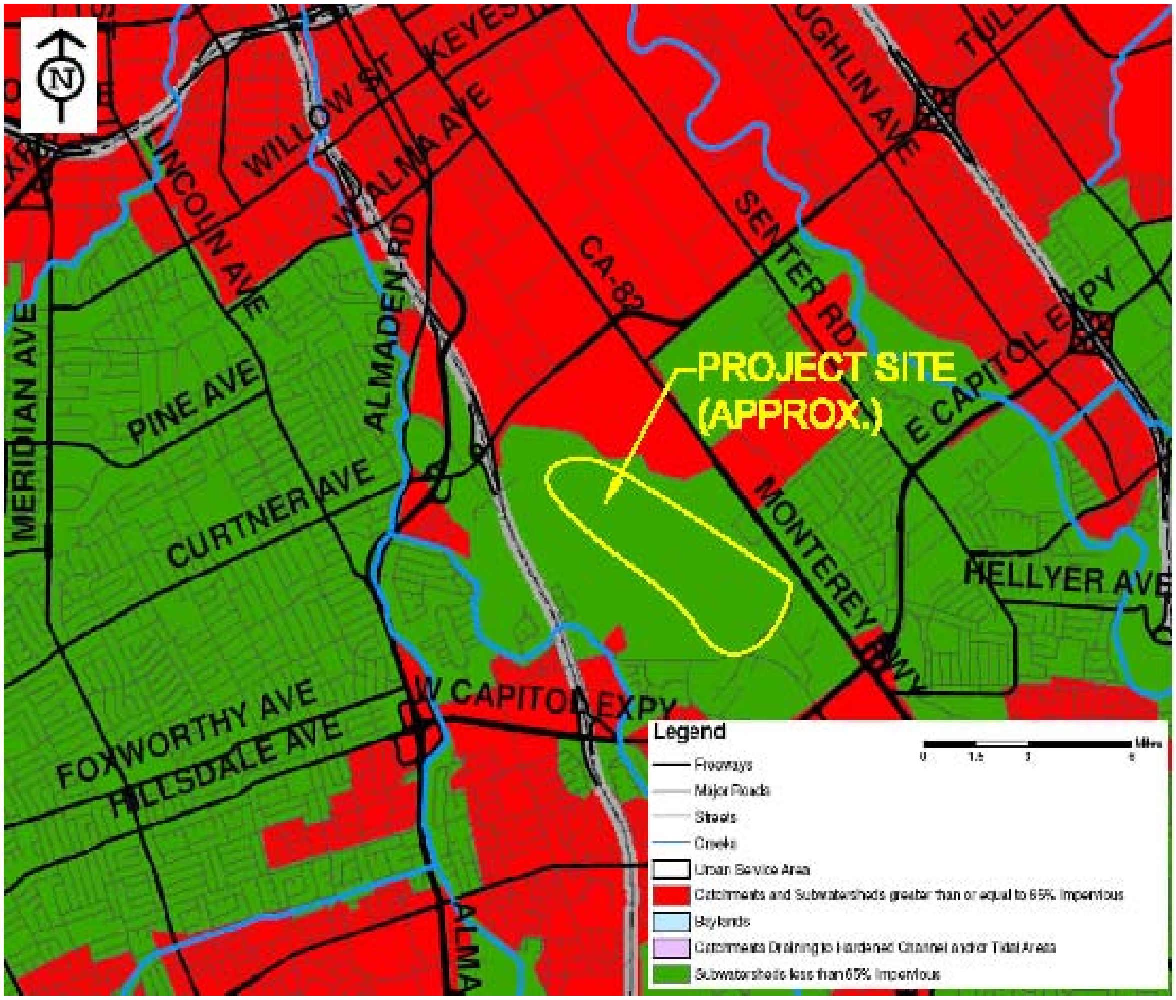

Figure 2.4-2. Map of HMP Applicability near Project Site

2.4.4 Other Surface Water Quality Issues

Residues of agricultural chemicals from fertilizers and pesticides may remain in the soil from previous site uses and be transported to the Los Gatos Creek adsorbed to eroded sediment. No definitive water and sediment quality studies of Los Gatos Creek have been conducted or are readily available to assess whether these substances are present or have caused problems.

The Regional Board's Basin Plan also lists several inactive mine sites within the Guadalupe River watershed, although only one appears to be within the Los Gatos Creek watershed, specifically. The "Hooker Creek" copper mine is shown approximately eight (8) miles south of the Project site near Los Gatos Creek. The Regional Board has ongoing monitoring throughout the Bay Area for various contaminants. Related to the Guadalupe River watershed, the Regional Board monitors for copper and nickel, specifically at the following sites:

- Just downstream of Alviso along the Alviso Slough;
- In the San Francisco Bay just downstream of the Alviso Slough discharge (Coyote Creek and Guadalupe River confluence).[24]

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[24] *Regional Board. 2007. San Francisco Bay Basin (Region 2). Water Quality Control Plan (Basin Plan). January 2007.*

Surface waters in the Bay Area, particularly the surface reservoirs, are used extensively for recreation and have significant wildlife habitat value. All of the reservoirs owned by the SCVWD are leased to the Santa Clara County Department of Parks and Recreation. Vasona Reservoir (i.e., at Vasona Lake County Park) is the most popular of Santa Clara County's regional park and recreation areas, with permitted uses including non-power boating, fishing, bird watching, and picnicking.[25] Protecting the quality of these waters is thus essential to maintaining their beneficial uses. Vasona Reservoir, however, is upstream of the Project and should not be affected by the Project.

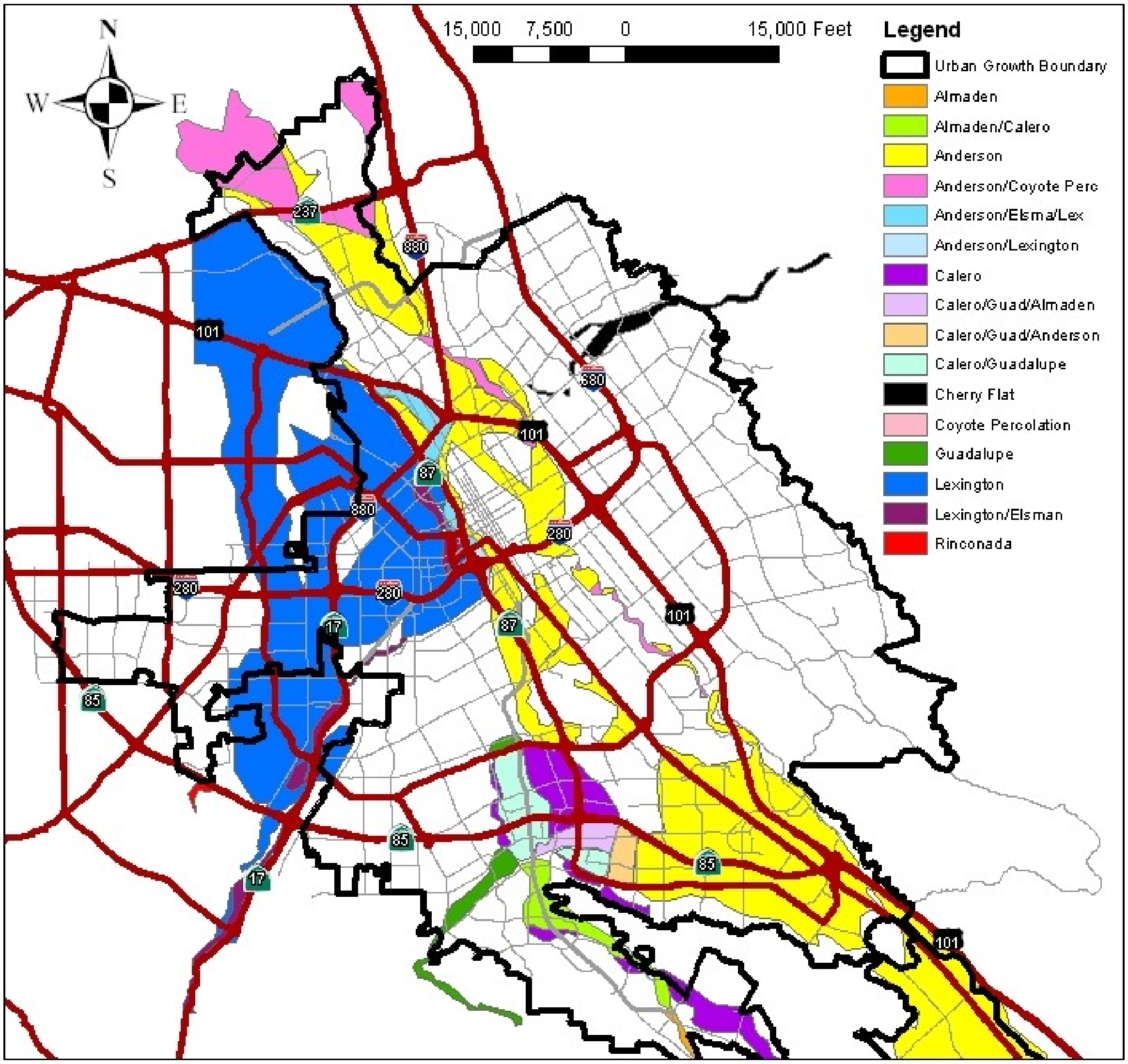

Figure 2.4-3. ABAG Dam Failure Inundation Map

[25] *Information on Vasona Lake County Park can be found at http://www.sccgov.org/portal/site/parks/ under the "Find a Park" option, accessed on October 29, 2009.*

2.5 Groundwater

Groundwater is an important source of water for the Santa Clara Valley Water District (providing about 45% of total District supplies), and all of the service providers that supply water to the City rely at least in part on groundwater for their water supplies. The Santa Clara Valley Groundwater Basin is the source for all groundwater in the County, and is divided into three sub-basins: the Santa Clara Valley Sub-basin (which can be further separated into its confined and unconfined portions), the Coyote Valley Sub-basin, and the Llagas Sub-Basin. The former two basins underlie San José. The three sub-basins occupy approximately the northern-most 44 miles of the Santa Clara Valley; a northwest trending feature situated at the southern end of the San Francisco Bay and bounded to the east by the Diablo Range and to the west by the Santa Cruz Mountains. Each of these groundwater basins is shown in Figure 2.5-1, and each basin and their relationship is described in more detail below. The relative available supply from each groundwater basin is summarized in Table 2.5-1.

Table 2.5.1 - Storage Capacities and Withdrawals for Groundwater Sub-Basins[26]

	Operational Storage Capacity (afy)	Average Historic Annual Withdrawal 1999-2004 (afy)	Maximum Annual Historic Withdrawal 1999-2004 (afy)
Santa Clara Valley Sub-basin	350,000	107,000	200,000
Coyote Valley Sub-basin	23,000 - 30,000	7,300	8,000
Llagas Sub-basin	152,000 - 165,000	45,000	92,000
TOTAL	530,000	159,300	300,000

The values summarized by Table 2.5-1 are based on data presented in the UWMP. Note that the District defines operational storage capacity as the volume of groundwater that can be stored in a basin or sub-basin as a result of District management measures. Operational storage capacity is generally less than total storage capacity as it accounts for the avoidance of land subsidence and high groundwater conditions, as well as available pumping capacity.

Santa Clara Valley Sub-Basin

All three water retailers and SCVWD use groundwater from the Santa Clara Valley Sub-basin (SCVSB) as a source of supply. Underlying the majority of the City UGB, and virtually all of its developed area, the SCVSB is bounded by the Santa Cruz Mountains to the west and the Diablo Range to the east. Approximately 22 miles long, the sub-basin narrows from a width of about 15 miles at the City's northern boundary, to about a half a mile wide at its southern edge, which is referred to as the Coyote Narrows.

The total area of the SCVSB is about 225 square miles, and it is not currently identified as adjudicated (a legal process of determining rights to water in an aquifer).[27]

The District estimates the long-term operational storage capacity of the Santa Clara Valley Sub-basin to be 350,000 acre-feet, and has determined groundwater withdrawal from the Sub-basin should not exceed 200,000 acre-feet in any one year. Historic groundwater withdrawal from the SCVSB is 107,000 afy on average for 1999 through 2004.[28]

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[26] *Ibid, Table 3-4, p. 28-30, p. 32 & p. 122.*
[27] *California Department of Water Resources, 2003: California's Groundwater, Bulletin 118.*
[28] *SCVWD UWMP p. 32.*

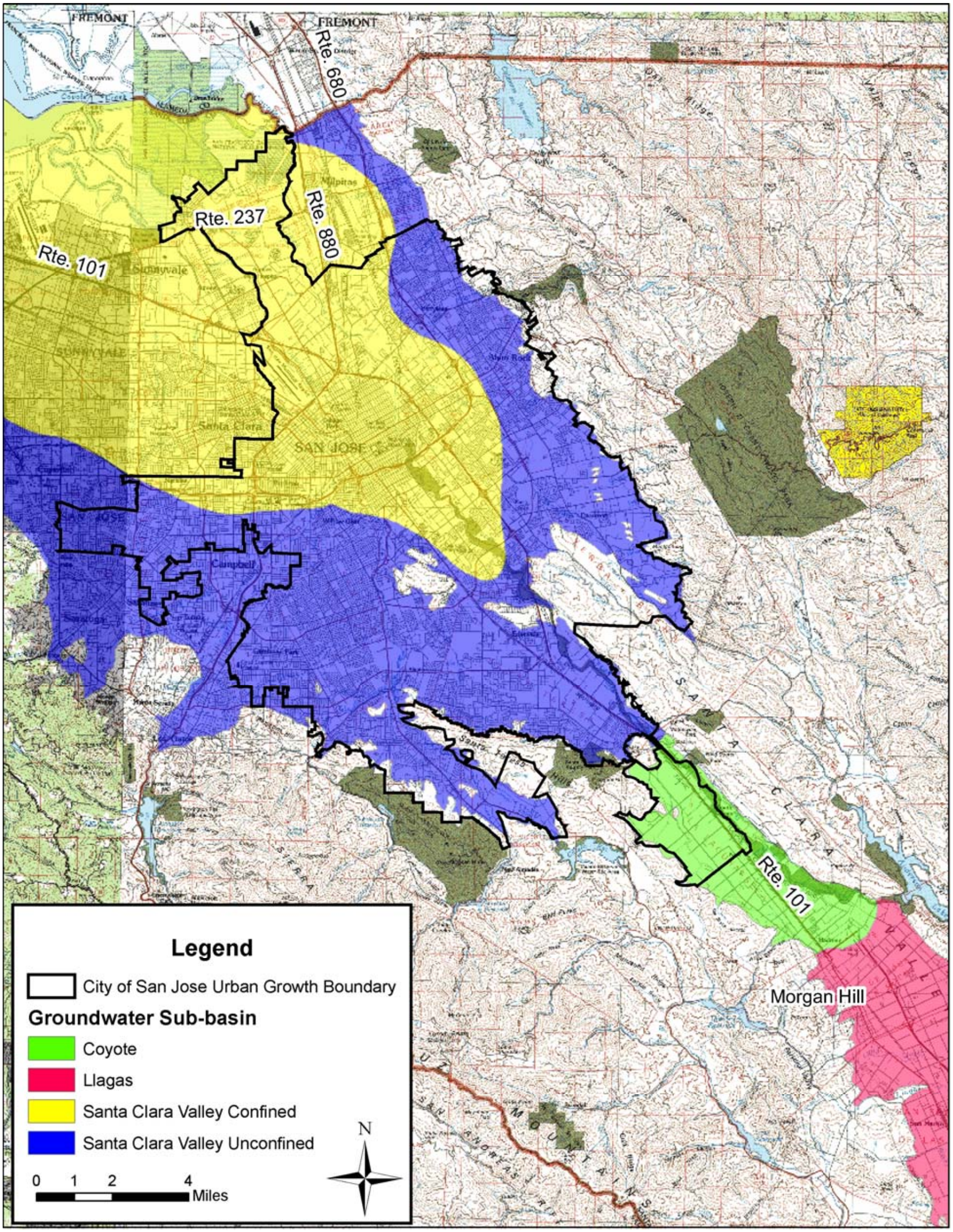

Figure 2.5-1. Santa Clara Valley Groundwater Basins

Coyote Valley Sub-Basin

The Coyote Valley Sub-basin is approximately 7 miles long and 2 miles wide, with a corresponding surface area of about 15 square miles. It is bounded to the north by the Coyote Narrows; a constriction in the permeable basin materials where the two bordering mountain ranges converge towards one another. It is defined at its southern edge by a proscribed boundary at Cochrane Road that generally coincides with a groundwater divide between the Coyote and Llagas Sub-basins. Although the SCVWD utilizes the Llagas groundwater basin for its water supplies, it lies far south of the San José Urban Growth Boundaries, and as such is discussed herein only in its relation and relevance to the Coyote Sub-basin.

The Coyote sub-basin generally drains north through the Coyote Narrows into the Santa Clara Valley Sub-basin, while groundwater in the Llagas Sub-basin drains to the south. Due to changes in hydrogeologic conditions such as rainfall, recharge, pumping, and groundwater basin exchanges, the actual location of the groundwater divide between the Llagas and Coyote sub-basins has historically been observed to move as much as one mile to the north or south of the designated boundary at Cochrane Road. When the divide moves to the north, some water from Coyote sub-basin will flow south into the Llagas sub-basin. Average flow from the Coyote Sub-basin to the Llagas Sub-basin is estimated to be approximately 2,400 acre-ft per year.[29]

2.5.1Groundwater Discharge Components

Discharge components refer to water uses or losses within the groundwater basin. They include in order of magnitude: direct groundwater extractions (i.e. pumping); subsurface outflow to another groundwater basin; discharges to surface water; direct consumption by plants, and the direct evaporation of surface water. Direct groundwater extraction via pumping is by far the most significant groundwater discharge component.

The total number of wells operating in the Santa Clara Valley groundwater basin is not precisely known. While the majority of wells are metered, there are un-metered private wells. Where meter data is not available, groundwater production has been estimated using efficiency or flow testing, power use, and/or crop factors. Table 2.5-2 summarizes District-estimated historic pumping for each sub-basin.[30]

Table 2.5-2 - Historical Groundwater Pumping (acre-feet)

Year	Sub-basin			Total (acre-feet)
	Coyote	Llagas	Santa Clara Valley	
1999	8,400	45,200	106,800	160,400
2000	7,900	44,300	112,600	164,800
2001	6,900	47,000	115,400	169,300
2002	6,700	44,600	104,700	156,000
2003	6,800	41,600	96,500	144,900
2004	7,300	45,900	105,700	158,900

2.5.2 Groundwater Recharge Components

Recharge components refer to water gains within the groundwater basin. They include in order of magnitude: direct surface water recharge (natural and artificial); the deep percolation of precipitation; septic system discharges to groundwater; and the deep percolation of irrigation return water. Recharge of the Santa Clara Valley Basin occurs both naturally and artificially, through SCVWD management.

Unmanaged natural sources of recharge to the groundwater basin include rainfall, pipeline leakage, net irrigation return flows to the basin, underground seepage from the surrounding hills, and infiltration of

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[29] *Santa Clara Valley Water District, April 2002: Operational Storage Capacity of the Coyote and Llagas Groundwater Sub-basins.*

[30] *SCVWD UWMP p. 32.*

flow in streams which drain areas of the Santa Cruz Mountains to the west.[31] Of these, deep percolation of rainfall accounts for most of the natural inflow to the basin.[32] The open bodies of water (lakes, gravel pits, etc.) that evaporate water from the basin are also available to directly infiltrate rainwater in lesser amounts. Table 2.5-3 presents SCVWD estimates of the total annual amount of natural groundwater recharge in each sub-basin.[33] It should be noted that these values are calculated based on known pumping, recharge, and change in storage from groundwater elevation maps. The period of record of groundwater pumping in the Llagas Sub-basin is much shorter than the other sub-basins, and so there is less confidence in the estimates of natural recharge for the Llagas Sub-basin.

Table 2.5-3 - Estimated Natural Groundwater Recharge (afy) for Various Rainfall Conditions

Rainfall	Santa Clara Sub-basin	Coyote Sub-basin	Llagas Sub-basin	Total
Average	32,000	2,600	19,000	53,600
Wet	52,000	4,000	31,000	87,000
Single Dry	25,000	1,600	7,000	33,600
Multiple Dry Year	29,000	2,400	19,000	50,400

The District has the ability to facilitate enhanced groundwater recharge (i.e. artificial or managed recharge) to all three of the Santa Clara County groundwater basins through 80 of its 90 miles of stream channels and 71 off-stream ponds. The recharge program consists of both releasing locally stored and imported water into District streams and ponds, and managing and maintaining the streams and ponds to ensure continued recharge. The total capacity of the SCVWD recharge systems is about 138,000 acre-feet.[34] Table 2.5-4 presents the amount of groundwater recharged to the whole Santa Clara Valley Basin for various rainfall conditions.[35]

Table 2.5-4 - Managed Groundwater Total Recharge for all Sub-basins (ac-ft/yr)

Source	Normal Year	Single Dry Year	Multiple Dry Years
Total Managed Recharge: Local and Imported Sources	116,000	49,000	92,000

Less significant groundwater recharge components mentioned previously include percolation of rainfall and irrigation return water. Both of these components are most pronounced in the Coyote Valley Sub-basin, because the Santa Clara Sub-basin is almost entirely developed with a higher concentration of impervious area and relatively few agricultural lands. The California Department of Water Resources estimates that a little more than two inches of rainfall over the Coyote Valley floor reaches the groundwater aquifer through deep percolation, providing about 1,700 acre-feet of supply to the basin every year. About ten percent of agricultural irrigation water returns to the aquifer through deep percolation, and about half of all residential water uses from the aquifer return as septic system discharge. Septic discharges are filtered through sandy soils and unconsolidated deposits before reaching the water table, similar to a slow sand filtration system found in a water treatment facility.

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31 *DWR Bulletin 118.*
32 *Santa Clara Valley Water District, July 2002: Groundwater Conditions 2001.*
33 *SCVWD UWMP p. 36.*
34 *Ibid, p. 30.*
35 *Ibid, p. 31.*

2.5.3 Groundwater Levels

Groundwater levels respond to changes in the balance between groundwater recharge and withdrawal, and indicate the relative amount of water stored in an aquifer at a given point in time. The District maintains groundwater elevation data for monitoring wells in the Santa Clara Valley Sub-basin dating back to 1915, the Coyote Sub-basin dating back to 1937, and the Llagas Sub-basin dating back to 1969. Because most wells were designed as production wells, they are screened at multiple depths, and therefore elevation data represents an average of the conditions in the various water-bearing formations. Data is currently collected monthly for index wells and quarterly for other monitoring wells. Long-term average depth to groundwater levels are shown in Figure 2.5-2.

By 1916, when the District began to monitor water levels, groundwater had been used as a water supply source for more than 60 years. Subsidence of nearly four feet had been recorded in San José; and the Almaden, Calero, Guadalupe, Stevens Creek, Vasona, and Coyote dams had been constructed to store excess winter streamflow for dry-month releases into recharge facilities. Countywide groundwater levels increased from the late '30s into the beginning of the below-normal precipitation in 1944. Between 1944 and 1950, a combination of low precipitation and use of groundwater for almost all of the county's water needs corresponded to an extreme drop in groundwater elevations. In 1950 construction of Anderson Dam was complete. In 1952 the county began importing Hetch-Hetchy water; however, the county population doubled between 1950 and 1960, and water levels in the northern Santa Clara Sub-basin declined further.

In the early 1960s the district contracted with the State for an entitlement of 100,000 acre-feet per year through the South Bay aqueduct. In 1967 the District began delivering surface water treated at the new Rinconada Water Treatment Plant (WTP) to north county residents, reducing groundwater extraction and allowing for some basin recovery. Between 1960 and 1970, the county population again doubled. In 1974 Penitencia WTP began delivering treated water to some county residents, reducing some of the demand for groundwater. In 1987 delivery of water from the Central Valley Project began, and in 1989 the Santa Teresa WTP began treating and delivering surface water.

