4.6 HYDROLOGY AND WATER QUALITY

This EIR section examines whether implementation of the proposed Transit Zoning Code (SD 84A and SD 84B) would alter the existing drainage patterns in the project area, increase the rate or amount of polluted urban runoff, exceed the capacity of existing or planned storm drainage systems, or otherwise adversely impact hydrology or water quality. Data used to prepare this section was taken from the City of Santa Ana's (City) General Plan. Two comment letters associated with hydrology and water quality were received in response to the IS/NOP for the proposed project.

4.6.1 Environmental Setting

Regional Hydrology

The City of Santa Ana (City) is located within the Santa Ana River Basin (SARB), a 2,800-square-mile area located roughly between Los Angeles and San Diego. The SARB is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwestward to the Pacific Ocean. The SARB can be divided into an upper basin and a lower basin by the Prado flood control dam, which is located at the upper end of the Lower Santa Ana River Canyon. The dam is located on the Santa Ana River in Riverside County, approximately 2 miles west of the City of Corona. The lower Santa Ana River has been channelized and modified so that in most years flows do not reach the Pacific Ocean but are used to recharge groundwater.

The Transit Zoning Code (SD 84A and SD 84B) area is located within the San Diego Creek Watershed, which covers 112.2 square miles in central Orange County. It includes portions of the cities of Costa Mesa, Irvine, Laguna Woods, Lake Forest, Newport Beach, Orange, Santa Ana, and Tustin. The existing storm drain system adjacent to and serving the project is the San Diego Creek. Its main tributary, San Diego Creek, drains into Upper Newport Bay. Smaller tributaries include Serrano Creek, Borrego Canyon Wash, Agua Chinon Wash, Bee Canyon Wash, Peters Canyon Wash, Sand Canyon Wash, Bonita Canyon Creek, and the Santa Ana Delhi Channel. The Santa Ana Regional Water Quality Control Board (RWQCB) has identified Newport Bay as impaired by nutrients, sediment, pathogens, pesticides, metals, and priority organics. The United States Environmental Protection Agency, Region IX established Total Maximum Daily Loads (TMDLs) for nutrients (nitrogen and phosphorus) and sediments for the San Diego Creek/Newport Bay watershed. In addition, it is generally recognized that Newport Bay is significantly impaired by trash.

Drainage

Areawide Drainage Facilities

The Orange County Flood Control District (OCFCD) is responsible for the design, construction, operation, and maintenance of regional flood control facilities. The County flood channels are maintained annually, and maintenance includes debris and vegetation removal. The existing storm drainage channels were originally designed to accommodate 25-year flood events or less. However, when

the channels were constructed, they were built to accommodate 65 percent of the 25-year flood event. The channels were built with restrictive channel bottoms, which reduce the amount of water the channel could carry, but which slow the flow rate of runoff water while still enabling the system to remove runoff water. The County now uses 100-year flood event standards for new storm drain construction and drainage improvements, and portions of the channels have been improved to accommodate up to a 100-year storm event.

Local Drainage

As discussed in the City's General Plan, the City of Santa Ana is fully urbanized and there are few areas that have not been modified due to historic development. As a result, the hydrologic characteristics of the City largely reflect past efforts to facilitate drainage and to eliminate any recurring problems with flooding and ponding. The City maintains approximately 1,600 storm drain inlets and 34,000 linear feet of open channels that transport urban runoff generated from nonpoint sources within the City. Runoff transported by these drainage facilities discharges to the Lower Santa Ana River, Newport Bay, and Bolsa Chica water bodies.[7] Major drainage features in the City include the Santa Ana River and Santiago Creek.