Groundwater elevation and land subsidence are related in San José. When groundwater levels decline, clay layers, previously saturated, are exposed and at risk of dewatering. As these clay layers dewater they compress, and do not expand when re-wetted. This compression causes land subsidence. The lowest groundwater elevations in the Santa Clara Valley Basin were recorded in about 1964. Since that time, imports from State and Federal water supplies both decreased groundwater extraction and increased groundwater recharge with the result that groundwater levels have generally risen. Within a few years of these changes, additional land subsidence had virtually stopped.[36]

Rising groundwater has other impacts. As shown in Figure 2.5-2, the Santa Clara Sub-basin is made up of two parts, a confined sub-basin and un-confined sub-basin. The northern, confined sub-basin is made up of an upper layer (Zone A) which is separated from the lower layer (Zone B) by an impermeable clay layer. This clay layer is at a gradient, with a higher elevation along the southern edge of the confined section and sloping downwards as it traverses north towards San Francisco Bay. At the interface of the unconfined and confined sub-basins, groundwater from the unconfined layer may enter both Zone A and Zone B and travels generally northward. As the clay layer slopes downward, pressure in the confined Zone B increases because it is controlled by the groundwater elevation at the interface between the confined and unconfined sub-basins. Thus, within the confined sub-basin when the clay layer separating Zones is breached, groundwater from Zone B has much greater head (up to 10 feet) compared to groundwater from Zone A. In several locations within the City of San José, breaching of this layer has required ongoing, full time pumping to avoid flooding of roads or buildings from groundwater which is pressure released from Zone B. Shallow nuisance groundwater is also occurring even where the confining layer has not been breached due to rising levels of water in the perched Zone A layer.

[36] *Santa Clara Valley Water District, May 2000: Relationship between Groundwater Elevations and Land Subsidence in Santa Clara County (Figure).*

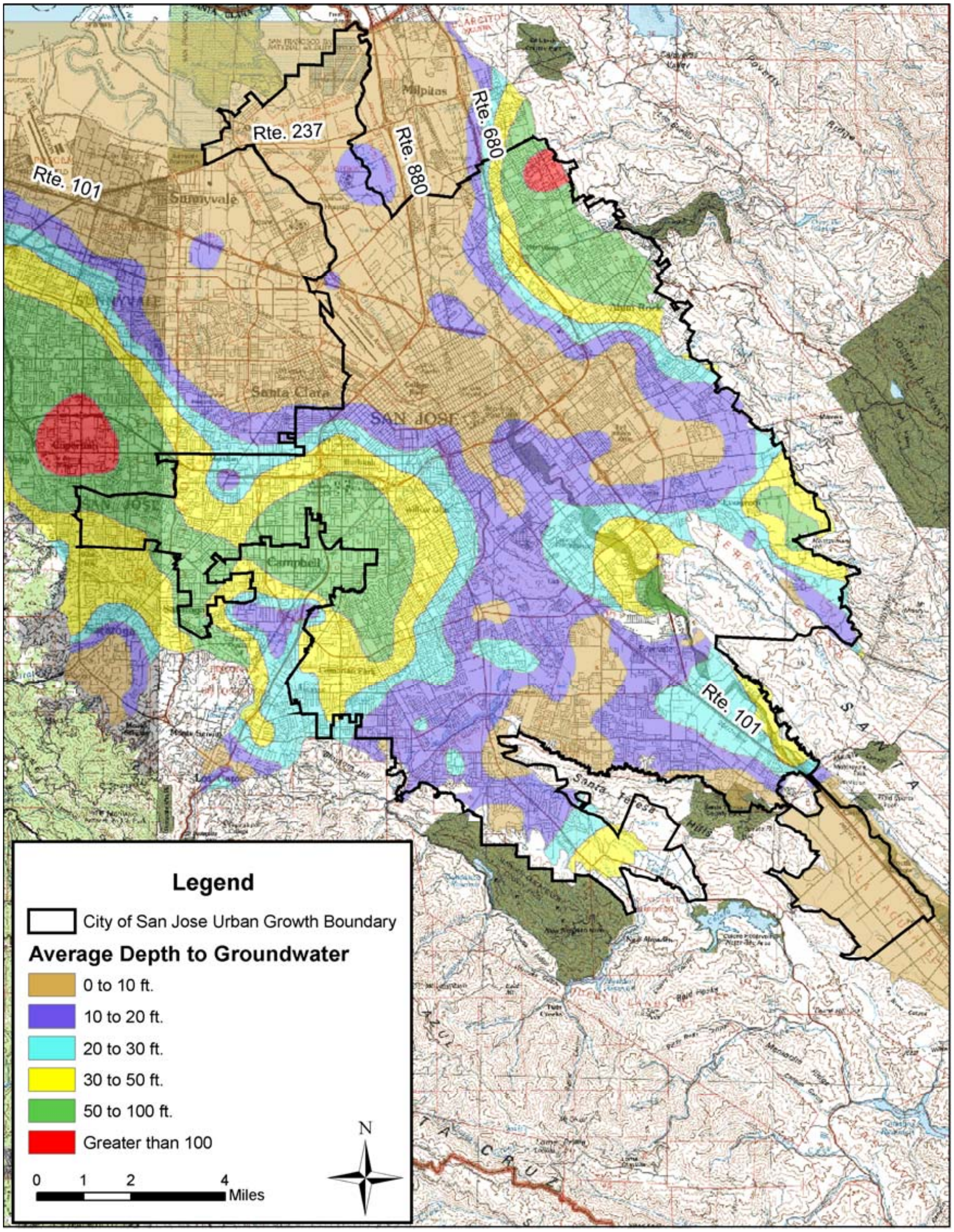

Figure 2.5-2. Average Depth to Groundwater in San José 1980-2003 (SCVWD GIS)

2.5.4 Groundwater Quality

Groundwater quality in Santa Clara County is generally quite good. That said, contamination sites and elevated nitrate concentrations have been observed. The SCVWD monitors groundwater quality for a variety of parameters, including calcium, sodium, iron, nitrate, chloride, organic solvents or gasoline additives. The type of monitoring at any given well depends on the well location, historic and existing land uses, and the availability of groundwater data in the area. In addition, water retailers and property owners also conduct groundwater monitoring. At polluted sites, responsible parties monitor the effectiveness of cleanup efforts.

San José Water Company (SJWC), whose service area encompasses Cupertino, Saratoga, Monte Sereno, Los Gatos, Campbell, and much of San José, completed their source water assessment for the California Department of Public Health in 2002, and an Annual Water Quality Report in 2007. SJWC reports that their wells are vulnerable to various potential contaminants from dry cleaners, gas stations, auto repair shops, low-density septic systems, industrial sites, and known contaminant plumes, among other sources. SJWC reports that physical barriers, treatment systems, and monitoring programs in place ensure that their supplied water is not adversely affected.[37]

Great Oaks Water Company (GOWC), whose service area borders the SJWC service area at Snell Avenue, serves primarily the Edenvale and Coyote Valley areas with only groundwater. GOWC has also completed their source water assessments, which indicate potential contamination from nearby septic systems, sewer collection systems, agricultural wells, gas stations, parks, highways, and industrial facilities, among other sources. However, the GOWC wells are constructed to minimize the influence of potential contaminants.[38]

The San José Municipal Water System (SJMW) provides water to the Evergreen, Edenvale, Coyote Valley, and North San José/Alviso service areas. For all of these areas, water quality vulnerabilities due to land use practices (i.e. agricultural and urban runoff, livestock grazing, etc.) are identified. Additional vulnerabilities include chemical and petroleum processing activities, illegal or unauthorized dumping, storage tank leaks and sewer collection systems. No contamination associated with any of these activities has been detected, however.[39] The most actively monitored groundwater pollutants are discussed in more detail below.

Nitrate

The nitrate concentration range in the principal aquifer of the Santa Clara Valley sub-basin is 13 to 16 mg/L, and the SCVWD has found that nitrate concentrations in this sub-basin appear to be stable. The nitrate concentration range for the Coyote sub-basin is 10 to 47 mg/L, with the wells with nitrate concentrations above the drinking water standard located in the southern half of the sub-basin. The nitrate concentration range for the upper aquifer zone of the Llagas sub-basin is 16 to 46 mg/L. The nitrate concentration range for the lower principal aquifer zone is 25 to 34 mg/L. The drinking water maximum contaminant level (MCL) for nitrate is 45 mg/L. Drinking water standards in areas of high nitrate are met through blending or treatment by the well owner. In addition, the SCVWD has implemented a nitrate management program since 1992. Over half of the 600 private wells tested in the Llagas and Coyote Valley Sub-basins between 1997 and 2001 exceeded the federal safe drinking standard for nitrate, although all public supply water wells meet drinking water standards.[40] This led to a regular monitoring program of Nitrate in the Coyote and Llagas sub-basins beginning in 1999, with 55 wells tested quarterly or biannually. In 2002, 33 wells in these sub-basins exceeded water quality standards for Nitrate loading. In 2003, 39 wells exceeded this threshold.[41]

Perchlorate

Perchlorate, a chemical used in rocket fuel and highway flares, has been detected in the Llagas Sub-basin south of Coyote Valley, contaminating wells in southeast Morgan Hill, San Martin and a few in north Gilroy. The contamination has been traced to a highway flare manufacturing plant operated by Olin

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37 *San José Water Company, 2007: Annual Water Quality Report.*

38 *Great Oaks Water Company, 2007: Annual Water Quality Report.*

39 *City of San José, San José Municipal Water System Environmental Services Department, 2007: Water Quality Report.*

40 *SCVWD Groundwater Management Plan, p 41.*

41 *Santa Clara Valley Water District, January 2005: Groundwater Conditions 2002/2003.*

Corporation from 1956 to 1997 on Tennant Avenue in Morgan Hill. Perchlorate affects the function of the thyroid gland (pregnant women and infants are most at risk), and water contaminated with the chemical should be avoided for drinking and cooking. Perchlorate has been found above California's perchlorate Public Health Goal (PHG) and notification level of 6 parts per billion in nearly 250 private and public wells, including several municipal wells in Morgan Hill and several mutual water company wells. More than 500 private wells are contaminated with perchlorate at levels below the Public Health Goal. The initial area of plume investigation was bound by Tennant Avenue on the north, Masten Avenue to the south, between Monterey Highway on the west and Center Avenue to the east. At one time, it was believed that the contaminated groundwater flowed only southeast from the site of initial contamination. (Coyote Valley is about two miles to the northwest.) However, the November 2003, Gilroy Dispatch reports - new information indicates "the chemical can migrate north in some gradients or sections after all." The California RWQCB, Central Coast Region, has issued a Cleanup and Abatement Order to Olin, and has ordered Olin to provide an alternate water supply to those with wells showing perchlorate at or above the PHG.

Other Groundwater Pollutants

Nitrate and perchlorate are currently the primary groundwater contaminant concerns in the Santa Clara Valley groundwater basin, although several other contaminants are monitored by SCVWD including volatile organic compounds (VOCs), fuel additives such as MTBE, synthetic organic compounds (SOCs) such as PCBs, and other unregulated chemicals. In 2003 no monitoring wells had levels of VOCs or SOCs above drinking water standards. MTBE contamination has impacted two public water supply wells in Santa Clara Valley. SCVWD participates in or administers programs to address these pollutants including the "Solvents and Toxics Liason Program", the "Leaking Underground Storage Tank Oversight Program".[42]

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42 *Ibid.*

3. Regulatory Framework

There are a variety of federal, state, and local laws and regulations pertaining to water resources that may impact San José planning. In addition, since San José is adjacent to the San Francisco Bay marshlands, climate change impacts may result in future regulations relevant to the City. These existing and potential regulations are presented in more detail below.

3.1 Federal Regulations

3.1.1 National Flood Insurance Program

To mitigate the costs of flood disaster relief, the U.S. Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. These acts were meant to reduce the need for large, publicly funded flood control structures and disaster relief by restricting development on floodplains.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. As part of the NFIP, FEMA publishes Flood Insurance Rate Maps (FIRMs) that identify flood hazard zones within a community. The extent of the FEMA-designated floodplains in the UGB is discussed previously.

3.1.2 Clean Water Act

The major federal legislation governing water quality is the Clean Water Act, as amended by the Water Quality Act of 1987 (Act). The U.S. Environmental Protection Agency (EPA) is the federal agency for water quality management nationwide. The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under the Clean Water Act, EPA has implemented pollution control programs such as setting wastewater standards and water quality standards for all contaminants in surface waters.

Three key regulatory programs are outlined in the Clean Water Act. Sections 303 and 304 of the Act call for the establishment of water quality standards, criteria, and guidelines, including for wastewater effluent. A water quality standard, under federal regulations (40 CFR 131.2) must define the water quality goals of a water body (or portion thereof) but designating the use(s) to be made of the water and setting criteria necessary to protect those uses. Under Section 303(d) States are required to identify impaired surface water bodies and develop total maximum daily loads (TMDLs) for contaminants of concern. As part of implementing Section 303, federal regulations (40 CFR 131.6) also require that each state develop and implement an “Anti-degradation Policy” to protect develop, adopt, and implement measures to protect surface water quality and support existing uses. Activities that may result in discharges to Waters of the United States and that require a federal permit are regulated under Section 401 of the Act. Water Quality Certification by the state is required for activities such as placement of fill in wetlands or bodies of water.

The EPA’s regulations, as called for under Section 402 of the Clean Water Act, also include the National Pollutant Discharge Elimination System (NPDES) permit program, which controls sources that discharge pollutants into waters of the United States (e.g., streams, lakes, bays, etc.). These regulations are implemented at the regional level by water quality control boards, which for the San José area is the San Francisco Bay Regional Water Quality Control Board (RWQCB). Historically, efforts to prevent water pollution have focused on “point” sources, meaning the source of the discharge was from a single location (e.g., a wastewater treatment plant, power plant, factory, etc.). Recent efforts also are focusing on pollution caused by “non-point” sources, meaning the discharge comes from multiple locations. The best example of this latter category is urban runoff, the source of which is a myriad of surfaces (e.g., roadways, rooftops, parking lots, etc.) that are found in a typical city or developed area. The RWQCB is tasked with protecting the quality of surface waters and groundwaters by issuing and enforcing compliance with the National Pollutant Discharge Elimination System (NPDES) permits and by preparation and revision of regional Water Quality Control Plan, also known as the Basin Plan. The RWQCB's latest Basin Plan was approved in January 2007.[43]

3.1.3 National Pollutant Discharge Elimination System Permit

The National Pollutant Discharge Elimination System (NPDES) Permit, though a federal program, is administered on the local level and will therefore be discussed in the Local Regulations section.

3.1.4 Section 404 of the Federal Clean Water Act

The U.S Army Corps of Engineers (Corps) is involved with the permitting process associated with all projects that have the potential to impact wetlands or other Corps jurisdictional waters, riparian areas, or endangered species through fill, development in or alteration of wetlands or jurisdictional waters. The Corps contacts the appropriate agencies (including the U.S Department of Fish and Wildlife and the National Marine Fisheries Service) and oversees and coordinates the permit application process.

Under the Section 404 permit process, the U.S. Fish and Wildlife Service (FWS) acts as a consultant for the Corps. Their primary responsibility is to enforce the Endangered Species Act. Any project that affects jurisdictional waters and has the potential to impact endangered species habitat must request FWS to initiate Section 7 Consultation.

The National Oceanic and Atmospheric Administration (NOAA) also acts as a consultant for the Corps. NOAA is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (water three to 200 mile offshore). NOAA works with communities on fishery management issues and works to promote sustainable fisheries and to prevent lost economic potential associated with over fishing, declining species and degraded habitats. Since degradation of waterways, riparian and coastal habitat can affect local fisheries NOAA may be requested to initiate Section 7 Consultation on projects that degrade these areas.

The Corps is responsible for contacting the appropriate consultant for the habitats and species involved.

3.2 State Regulations

3.2.1 Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and the Act assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board (SWRCB) and the nine regional water quality control boards. The SWRCB provides state-level coordination of the water quality control program by establishing state-wide policies and plans for the implementation of state and federal laws and regulations.

The San Francisco Bay office of the Regional Water Quality Control Board (Regional Board or RWQCB Region 2) regulates water quality in the Bay area in accordance with the Water Quality Control Plan or 'Basin Plan'.[44] The Basin Plan presents the beneficial uses, which the Regional Board has specifically designated for local aquifers, streams, marshes, rivers, and the Bay, as well as the water quality objectives, and criteria that must be met to protect these uses. The RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements to control water quality and protect beneficial uses.

3.2.2 NPDES Municipal Stormwater Permit

The National Pollutant Discharge Elimination System Permit, though a state program, is administered on the local level and will therefore be discussed in the Local Regulations section.

3.2.3 NPDES General Permit for Construction Activity

For any proposed project that would disturb more than 1.0 acre of land, the project applicant is required to submit a Notice of Intent to the State Board and apply for coverage under the NPDES Construction General Permit. Effective July 1, 2010, all dischargers are required to obtain coverage under the

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43 *California Water Quality Control Board Basin Plan*

44 *Ibid.*

Construction General Permit Order 2009-009-DWQ, adopted by the RWQCB on September 2, 2009. Construction activities subject to this permit include grading, clearing, or any activities that cause ground disturbance such as stockpiling or excavation. Regular maintenance activities performed to restore original line, grades, or capacities of facilities are not subject to this permit requirement. Administration of these permits has not been delegated to cities, counties, or Regional Boards but remains with the State Board. Enforcement of permit conditions, however, is the responsibility of Regional Board staff, assisted by local municipal or county staff.

The City of San José requires the project applicant to prepare a Storm Water Pollution Prevention Plan (SWPPP) and submit it for review prior to commencing construction. Once grading begins, the SWPPP must be kept on-site and updated as needed during construction. The SWPPP details the site-specific best management practices (BMPs) to control erosion and sedimentation and maintain water quality during the construction phase. The SWPPP also contains a summary of the structural and non-structural BMPs to be implemented during the post-construction period, pursuant to the nonpoint source practices and procedures encouraged by the City of San José and the Regional Board.

3.2.4 NPDES Industrial Discharge Permit(s)

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component that covers 29 industrial sectors that require authorization under an NPDES industrial stormwater permit for stormwater discharges. Industrial facilities will need to obtain NPDES permit coverage through the state. Facilities with the following industrial activities require permit coverage: facilities subject to federal stormwater effluent discharge standards in 40 CFR Parts 405-471; heavy manufacturing (for example, paper mills, chemical plants, petroleum refineries, and steel mills and foundries); coal and mineral mining and oil and gas exploration and processing; hazardous waste treatment, storage, or disposal facilities; landfills, land application sites, and open dumps with industrial wastes; metal scrap yards, salvage yards, automobile junkyards, and battery reclaimers; steam electric power generating plants; transportation facilities that have vehicle maintenance, equipment cleaning, or airport deicing operations; treatment works treating domestic sewage with a design flow of one million gallons a day or more; light manufacturing. (For example, food processing, printing and publishing, electronic and other electrical equipment manufacturing, and public warehousing and storage.)

3.2.5 California Fish and Game Code - Lake and Streambed Alteration

The California Department of Fish and Game (DFG) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify DFG of any proposed activity that may substantially modify a river, stream, or lake.

If DFG determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may then proceed with the activity in accordance with the final Agreement.

3.2.6 California Department of Public Health Drinking Water Program

The Drinking Water Program (DWP) within the Division of Drinking Water and Environmental Management regulates public water systems, oversees water recycling projects, permits water treatment devices, certifies drinking water treatment and distribution operators, supports and promotes water system security, provides support for small water systems and for improving technical, managerial, and financial (TMF) capacity and provides funding opportunities for water system improvements. The operation of a drinking water system is regulated under both Title 17 and Title 22 of the California Code of Regulations.

Under the California Water Code, the SWRCB is responsible for formulating and adopting state policy for water recycling, while the California Department of Health Services [now the California Department of Public Health (DPH)] is responsible for establishing uniform statewide criteria to ensure that the use of recycled water would not be detrimental to public health. The currently adopted regulations and statutes governing water reuse in the state of California are compiled in the California Health Laws Related to

Recycled Water, aka “The Purple Book”. These rules and regulations were compiled in 2001, and are based on the health and safety code (Articles 2 and 7), the California water code (most notably sections 13540-13583), and the California Code of Regulations (Title 22, Sections 60301 – 60355). Title 22 establishes water quality standards and treatment reliability criteria for water recycling, as well as setting bacteriological water quality standards on the basis of the expected degree of public contact with recycled water. The highest level of treatment required by Title 22 (recycled water with a high potential for public contact) is disinfected tertiary treatment. As mentioned previously, all recycled water in the SBWR meets this standard. Any uses of recycled water not addressed by these statewide criteria are established by the state Department of Public Health on a case-by-base basis.

3.2.7 Dam Safety

Also part of the DWR, the Division of Safety of Dams is responsible for regular inspection of the dams in the area. Much of San José is in a dam failure inundation zone. It is the responsibility of DWR and other local agencies to minimize the risk of dam failure. Dams regulated by DWR are identified in California Water Code Sections 6002, 6003, and 6004 and regulations for dams and reservoirs are included in the California Code of Regulations.[45]

3.3 Local Regulations

3.3.1 City of San José

NPDES Permit

The 1987 amendments to the Clean Water Act [Section 402(p)] provided for U.S. EPA regulation of several new categories of nonpoint pollution sources within the existing National Pollutant Discharge Elimination Program (NPDES). In Phase I, NPDES permits were issued for urban runoff discharges from municipalities of over 100,000 people, from plants in industries recognized by the EPA as being likely sources of storm water pollutants, and from construction activities which disturb more than 5 acres. Phase II implementation, effective March 10, 2003, extended NPDES urban runoff discharge permitting to cities of 50,000 to 100,000 people, and to construction sites which disturb between one and 5 acres.

The EPA has delegated management of California’s NPDES Municipal Stormwater Permit program to the State Water Resources Control Board and the nine Regional Water Quality Control Board offices. In both Phase I and Phase II, urbanized counties and cities that implemented a comprehensive storm water management plan (SWMP) for urban runoff management meeting Regional Board standards could apply to the Regional Board for a joint city-county NPDES Municipal Stormwater Permit. Upon acceptance, the authority to regulate storm runoff discharges from municipal storm drain systems was transferred to the permit holders, allowing them to more effectively integrate the storm-water control program with other nonpoint source control programs.

Each incorporated city and town in Santa Clara County, including the City of San José, joined with the County of Santa Clara to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) in applying for a regional NPDES permit. SCVURPPP was established with offices in San José as part of the regional NPDES permit to apply for and administer the permit for the County and its cities and towns. SCVURPPP received its first 5-year Phase I NPDES Municipal Stormwater Permits in 1990, reissued in 1995, 2001, and 2009. As part of the NPDES permit requirements, the Program produced an Urban Runoff Management Plan and submits annual work plans and reports to the Regional Board. Included in this is the Hydromodification Management Plan (HMP). The goal of an HMP is to manage increased peak runoff flows and volumes (hydromodification) to avoid erosion of stream channels and degradation of water quality both on and off the project site.

The most recent NPDES permit (Order No. R2-2009-0074, adopted by the RWQCB October 14, 2009) is significantly changed from the previous permit. Language is generally more proscriptive, and meeting

[45] *California Department of Water Resources, Division of Safety of Dams, Statutes and Regulations Pertaining to Supervision of Dams and Reservoirs.*

specific numeric criteria for various pollutant reduction efforts is required. Beginning December 1, 2011 the impervious surface threshold for regulated projects is decreased from 10,000 square feet to 5,000 square feet for special land use categories (auto service facilities, gas stations, restaurants, parking lots, etc.). Some of the other additions to the NPDES permit include an expansion of trash reduction efforts and requirements and the requirement for all regulated projects to implement source control measures (i.e. BMPs and/or LID efforts) onsite.

Storm Water Management Plan

The Storm Water Management Plan (SWMP) was prepared to supplement the joint NPDES Phase I Municipal Storm Water permit to be issued to the co-permittees, by the San Francisco Bay Regional Water Quality Control Board (SCBRWQCB). The intent of the Management Plan is to identify specific tasks and programs to reduce the discharge of pollutants in storm water to the Maximum Extent Practical (MEP) in a manner designed to achieve compliance with water quality standards and objectives. The Management Plan identifies measures to effectively prohibit non-storm water discharges into municipal storm drain systems and watercourses within the permittees' jurisdictions. The Management Plan fulfills the Regional Water Board's permit application requirements.

The SWMP seeks to control post-development storm water runoff through source control and treatment control Best Management Practices (BMP's). SWMP measures will be required on new projects that create or replace more than 10,000 square feet of impervious surface.

Updated General Plan Policies

San José's Draft 2040 General Plan policies and actions relevant to water resources and flooding are identified below.[46]

Environmental Considerations/Hazards Policy 5.1: The City shall require evaluation of flood hazards prior to approval of development projects within a Federal Emergency Management Agency (FEMA) designated floodplain. New development and substantial improvements to existing structures shall be reviewed to ensure it is designed to provide protection from flooding with a one percent annual chance of occurrence, commonly referred to as the "100-year" flood or whatever designated benchmark FEMA may adopt in the future. New development should also provide protection for less frequent flood events when required by the State.

Environmental Considerations/Hazards Policy 5.2: Allow development only when adequate mitigation measures are incorporated into the project design to prevent or minimize siltation of streams, flood protection ponds, and reservoirs.

Environmental Considerations/Hazards Policy 5.3: Preserve designated floodway areas for non-urban uses.

Environmental Considerations/Hazards Policy 5.4: Develop flood control facilities in cooperation with the Santa Clara Valley Water District to protect areas from the occurrence of the "1%" or "100-year" flood or less frequent flood events when required by the State.

Environmental Considerations/Hazards Policy 5.5: Prepare and periodically update appropriate emergency plans for the safe evacuation of occupants of areas subject to possible inundation from dam and levee failure and natural flooding. Include maps with pre-established evacuation routes in dam failure plans.

Environmental Considerations/Hazards Policy 5.6: Support State and Federal legislation which provides funding for the construction of flood protection improvements in urbanized areas.

Environmental Considerations/Hazards Policy 5.7: Allow new urban development only when mitigation measures are incorporated into the project design to ensure that new urban runoff does not increase flood risks elsewhere.

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[46] *http://www.sanjoseca.gov/planning/gp_update/DraftPlan/008_Chapter03_9-20-2010.pdf .*

Environmental Considerations/Hazards Policy 5.8: Cooperate with the Santa Clara Valley Water District to develop and maintain additional flood protection retention facilities in areas where they are needed or where the design capacity of existing retention facilities cannot be restored.

Environmental Considerations/Hazards Policy 5.9: Work with local, regional, state and federal agencies to ensure new and existing levees provide adequate flood protection and actively partner with the Santa Clara Valley Water District and other levee owners with respect to National Flood Insurance Program (NFIP) levee recertification.

Environmental Considerations/Hazards Policy 5.10: Encourage the preservation of urban creeks and rivers to maintain existing floodplain storage. When in-channel work is proposed, engineering techniques which include the use of plant materials (bio-engineering) are encouraged.

Environmental Considerations/Hazards Policy 5.11: Reduce the amount of impervious surfaces as a part of redevelopment and roadway improvements through the selection of materials, site planning, and street design where possible.

Environmental Considerations/Hazards Policy 5.12: Locate critical or public facilities (such as the Water Pollution Control Plant, local hospitals, police and fire service facilities, and schools) above the 500-year floodplain or protect such facilities up to the magnitude 500-year flood. Construction standards based on FEMA guidelines may include freeboard, elevation above the 500-year floodplain and elevated access ramps.

Environmental Considerations/Hazards Policy 5.13: As a part of the City's policies for addressing the effects of climate change and projected water level rise in San Francisco Bay, the City requires evaluation of projected inundation for development projects near San Francisco Bay or at flooding risk from local waterways which discharge to San Francisco Bay. For projects affected by increased water levels in San Francisco Bay, the City requires incorporation of mitigation measures prior to approval of development projects. Mitigation measures incorporated into project design or project location shall prevent exposure to substantial flooding hazards from increased water levels in San Francisco Bay during the anticipated useful lifetime of structures.

Environmental Considerations/Hazards Action 5.14: Implement the requirements of FEMA relating to construction in Special Flood Hazards Areas as illustrated on Flood Insurance Rate Maps. Periodically update the City's Flood Hazard Regulations to implement FEMA requirements.

Environmental Considerations/Hazards Action 5.15: The City will participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed minimum NFIP requirements. Flood insurance premium rates for property owners within the city may be discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS, which are to reduce flood damage to insurable property; strengthen and support the insurance aspects of the NFIP; and encourage a comprehensive approach to floodplain management.

Environmental Considerations/Hazards Action 5.16 : Implement the Post-Construction Urban Runoff Management requirements of the City's Municipal NPDES Permit to reduce urban runoff from project sites.

Environmental Considerations/Hazards Action 5.17 : Implement the Hydromodification Management requirements of the City's Municipal NPDES Permit to manage runoff flow and volume from project sites.

Environmental Considerations/Hazards Action 5.18 : Maintain City storm drainage infrastructure in a manner that reduces flood hazards. As the storm drainage system is extended or modified, provide capacity to adequately convey the 10-year storm event.

Environmental Considerations/Hazards Action 5.19 : Develop and maintain a Storm Drainage Master plan and work with other agencies to develop broader Watershed Management Plans to model the City's hydrology.

Environmental Considerations/Hazards Action 5.20: Monitor information from regional, state, and federal agencies on water level rises in San Francisco Bay on an on-going basis. Use this information to determine if additional adaptive management actions are needed to deal with flooding hazards from increasing sea levels for existing or new development and infrastructure.

Environmental Resources Policy 9.1: Manage stormwater runoff in compliance with the City's Post-Construction Urban Runoff (6-29) and Hydromodification Management (8-14) Policies.

Environmental Resources Policy 9.2: Coordinate with regional and local agencies and private landowners to plan, finance, construct, and maintain regional stormwater management facilities.

Environmental Resources Policy 9.3: Ensure that private development in San José includes adequate measures to treat stormwater runoff.

Environmental Resources Policy 9.4: Assess the potential for surface water and groundwater contamination and require appropriate preventative measures when new development is proposed in areas where storm runoff will be directed into creeks upstream from groundwater recharge facilities.

Environmental Resources Policy 9.5: Ensure that all development projects in San José maximize opportunities to filter, infiltrate, store and reuse or evaporate stormwater runoff onsite.

Environmental Resources Policy 9.6: Eliminate barriers to and enact policies in support of the reuse of stormwater runoff for beneficial uses in existing infrastructure and future development in San José.

Environmental Resources Policy 9.7: Encourage stormwater reuse for beneficial uses in existing infrastructure and future development through the installation of rain barrels, cisterns, or other water storage and reuse facilities.

Environmental Resources Policy 9.8: Consider the characteristics and condition of the local watershed and identify opportunities for water quality improvement when developing new or updating existing development plans or policies including, but not limited to, specific or area land use plans.

Environmental Resources Action 9.9: Partner with public, private, and non-profit agencies on public outreach and education on the importance of responsible stormwater management.

Environmental Resources Action 9.10: Continue to participate in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SVURPPP) and take other necessary actions to formulate and meet regional water quality standards which are implemented through the National Pollution Discharge Elimination System (NPDES) permits and other measures.

Measurable Sustainability Policy 20.1: Lead through advocacy with local, regional and state agencies to ensure the protection and enhancement of the quality of San José's water sources.

Measurable Sustainability Policy 20.2: Avoid locating new development or authorizing activities with the potential to negatively impact groundwater quality in areas that have been identified as having a high degree of aquifer vulnerability by the Santa Clara Valley Water District or other authoritative public agency.

Measurable Sustainability Policy 20.3: Protect groundwater as a water supply source through flood protection measures and the use of stormwater infiltration practices that protect groundwater quality. In the event percolation facilities are modified for infrastructure projects, replacement percolation capacity will be provided.

City of San José Urban Runoff Policy 6-29

The Policy requires all new and redevelopment projects to implement Post-Construction Best Management Practices (BMPs) and Treatment Control Measures (TCMs). This Policy also establishes specified design standards for Post-Construction TCMs for Applicable Projects defined as:

Applicable Project: new development project that creates ten thousand (10,000) square feet or more of Impervious Surface Area; new streets, roads, highways and freeways built under the City's jurisdiction that create ten thousand (10,000) square feet or more of Impervious Surface Area and Significant Redevelopment Projects.

The policy also establishes minimum Post-Construction TCMs and BMPs for all Land Uses of Concern, including Expansion Projects. This Policy further establishes the criteria for determining the situations in which it is impracticable to comply with the design standards for Applicable Projects, including the criteria for evaluating the equivalency of Alternative Compliance Measure(s). At the City's discretion, if it determines that installation of Post-Construction TCMs is impracticable in a specific project, it may approve a request that a proposed project may provide an Alternative Measure in lieu of demonstration compliance with the numeric sizing standard, (where installation of Post-Construction TCMs are impracticable).

All projects shall be encouraged to minimize impervious surface through techniques such as those described in the Bay Area Storm Water Management Agencies Association's (BASMAA's) "Start at the Source Design Guidance Manual for Stormwater Quality Protection," 1999 edition, and the SCVURPPP Stormwater Handbook, including the use of permeable pavement, where appropriate.

Vegetative swales or other biofilters are recommended as the preferred choice for Post-Construction TCMs for all projects with suitable stormwater quality and landscape areas, because these measures are relatively economical and require limited maintenance. For projects where landscape based treatment is impracticable, or insufficient to meet required design criteria, other Post-Construction TCMs should be incorporated. Projects generating heavy pollutants ("Land Uses of Concern"), including expansion of such uses, shall include Post Construction TCMs and BMPs to treat project specific storm water pollutants as specified in this policy. All Post-Construction BMPs/TCMs must be maintained to operate effectively.

Hydromodification Policy 8-14

The Policy requires stormwater discharges from new and redevelopment projects that create or replace one acre or more of impervious surface to be designed and built to control project-related hydromodification, where such hydromodification is likely to cause increased erosion, silt pollutant generation, or other impacts to beneficial uses of local rivers, streams, and creeks. The Policy establishes specified performance criteria for Post-Construction hydromodification control measures and identifies projects which are exempt from hydromodification requirements.

Floodplain Ordinance – Municipal Code 17.08

Municipal Code 17.08 covers the requirements for building in various types of flood zones. This includes requirements for elevation, fill, flood passage, floodproofing, maximum flow velocities, and utility placement for multiple types of development including mobile homes, subdivisions, etc, located within a floodplain. The requirements are extensive and project-specific; therefore, the Code should be referenced for specific requirements.

Riparian Corridor Policy

The City of San José has a Riparian Corridor Policy promote the preservation of riparian corridors, the areas along natural streams, and how these corridors should be treated for consistency with the General Plan. The following guidelines are relevant for hydrology and water quality:[47]

Guideline 6A: Grading – The integrity of riparian corridors, in terms of width, linear continuity and native plant species composition, should be preserved unless no other alternative exists. No grading should be allowed within the riparian corridor except for approved construction projects for trails, bridges, interpretive facilities, recreation facilities, slope stabilization, flood improvements, or habitat improvements.

[47] *The Habitat Restoration Group & Jones and Stokes Associates. City of San José, March 1999: Riparian Corridor Policy Study.*

Guideline 6F: Flood Control Channel Maintenance – Vegetation removal in improved and/or constructed flood control channels should be in accordance with an approved operations and management plan for the flood control project area.

Guideline 6G: Maintenance of Natural Channels – In general, the streambed and stream banks of natural channels should be allowed to remain undisturbed. The removal of streambank vegetation within natural channels should be limited to specific fallen trees, root wads, and trees rooted on the channel bottom which clearly present an obstruction to natural streamflow and/or could significantly increase the likelihood of bank erosion.

Guideline 7A: Erosion Control/Slope Protection – In areas where the creek channel is deeply incised and banks are unstable, actively eroding, or identified as hazardous to public safety, banks should be stabilized/protected using biotechnical bank protection measures.

Guideline 7B: Water Quality/Drainage and Runoff – The direct discharge of industrial effluent into the riparian channel, corridor or floodplain is prohibited. Impervious surfaces should be graded to drain away from an adjacent riparian corridor to protect water quality and to minimize erosion potential. Direct surface drainage from all new development should be treated through the use of Best Management Practices (BMP's) used to control water quality. Outfalls should be fitted with energy dissipaters. Retention areas should be sited at least 25 feet from the edge of riparian areas.

Guideline 7C: Flood Control – Where armoring materials are necessary for flood and slope protection, planting pockets and terraces should be created as an integral part of the structures. Bypass channels or culverts are the preferred methods to improve flood flows and channel capacity. Pipe outlets should not be allowed to damage the natural channel. Channel widening may be considered when minimizing the disturbance of natural vegetation as much as possible. Maintenance roads and utilities should be incorporated with disturbed soils, such as levees.

Guideline 7D: Agricultural Runoff – Surface drainage from growing areas should not be permitted to run directly into the corridor; runoff from these areas should be directed to retention areas for infiltration and settlement prior to entry to the corridor.

San José's Green Vision

San José's Green Vision is a comprehensive strategy to show the world how environmental responsibility makes financial sense and stimulates economic opportunity. It includes 10 goals to serve as a roadmap to reduce the carbon footprint of the city by more than half within 15 years. One of these goals is to recycle or beneficially reuse 100% of San José's wastewater (100 million gallons per day). This will be accomplished through a combination of water conservation, expanded use of recycled water, and habitat protection.

San José's Green Building Policies

In 2001, the City Council of the City of San José first adopted a Green Building Policy (Policy No. 8-13), and in March 2007, City Council amended the Green Building Policy to mandate that City and Agency facilities over 10,000 square feet attain a LEED Silver certification through the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program, and to encourage green building in the private sector.

In April 2008, City Council adopted recommendations from the Santa Clara County Cities Association to recognize Build It Green's (BIG) GreenPoint Rated (GPR) and USGBC's LEED green building rating systems as reference standards for new residential and non-residential construction, and to incorporate the use of a green building checklist for planning applications. City Council adopted these recommendations in order to promote regional consistency, raise awareness of green building practices, and to make progress on Green Vision Goal No. 4.

The City Council adopted the Private Sector Green Building Policy (Policy No. 6-32) in October 2008. The policy requires that industrial, commercial, and residential projects achieve minimum green building performance levels using the City Council adopted reference standards. This policy applies to those development projects that first make application for a development permit to the Planning Division on or after January 1, 2009. The green building rating systems assign points based in part on installation of water efficient fixtures and landscaping, minimization of hardscape, and use of drought-tolerant native species.

3.3.2 Santa Clara Valley Water District

The Santa Clara Valley Water District operates as the flood control agency for the County. Their stewardship also includes creek restoration and pollution prevention efforts. All projects that could potentially affect the quantities of flows released to County watercourses, disturb creeks, alter creek geometry or that include development in floodplains must be approved by the SCVWD. The District role and responsibility in water supply and resources management is explored in detail in the Water Supply section of this report.

3.3.3 San Francisco Bay Conservation and Development Commission

The Bay Conservation and Development Commission (BCDC) has regulatory responsibility over development in San Francisco Bay and along the Bay's nine-county shoreline. It is necessary to obtain a BCDC permit prior to undertaking most work in the Bay or within 100 feet of the shoreline, including filling, dredging, shoreline development and other work. There are several different types of permit applications, depending on the size, location, and impacts of a project.

4. Project Analysis

4.1 Introduction

This section contains an analysis of the of potential runoff effects resulting from construction of the proposed development of the North Communications Hill area (the "Project") with regard to the hydrology and discharge flows to the affected drainage systems and relevant streams.

The Project site is located within the City of San Jose in the Communications Hill Specific Plan area, north of the existing KB Home Tuscany Hills development. (See Figure 4.2-1 below) The site is bounded by the Caltrain/Union Pacific railroad tracks on the north, Old Hillsdale Avenue to the east, the Tuscany hills development to the south, and the Mill Pond and Dairy Hill neighborhoods to the west.

Potentially affected water bodies include the Canoas Creek, a tributary of the Guadalupe River, the Guadalupe River, and Coyote Creek. The Guadalupe River and Coyote Creek discharge to the San Francisco Bay and Pacific Ocean. All of these water bodies have been designated by the San Francisco Regional Water Quality Control Board (Regional Board) as having beneficial uses.[48] Both the quantity and quality of flows from the Project site to these water bodies should be consistent with these beneficial uses and other national, state, and local policies.

This analysis is primarily related to the Project hydrology and concentrates on the design parameters of the proposed detention basins in the Project, the analysis of the existing and Project conditions, and any related flow related impacts. Report section 5.0 – Environmental Impacts, includes a summary of impacts relating to surface water and water quality.

4.2 Project Location

The entire Communications Hill Specific Plan area comprises approximately 900 acres of hilly land located approximately four miles south of downtown San José. The Plan Area is bounded by Curtner Avenue to the north, Monterey Road to the east, Capitol Expressway, Snell Avenue, and Hillsdale Avenue to the south, and Guadalupe Freeway (SR 87) to the west. The Oak Hill Cemetery is located adjacent to the northeastern boundary of the Plan area.

The proposed project site is within the Specific Plan Area near the top of the hill adjacent to the existing KB Home Tuscany Hills development. The site is generally bounded by the Caltrain/Union Pacific railroad tracks on the north, Old Hillsdale Avenue to the east, the Tuscany Hills development to the south, and the Millpond and Dairy Hill neighborhoods to the west. The gross acreage of the project site is approximately 312 acres, with a net acreage of approximately 250 acres (not including public parks dedication and public right-of-way). The site is vacant and comprised primarily of grassland. The residential/commercial portion of the site is approximately 79 gross acres, while the industrial property is approximately 55 gross acres.

[48] Regional Board. 2007. San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan). January 2007.

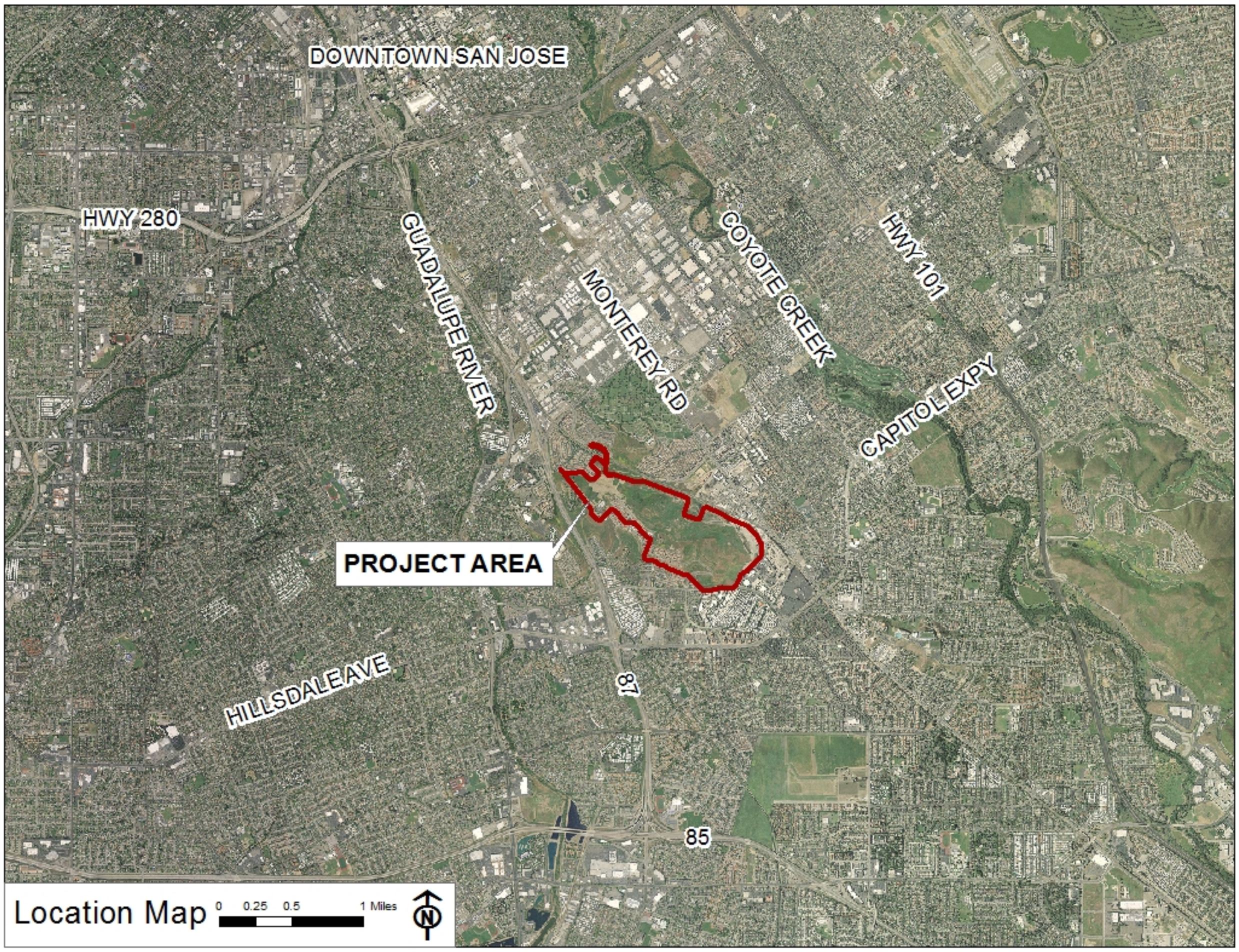

Figure 4.2-1. Location Map

4.3 Description of Project

The proposed Project is the build-out of the remaining approximately 2,200 residential units allowed within the Specific Plan Area, which is anticipated to occur over a 12-15 year timeframe. It also includes construction of up to 67,500 square feet of commercial/retail uses, parks, open space, trails, streets, stormwater facilities, and other associated supporting infrastructure. The SEIR will also provide program-level environmental review for the development of an elementary school, centrally located on approximately 4.2 acres.

The proposed Project also includes the future development of approximately 55 acres of industrial park uses in the eastern portion of the site near the base of Communications Hill adjacent to Old Hillsdale Avenue (refer to Figure 4.5-1). Details for this development have not yet been determined, although it is anticipated that it would have a Floor Area Ratio (FAR) of approximately 0.6. This would allow approximately 1.44 million square feet of industrial park development, consistent with the Specific Plan and the City's Zoning Ordinance. Proposed land uses are shown in Table 4.3-1 on the following page.

Table 4.3-1 - Proposed Land Uses

Land Use	Area in Acres
Residential	79.1
Mixed Use Commercial/Village Center*	3.1
Public Right-of-Way Dedication	43
Public Park	16
School	4.2
Future Industrial Park	55
Public/Private Open Space/Water Quality Facilities	111.5
Existing Right-of-Way	3.3
Total	**312.1**
*The 3.1 acres in the Village Center are included in the 79.1 acres of residential lands.	

The Project proposes the development of up to 2,200 residential units consisting of townhomes/flats, detached alley townhomes, detached row townhomes, podium condominiums, and apartments in the Village Center. Four podium condominium buildings are proposed as part of the project.

Uses within the commercial/retail area would include restaurants, shops, entertainment, and small office consistent with the Specific Plan. Approximately 16 acres of parks and 112 acres of open space will be constructed as part of the proposed Project.

There is an existing abandoned mercury mine and a former rock quarry within the boundary of the proposed Project site. The Project proposes to close these existing uses according to all local, state, and federal laws. An aggregate recycling center is currently using the quarry property which has been identified for future industrial park uses. It is anticipated that the recycling center will continue to operate until its Use Permit expires in approximately 10 years.

Infrastructure constructed as part of previous development on Communications Hill (primarily the Tuscany Hills project) was sized to accommodate the Proposed project, although the facilities would need to be extended onto the site. This infrastructure includes streets, water and sewer lines, and utilities (gas, electricity, cable, and telephone). An existing PG&E distribution/transmission line runs east/west through the Specific Plan Area. Major infrastructure elements are described below:

1. The Specific Plan includes the extension of Pullman Way from Communications Hill Boulevard to Monterey Road. The extension of Pullman Way was realigned as part of the Specific Plan amendments approved in 2002. The environmental analysis will include scenarios that analyze the conditions with and without the Pullman Way extension and possible alignments/designs for this roadway.
2. A vehicle bridge over the Caltrain/UPRR tracks will be constructed as part of Communications Hill Boulevard consistent with the Specific Plan.
3. The proposed Project will require stormwater filtration/detention basins to be located on the site. One basin system will be located in the northern portion, while the other would be constructed in the southeastern portion of the site near the existing Tuscany Hills basin. The existing basin may require modifications/expansion to accommodate run-off from the site. These basins would provide water quality benefits as well as detain water on-site during rain events prior to outfall to the City's stormwater system, consistent with the Specific Plan.
4. The site will be re-graded to repair the grading alterations that were done as part of the former quarry operations. The grading will be designed to more closely follow the previous pre-quarry and natural topography. This will generally result in streets and blocks with slopes similar to development on the south/southwestern facing slopes of the hill.

4.4 Surface Water Drainage

The Communications Hill Specific Plan area is divided into two major watersheds and several local drainage areas within the two watersheds. The south side of Communications Hill drains to the Guadalupe River watershed. The south side of the hill is divided into four separate drainage areas which drain to storm drain separate storm drain systems.