Within the Transit Zoning Code (SD 84A and SD 84B) area, there are several existing storm drainage lines. These include:

- 24-inch line that runs north/south along Ross Street
- 21- to 33-inch line that runs east/west along Third Street between Ross Street and Bush Street
- 18-inch line that runs west/east along Civic Center Drive between Bush Street and Spurgeon Street
- 33-inch line that extends north/south along Spurgeon Street from north of Civic Center Drive, then east along Santa Ana Boulevard, and south along French Street to Third Street
- 24- to 39- inch line that extends from Spurgeon Street to Minter Street along Third Street
- 27-inch line that runs east/west from Poinsettia Street to Lacy Street along Santa Ana Boulevard
- 21- to 27- inch line that runs along the southern boundary of the Transit Zoning Code (SD 84A and SD 84B) Additional to the storm drainage lines, there are several existing sewer lines within the Transit Zoning Code (SD 84A and SD 84B) area. These include:
- 6- to 12-inch line that runs north/south along Grand Avenue
- 8- to 12-inch line that extends along Poinsettia Street between Wellington Avenue and Sixth Street
- 6-inch line that extends east/west along Washington Avenue at the northern end of the project
- 6- to 8-inch line that extends north/south along French Street between Washington Avenue and Fourth Street
- 6-inch lines that run north/south along Garfield Street, Lacy Street, and Minter Street north of Civic Center Drive
- 6- to 15-inch lines that run east/west along First Street to Sixth Street

[7] CDM, City of Santa Ana: GIS Integrated for Drainage Facility Inventory and Analysis, 2005.

- Manholes and catch basins are located throughout the Transit Zoning Code (SD 84A and SD 84B) area

Santa Ana River

The Santa Ana River is the major drainage channel that flows through the City, and many of the major storm drains are connected (directly or indirectly) to the River. Water flows in a general southwest direction from Prado Reservoir, through the City of Santa Ana and into the Pacific Ocean between Huntington Beach and Costa Mesa. The Santa Ana River's drainage basin covers over 3,200 square miles. The River reaches the City near the I-5 Freeway, traveling along the City's northwestern edge. Near Garden Grove Boulevard, the River enters into a western portion of the City at Harbor Boulevard. From there, the River follows the City's southwestern boundary.

In order to increase levels of flood protection along the River, the Santa Ana River Mainstem Project began in 1989 and is scheduled for completion in 2010. The proposed improvements to the system cover 75 miles, from the headwater of Santa Ana River east of the city of San Bernardino, to the mouth of the river at the Pacific Ocean between the cities of Newport Beach and Huntington Beach. The project includes seven independent features: Seven Oaks Dam, Mill Creek Levee, San Timoteo Creek, Oak Street Drain, Prado Dam, Santiago Creek, and Lower Santa Ana River.

Santiago Creek

Santiago Creek is the main tributary to the Santa Ana River. The creek joins the Santa Ana River just south of Garden Grove Boulevard. Improvements to the Santiago Creek Channel included a trapezoidal riprap channel to prevent erosion and to protect surrounding residential neighborhoods. Santiago Creek is one of the last remaining unchannelized drainage areas in the City.

Surface Water Quality

Urban runoff (both dry and wet weather) discharges into storm drains and, in most cases, flows directly to creeks, rivers, lakes, and the ocean. Polluted runoff can have harmful effects on drinking water, recreational water, and wildlife. Urban runoff pollutants include a wide array of environmental, chemical, and biological compounds from both point and nonpoint sources. In the urban environment, stormwater characteristics depend on site conditions (e.g., land use, perviousness, pollution prevention, types and amounts of Best Management Practices [BMPs]), rain events (duration, amount of rainfall, intensity, and time between events), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition (EPA, 2000). Major pollutants typically found in runoff from urban areas such as the City include sediment, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic, and bacteria.[8]

Urban runoff can be divided into two categories:

- Dry weather urban runoff occurs when there is no precipitation-generated runoff. Typical sources include landscape irrigation runoff; driveway and sidewalk washing; noncommercial vehicle

[8] CDM, City of Santa Ana: GIS Integrated for Drainage Facility Inventory and Analysis, 2005.

washing; groundwater seepage; fire flow; potable water line operations and maintenance discharges; and permitted or illegal nonstormwater discharges.

- Wet weather urban runoff refers collectively to non-point source discharges that result from precipitation events. Wet weather discharges include stormwater runoff. Stormwater discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events that often contain pollutants in quantities that could adversely affect water quality. Most urban stormwater discharges are considered non-point sources and are regulated by an NPDES Municipal General Permit or Construction General Permit.