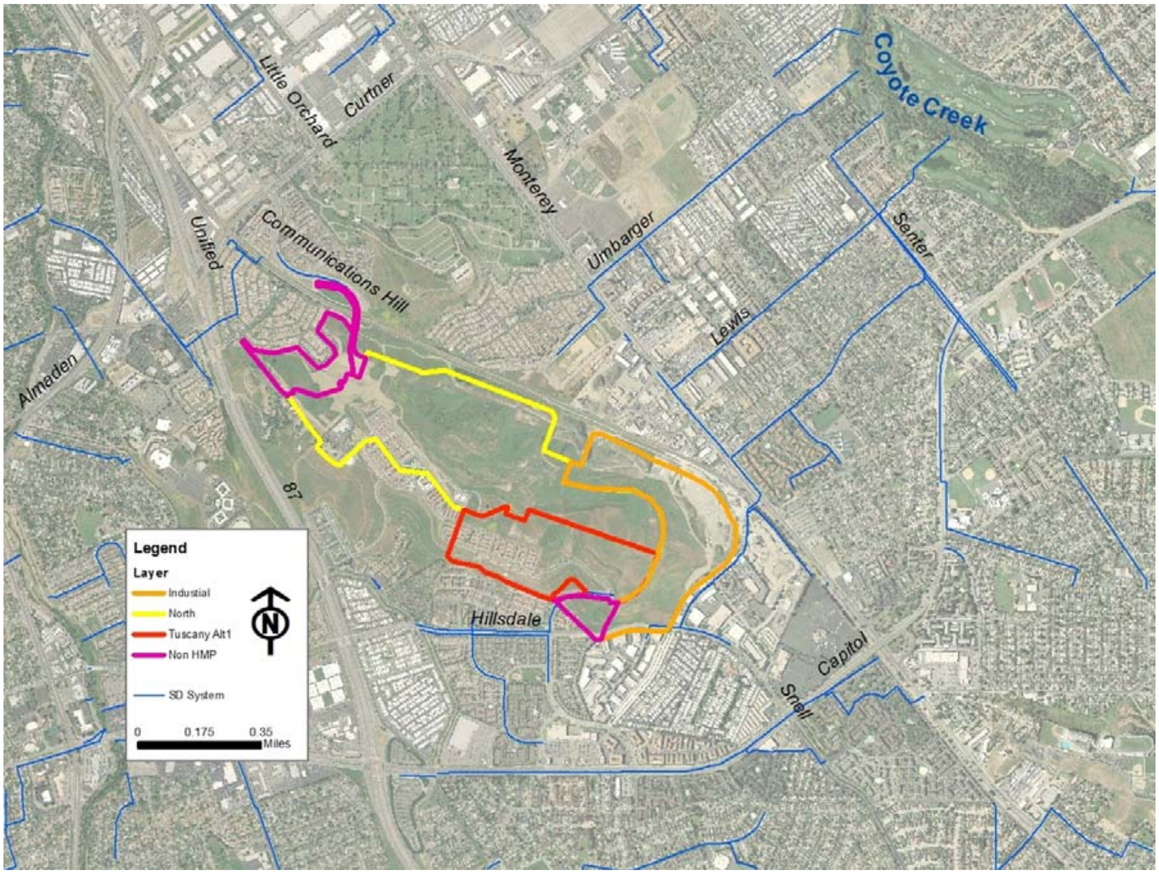

Figure 4.4-1. Site Drainage Areas

The western end of the Project site area drains down the hill toward the Mill Pond Mobile Home Park area and the mobile home park drainage system. The Mill Pond area is served by a City of San Jose stormdrain system connection to the Canoas Garden Avenue stormdrain which discharges to the Guadalupe River upstream of Malone Road. The Canoas Garden system also drains the existing Dairy Hill development which is within the Specific Plan area. The Canoas Garden system does not have capacity for the city standard 10-year design storm. The Dairy Hill development includes a detention basin to reduce peak flows into the Mill Pond and Canoas Garden drainage system to mitigate for potential induced flood effects. The Dairy Hill detention system was designed to mitigate for additional later development within the Project site based on the Specific Plan. The Dairy Hill detention system was constructed prior to the implementation of hydromodification plan (HMP) requirements in San Jose.

The northern portion of the existing Tuscany Hills development is served by a drainage system that discharges to Canoas Creek at Helzer Road. The system also serves the Helzer Ranch development on Helzer Road east of Highway 87. Canoas Creek is a tributary to the Guadalupe River and discharges to the river near Almaden Expressway. The Helzer Road drainage system includes a detention basin at Canoas Creek to mitigate for potential increased peak flows due to the Helzer Ranch and Tuscany Hills developments. The existing system also includes a temporary detention basin and stormwater pump station serving approximately three development blocks within the Tuscany Hills development which are on the north side of the watershed divide and would historically drain to the north toward Coyote Creek. The area was planned to be connected to a future drainage system as part of the development of the north side of the hill.

The southern portion of the existing Tuscany Hills development is served by a drainage system at Communications Hill Boulevard which drains to Hillsdale Boulevard. The Hillsdale Boulevard system drains to the west to Canoas Creek. The Tuscany Hills development includes an existing detention basin on the north side of Communications Hill Boulevard to serve the southern portion of the Tuscany Hills development and proposed Specific Plan development on the hillside above the detention basin. The existing detention basin was designed to mitigate for increased peak flows to the Hillsdale drainage system and Canoas Creek for the existing Tuscany Hills development and the proposed Specific Plan development within the Canoas Creek watershed. The Tuscany Hills detention system was constructed prior to the implementation of hydromodification plan (HMP) requirements in San Jose.

The last portion of the south side of the project area is an existing undeveloped area on the south side of Communications Hill Boulevard, which fronts on Hillsdale Boulevard east of the existing development. The area is a low-lying open space area below the elevation of Hillsdale Boulevard with no direct connection to the Hillsdale Boulevard storm drain system. Runoff from the hillside area below Communications Hill Boulevard collects on the north side of Hillsdale Boulevard either evaporates by evapotranspiration or infiltrates into the ground.

The north side of the Project site from the hill crest down to the UPRR is historically part of the Coyote Creek watershed. The area has been extensively disturbed by quarry operations on the site. Prior to the quarry operation, there were several cross culverts under the UPRR tracks which would drain the site into the private lands to the north. As part of the quarry operation, the railroad frontage area has been excavated into a relatively flat lower area and the hill slope has been steepened to extract rock for the quarry. The existing quarry site area does not have a low flow connection to a drainage system. The site runoff collects in a number of low lying areas within the quarry site and an approximately three acre retention basin area. After the quarry operations were ended, the past and current asphalt and concrete recycling operations have drained to a ditch system which connects to the retention basin. However, there are a number of low areas within the site which are not connected to the retention basin which collect local and hillside runoff and act as retention areas. The retention basin has been used as a source of dust control water for the quarry and concrete recycling operations on the site.

A portion of the hillside area west of the retention basin, which was not part of the quarry area, drains to the UPRR right of way and then west along the railroad toward the Mill Pond drainage system.

Although the quarry site had been separated from the downstream drainage systems for low flow conditions, the area has overflowed in particularly wet years when the onsite retention capacity was exceed. The overflows have discharged along the railroad toward the Mill Pond to the west and through an access underpass under the railroad near Pulman Way toward Monterey Road to the north.

There are City of San Jose stormdrain systems which serve the area north of the UPRR along Monterey Road. Both systems drain directly to Coyote Creek. The Lewis Road/Southside Drive system drains the area southeast of the project site including the development east of Old Hillsdale Avenue and portions of the development south of Hillsdale Boulevard east of Communications Hill Boulevard. The Lewis Road system also drains the area on the south side of Monterey Road from Southside Drive westerly to the Goble Lane development area. The existing Chateau La Salle Drive mobile home park, south of Monterey Road at Umbarger Road drains to a parallel stormdrain system in Umbarger Road.

Based on the Communications Hill Specific Plan and stormdrain analyses for Monterey Road, the project site was intended to drain to the Lewis/Southside and Umbarger drainage systems. However, no direct conection was designed or constructed to serve the site west of the existing Old Hillsdale Ave stormdrain at the east end of the site. Due to the existing slope of the site, the drainage pattern is toward the west and away from Old Hillsdale Avenue. Similarly, the UPRR and Monterey Road slope toward the west and northwest.

Figure 4.5-1. San Jose Storm Drain System Map

4.5 Drainage Design

Drainage design for the Project has followed a general sequence from local collector drainage facilities, Project level drainage system facilities, and finally offsite facilities. The local collector and drainage facilities are designed for City of San Jose drainage standards for a 10-year design storm. At the Project discharge to an existing or offsite drainage system, the Project includes detention basins and treatment basins to meet the Regional Water Quality Control Board discharge permit C.3 and hydromodification (HMP) requirements. This includes bioretention water quality treatment for urban runoff, and detention of peak flows to conform to existing or pre-project conditions to minimize potential increased erosion or scour in the downstream stream channels. The detention basin sizes for the HMP requirements were analyzed using the Bay Area Hydrology Model (BAHM), a continuous simulation computer model developed for the HMP analysis. In addition, the Project design included an evaluation of the potential effects of increase runoff flows for storms greater than the HMP requirement. The HMP requirements consider runoff for flows up to the 10-year flow. The existing and Project condition 10-year and 100-year flow conditions were modeled based on the County Storm drainage Design Manual to consider the effects of larger storms.

4.5.1 Tuscany Hills Drainage System

The existing Tuscany Hills detention basin was designed to detain post-development runoff from the Hillsdale Avenue drainage area on the south side of Communications Hill in San Jose. The detention basin was originally designed to limit post-development peak flows to the respective pre-development peak flows for both the 10-year and 100-year storm events. The basin includes a grassy swale to provide stormwater quality treatment. The existing Tuscany Hills development was constructed prior to the current HMP requirements and the basin was not designed to control or limit potential increased runoff for storms less than the undeveloped 10-year runoff.

The original detention basin design included capacity for additional development upstream of the basin to include an area equal to the existing undeveloped drainage area within the Canoas Creek watershed. Therefore, the remaining development in the Hillsdale Avenue drainage area could be constructed, and the existing detention basin would be adequate to meet the detention criteria of this development for the 10-year and 100-year peak flows. However, the existing detention basis would not meet the additional HMP requirements.

The proposed Project would include a modification of the existing detention basin to meet HMP requirements by modifying the basin's outlet works (i.e., the orifices and weirs) as well as by increasing the height of the berm on the lower side of the detention basin. However, the modified basin would still need to meet its original design function of mitigating the 10-year and 100-year peak flows while maintaining adequate freeboard in the basin. The basin would also be required to meet the HMP requirements associated with the new development which would drain to the detention basin.

The specific HMP regulations in San Jose limit runoff durations and peaks from a development to pre-project conditions between certain flowrates (the 10-year flow and 10% of the 2-year flow). For purposes of the HMP analysis, the existing Tuscany Hills development is considered "pre-project" since the hydromodification regulations have come into effect after their construction.

Figure 4.5-2 and Figure 4.5-3 show the pre- and post-project drainage areas for the Tuscany Hills detention basin. These drainage areas correspond to the portion of the Communications Hill development that will outlet to the Hillsdale Boulevard stormdrain to Canoas Creek.

The post-project drainage area for the Tuscany Hills detention basin is larger than the existing drainage area by 11.6 acres. The proposed Project includes the diversion of 11.6 acres of drainage area on the west end of the Project site which drains to the Mill Pond drainage system under existing conditions. Due to the difficulties of constructing a new HMP detention basin on the west slope of Communication Hill, it was considered more efficient to drain the majority of the development on the west slope of the hill around to the north side of the hill to the Coyote Creek watershed. The proposed addition to the Tuscany Hills system was intended to balance the overall watershed areas between the Guadalupe River drainage and the Coyote Creek watershed to minimize the diversion of watershed area between the two major streams. The HMP and peak flow analyses for the Tuscany Hills detention basin included the additional development area as an additional Project impact. Therefore, the Project condition included the additional development area, but the existing condition included the smaller existing area to avoid any increase flow to the Hillsdale Boulevard drainage system based on both the HMP and peak flow analyses.

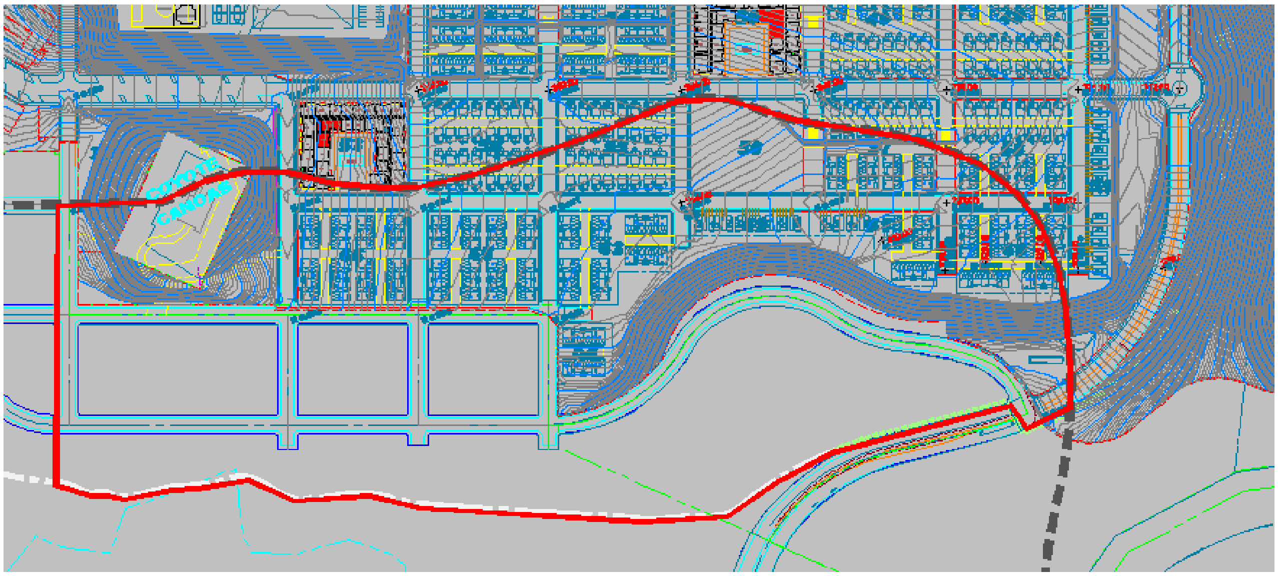

Figure 4.5-2. Pre-Project Drainage Area

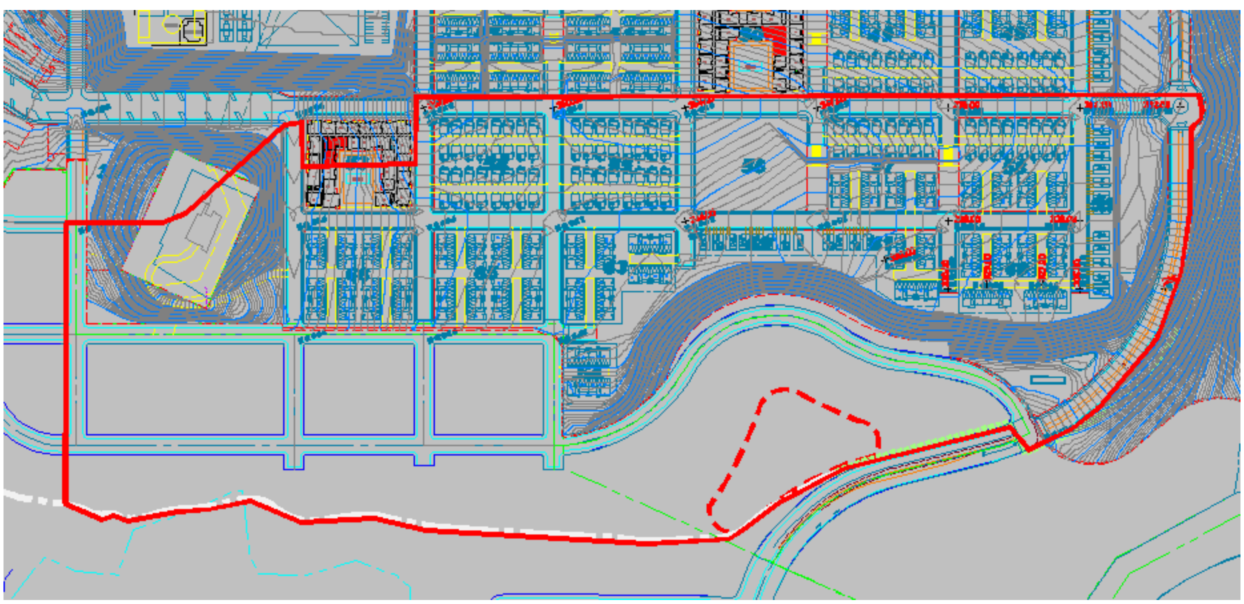

Figure 4.5-3. Post-Project Drainage Area

Hydrologic Model Setup

The original hydrologic analyses for the Tuscany Hills detention basin were based on the event-type (hydrograph) model HEC-1. The HMP analysis requires a continuous simulation of rainfall and runoff, so the Bay Area Hydrology Model (BAHM) has been used. Once adequate retrofit parameters were found to meet hydromodification requirements, the new basin parameters were input back into and run with HEC-1. The HEC-1 analysis was used to verify whether the altered basin would still meet detention requirements. Details of the BAHM analysis are described first, followed by a discussion of the revised HEC-1 runs.

BAHM Analysis

Land use input for the BAHM was estimated based on the proposed site plan dated 4/16/13. Drainage areas were based on proposed stormdrain locations and slope directions and available AutoCAD contours.

The BAHM requires the following input to model the drainage subbasins:

- Project location, to estimate rainfall data;
- Areas of subbasin land uses, to account for rainfall-runoff response;
- Hydrologic soil type for pervious land uses (choice of A, B, or C/D soils);
- Slope of identified land uses (varies from flat (0-5%) to very steep (>20%).

The model then calculates a time-of-concentration based on the input areas of the subbasins, assuming they are square, and with the identified slope range. This time-of-concentration is then used with the land use parameters to estimate runoff peaks for various rainfall inputs.

A project location was chosen in BAHM based on the actual Project location and the Santa Clara County map. Choosing this location indicates a mean annual precipitation equivalent to that at the San Jose gage. Areas of land uses by subbasin were based on available acreages, as detailed in Table 4.5-1 below. All parameters are for hydrologic type C or D soils, which are grouped together in BAHM, and have varying slopes. For the breakdown of impervious areas, roads were assumed to account for 15%, roof area for 65%, driveway for 5% and sidewalks for 5% for the development areas. Although BAHM has slightly different hydrologic parameters for each of these land uses, some variances in their values should not significantly affect the results.

Table 4.5-1 - Drainage Subbasin Areas (acres)

		Area (ft^2)	Area (ac)	Slope	Grass	Urban	Road	Roof	Drive way	Side walk
EX	EX Development	546735	12.55	5-10%		1.26	1.88	8.16	0.63	0.63
	Comm Hill	178358	4.09	>20%	3.28		0.82			
	Hillside	820635	18.84	>20%	16.96		1.88			
	Proj Development	719006	16.51	0-5%	16.51					
PROJ	EX Development	544108	12.49	5-10%		1.25	1.87	8.12	0.62	0.62
	Comm Hill	215753	4.95	>20%	3.96		0.99			
	Hillside	1003932	23.05	>20%	20.74		2.30			
	Proj Development	1004737	23.07	0-5%		2.31	3.46	14.99	1.15	1.15

HEC-1 Analysis

Once adequate basin parameters to meet hydromodification requirements were found through the BAHM analysis, the stage-storage-discharge curve for the optimum detention basin was inserted into HEC-1. The land use varies from that of the BAHM analysis for the pre-project condition. The existing Tuscany Hills development and detention basin are considered “pre-project” for the HMP analysis since the HMP regulations have come into effect after their construction. For the purposes of flood control, the existing detention basin was built to mitigate increased flood discharges for the now existing Tuscany Hills development and needs to do the same for the propose development. The pre-project condition for the HEC-1 analysis is therefore not the existing condition but the historic condition, before the Tuscany Hills development.

The SCS method per Santa Clara County standards was utilized for the HEC-1 analysis. The lag time for the historic condition was calculated as 0.105 hours. The post-project lag time was 0.161 hours. The post-project lag time is longer because the addition of stormdrain increases the travel length and decreases the slope. The 10-year and 100-year events were run to ensure that the modified basin mitigates the high flow runoff effectively.

Hydrologic Model Results

Note that the BAHM analysis focuses on the detention basin outlet, whereas the HEC-1 analyses focus on the entire Hillsdale Avenue drainage area. Therefore, comparisons for the BAHM results are made at just the detention basin, but the HEC-1 comparisons are made at both the detention basin and at the junction where the detention basin discharge converges with outflow from the Tuscany Lower area. This junction is referred to as “K3” in the HEC-1 models.

Hydromodification Results

The BAHM model was used to optimize an stage-storage-discharge curve to compare pre- and post-project scenarios.

Table 4.5-2 presents the final stage-storage-discharge curve used. The new project curve thus allows more volume to be stored (detained) by raising the height of the basin dam to increase the available volume.

The recommended outlet works are:

- 36-inch diameter riser, 8 feet tall (elev 221);
- 4.75-inch diameter orifice at basin invert (elev 213);
- 1.5-foot wide by 3-foot high riser notch (notch invert at elev 218);
- Overflow weir raised to elev 221.4 feet (1.4-ft increase) and remainder of the dam to a height to provide the desired amount of freeboard

Table 4.5-2 - Potential Project Detention Basin Operation (SSD Curve)

Stage (ft)	Storage (ac-ft)	Discharge (cfs)
213	0	0.00
214	0.01	0.59
215	0.08	0.84
216	0.31	1.03
217	0.80	1.19
218	1.57	1.33
219	2.52	6.45
220	3.56	15.7
221	4.69	27.6
222	5.90	56.9

BAHM calculates annual peaks for various storm events. Table 4.5-3 presents the calculated 10% of the 2-year and 10-year peak flow results for both the pre- and post-project simulations. With the recommended changes to the basin outlet works, the post-project peaks are brought below the pre-project peaks at the outlet of the detention dasin for the 2-year and 10-year events.

Table 4.5-3 – BAHM Flow Results

	10% of 2-year (cfs)	2-year (cfs)	10-year (cfs)
Pre	1.42	14.2	23.37
Post		22.6	34.79
Mitigated		11.0	19.64

Figure 4.5-4 shows the entire flow-duration curves for both pre-project (blue) and post-project (red) output at the detention dasin outlet. As the figure indicates, the modified detention basin allows the post-project flows to match the pre-project flows along the flow-duration curve between the regulated limits.

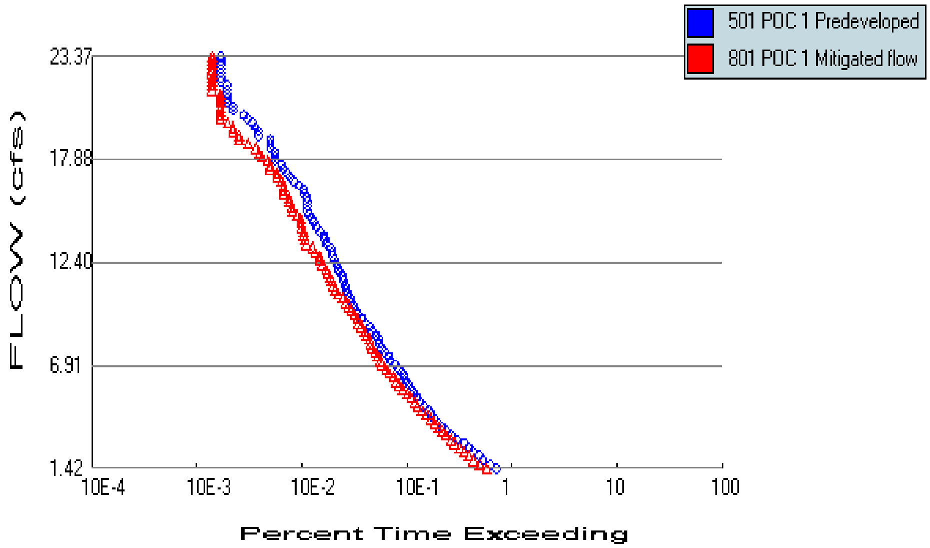

Figure 4.5-4. Output of Detention Basin for Project

It is also important to note that the altered basin significantly affects the water levels in the detention basin. Both the BAHM and the HEC-1 models indicate a maximum water surface elevation of approximately 221.34 feet. Unobstructed, this basin should take less than a day to drain.

HEC-1 Results

The HEC-1 models produce DSS files that store requested output data. Relevant data for the current analysis was exported from the DSS files for each run and setup in an MSExcel spreadsheet for analysis and graphical display. Table 4.5-4 includes the results of the HEC-1 runs and indicates the 10-year and 100-year peak flow rates, as well as the peak stages reached in the Detention Basin.

Table 4.5-4 - HEC-1 Flow Results

Storm Event	10-Year	100-Year
Historic Flows (cfs)	38	60
Post-Project Unmitigated Flows (cfs)	42	75
Post-Project Mitigated Flows (cfs)	21	38
Peak Water Surface Elevation (ft)	220.47	221.34

As summarized in Table 4.5-3, the peak flows from the Detention Basin adequately mitigate the post-project runoff for the 10-year and 100-year events.