Wet- and dry-weather runoff typically contains similar pollutants of concern. However, except for the first flush concentrations following a long dry period between rainfalls, the concentrations levels found in wet weather flows are typically lower than levels found in dry weather flows because the larger wet weather flows dilute the amount of pollutants in runoff waters. The following are major types of pollutants in runoff:

- Bacteria. Members of two bacteria groups, coliforms and fecal streptococci, are often used as indicators of possible microbiological contamination. Sources of fecal contamination to surface waters include wastewater treatment plants, on-site septic systems, domestic and wild animal manure, and urban runoff.
- Pesticides and petroleum hydrocarbons. The intensity of activities, including vehicle traffic, and fueling activities, leaks and spills, and landscaping/gardening activities within an urban setting contribute heavily to the level of these pollutants present in adjacent surface waters. Elevated levels of oil and grease and petroleum hydrocarbons can be found in wet weather runoff, particularly from streets, roads, and other paved surfaces.
- Metals. Heavy metals such as copper, lead, zinc, arsenic, chromium, and cadmium may be typically found in urban water runoff. Metals in stormwater may be toxic to some aquatic life and may accumulate in aquatic animals. Sources of metals in stormwater may include automobiles, paints, preservatives, motor oil, and various urban activities including atmospheric deposition from industrial plants and other operations.
- Nutrients. The nutrients most often identified in stormwater runoff are phosphorus and nitrogen. Nitrogen and phosphorus are present in runoff that originates, primarily from irrigation nuisance flows, on-site septic system leakage, and direct deposit of animal waste or other organic debris deposited on impervious surfaces.
- Trash and debris. Significant loads of trash, debris, and coarse solids can be found in wet weather urban runoff. Plant material can be a substantial component of coarse solids.
- Suspended solids. Sediment is often viewed as the largest pollutant load associated with stormwater runoff in an urban setting. This includes coarser to very fine sediments resulting from soil erosion and many other natural and human-activity based sources of sediment. Sediment loads have been shown to be exceptionally high in the case of construction activity.

Runoff Treatment and Best Management Practices

Runoff during storm events is part of the natural hydrologic cycle; however activities such as construction and development can impact stormwater runoff. Federal, State, and local regulatory and

management agencies have begun to place emphasis on preventing pollution at the source and implementing treatment of polluted runoff to prevent degradation of water resources. Management strategies known as BMPs are often implemented to provide treatment of runoff in order to eliminate or reduce the discharge of pollutants.

Construction Best Management Practices

Excessive erosion and sedimentation are perhaps the most visible water quality impacts because of construction activities. Erosion control is a source control practice that protects the soil surface and prevents soil particles from being detached by rainfall or flowing water; whereas, sediment control is a practice for trapping soil particles after they have been detached and moved by rain or flowing water (California Stormwater Quality Association [CASQA] 2003). Reduction in sediment transport is often the primary goal of BMPs because sediment can carry other pollutants that are attached to it to surface water resources, including nutrients, trace metals, and hydrocarbons. Therefore, a reduction in the amount of detached or transported sediment will also reduce the amount of other pollutants reaching surface waters. It is recognized that some BMPs provide both erosion and sediment control.

Additionally, the City of Santa Ana is a co-permittee of the Orange County Drainage Area Master Plan (DAMP), which requires appropriate actions to reduce discharges of pollutants and runoff during each of the three major phases of urban development, planning, construction, and operation. Examples of BMPs for erosion control include: soil binders, straw mulch, earth dikes and drainage swales, and velocity dissipation devices. Examples of sediment control include: silt fences, sediment traps, fiber rolls, gravel bag berms, and sandbag barriers.