4.5.2 No Detention Basin Areas

There Project drainage areas were identified which would not require detention basins for HMP or peak flow control. The areas are shown in Figure 4.4-1. Two of the areas do not include development, although there may be some grading required. The first is the area along Hillsdale Boulevard east of the existing Tuscany Hills development and below Communications Hill Boulevard. The second area with no development is the hillside area below the development on the westerly end of the Project above the Mill Pond mobile home park.

The third area which would not require a detention basin is the extension of Dairy Hill Boulevard across the UPRR to link up to Communications Hill Boulevard on the Project site. The portion of the new roadway below the new watershed boundary to the northern area would drain along the roadway across the UPRR bridge into the Dairy Hill development area. The runoff would drain to the existing Dairy Hill detention basin which was designed for peak flow reduction to include the larger development area shown in the original Specific Plan. The estimated impervious area associated with the roadway is greater than 1.0 acres and would normally require HMP controls for the Project condition. However, the proposed modifications to the Tuscany Hills detention basin are designed to account for a diversion of over 10 acres of drainage area which would offset the need for HMP requirements for the smaller area of new roadway.

4.5.3 North Development Area

The North Development Area includes two main drainage areas: the project residential/commercial development area which is expected to proceed in the near future, and the industrial development area which is expected to proceed at a later time. For the purposes of the drainage analyses, the two areas were considered separate Project drainage areas with separate drainage requirements and separate detention basins.

The hydrologic analysis for the future industrial area includes a separate HMP detention basin for the proposed future industrial area for several reasons. First, the existing ground elevations on the industrial site are lower than the proposed grade elevations for the basin area for the residential/commercial development, which may constrain the grading requirements for the future industrial development if the area needed to drain to a detention basin designed for the residential/commercial development area. Second, the Specific Plan and prior drainage analyses have identified the industrial area (or a similar portion of Communications Hill) would drain to the Southside Drive drainage system. The current analyses have identified a Project to include the industrial area in the Umbarger Road drainage system, but the City may prefer some other distribution of the drainage areas. Preliminary analysis of the Lewis Road/Southside Drive drainage system has shown less than 10-year design capacity for the existing stormdrain system. However, the City has started a new stormdrain master plan process which may modify the service areas of the drainage systems before the construction of the industrial area. Third, a major component of the detention requirements is the HMP requirement. The RWQCB updates the stormwater permit approximately every five years. Therefore there will be one or more revisions of the HMP requirements before construction of the industrial area which may affect the design of the detention system.

4.5.4 North Residential / Commercial Area

The proposed detention basin for the north residential/commercial area was designed to detain post-development runoff from the residential/commercial development are on the north side of Communications Hill which would drain northward to Coyote Creek. The detention basin is designed to limit post-development peak flows to the respective pre-development peak flows for both the 10-year and 100-year storm events for flood control, as well as limit runoff durations and peaks from a development to pre-project conditions between the 10-year flow and 10% of the 2-year flow for HMP purposes. The flood control peak flow analysis and hydraulic analysis of the Umbarger Road drainage system is described later in this report.

For purposes of the HMP analysis, the existing development within the drainage area is considered "pre-project" since the HMP regulations have come into effect after their construction. This includes only the three blocks of the Tuscany Hills development served by the existing temporary detention basin and pump station. The area is historically part of the north drainage area which drains to Coyote Creek. The temporary basin was constructed to allow the phased development of the overall Specific Plan development.

Figure 4.5-5 and Figure 4.5-6 show the pre- and post-project drainage areas for the north residential area. These drainage areas correspond to the portion of the Communications Hill development that will outlet to the North Basin which in turn will outlet to the Umbarger Road stormdrain system and to Coyote Creek.

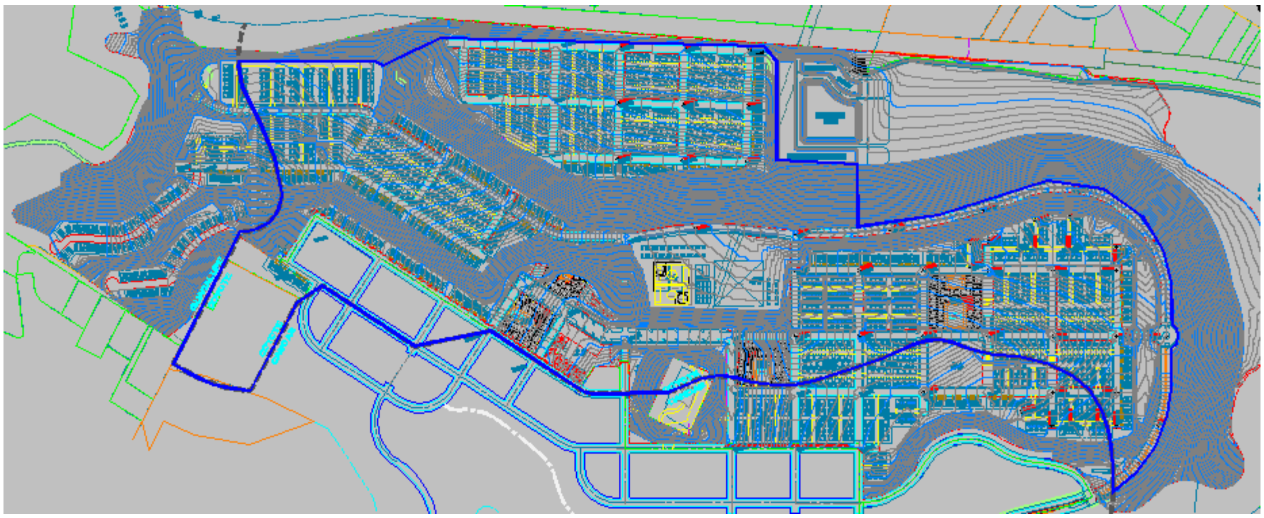

Figure 4.5-5. Pre-Project Drainage Area

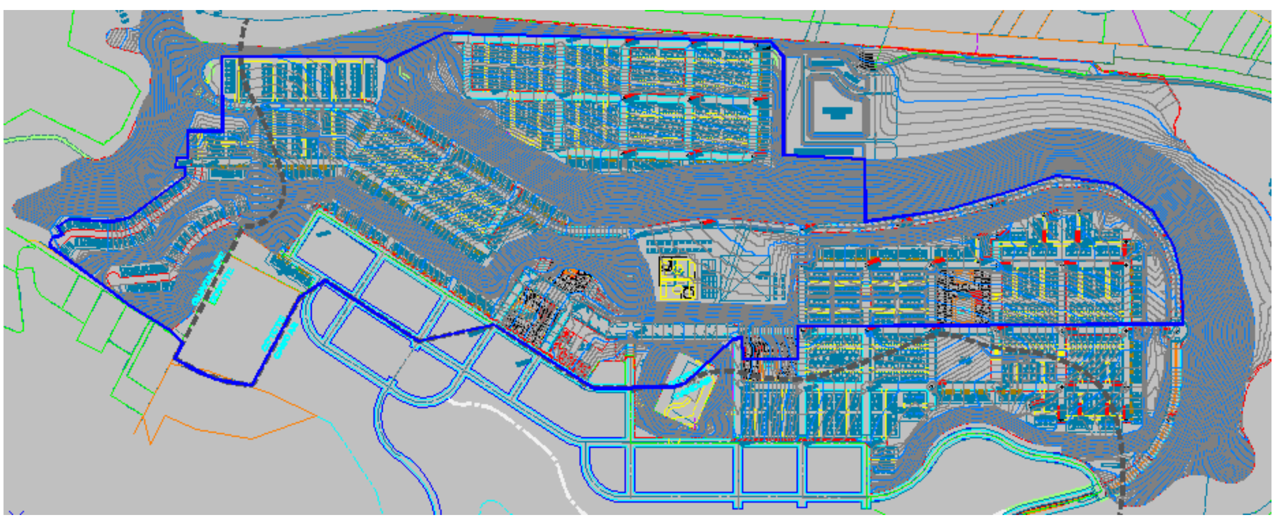

Figure 4.5-6. Post-Project Drainage Area

BAHM Analysis

Land use input for the BAHM was estimated based on the proposed site plan dated 4/16/13. Drainage areas were based on proposed stormdrain locations and slope directions and available AutoCAD contours.

Drainage Subbasins

The BAHM requires the following input to model the drainage subbasins:

- Project location, to estimate rainfall data;
- Areas of subbasin land uses, to account for rainfall-runoff response;
- Hydrologic soil type for pervious land uses (choice of A, B, or C/D soils);
- Slope of identified land uses (varies from flat (0-5%) to very steep (>20%).

The model then calculates a time-of-concentration based on the input areas of the subbasins, assuming they are square, and with the identified slope range. This time-of-concentration is then used with the land use parameters to estimate runoff peaks for various rainfall inputs.

A p0roject location was chosen in BAHM based on the actual Project location and the Santa Clara County map. Choosing this location indicates a mean annual precipitation equivalent to that at the San Jose gage. Areas of land uses by subbasin were based on available acreages, as detailed in Table 4.5-5 below. All parameters are for hydrologic type C or D soils, which are grouped together in BAHM, and have varying slopes. For the breakdown of impervious areas, roads were assumed to account for 15%, roof area for 65%, driveway for 5% and sidewalks for 5% for the development areas. For the school site, the breakdown is 5% road, 25% roof and 20% parking. Although BAHM has slightly different hydrologic parameters for each of these land uses, some variances in their values should not significantly affect the results.

Table 4.5-5 - Drainage Subbasin Areas (acres)

		Area (ft^2)	Area (ac)	Slope	Grass	Urban	Road	Roof	Drive way	Side walk	Parking
EX	EX Development	570460	13.10	0-5%		1.31	1.96	8.51	0.65	0.65	
	Comm Hill	113646	2.61	>20%	2.09		0.52				
	Hillside	6117898	140.45	>20%	70.22						
				0-5%	70.22						
PROJ	EX + Proj Development	4339140	99.61	0-5%		9.96	14.94	64.75	4.98	4.98	
	Comm Hill	139886	3.21	>20%	2.57		0.64				
	Hillside	2098115	48.17	>20%	48.17						
	School	349758	8.03	0-5%		4.01	0.40	2.01			1.61

Hydromodification Results

The BAHM model was used to optimize a basin footprint. Two basin scenarios were optimized based on different depths. One had maximum storage depth of 5 feet, which is a typical depth for safety and aesthetics. A second basin had a maximum storage depth of 8 feet which accommodates the lowest invert possible while still maintaining gravity outflow. To further decrease the required footprint, the BAHM model includes the planned BMP storage basin and bioretention cell. The sizing for these two facilities is as follows:

BMP Storage Basin:

- Bottom dimensions = 150 ft by 350 ft (top 180 ft by 380 ft, 1.57 ac)
- 5 ft deep, 3:1 side slopes
- 4-ft riser, 100-in diameter, 6-in orifice at basin bottom

Bioretention Cell:

- Bottom dimensions = 118 ft by 118 ft (top 133 ft by 133 ft, 0.41 ac)
- 4-in underdrain, standard soil sections
- 1-ft riser, 48-in diameter

The designs for the two alternative HMP basins are as follows:

Option 1 - 5-ft Deep Basin:

- Bottom dimensions = 290 ft by 290 ft (top 320 ft by 320 ft, 2.35 ac)
- 5 ft deep, 3:1 side slopes
- Riser:
- 2.8-ft tall
- 30-in diameter
- 0.5 ft by 0.5 ft notch
- 9-in orifice at basin bottom

Option 2 - 8-ft Deep Basin:

- Bottom dimensions = 180 ft by 180 ft (top 228 ft by 228 ft, 1.19 ac)
- 8 ft deep, 3:1 side slopes
- Riser:
    - o 6.8-ft tall
    - o 33-in diameter
    - o 1.7 ft wide by 4.0 ft tall notch
    - o 8.5-in orifice at basin bottom

BAHM calculates annual peaks for various storm events.

Table 4.5-6 presents the calculated 10% of the 2-year and 10-year peak flow results for both the pre- and post-project simulations. With the recommended basin outlet works, the post-project peaks are brought below the pre-project peaks at the outlet of the detention basin for the 10% of the 2-year and 10-year events.

Table 4.5-6 – BAHM Flow Results

	10% of 2-year (cfs)	2-year (cfs)	10-year (cfs)
Pre	3.55	35.50	6.77
Post		41.93	77.95
Mitigated (5-ft Basin)		16.41	56.42
Mitigated (8-ft Basin)		24.33	57.73

Figure 4.5-7 and Figure 4.5-8 show the entire flow-duration curves for both pre-project (blue) and post-project (red) output at the detention basin outlet for both basin alternatives. As the figures indicate, the modified detention basins allow the post-project flows to match the pre-project flows along the flow-duration curve between the regulated limits.

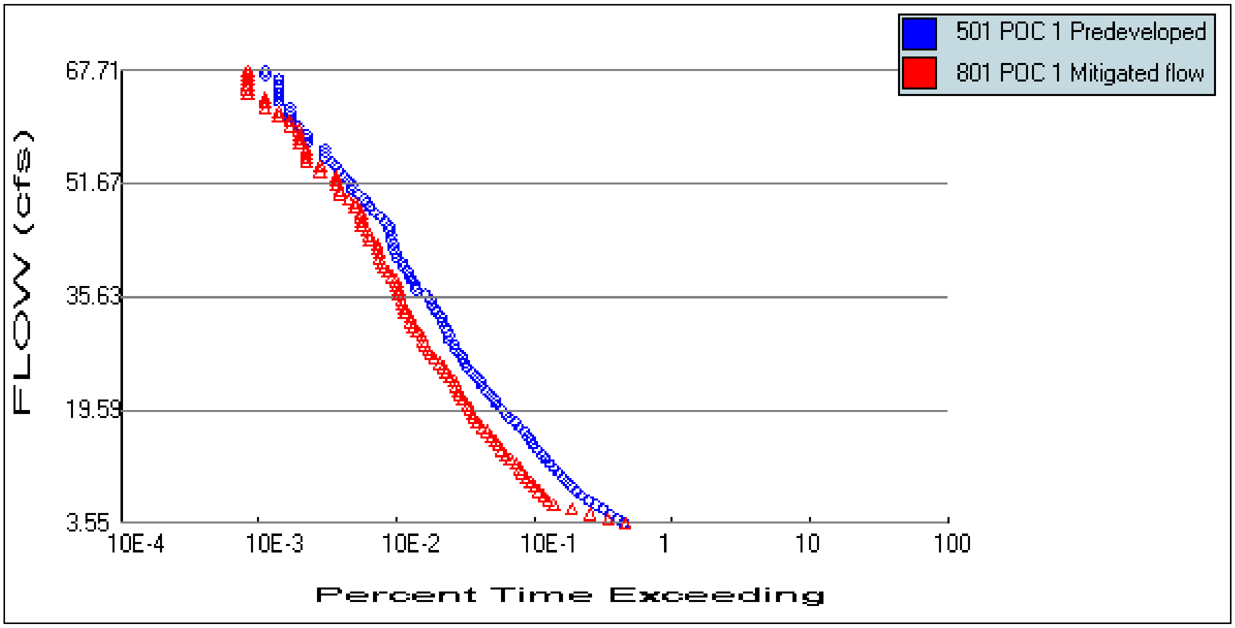

Figure 4.5-7 - Output of 5-ft Detention Basin for Project

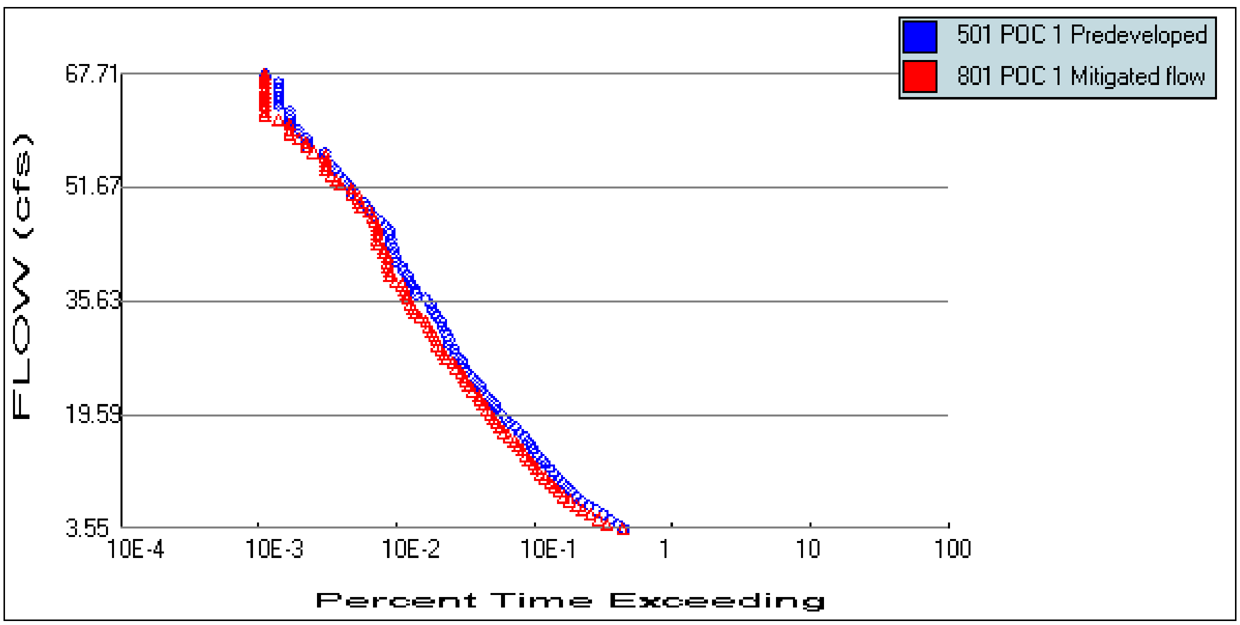

Figure 4.5-8. Output of 8-ft Detention Basin for Project

Either basin alternative will take less than a day to drain.

4.5.5 Industrial Area

The industrial area detention basin was designed to detain post-development runoff from the industrial area of the Project site. The detention basin is designed to limit post-development peak flows to the respective pre-development peak flows for both the 10-year and 100-year storm events for flood control as well as limit runoff durations and peaks from a development to pre-project conditions between the 10-year flow and 10% of the 2-year flow for hydromodification (HMP) purposes. Figure 4.5-9 shows the pre- and post-project drainage areas. This drainage area corresponds to the portion of the Communications Hill development that will drain to the Industrial Area basin which in turn will discharge to the Umbarger Road stormdrain and Coyote Creek.

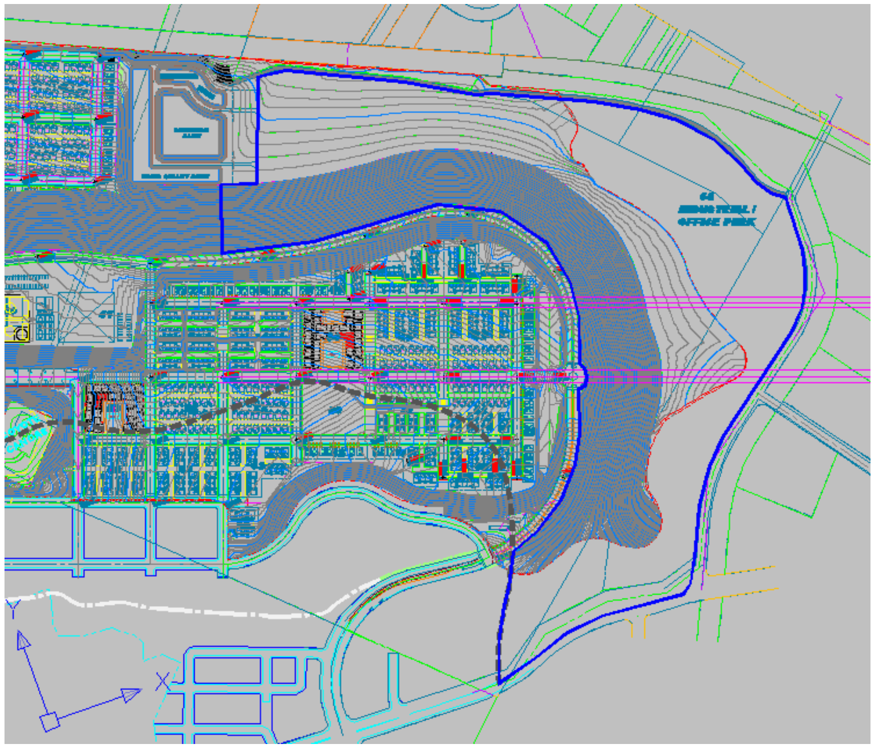

Figure 4.5-9. Pre and Post Project Drainage Area

BAHM Analysis

Land use input for the BAHM was estimated based on the proposed site plan dated 4/16/13. Drainage areas were based on proposed stormdrain locations and slope directions and available AutoCAD contours.

Drainage Subbasins

The BAHM requires the following input to model the drainage subbasins:

- Project location, to estimate rainfall data;
- Areas of subbasin land uses, to account for rainfall-runoff response;
- Hydrologic soil type for pervious land uses (choice of A, B, or C/D soils);
- Slope of identified land uses (varies from flat (0-5%) to very steep (>20%).

The model then calculates a time-of-concentration based on the input areas of the subbasins, assuming they are square, and with the identified slope range. This time-of-concentration is then used with the land use parameters to estimate runoff peaks for various rainfall inputs. A project location was chosen in BAHM based on the actual Project location and the Santa Clara County map. Choosing this location indicates a mean annual precipitation equivalent to that at the San Jose gage. Areas of land uses by subbasin were based on available acreages, as detailed in Table 4.5-7 below. All parameters are for hydrologic type C or D soils, which are grouped together in BAHM, and have varying slopes. For the breakdown of impervious areas, roof was assumed to account for 60%, driveway for 5% and parking for 30% for the development areas. Although BAHM has slightly different hydrologic parameters for each of these land uses, some variances in their values should not significantly affect the results.

Table 4.5-7 - Drainage Subbasin Areas (acres)

		Area (ft^2)	Area (ac)	Slope	Grass	Urban	Road	Roof	Drive way	Side walk	Parking
EX	Hillside	1413035	32.44	>20%	32.44						
EX	Flatland	1736042	39.85	0-5%	39.85						
PROJ	Hillside	1413035	32.44	>20%	32.44						
PROJ	Industrial	1736042	39.85	0-5%		1.99		23.91	1.99		11.96

Hydromodification Results

The BAHM model was used to optimize a basin footprint. The basin was optimized based on a maximum storage depth of 5 feet, which is a typical depth for safety and aesthetics.

The design for the HMP basin is as follows:

- Bottom dimensions = 220 ft by 220 ft (top 250 ft by 250 ft, 1.43 ac)
- 5 ft deep, 3:1 side slopes
- Riser:
    - 4.1-ft tall
    - 48-in diameter
    - 1.5 ft h by 2.0 ft w notch
    - 5.5-in orifice at basin bottom

BAHM calculates annual peaks for various storm events. Table 4.5-8 presents the calculated 10% of the 2-year and 10-year peak flow results for both the pre- and post-project simulations. With the recommended basin outlet works, the post-project peaks are brought below the pre-project peaks at the outlet of the detention basin for the 10% of the 2-year and 10-year events.

Table 4.5-8 – BAHM Flow Results

	10% of 2-year (cfs)	10% of 2-year (cfs)	10-year (cfs)
Pre	1.51	15.08	30.65
Post		25.53	39.10
Mitigated		8.93	25.93

Figure 4.5-10 shows the entire flow-duration curves for both pre-project (blue) and post-project (red) output at the detention basin outlet for both basin alternatives. As the figure indicates, the modified detention basins allow the post-project flows to match the pre-project flows along the flow-duration curve between the regulated limits.