Post-Construction Best Management Practices

Development projects can create long term, post-construction impacts from stormwater runoff depending upon associated land use and other characteristics of the project. Impervious surfaces such as, streets, rooftops, and parking lots prevent infiltration and increase the rate and volume of stormwater runoff. Additionally, various urban activities such as gardening, landscaping, and automobile maintenance activities, in conjunction with increased impervious surfaces, may increase the concentration and/or total load of various pollutants, as well as altering the types of constituents carried in stormwater. Post-construction measures under the Orange County DAMP require the co-permittees to implement structural and nonstructural BMPs that would mimic pre-development quantity and quality runoff conditions from new development.

There are several management strategies that can be included into site planning and design that can significantly reduce pollutant concentrations in stormwater. A development project can achieve stormwater management goals by incorporating basic elements such as infiltration and biofilters. Several other post-construction water quality BMPs can be included and incorporated in site design and operations. These include disconnected roof drains, rain gardens, minimum required street widths, curb and gutter systems for street sweeping or no curbs and gutters for roadside swales, public education, installation of pet waste stations, proprietary structural devices, and others. Details on several of these can be found in the CEQA Handbooks and local and regional Water Quality Management Plans.

Groundwater

The Orange County Groundwater Basin (Basin) underlies the northern half of Orange County, including the City. The water basin is bordered by the Puente Hills, Chino Hills, and Santa Ana Mountains in the north and east, the Pacific Ocean in the south and southwest, the San Joaquin Hills on the southeast, and the Los Angeles Groundwater Basin on the northwest. The Basin is bisected by the Santa Ana River, which serves as the main source of water used for recharge. Flows in the river come from treated effluent from upstream discharges, stormwater runoff, and imported supplies through the Orange County Water District (OCWD).

Groundwater pumping in the Basin removes groundwater from the aquifers. Removal of pumped groundwater needs to be balanced with refilling the Basin so that the amount of water is sufficient to meet future pumping needs. In addition to natural replenishment processes that refill the Basin, the District maintains programs to enhance recharge. The Basin's primary source of water for groundwater recharge ('recharge water') is the Santa Ana River. River flows are diverted into spreading basins located in the cities of Anaheim and Orange for percolation into the Basin. The District also operates the Talbert Barrier in Fountain Valley and Huntington Beach and participates in the Alamitos Barrier in Seal Beach and Long Beach. In addition to helping to prevent seawater intrusion, the barriers also help refill the Basin.[9]

Flooding

As part of the National Flood Insurance Program, floodplain studies have been performed for various communities in Orange County including the City of Santa Ana. The 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of floodplain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. The results of these studies are presented in the floodplain boundary maps and Flood Insurance Rate Maps (FIRMs). These maps contain official delineation of flood insurance zones and base flood elevation lines.

According to the Land Use Element of the General Plan, the Transit Zoning Code (SD 84A and SD 84B) area is not located within a flood hazard area. Rather, the 100-year and 500-year flood hazard zones are located in the western portions of the City, near the Santa Ana River. In addition, the Transit Zoning Code (SD 84A and SD 84B) area is also not located in the flood inundation area of the Prado Dam or the Santiago Dam.

However, as discussed in the EIR for the City's Land Use Element, deficient storm drain facilities have been identified in several areas of the City. Existing structures and residents in these areas may be exposed to street flooding during period of heavy rains. In addition, new development on these streets could exacerbate street flooding if no infrastructure improvements are implemented.

[9] OCWD, Groundwater Management Plan, 2004.

4.6.2 Regulatory Framework

Federal

Clean Water Act (CWA)

In 1948, Congress enacted the Water Pollution Control Act, which has been amended significantly on several occasions, and is now commonly referred to as the Clean Water Act (CWA). The CWA established the basic structure for regulating discharges of pollutants into the waters of the United States. The primary purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The EPA has delegated responsibility for implementation of portions of the CWA to the State Water Resources Control Board (SWRCB) and the RWQCB for water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) Program. NPDES is the basic regulatory and enforcement tool available under the CWA. Traditional NPDES permits typically incorporate specific discharge limitations for point source discharges to ensure that dischargers meet permit conditions and protect state-defined water quality standards. Municipal NPDES permits typically include receiving water limitations but not effluent limitations.

State

State Water Resources Control Board

California is authorized to administer key components of the federal water quality management program in the State. The California Water Code (CWC) establishes nine administrative areas in the State, which are administered by Regional Water Quality Control Boards (RWQCB). Each Board adopts Water Quality Control Plans for their respective regions. The City of Santa Ana is located in Region 8 (Santa Ana). The State Water Resources Control Board (SWRCB) was established through the California Porter-Cologne Water Quality Act of 1969 and is the primary state agency responsible for Water Quality Control Plans in California.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act establishes the SWRCB and each RWQCB as the principal State agencies for coordinating and controlling water quality in California. Specifically, the Porter-Cologne Water Quality Control Act authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface and groundwaters) and directs the RWQCBs to develop regional Basin Plans.

National Pollutant Discharge Elimination System Permits

The SWRCB has adopted a statewide Construction General Permit (WQ Order 99-08-DWQ) for stormwater discharges associated with construction activity. These regulations prohibit the discharge of stormwater from construction projects that include one acre or more of soil disturbance. Construction

activities subject to this permit include clearing, grading, and other disturbance to the ground, such as stockpiling, or excavation that results in soil disturbance of at least 5 acres of total land area. As required by NPDES, because construction on project sites within the Transit Zoning Code (SD 84A and SD 84B) could occur over an area greater than one acre, individual developers would be required to submit a Notice of Intent (NOI) to the SWRCB for coverage under the permit and would be required to comply with all its requirements.

The NPDES Construction General Permit requires all dischargers to (1) develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies BMPs used during construction of the project; (2) eliminate or reduce nonstormwater discharge to stormwater conveyance systems; and (3) develop and implement a monitoring program of all BMPs specified. The two major objectives of the SWPPP are to (1) help identify the sources of sediment and other pollutants that affect the water quality of stormwater discharges and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges.

Regional

Santa Ana River Basin Plan

Existing water quality issues have been identified in the watershed planning process and are incorporated in the Water Quality Control Plan (WQCP) for the Santa Ana River Basin (Basin Plan). The Basin Plan establishes water quality standards for all the ground and surface waters of the region and specifies water quality objectives intended to protect those uses. The Basin Plan also specifies an implementation plan describing actions that are necessary to achieve and maintain water quality standards, and regulates waste discharges to minimize and control their effects. Dischargers must comply with the water quality standards contained in the Basin Plan.

Orange County Drainage Area Management Plan

The purpose of the DAMP was to satisfy NPDES permit conditions for creating and implementing an Urban Runoff Management Program to reduce pollutant discharges to the maximum extent practicable (MEP) for protection of receiving waterbody water quality and support of designated beneficial uses. The DAMP contains guidance on both structural and nonstructural BMPs for meeting these goals. The DAMP identifies activities required to implement the following six minimum control measures required under the Municipal Permit: public outreach; public involvement; illicit discharge detection and elimination; construction site runoff; new development and redevelopment; and municipal operations.

In order to ensure that construction sites implement the appropriate pollution control measures, the 2003 DAMP details recommended BMPs to be applied to new development and significant redevelopment in Orange County. Projects are identified as either priority projects or non-priority projects. Priority projects include, but are not limited to, residential development of ten units or more; commercial and industrial development greater than 100,000 square feet (sf), including parking area; impervious surface of 2,500 sf or more located within, directly adjacent to (within 200 feet), or discharging directly to receiving waters within Environmentally Sensitive Areas; and parking lots 5,000 sf

or more, with 15 parking spaces or more, and potentially exposed to urban stormwater runoff. Some projects developed under the Transit Zoning Code (SD 84A and SD 84B) would be considered priority projects under the 2003 DAMP Model Water Quality Management Plan (WQMP). These regulations require that individual projects incorporate and implement all source control BMPs (routine structural and routine non-structural), unless not applicable to the project due to project characteristics, and document clearly why any applicable source control BMP was not included; incorporate and implement site design BMPs, as appropriate, and document the site design BMPs that are included; and either incorporate and implement treatment control BMPs, by including a selection of such BMPs into the project design; or participate in or contribute to an acceptable regional or watershed-based program.