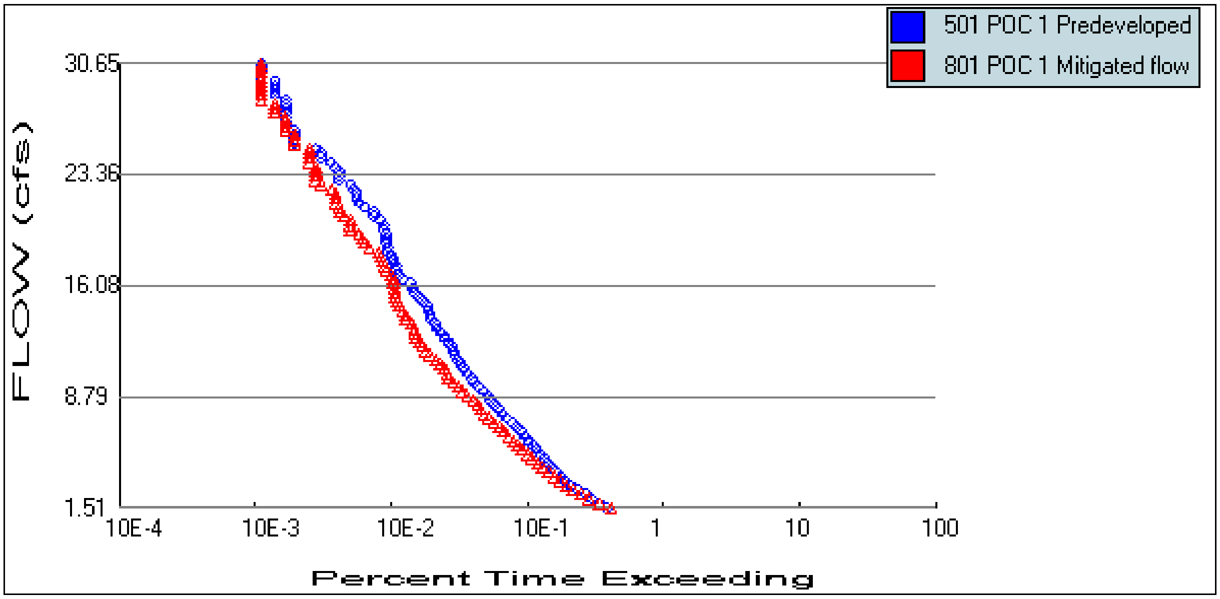

Figure 4.5-10. Output of Detention Basin for Project

The basin will take a day and a half to drain.

4.6 Umbarger Road Drainage System

The Umbarger Road drainage system was analyzed for existing and Project conditions to consider the potential effects of the Project on the drainage system including potential flood conditions. The proposed Project development includes two detention basins to meet the project HMP requirements, and to attenuate the 10-year and 100-year peak runoff from the site and into the Umbarger System. Two design storm patterns were modeled, the 24-hour 5-minute pattern from the Santa Clara County Drainage Manual and the Santa Clara Valley Water District's 72-hour 1-hour pattern for the Coyote Creek watershed. The 24-hour storm was used to evaluate the stormdrain system capacity an potential street flow or ponding conditions. The 72-hour storm was used to evaluate the potential effects of the Project condition discharge to Coyote Creek. Due to the large watershed for Coyote Creek and the storage effects of the Anderson Dam reservoir upstream on Coyote Creek, the Santa Clara Valley Water District, and other agencies have used a longer 72-hour storm to model the watershed.

4.6.1 Drainage Area

Existing System

The existing storm drainage system along Umbarger Road drains roughly 211-acres. The analysis assumed that during the 10-year and 100-year 24-hour events, no water from the Communications Hill site would flow over or under the UPRR to reach the Umbarger System. City of San Jose (City) drainage system maps, GIS data from the Santa Clara Valley Water District (SCVWD), Caltrans drainage studies, and field observations were used to estimate existing drainage catchments. Figure 4.6-1 shows the existing catchments used in the existing conditions analyses.

The existing system serving the 32-acres of the Goble Lane region shown in Figure 4.6-1 were assumed to drain to the Lewis Road system for the stormdrain hydraulic analyses. However, the drainage system would be affected by the proposed Project and therefore, the area was included in the existing conditions analyses. The Goble Lane region, which includes the existing development along Esfahan Drive, was considered in the existing condition surface flow analyses.

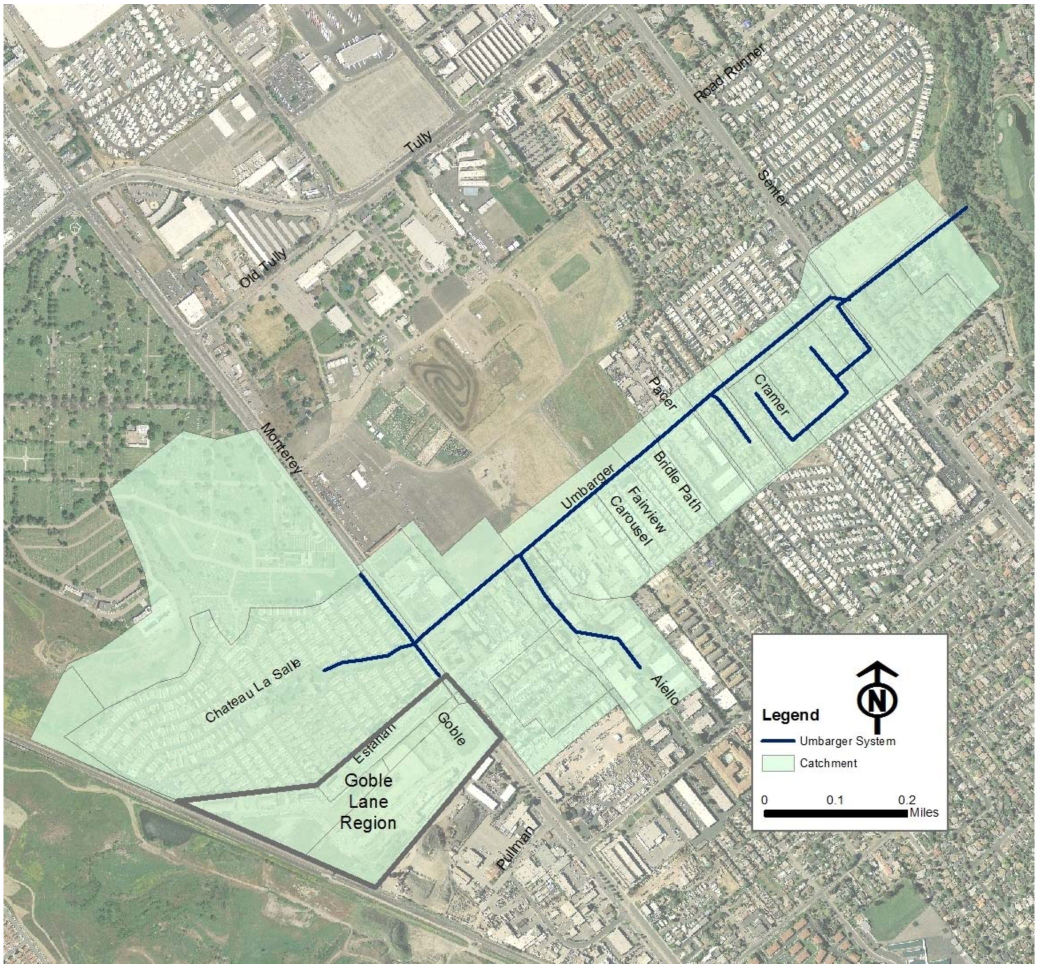

Figure 4.6-1. Existing Drainage Area

Proposed System

Proposed conditions analysis includes the drainage area from the existing conditions analyses along with approximately 230-acres for the Communications Hill drainage area. This includes the North and Industrial areas shown in Figure 4.4-1. The post development runoff from those areas will be routed through two HMP basins and discharged to the Umbarger System via a 42-inch pipe along a new drainage easement west of Pullman Way. Figure 4.6-2 shows the additional drainage area, the HMP basin locations and connection to existing storm drain system.

Because the proposed stormdrain connection from the Project site to the Umbarger system would follow Monterey Road in front of the Goble Lane area, the new stormdrain would conflict with the existing Goble Lane stormdrain in Monterey Road which drains southward toward Lewis Road. Therefore, the proposed Project was assumed to collect the Goble Lane drainage and add the additional runoff to the Umbarger system at Monterey Road at Esfahan Drive. The City may want to consider the potential advantages of an interconnection between the two systems in the future, but the full diversion of the Goble Lane area was considered a conservative assumption for the Project condition.

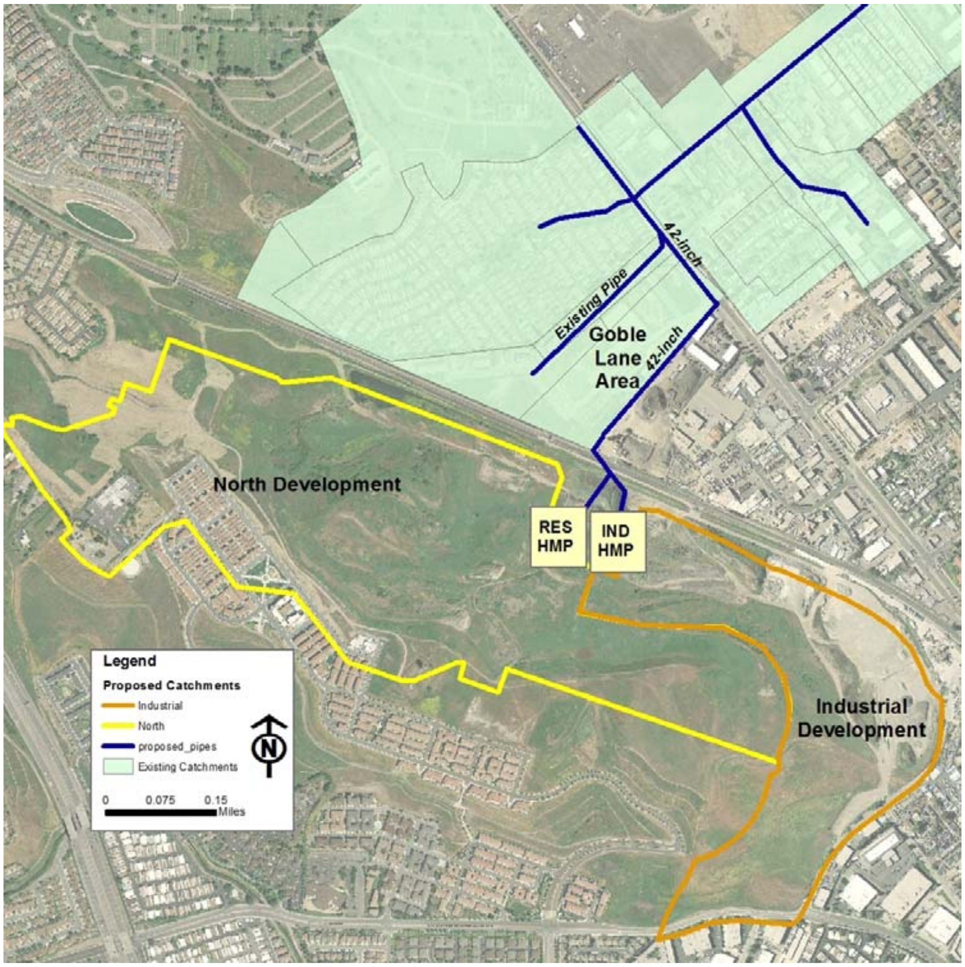

Figure 4.6-2. Proposed Drainage Area and System.

4.6.2 System Performance

Existing Conditions

The stormdrain system and street flow conditions were modeled using the 10-year and 100-year 24-hour storm events for the existing storm drain pipe network using the MIKE-URBAN (MOUSE) storm water modeling software. This model couples the 1-dimensional pipe network to a 2-dimensional surface model (MIKE-21). This approach helps quantify and visualize the impacts of adding the proposed development runoff to the existing Umbarger system. The SCS unit hydrograph methodology was used to estimate runoff hydrographs from each basin. SCS curve numbers from the Santa Clara Valley Water District's Drainage Manual (2006, Schaaf & Wheeler) were used. These curve numbers are based on NRCS soil data and existing land uses.

The system model does not include the entire drainage system, but models the City stormdrains in the street. The model does not include private onsite drainage facilities or street inlets. Therefore, the model can create unrealistic surface flow results if the inlet capacity is poorly defined. The existing system inlet capacity for the individual sub areas added to the system was assumed to be equal to the estimated 10-year peak runoff rate. The City stormdrain standard for street inlets and onsite drainage systems is the 10-year design storm. Although several portions of the stormdrain system predate the City 10-year design standard and may not have 10-year capacity drainage system, the assumption of a 10-year inlet capacity was considered reasonable.

The models also assume no runoff or surface flows from other drainage systems, such as the Lewis Road system, enter the Umbarger system study area. Therefore, the depth and extent of the surface flows may underestimate the existing and project conditions, but the potential effects of the Project would be evaluated based on the change due to the project and not the absolute value of the depths or flow rates. As noted previously, the Goble Lane area was included in the surface flow analysis because it could be affected by the Project due to the proposed drainage system connection to the Umbarger system. For the surface flow analysis, the Goble Lane area was assumed to discharge to the Lewis Road system up to the 10-year inlet capacity and flow in excess of the assumed inlet capacity would become surface flow and contribute to the surface flow modeled for the Umbarger system. For the Project condition, the Goble Lane area would also contribute pipe flow directly to the Umbarger system, as well as surface flows.

Figure 4.6-3 shows the pipe network system used in the MOUSE model for existing conditions. Based on the Mouse hydraulic analysis the existing Umbarger system has more than 10-year design storm capacity. No portion of the drainage system overflowed into the street for the 10-year storm. Figure 4.6-4 shows the profile of the Umbarger system for the existing condition 10-year storm. The hydraulic grade line is above the top of pipe, and the system does reach pressure flow, but the hydraulic grade line does not approach the ground surface.

Figure 4.6-3. Existing Conditions MOUSE Model Layout

The Umbarger system experiences localized regions of surcharging and inlet capacity limitations during the 100-year event. A total of 2.4 cfs spills from the pipe system at three nodes, while a total of 152 cfs of runoff is diverted to surface flow in 13 catchments due to inlet capacity restrictions. The inlet capacity restrictions include both inlets and the 10-year design capacity assumed for private stormdrain systems. Figure 4.6-5 shows the existing condition model hydraulic grade line profile along the Umbarger system during the peak of the 100-year storm. Figure 4.6-6 shows the maximum flooding depths in the study area. A static water level of 123.75-feet (NAVD) was assumed in Coyote Creek, based on FEMA published 100-year profiles, while a 10-year level of 121.75-feet was used.

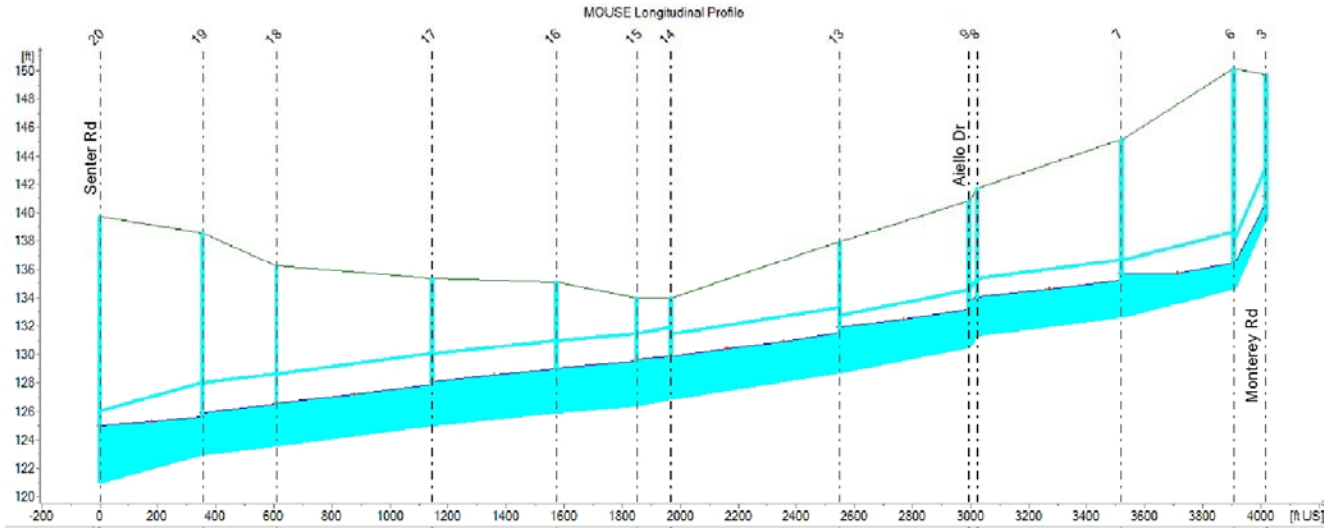

Figure 4.6-4. 24-hr 10-year Existing Umbarger Road Profile

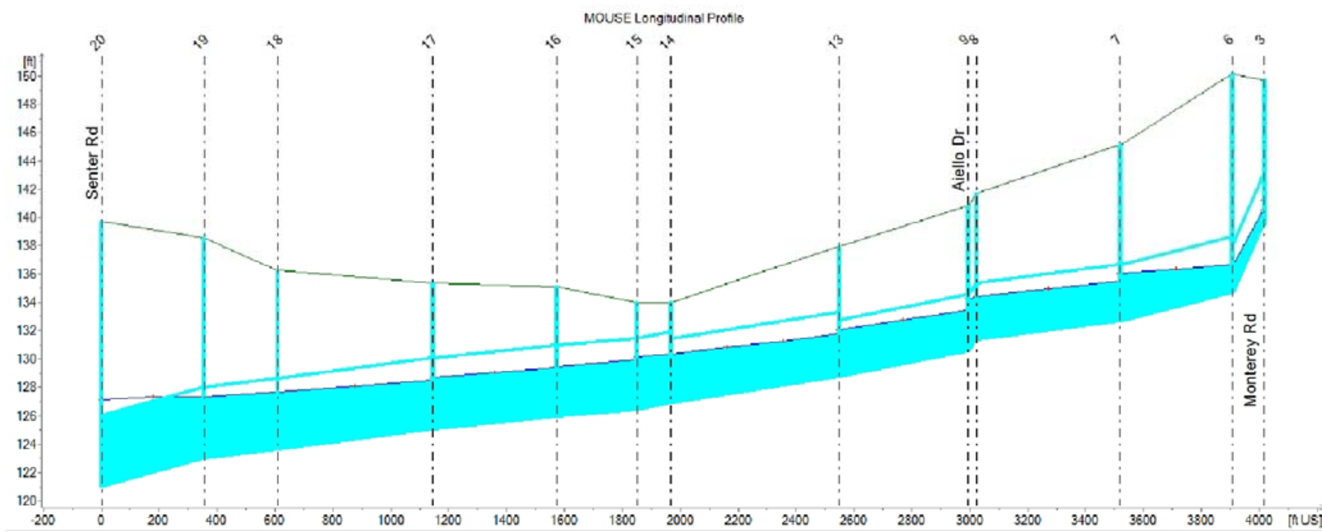

Figure 4.6-5. 24-hr 100-year Existing Umbarger Road Profile

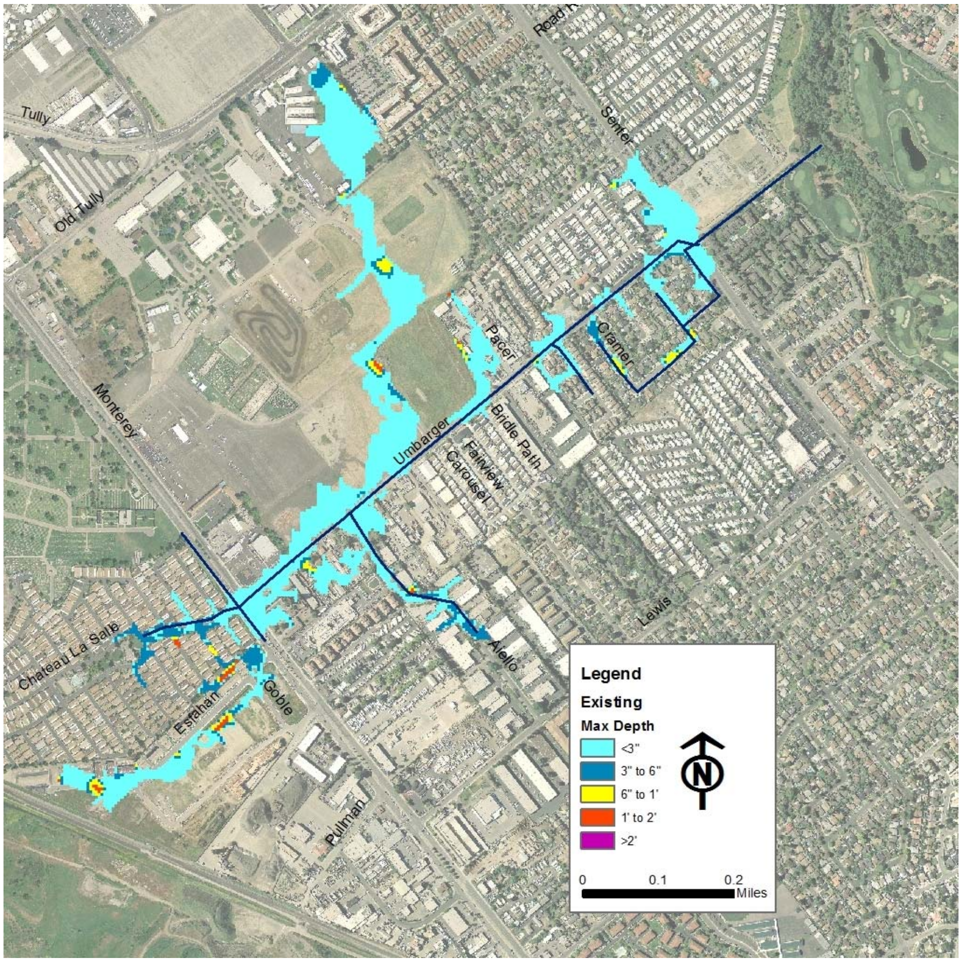

Figure 4.6-6. Existing 100-year Flooding

Proposed Conditions

The proposed Project stormdrain system will connect the north Communications Hill development to the existing Umbarger System. Runoff from the proposed development will discharge to two basins designed to meet HMP requirements. The HMP basins discharges will be conveyed in a 42-inch pipe connecting to the existing Umbarger System near the intersection of Umbarger Road and Monterey Road north of the Goble Lane area. The existing conditions MOUSE model was modified to include the additional runoff from the Project site drainage areas, the two detention basin systems, and the storm drain connection to the Umbarger system. The storm drain from the Goble Lane area was also connected to the Umbarger system. Based on the results of the Project conditions analysis, the volume of the detention basins, with outlet structures, attenuate the Project runoff enough to have a minimal increase in flooding or surface flows in the Umbarger system area.

Figure 4.6-7 shows the maximum 100-year flooding depth in the system. Figures 4.6-8 and 4.6-9 are the 10-year and 100-year peak profiles along Umbarger Road. A total of 1.3 cfs spills from the system at one node while a total of 153 cfs of runoff is diverted in 13 catchments. As noted previously, for this analysis it was assumed that the Umbarger system is independent of the other City stormdrain systems and that no surface flows from other City drainage systems overflow into the Umbarger system during the 100-year storm.