Projects participating in a regional or watershed program will also implement source control BMPs and site design BMPs consistent with the requirements of the approved regional or watershed-based plan. The combination of source control, site design, and treatment control BMPs or regional or watershed-based programs must adequately address all identified pollutants and hydrologic conditions of concern. These regulations are designed to ensure that stormwater quality management is considered during a project's planning phase, implemented during construction, and maintained for the life of the project.

Routine structural BMPs may function either to minimize the introduction of pollutants into the drainage system or to remove pollutants from the drainage system. Appropriate residential nonstructural BMPs listed in the DAMP that may be used on site to control typical runoff pollutants include homeowner/tenant education, activity restrictions, common area landscape management, BMP maintenance, common area litter and animal waste control, catch basin inspection, employee training, private street/lot sweeping, smart irrigation controllers to avoid over-watering, use of native drought-tolerant landscaping, and designated car washing location on site. BMPs can serve to address bacterial contaminants in addition to other contaminants, although there are no water quality standards set for bacteria levels. Applicable structural and nonstructural BMPs implemented on the site for source control and pollution prevention to minimize the introduction of pollutants into the drainage system depend on the ultimate configuration of the proposed land use.

Orange County Water District Groundwater Management Plan

In 1974, the OCWD proposed a Basin-wide groundwater quality monitoring program, on behalf of Basin Producers, to satisfy the drinking water testing requirements specified in the federal Safe Drinking Water Act (SDWA). The OCWD Plan also addresses the requirements of Senate Bill 1938, passed in 2002, which includes a list of issues to be addressed to ensure compliance of groundwater management plans with the California Water Code.

The Plan does not commit the OCWD to a particular program or level of Basin production, but describes the factors to consider and key issues as the Board makes Basin management decisions on a regular basis each year. Potential projects that are conceptually described in the Plan are described in greater detail in the Long-Term Facilities Plan. Two major objectives drive the Plan: protecting and enhancing groundwater quality and cost-effectively protecting and increasing the Basin's sustainable yield.

Local

City of Santa Ana Urban Water Management Plan 2005

The City of Santa Ana Urban Water Management Plan 2005 (UWMP) was prepared in compliance with the California Water Management Planning Act of 1983. The plan is intended to ensure that water service is sufficient to meet local demands through conservation and efficient use of urban water supplies. The City of Santa Ana Public Works Agency (PWA), the Metropolitan Water District of Southern California (Metropolitan), and the Orange County Water District (OCWD) coordinated with the City in preparation of the Plan, which was adopted by City Council in November of 2005.

As required by the Environmental Protection Agency and the California Department of Health Services, the UWMP evaluates water quality of existing sources and ensures that the City's source of water from imported water supplies and groundwater meet the requirements of the Safe Drinking Water Act of 1996 in terms of salinity, levels of perchlorate, MTBE, uranium and other chemicals. The Water Quality Control Plan was developed by the Santa Ana RWQCB and updated in 1995 to establish water quality standards for all the ground and surface waters in the region and to address issues that have evolved over time due to increasing populations and changing water demands in the region.

Under the 2000 UWMP, Metropolitan projected a 0.5 percent decrease in available supply during an average year, a 4.5 percent increase during a single dry year, and a 3.8 percent increase during the third year of a multiple dry year period over the 20-year period beginning in 2010 and ending in 2030. According to the UWMP, water shortage may occur as the City experiences peak water demands during hot summer months or in response to a future drought. In response to possible water shortage concerns, Metropolitan and the OCWD have invested in conservation, water recycling, storage, and supply as part of their long-term water management strategies. Additionally, the City of Santa Ana's Emergency Water Conservation Plan provides mechanisms to deal with extended water shortage to ensure water is available for domestic use, sanitation, and safety.

City of Santa Ana Sewer Master Plan

The City of Santa Ana Sewer Master Plan presents an assessment of the hydraulic capacity of the City's major sewers and a prioritized set of capital improvement projects to address existing and projected future capacity deficiencies. The two main objectives of the Sewer Master Plan study were to assess the hydraulic capacity of major sewers to ensure adequate capacity for current and projected future wastewater flows and to perform a study to determine the infiltration/inflow of groundwater and stormwater into the City's sewers. The Sewer Master Plan describes existing and future wastewater flows and sewer system capacity. It also recommends a capital improvement program and provides additional recommendations for infiltration/inflow control.

City of Santa Ana General Plan – Public Safety Element

The City of Santa Ana General Plan contains strategies for the City's land use and economic development through a Framework Plan that describes Santa Ana's overall planning strategy and a Policy Plan that spells out the goals and objectives underline the Framework Plan. The Public Safety Element

contains the following objective and policy applicable to the area of hydrology and water quality relative to the proposed project.

Goal 1	Minimize loss of life and property due to natural and man-made catastrophes	
	Objective 1.2	Effectively manage risks associated with earthquakes, floods, fires, and hazardous materials
	Policy	Assure acceptable levels of risk to people and property from flooding and from toxic materials

Consistency Analysis

The Transit Zoning Code (SD 84A and SD 84B) area is not located in a flood hazard area, as identified by the City of Santa Ana. As indicated on the federal Flood Hazard Boundary and Flood Insurance Rate Map, the proposed Transit Zoning Code (SD 84A and SD 84B) area is determined to be outside the 0.2 percent annual chance floodplain. Therefore, the risk of exposing a house or property to natural and man-made catastrophes such as flooding is minimized (refer to goals 2; objectives 1.2; implementation policies). In addition, as discussed below under Project Impacts and Mitigation, adherence to existing regulations (NPDES, Orange County DAMP requirements, and the City's Local Implementation Plan [LIP]) would reduce the potential for increased runoff at development sites and would minimize the alteration of existing drainage patterns. Further, adherence to mitigation measure MM4.6-2, as shown below, would ensure that storm drain capacity is adequate for future development in the Transit Zoning Code (SD 84A and SD 84B) area, which would reduce the risk of downstream flooding. Consequently, implementation of the proposed Transit Zoning Code (SD 84A and SD 84B) would not conflict with the General Plan policies and objectives.

The Transit Zoning Code (SD 84A and SD 84B) complies with the requirements of the Flood Plain Management Ordinance by initiating a variety of development programs and Best Management Practices that would minimize environmental degradation. These practices include the use of bioswales and pervious paving to reduce runoff, installation of overflow piping to storm drains, and the use of drought tolerant species and water conserving landscape features to enable collection and re-use of water.

4.6.3 Project Impacts and Mitigation

Analytic Method

Potential impacts that could result from implementation of the proposed project were evaluated by comparing current uses to those that are proposed. Impacts to surface and groundwater quality were analyzed by reviewing existing groundwater and surface water quality literature that pertains to the area; identifying existing on-site ground and surface waters, including the depth to groundwater; and evaluating existing and potential sources of water quality pollutants based on the types of land uses and operational activities that occur or could occur on the plan area. Additionally, the applicability of federal and state regulations, ordinances, and/or standards to surface and groundwater quality of the project area

and subsequent receiving waters was assessed. Potential impacts from implementation of the proposed project were determined by evaluating the thresholds of significance outlined below.

Thresholds of Significance

The following thresholds of significance are generally based on Appendix G of the 2009 CEQA Guidelines. For the purposes of this EIR, new construction associated with the adoption of the Transit Zoning Code (SD 84A and SD 84B) may have a significant adverse impact on hydrology and water quality if it would result in any of the following:

- Violate any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map
- Place within a 100-year flood hazard area structures, which would impede or redirect flood flows
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow

Effects Found to have No Impact

Threshold	Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The proposed Transit Zoning Code (SD 84A and SD 84B) area is not located within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. The proposed Transit Zoning Code (SD 84A and SD 84B) area is within Zone X on FEMA public flood maps, which is determined to be outside the 0.2 percent annual chance

floodplain.[10] In addition, as shown in the Public Safety Element of the City of Santa Ana General Plan[11], the area is not within the 100-year or 500-year flood hazard area. Thus, implementation of the proposed project would not place housing within a flood hazard area, and there would be ***no impact***, and no further analysis is required.