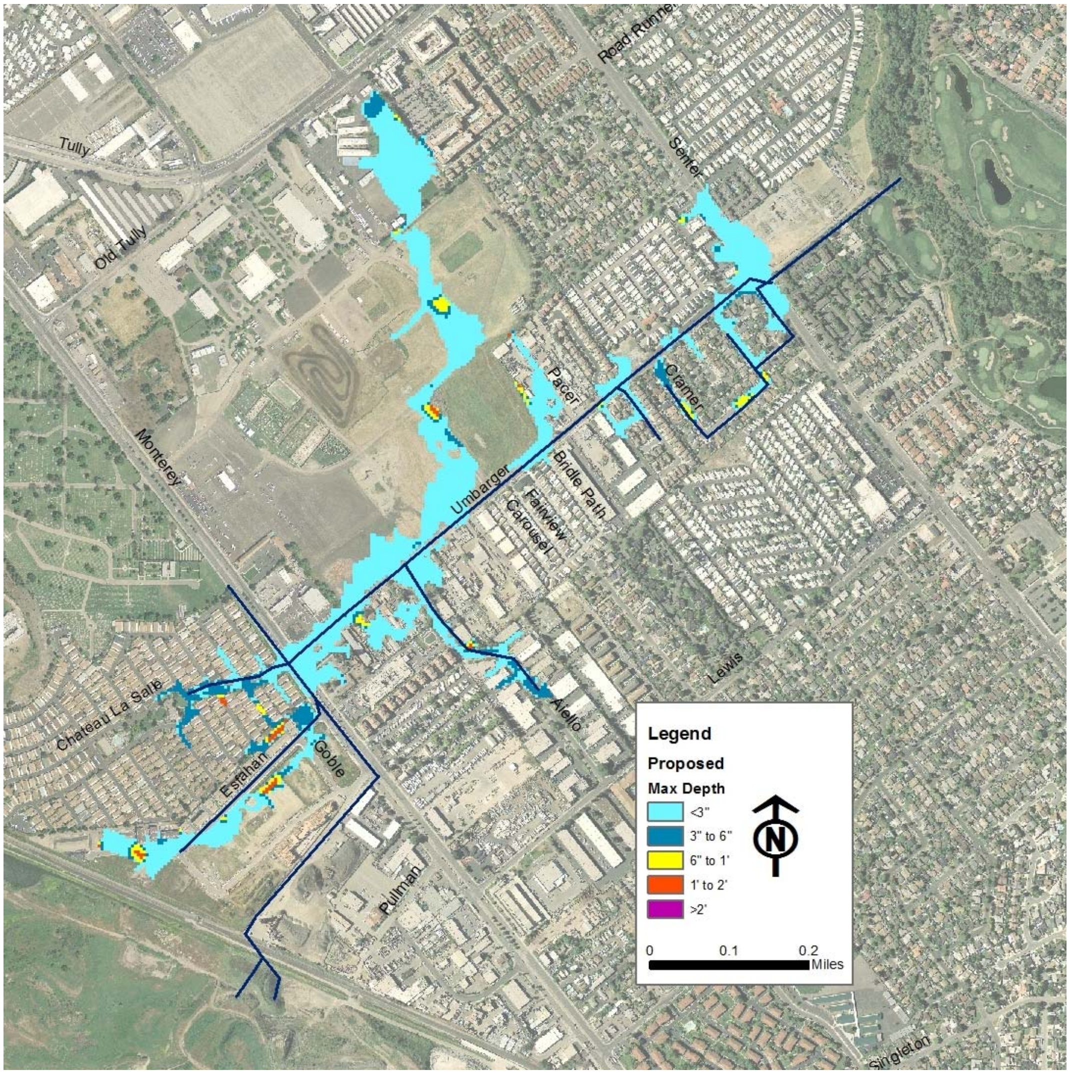

Figure 4.6-7. Proposed Condition Flooding

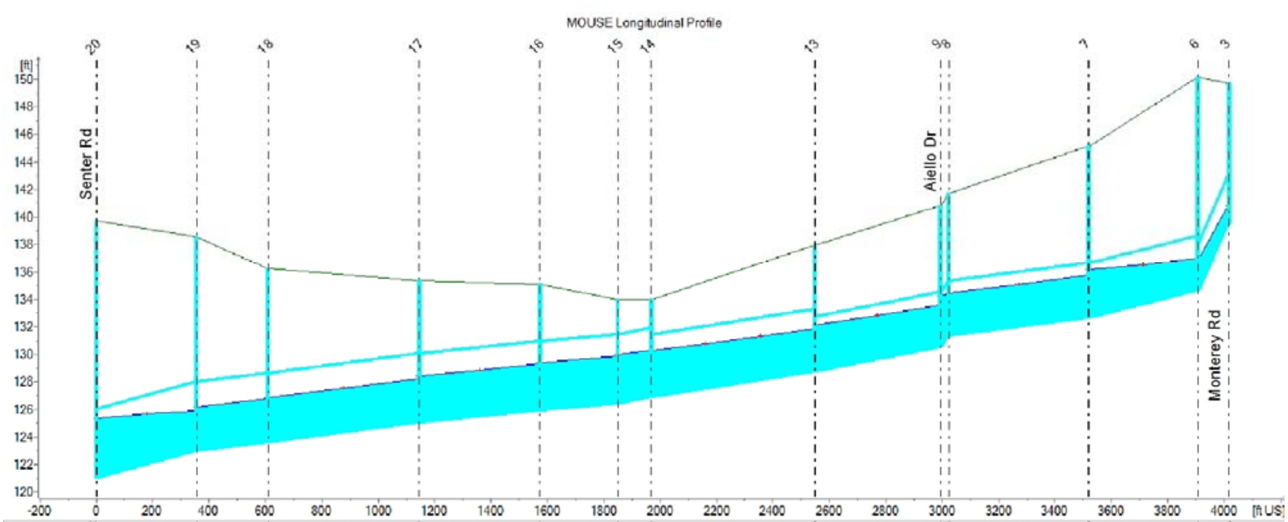

Figure 4.6-8. 24-hr 10-year Proposed Condition Umbarger Road Profile

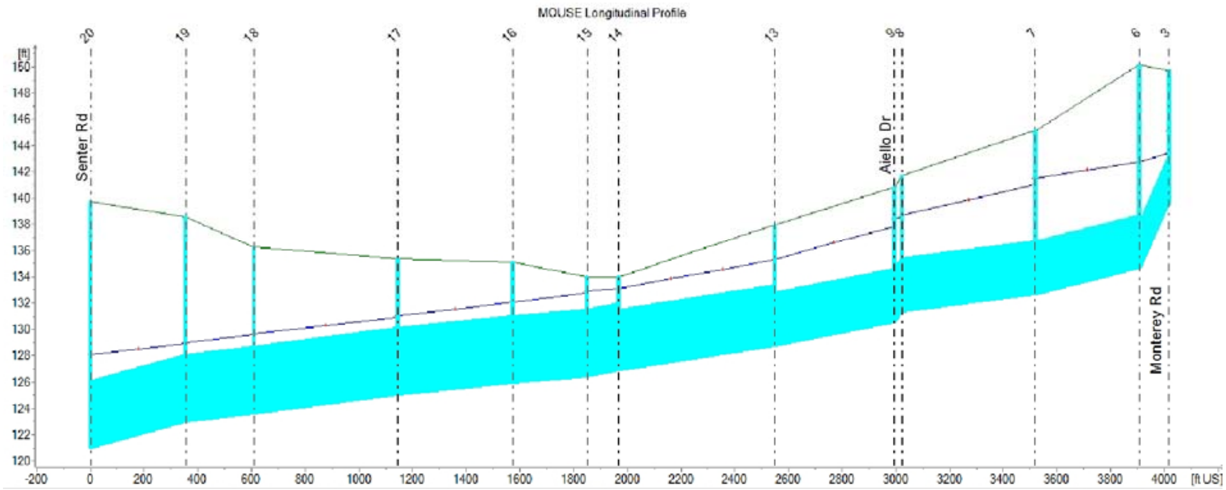

Figure 4.6-9. 24-hr 100-year Proposed Condition Umbarger Road Profile

Figures 4.6-10 and 4.6-11 show the 10-year and 100-year hydrographs for the Umbarger stormdrain, upstream of Aiello Drive, for existing and proposed conditions. The existing conditions stormdrain models do not include flows from the Project site or the Goble Lane area (Figure 4.6-1). The 10-year and 100-year model for the Project condition results show an increase in runoff in the Umbarger system. However, because the stormdrain system along Umbarger Road has available capacity, there is no significant increase in system surcharging (spills) during these events.

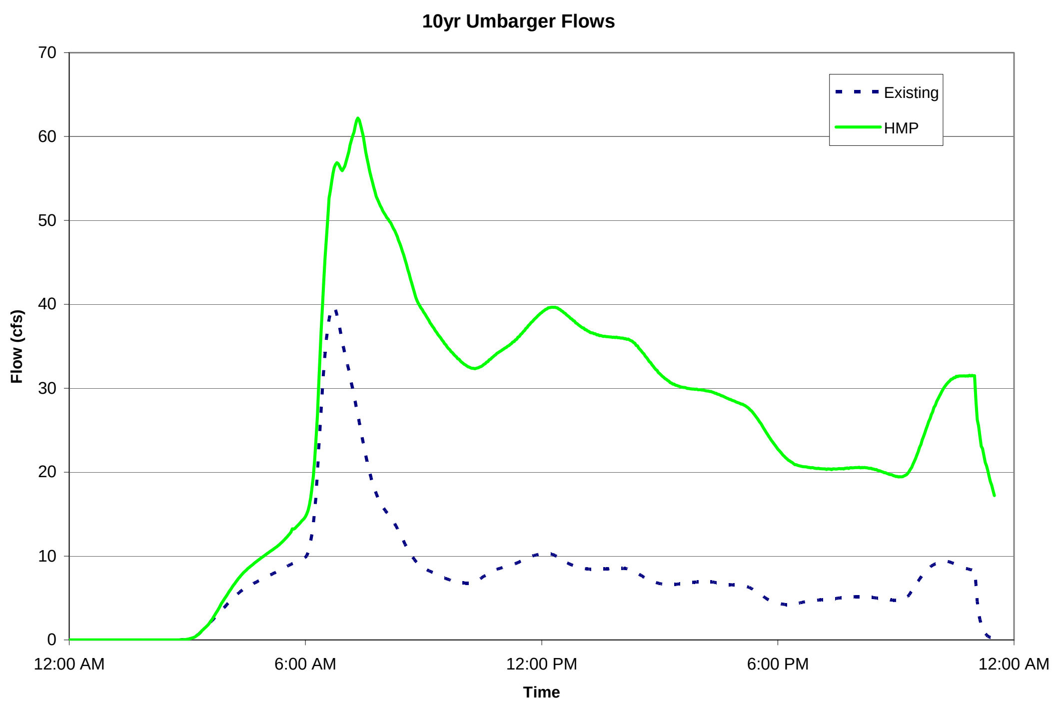

Figure 4.6-10. 10-year Flow Hydrographs at Umbarger Road and Aiello Drive

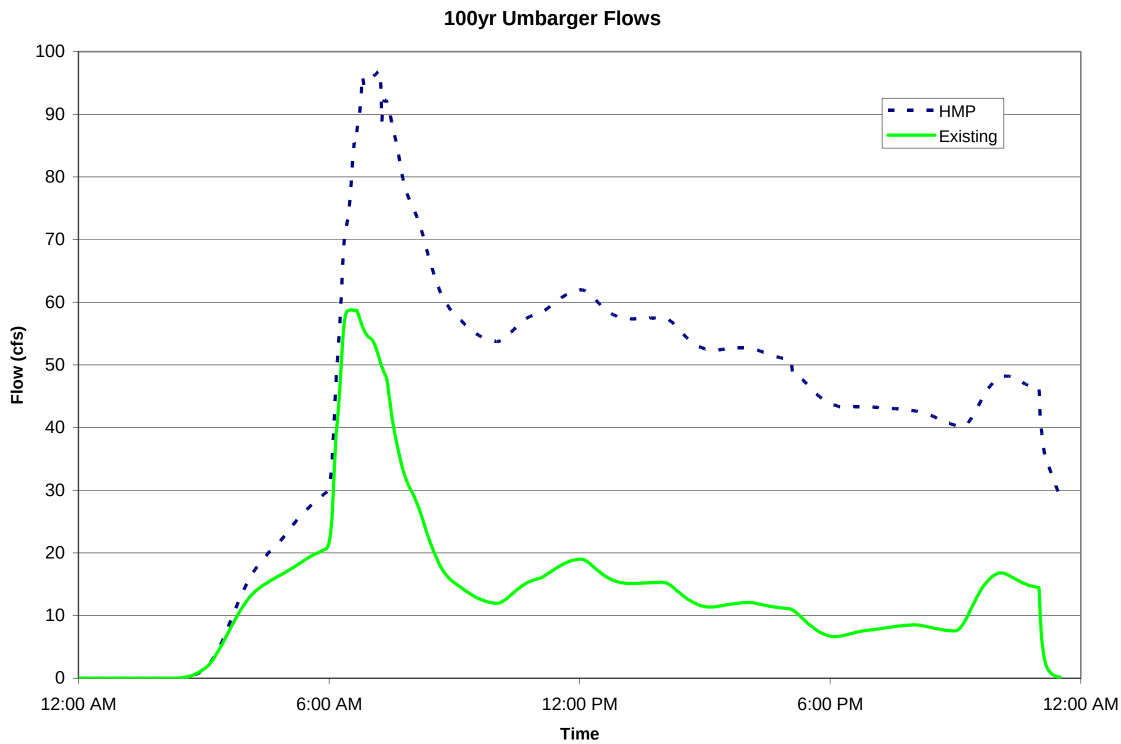

Figure 4.6-11. 100-year Flow Hydrographs at Umbarger Road and Aiello Drive.

Figure 4.6-12 shows the estimated increase in potential surface flow depths from the additional Project condition drainage area. There is only a small increase (less than 1-inch) in flood depths along Cramer Circle. The increase in surface flow depths appears to be related to the high hydraulic grade line in the most upstream portion of the system for both existing and Project conditions, but may be an effect of the model topography, the size of the model subareas and the assumed location of the subarea inflow. The area affected by the increased maximum surface flow depth at Cramer Circle was estimated to be less than 6 inches deep for both the existing and Project condition models.

Figure 4.6-12. 100-year Increase in Flood Depths

4.6.3. 72-hour Storm Results

To determine the potential impact from increase runoff from the development of Coyote Creek, a second long duration storm was modeled for the Umbarger System with Santa Clara Valley Water District's 72-hour Coyote Creek rainfall pattern. This pattern has a smaller peak rainfall intensity and a larger volume than the 24-hour rainfall pattern from the County Drainage Manual. Figure 4.6-13 illustrates the differences in the rainfall patterns.

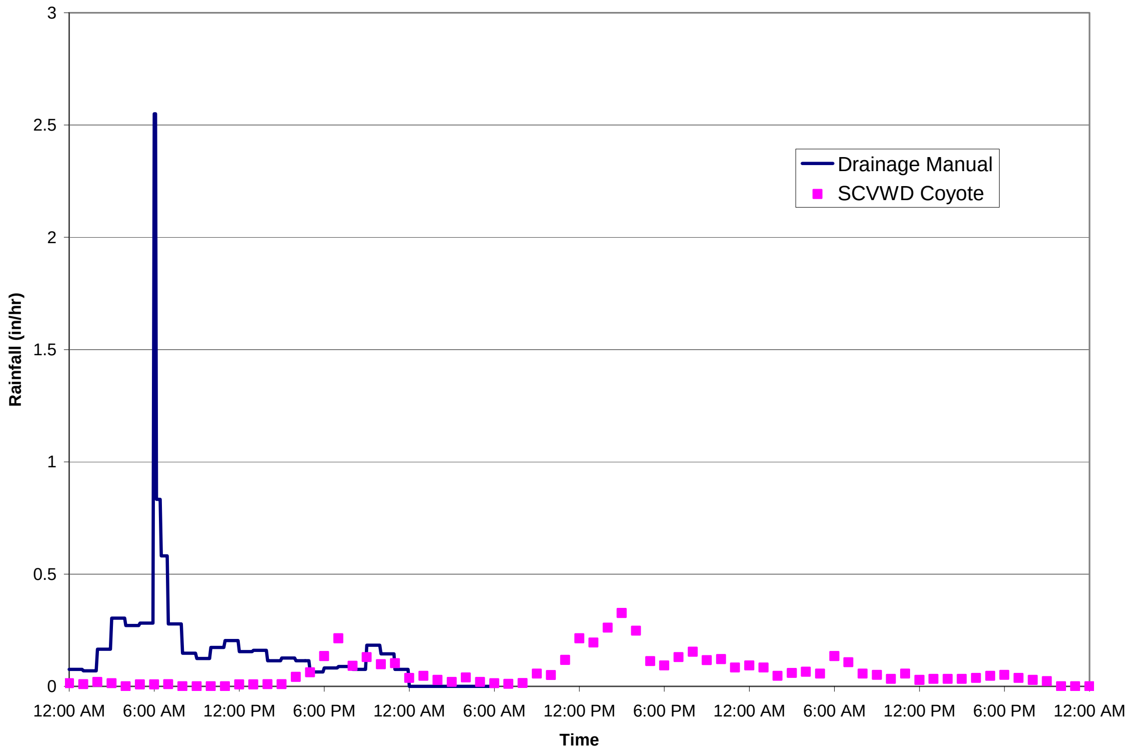

Figure 4.6-13. Rainfall Patterns

The model results for the 72-hour 100-year storm show an increase in peak flow rates from the Umbarger system to Coyote Creek and runoff volume in the system. However, there are no increased surface flow impact in the Umbarger system study area due to the additional runoff from the Project site with the detention basins and the increased runoff from the Goble Lane area. Due to the smaller peak rainfall intensity associated with the long duration storm, the 72-hour storm has lower peak flows in the drainage system and surface flows.

Figure 4.6-14 shows the existing and Project condition hydrographs for the Umbarger system discharge to Coyote Creek. The line labeled HMP represents the Project condition. The proposed Project site is connected into the Umbarger System in the Project condition and not under existing conditions. In order to evaluate the direct effects of the Project contribution to the increase stormdrain flow at Coyote Creek, the Goble Lane area was assumed to be included in the existing condition. The stormdrain flow from the Goble Lane area would follow the Lewis Road stormdrain system to reach the same portion of Coyote Creek for existing condition, but the Umbarger stormdrain system for the Project condition. The 72-hour peak flow rates and volumes are increased for the project condition due to the additional drainage area from the Project site.

The Coyote Creek hydrograph has two distinct peaks during the 100-year 72-hour storm event. The first peak occurs approximately 18 hours into the storm due to runoff from the lower portion of the Coyote Creek watershed below Anderson Dam. The peak flow for the first peak is approximately 8000 cfs which is near the initial stage of flooding for portions of Coyote Creek downstream. The peak flow from the Umbarger system discharges to Coyote Creek before the first flood peak in Coyote Creek, but the estimated increase near the first flood peak would be approximately 40 cfs. At the time of the second peak flow in Coyote Creek, approximately 37 hours into the storm, the peak flow in Coyote Creek is over 13,000 cfs. At that time the estimated increase flow from the Umbarger system due to the Project would be approximately 10 cfs.

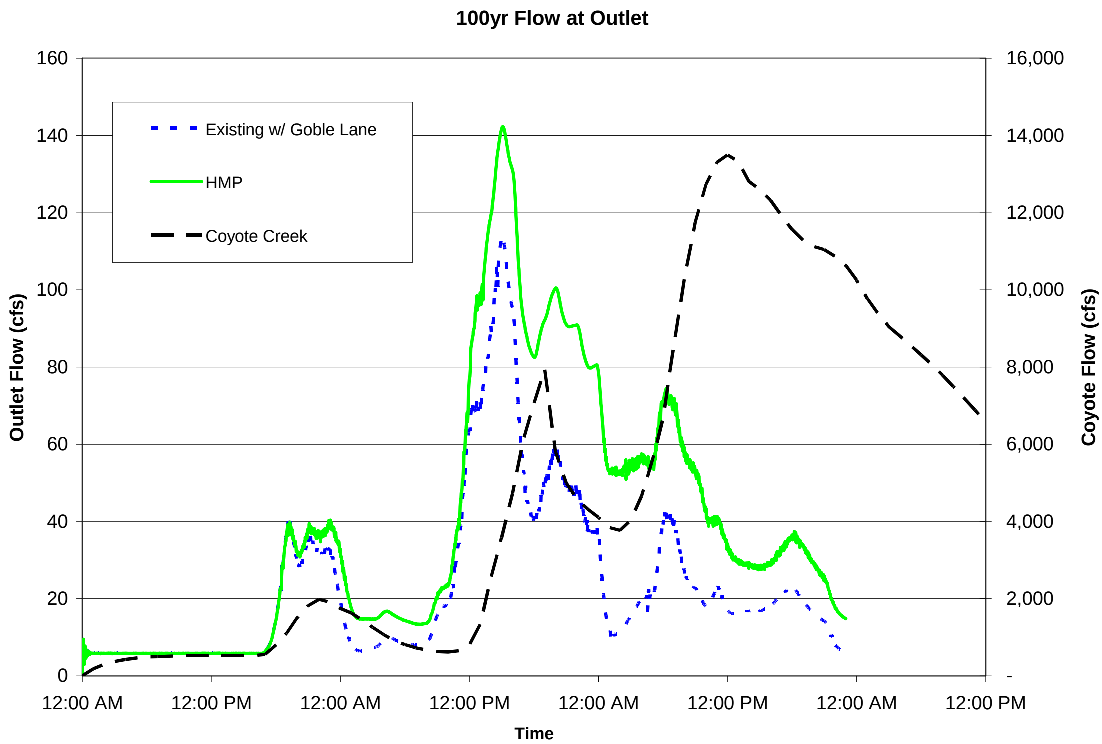

Figure 4.6-14. 100-year 72-hour Flow Hydrographs at Outlet to Coyote Creek.

However, the existing conditions on the Project site with no existing drainage connection to any offsite drainage system is an unusual condition associated with the use of the site for the quarry operation. Without the quarry, the site would have continued to drain to Coyote Creek and therefore the Project could reasonably expect to have the right to have a drainage connection in the future. The City included the site in the Specific Plan. Caltrans included the Project site in drainage calculations for improvements to Monterey Road. The SCVWD, Corps of Engineers and FEMA have included the area in the Coyote Creek watershed drainage area to calculate flood flows for Coyote Creek. Therefore, an alternative model was prepared which includes the Project site runoff based on undeveloped conditions on the Project site. The runoff from the Goble Lane area was included in both the existing conditions and Project conditions.

Figure 4.6-15 shows the 100-year existing (labeled as undeveloped) and proposed (labeled as HMP0 Umbarger system hydrographs at the outlet to Coyote Creek with the Project site contributing under both scenarios. The Project condition includes the Project development and onsite detention basins. The model results show that the with the proposed Project, the peak flow to Coyote Creek is less than the undeveloped condition with not development on the Project site, but the site draining the Coyote Creek. Therefore, the primary effect of the Project on flow rates into Coyote Creek is due to the restoration of the drainage connection from the site to Coyote Creek, and not due to the proposed development. The onsite detention basins reduce the potential increase due to the additional impervious area associated with the Project.

There is a 4.7 cfs (0.03%) increase in the Umbarger system discharge at the time of the second Coyote Creek peak. This is partially due to the direct runoff associated with the Project site impervious area at the time of the second Coyote Creek peak, but it is also due to the release of stored runoff in the HMP basins which have not fully drained between the time of the peak local runoff and the later second peak in Coyote Creek. The estimated increase of 4.7 cfs represents 0.03 percent of the peak flow in Coyote Creek.

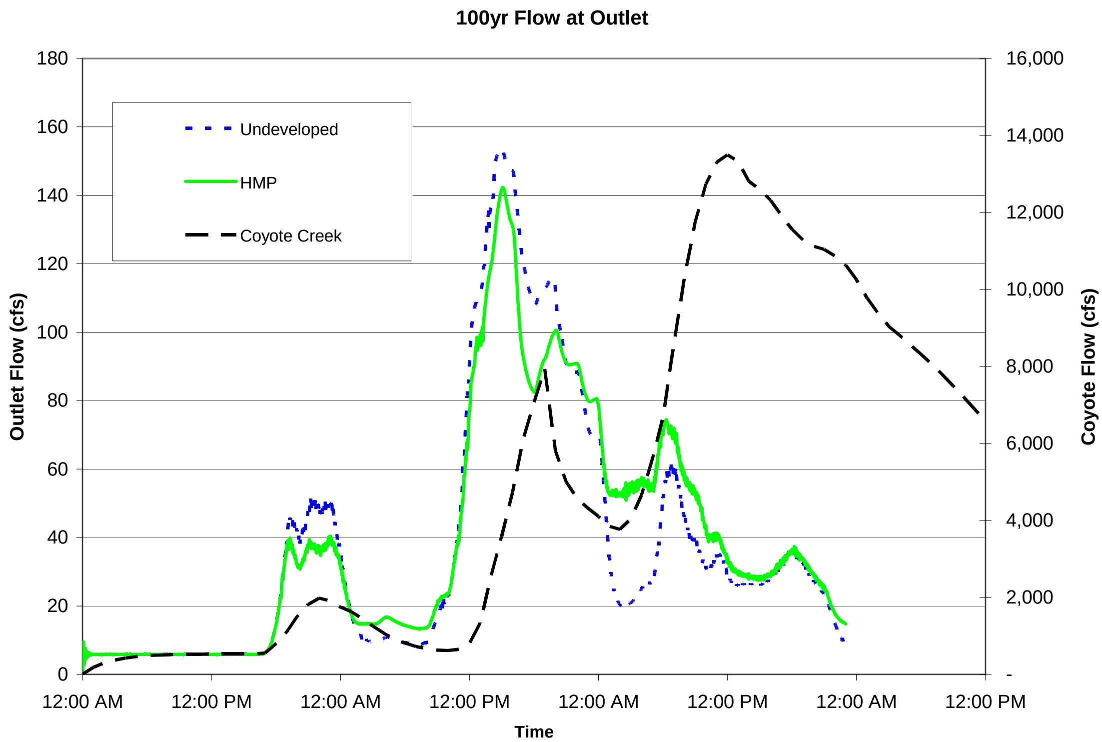

Figure 4.6-15. 100-year 72-hour Flow Hydrographs at Outlet with Undeveloped Site

4.7 Conclusion

The proposed Project development on Communications Hill would have minimal impact on the City of San Jose's Umbarger Road stormdrain system. The existing system is oversized for the existing drainage area and appears to have additional capacity for the 10-year design storm. The combination of the onsite detention basins and the stormdrain network attenuate the peak runoff from the proposed Project site enough to have no significant effects on the 10-year design storm hydraulic conditions or 100-year surface flow conditions in the Umbarger system study area. The improvements were modeled with the 24-hour County rainfall pattern and were checked with the 72-hour SCVWD Coyote Creek pattern. The proposed system would have a minimal impact of local flooding and a less than significant increase in peak flows in Coyote Creek.

5. Environmental Impacts

5.1 Thresholds of Significance

Based on Appendix G to the CEQA Guidelines, the proposed Project would have a significant hydrology and water quality environmental impact if it would:

(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 stormwater drainage systems or provide substantial additional sources of polluted runoff;

(f) Otherwise substantially degrade water quality (e.g., temperature, dissolved oxygen, or turbidity);

(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) Expose people or structures to inundation by seiche, tsunami, or mudflow.

5.2 Proposed Project

The proposed Project is the build-out of the remaining approximately 2,200 residential units allowed within the Specific Plan Area, which is anticipated to occur over a 12-15 year timeframe. It also includes construction of up to 67,500 square feet of commercial/retail uses, parks, open space, trails, streets, stormwater facilities, and other associated supporting infrastructure. The SEIR will also provide program-level environmental review for the development of an elementary school, centrally located on approximately 4.2 acres.

The proposed project also includes the future development of approximately 55 acres of industrial park uses in the eastern portion of the site near the base of Communications Hill adjacent to Old Hillsdale Avenue. Details for this development have not yet been determined, although it is anticipated that it would have a Floor Area Ratio (FAR) of approximately 0.6. This would allow approximately 1.44 million square feet of industrial park development, consistent with the Specific Plan and the City's Zoning Ordinance.

The project proposes the development of up to 2,200 residential units consisting of townhomes/flats, detached alley townhomes, detached row townhomes, podium condominiums, and apartments in the Village Center. Four podium condominium buildings are proposed as part of the project.

Uses within the commercial/retail area would include restaurants, shops, entertainment, and small office consistent with the Specific Plan. Approximately 16 acres of parks and 112 acres of open space will be constructed as part of the proposed project.

There is an existing abandoned mercury mine and a former rock quarry within the boundary of the proposed project site. The project proposes to close these existing uses according to all local, state, and federal laws. An aggregate recycling center is currently using the quarry property which has been identified for future industrial park uses. It is anticipated that the recycling center will continue to operate until its Use Permit expires in approximately 10 years.

Infrastructure constructed as part of previous development on Communications Hill (primarily the Tuscany Hills project) was sized to accommodate the proposed project, although the facilities would need to be extended onto the site. This infrastructure includes streets, water and sewer lines, and utilities (gas, electricity, cable, and telephone). An existing PG&E distribution/transmission line runs east/west through the Specific Plan Area. Major infrastructure elements are described below:

5. The Specific Plan includes the extension of Pullman Way from Communications Hill Boulevard to Monterey Road. The extension of Pullman Way was realigned as part of the Specific Plan amendments approved in 2002.
6. A vehicle bridge over the Caltrain/UPRR tracks will be constructed as part of Communications Hill Boulevard, consistent with the Specific Plan.
7. The proposed project will require stormwater filtration/detention basins to be located on the site. One basin system will be located in the northern portion, while the other would be in the southeastern portion of the site near the existing Tuscany Hills basin. The existing basin would require modifications/expansion to accommodate run-off from the site. These basins would provide water quality benefits as well as detain water on-site during rain events prior to outfall to the City's stormwater system, consistent with the Specific Plan.
8. The site will be re-graded to repair the grading alterations that were done as part of the former quarry operations. The grading will be designed to more closely follow the previous pre-quarry and natural topography. This will generally result in streets and blocks with slopes similar to development on the south/southwestern facing slopes of the hill.

5.3 Project Impacts and Mitigation Measures

5.3.1 Impact HYDRO-1 Violate Water Quality Standards or Waste Discharge Requirements

As an urban development with impervious surfaces and vehicular and pedestrian uses, the Project may contribute both point and non-point source pollution to receiving waters. Both point sources and nonpoint sources of water pollution are usually discharged via separate storm drains to "waters of the U.S." and are thus regulated under the CWA. The State Board and Regional Board policies regulating any receiving waters would also apply since development of the Project would potentially impact the quality of runoff and other pollutant loadings to receiving waters. Water quality impacts may also be significantly greater during the region's rainy season (i.e., Winter through Spring).

Non-point source pollution is generally handled via stormwater BMPs, including site design BMPs, source control BMPs, and treatment control BMPs. Project plans at a level of detail to indicate all the Project stormwater BMPs have not been provided. The proposed Project would include water quality basins and bioretention treatment basin systems to treat the urban runoff from the impervious surfaces to conform to the treatment and HMP requirements of the RWQCB regional municipal NPDES permit.

Two springs and the quarry pond at the Project site were sampled as part of the Project site investigations[49]. One of the springs emanates from the former main haul line portal for the mine, and the other spring is in an area north of the mine and it drains to the quarry pond. The sampling results were compared to the very

[49] *Strategic Engineering & Science, Inc., 2009. Draft Phase II Environmental Site Assessment Report, Proposed Communications Hill Development, San Jose, CA.*

restrictive RWQCB Environmental Screening Levels (ESLs) for surface water screening levels for estuary habitats because this water may be captured by subdrains installed for the future development and eventually be discharged to Coyote Creek and the San Francisco Bay. The only constituents identified at potentially elevated concentrations in the samples collected were arsenic, thallium, and nickel. These metals were most likely naturally occurring and related to the hydrothermally altered and/or ultramafic rocks at the site. The Project would include a bioretention basin for stormwater treatment which would also treat dry weather nuisance flow including irrigation runoff and subdrain drainage. Available data for bioretention basins have documented over 90 percent removal of dissolved metals50. Therefore, the proposed treatment system should be effective in reducing the potential discharge of metals to a less than significant impact.

Water samples collected from the quarry pond identified methyl mercury concentrations that exceed the SFRWQCB ESLs for surface water screening levels for estuary habitats. Methyl mercury is soluble and is produced in water by sulfate reducing bacteria under low-oxygen conditions when elemental mercury is present in sufficient concentrations. The quarry pond is therefore capable of generating methyl mercury which likely occurs at depth in the pond during the summer months when algae depletes the pond water of oxygen allowing anaerobic conditions to develop resulting in the production of methyl mercury. The construction of the proposed Project would fill the existing quarry pond and prevent future production of methyl mercury which could be discharged to the groundwater or surface waters. The proposed Project detention basins would not include a permanent pool which may create anerobic conditions. The detention basins would drain within 48 hours to meet HMP requirements. Therefore, the Project would have a less than significant impact for a release or discharge of methyl mercury.

Implementation of the Project would result in disturbing an area greater than one (1) acre, thus requiring conformance with the Statewide Construction NPDES permit for construction. The Statewide Construction NPDES permit requires the project applicant to file a Notice of Intent (NOI) to comply with the terms of the permit and to submit a SWPPP to the Regional Board. The SWPPP needs to contain a listing and implementation plan for the stormwater BMPs that would be implemented during construction of the Project to minimize erosion and sedimentation.

The following mitigation measure would reduce Impact HYDRO-1 to a ***less-than-significant*** level:

Mitigation Measure HYDRO-1

The applicant shall design and implement appropriate stormwater BMPs during and following construction. Construction BMPs are described in a SWPPP, as discussed later. Post-construction BMPs are typically part of a Stormwater Management Plan (SWMP) and can include a variety of site design, source control, and treatment control measures. Site design measures include minimizing impervious surfaces. Source control measures include adequate placement and maintenance of trash storage bins. Treatment control BMPs, such as landscaped swales and inlet filters, are typically used as a final measure to remove mobilized stormwater pollutants prior to entrance into a municipal storm drainage system. Any planned BMPs should meet the appropriate NPDES criteria as required in the RWQCB regional municipal permit.

5.3.2 Impact HYDRO-2 Substantially Deplete Ground Water Supplies or Substantially Interfere with Ground Water Recharge

Development or redevelopment of any particular area has the potential to impact groundwater resources by (1) increasing water demand, if that demand is met with groundwater, and/or (2) increasing the amount of ground covered by impermeable surfaces that would thus interfere with the ability for surface water to infiltrate into subsurface soils and recharge groundwater aquifers.

As discussed below, effects on the regional aquifer effects on recharge to the Santa Clara Valley Subbasin are expected to be **less than significant**, and no mitigation is required.

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[50] *Davis, Allen P, 2003. Water Quality Improvement through Bioretention: Lead, Copper, and Zinc Removal, Water Environment Federation, January/February 2003, pg 73.*

Effects of Proposed Water Usage on the Regional Aquifer

The proposed domestic (potable) water supply for the Project would be obtained from the San Jose Water Company (SJWC). SJWC has three different sources of water – groundwater pumped from over 100 wells in the Santa Clara Groundwater Basin, imported surface water from the SCVWD, and local mountain surface water collected from the Santa Cruz Mountains.[51] The constructed Project, therefore, should not require groundwater as a water supply.

Interference with Ground Water Recharge

The Project would increase the impervious surface area of the site which could decrease infiltration of precipitation. However, the existing site is unlikely to contribute significantly to groundwater recharge due to the existing geology on the site. Communications Hill is a major bedrock outcrop within the valley floor, with very shallow surface soils and low infiltration rates. The flat land areas created by the quarry operations are predominantly exposed bedrock overlain by shallow to deep layers of quarry spoil materials. The existing onsite retention pond which collects some natural spring water has poor infiltration and holds water throughout the summer. As a result, the Project would reduce the potential for groundwater recharge by a negligible amount.

5.3.3 Impact HYDRO-3 Substantially Alter Drainage Patterns Resulting in Increased Erosion or Siltation

Communications Hill located on the drainage divide between the Guadalupe River and Coyote Creek. The existing site drains to both major watersheds, and several separate drainage systems. The separate drainage systems are discussed below.

The Project would increase by 11.6 acres the drainage area which drains to the Hillsdale Boulevard drainage system which discharges to Canoas Creek, a tributary of the Guadalupe River. The Project would also decrease by 11.6 acres the drainage area which drains to the Mill Pond and Canoas Garden drainage system which also discharges to the Guadalupe River. The diversion of the drainage area to Canoas Creek may increase the potential erosion in the unlined stream channel. As described in section 4.5, the Project includes a modification of the existing Tuscany Hill detention basin to increase the basin capacity and modify the outlet structure to utilize the detention basin as an HMP basin for the Project condition drainage area. The proposed basin would detain the runoff from the larger developed Project drainage area to meet the HMP flow duration requirements for the existing condition runoff for the smaller existing drainage area. Therefore, the Project would have a less than significant impact on erosion and scour in Canoas Creek or Guadalupe River.

The portion of the Project site on the north side of Communications Hill is located within the Coyote Creek watershed. The Project would not divert additional drainage area from the Guadalupe River watershed. However, the operation of the quarry on the Project site has modified the historic drainage conditions for the area. Prior to construction of the UPRR and the quarry, runoff from the north side of the hill drained overland toward Coyote Creek to the north. The railroad originally included cross culverts to allow drainage under the railroad. During the quarry operation period, drainage from the quarry area was retained onsite, and the cross culverts were abandoned or blocked. Therefore, the historic flow pattern with drainage to Coyote Creek was interrupted. The Project would restore the drainage discharge from the site and therefore would increase the runoff to Coyote Creek which may increase erosion or siltation in the Creek.

The applicant and the City of San Jose has reviewed the Project with the RWQCB staff to clarify the HMP requirements for the Project. The connection of the Project to the City stormdrain system which discharges to Coyote Creek would be considered a restoration of the historic natural condition and would not be considered a diversion or increase in drainage area. The Project would be required to meet water quality and

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[51] *San Jose Water Company. Water Supply Source. Accessed at http://www.sjwater.com/quality/supply.jsp. Accessed on November 13, 2009.*

HMP requirements for new development as described in the NPDES permit. The Project includes HMP basins for the residential area and industrial areas which drain to Coyote Creek to detain development runoff to the flow duration conditions of the pre-development conditions.

The following mitigation measure would reduce Impact HYDRO-3 to a ***less-than-significant*** level:

Mitigation Measure HYDRO-3

The applicant shall prepare a hydrology study for the Tuscany Hill detention basin to document detailed design requirements for the use of the basin as an HMP basin for the project. The final hydrology study shall be coordinated with the final design plans for the Project. The applicant shall prepare hydrology studies for the north Communication Hill residential/commercial and industrial areas to document the detailed design requirements for the HMP basins. The final hydrology studies shall be coordinated with the final design plans for the detention basins. The HMP basins shall conform to the requirements of the RWQCB regional municipal NPDES permit.

5.3.4 Impact HYDRO-4 Substantially Alter Drainage Patterns Resulting in Increased Flooding

As described above, the Project would add 11.6 acres of drainage area to the Hillsdale Boulevard stormdrain system, and reduce the drainage area to the Canoas Garden stormdrain system by 11.6 acres. The Project would modify the existing Tuscany Hill detention basin to detain runoff from the larger drainage area to control the peak flow from the Project site to be less than the undeveloped runoff condition for the 10-year and 100-year design storms for both the Tuscany Hills development and the Project development.

As described above, the Project would add the drainage area on the north side of Communications Hill to the City stormdrain system which drains to Coyote Creek. Historically, the area did drain to Coyote Creek and was separated from the historic flow path during the operation of the quarry on the Project site. The retention capacity on the quarry site has been exceeded in the past and overflowed through and access underpass at the UPRR to flood downstream properties between the UPRR and Monterey Road. The Project would include construction of a new stormdrain connection from the site to the Umbarger Road stormdrain system to restore the drainage connection from the site to Coyote Creek. Due to piping conflicts at Monterey Road, the Project would also connect approximately 32 acres of other property to the Umbarger system. These other properties currently drain to the Lewis Road stormdrain system, which also drains to Coyote Creek parallel to the Umbarger system. The overall effect of the Project would be to increase the drainage area of the Umbarger by 262 acres, 230 acres from the Project and 32 acres from the off site area. The Project would increase the effective drainage area for Coyote Creek by 230 acres.

Based on the Project analysis, the Umbarger stormdrain system has available capacity for the proposed Project for the city of San Jose 10-year design storm. In addition, two-dimensional surface flow modeling for the Umbarger system study area shows that the increased flows from the proposed Project would increase the estimated flood depths at one node in the modeled Umbarger system. The estimated depth of flooding would increase by less than one inch. The depth of flooding in the street would be less than six inches deep for the Project condition. The estimated change in the surface flow depths would not increase the potential flood risk and would not be considered significant.

The Project analysis also evaluated the potential increase flood flows from the Project at Coyote Creek to consider the potential Project effects in Coyote Creek. The restoration of the drainage connection to Coyote Creek for the Project was estimated to increase the existing condition peak discharge from the area into Coyote Creek by approximately 40 cfs, and would increase the local contribution to the peak 100-year flood flow in Coyote Creek by approximately 10 cfs. However, the City of San Jose, Caltrans, SCVWD, Corp of Engineers and FEMA have all included the Project site in the Coyote Creek watershed. A comparison of the Project contribution to Coyote Creek with a similar undeveloped Project site has shown that the peak flow rate to Coyote Creek would decrease with the project due to the onsite detention basins, and the potential contribution to the peak flow in Coyote Creek would be 4.7 cfs, or approximately 0.03 percent of the peak flow in the creek. The potential effects of the increased runoff from the project site would be considered less than significant.

The following mitigation measure would reduce Impact HYDRO-4 to a ***less-than-significant*** level:

Mitigation Measure HYDRO-4

The applicant shall prepare a hydrology study for the Tuscany Hill detention basin to document detailed design requirements for the use of the basin to control the peak runoff discharge to the Hillsdale Boulevard stormdrain system with the Project. The applicant shall prepare hydrology studies for the north Communication Hill residential and industrial areas to document the detailed design requirements for use of the onsite detention basins to control potential increased flooding in the Umbarger drainage system and increased flood flows to Coyote Creek. The final hydrology studies shall be coordinated with the final Project design plans.

5.3.5 Impact HYDRO-5 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

As described above, the Project would add 10.0 acres of drainage area to the Hillsdale Boulevard stormdrain system, and reduce the drainage area to the Canoas Garden stormdrain system by 10.0 acres. The Project would modify the existing Tuscany Hill detention basin to detain runoff from the larger drainage area to control the peak flow from the Project site to be less than the undeveloped runoff condition for the 10-year and 100-year design storms for both the Tuscany Hills development and the Project development.

As described above, the Project would add the drainage area on the north side of Communications Hill to the City Umbarger stormdrain system which drains to Coyote Creek. The Project analysis includes an evaluation of the Umbarger stormdrain system. The analysis shows that the Umbarger stormdrain system has capacity to add the proposed additional drainage area based on the City 10-year stormdrain design standard.

Based on the Project analysis, the impacts of increasing quantities of stormwater runoff are considered ***less than significant***.

The proposed Project may generate significant adverse impacts on water quality. Pollutants and chemicals associated with urban development could run off the new impervious areas. The pollutants could then flow into the municipal storm drain system and any receiving waters. These pollutants could include, but are not limited to, heavy metals from automobile emissions, oil, grease, trash and debris, and air pollution residue. Eventually, these urban pollutants could filter down into the groundwater table. Such contaminated urban runoff generally remains untreated, thus resulting in incremental long-term degradation of water quality. Increased stormwater runoff can also lead to erosion, which can then contribute sediment to receiving waters; sediment can impair water quality by carrying with it any of the pollutants mentioned above.

Short-term adverse impacts to water quality may also occur during construction of the Project when areas of disturbed soils become susceptible to water erosion. Pollutants other than sediment which might typically degrade surface-water quality during a project's construction include petroleum products (gasoline, diesel, kerosene, oil, and grease), hydrocarbons from asphalt paving, paints, and solvents, detergents, nutrients (fertilizers), pesticides (insecticides, fungicides, herbicides, rodenticides), and litter. Grading and vegetation removal in proximity to drainage features could result in an increase in bank erosion, affecting both water quality and slope stability along the drainage feature.

Best management practices to managing urban runoff include site design to reduce impervious area coverage; limited grading; fitting structures to the existing topography; and use of landscaped BMPs, such as on-site swales and rain gardens, rather than storm drain pipes to convey runoff.[52,53] Current agency guidance also recommends that, where soils and geotechnical conditions allow, runoff should be infiltrated using a combination of treatment BMPs, such as grass swales and infiltration trenches, to reduce peak flows and enhance water quality.

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52 *Bay Area Stormwater Management Agencies Association (BASMAA). 1999. Start at the source, 2nd Edition.*
53 *California Storm Water Quality Task Force. 2003. Ibid.*

The proposed Project includes the use of detention basins and bioretention treatment basins to provide water quality treatment for the Project runoff to meet the requirements of the RWQCB regional municipal NPDES permit.

Without mitigation, the effects on surface water quality could be ***significant***.

Therefore, the following mitigation measure is required to reduce the effects on surface quality to a ***less-than-significant*** level:

Mitigation Measure HYDRO-5

The applicant shall prepared and submit a comprehensive erosion control plan and SWPPP. Potential construction-phase and post-construction pollutant impacts from development can be controlled through preparation and implementation of an erosion control plan and a SWPPP consistent with recommended design criteria, in accordance with the NPDES permitting requirements enforced by the City of San Jose and the Regional Board. The erosion control plan forms a significant portion of the construction-phase controls required in a SWPPP, which also details the construction-phase housekeeping measures for control of contaminants other than sediment, as well as the treatment measures and BMPs to be implemented for control of pollutants once the project has been constructed. The SWPPP also sets forth the BMP monitoring and maintenance schedule and identifies the responsible entities during the construction and post-construction phases.

The applicant's SWPPP shall identify the BMPs that will be used to reduce post-construction peak flows to existing levels in all on-site drainages where construction will occur. Neighborhood- and/or lot-level BMPs to promote infiltration of storm runoff shall be emphasized, consistent with Regional Board and SCVURPPP guidance for NPDES Phase 2 permit compliance.

5.3.6 Impact HYDRO-6 Otherwise Substantially Degrade Water Quality

Stormwater discharges from the proposed Project site could potentially degrade surface and ground water quality due to contractor activities during construction and commuters' and workers' activities following occupation of the constructed facilities.

Potential pollutants from these sources are the same as described above for surface waters, and the regulatory framework and mitigation measures proposed to minimize impacts to surface waters are also identical. No further mitigation to protect surface waters would be required.

Groundwater, particularly in the so-called Shallow Aquifer of the Santa Clara Basin is particularly vulnerable to contamination from surface land uses. However, the SCVWD does not currently use the Shallow Aquifer for water supply purposes.[54] Being within the recharge area even of the principal (i.e., lower) portion of the Santa Clara Basin, contaminants from the Project could impact groundwater quality of the principal aquifer of the Santa Clara Basin. Impacts to groundwater quality could be significant.

The following mitigation measure is required to reduce the impacts to groundwater quality to a ***less-than-significant*** level:

Mitigation Measure HYDRO-6

Mitigation measures are the same as for HYDRO-5 – i.e., generating and implementing a SWPPP with proper erosion control measures.

5.3.7 Impact HYDRO-7 Place Housing Within a 100-year Flood Hazard Area or Place Within 100-Year Flood Hazard Area Structures that would Impede or Redirect Flood Flows

[54] *SCVWD. 2009. Groundwater Vulnerability Study, Santa Clara County, California. Ibid.*

The Project is not located in or near an existing FEMA special flood hazard area. Therefore the Project would not locate housing within a 100-year flood hazard area or impede or redirect flood flows.

The Project will have **less than significant impacts** related to existing special flood hazard areas.

5.3.8 Impact HYDRO-8 Expose People or Structures to a Significant Risk of Loss, Injury or Death Involving Flooding, Including Flooding as a Result of the Failure of a Levee or Dam

The lowest portions of the Project site are potentially located within the mapped dam failure inundation area for Anderson Dam. Failure of the Anderson Dam or other upstream dam on Coyote Creek or the Guadalupe River could also potentially affect the Project area, as discussed previously. However, the impact (dam inundation) area of these other dams is determined to be west of the Project site. In general, existing dam inspection and maintenance programs ensure that dam failures remain a very low probability event. No other potential flood sources, including levees, are known that would affect the Project area.

For these reasons, the Project is assumed to have a ***less-than-significant*** impact of exposing people or structures to flooding as a result of dam or levee failure; there, no mitigation measures are required.

5.3.9 Impact HYDRO-9 Expose People or Structures to Inundation by Seiche, Tsunami, or Mudflow

There are hydrologic risks associated with seismic activity near large bodies of water, which can cause a tsunami, a seiche, or flow of mud and other debris from hillsides.

As described earlier, ABAG has created tsunami maps for the Bay Area. The map showing the Project vicinity indicates that the Project site is outside any mapped tsunami evacuation area. The Project thus has a ***less-than-significant*** impact of exposing people or structures to inundation by tsunami.

The Project site is not located near a large enclosed water bodies which could generate a significant seiche. Therefore, the Project is expected to have a ***less-than-significant*** impact of exposing people or structures to inundation by seiche.

The Project site is not located near an offsite hillside area which may generate mudflows or debris flows on to the site. The hillsides within the project site will be evaluated for stability as part of the grading design for the Project. Therefore, the Project is expected to have a ***less than significant*** impact of exposing people or structures to mud flows or debris flows.

For these reasons, no mitigation measures are required for impacts of exposure to seiche, tsunami, or mudflow events.

5.4 Cumulative Impacts

This section analyzes potential cumulative hydrologic and water quality impacts that could occur from the combination of the proposed Project with other reasonably foreseeable projects in the near vicinity. CEQA's concept of a cumulative impact is a change in the environment that results from adding the effects of the Project to those effects of cumulative projects in the Project vicinity. A cumulative impact related to hydrology would be an impact caused by the Project that, when added to impacts of related past, present, and probably future projects, would rise to the level of significance.

Any new development or significant redevelopment in the City of San Jose and Santa Clara County is required to meet NPDES permitting requirements, including stormwater BMP design and implementation. In other words, these developments would be subject to federal, state, and local water quality regulations. These developments would also be subject to federal, state, and local regulations governing development in floodplains and flood control to limit impacts of floods on people and structures.

By complying with the applicable flood control and water quality regulations, through incorporation of BMPs to prevent increases in peak flows and treat post-construction runoff, cumulative hydrologic and water quality impacts are considered to be ***less-than-significant***.

5.5 Level of Significance After Mitigation

With implementation of mitigation measures, Project overall and individual impacts on hydrology and water quality would be ***less than significant***.