Threshold	Would the project place within a 100-year flood hazard area structure, which would impede or redirect flood flows?

As stated above, the proposed Transit Zoning Code (SD 84A and SD 84B) area is not within the 100-year flood hazard area, and is outside the 0.2 percent annual chance floodplain. As there would be no risk of flooding in the proposed Specific Plan, there would be ***no impact*** to the placement of structures which would impede or redirect flood flows, and no further analysis is required.

Threshold	Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

As discussed previously, the Transit Zoning Code (SD 84A and SD 84B) area is not located in the flood inundation area of the Prado Dam or the Santiago Dam. Consequently, implementation of the proposed project would not expose people or structures to a significant risk as a result of the failure of a levee or dam, and there would be ***no impact***. No further analysis is required.

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

The proposed Transit Zoning Code (SD 84A and SD 84B) would not expose people to a significant risk of loss, injury, or death involving inundation by a seiche, tsunami, or mudflow because the project site is not located near a coastal area, large water body, or unstable and exposed hills or slopes. The project site is located approximately 10 miles from the Pacific Ocean and 130 feet above sea level, which is a sufficient distance so as not to be subject to tsunami impacts. No impact associated with tsunamis is anticipated to occur.

The closest enclosed bodies of water that could result in earthquake-induced seiches are the Prado Dam, which is located near the City of Corona to the northwest of the Cleveland National Forest, or the Santiago Dam, which is located approximately 12 miles east of the area in Silverado. The project site is not located within a flood hazard (inundation) area associated with either dam.[12] Therefore, overflow as the result of a seiche would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche within the proposed Transit Zoning Code (SD 84A and SD 84B) area.

The City of Santa Ana is located on nearly flat surfaces and there are no areas with slopes significant enough to cause mudflows near the proposed Transit Zoning Code (SD 84A and SD 84B) area which

[10] FEMA. FEMA Map Service Center. Public Flood Map. Map ID: 06059C0277H.
[11] Santa Ana, City of. General Plan Safety Element. Flood and Fire Hazard Areas. Pg. 20.
[12] Santa Ana, City of. General Plan Safety Element. Flood and Fire Hazard Areas. Pg. 20.

would expose people or structures to a significant risk of loss, injury, or death. Therefore, no impact associated with mudflows is anticipated to occur.

In summary, there would be ***no impact*** to the exposure of people or structures at the proposed Specific Plan to a significant risk of loss, injury, or death involving inundation by a seiche, tsunami, or mudflow. No further analysis is required.

Effects Found to Be Less Than Significant

Threshold	Would the project violate any water quality standards or waste discharge requirements? Would the project otherwise substantially degrade water quality?

Impact 4.6-1 **Implementation of the Transit Zoning Code would not violate water quality standards, waste discharge, or otherwise substantially degrade water quality. Compliance with mitigation measure MM4.6-1 and existing regulations would ensure that this would be a *less-than-significant* impact.**

Construction

Soil disturbance would temporarily occur due to construction of future developments under the proposed project, due to earth-moving activities such as excavation and trenching for foundations and utilities, soil compaction and moving, cut and fill activities, and grading. Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in sediment transport via stormwater runoff from the project area. Erosion and sedimentation affects water quality through interference with photosynthesis, oxygen exchange, and respiration, growth, and reproduction of aquatic species. Runoff from construction sites would be typical of urban areas, and may include sediments and contaminants such as oils, fuels, paints, and solvents. Additionally, other pollutants such as nutrients, trace metals, and hydrocarbons can attach to sediment and be transported to downstream drainages and ultimately into collecting waterways, contributing to degradation of water quality.

Construction materials and waste handling, and the use of construction equipment, could also result in stormwater contamination and impact water quality. Spills or leads from heavy equipment and machinery could result in oil and grease contamination. The potential demolition of buildings to allow for redevelopment and infill activities, and the removal of waste material during construction could also result in tracking of dust and debris and release of contaminants in existing structures. Staging areas or building sites can also be the source of pollution due to the use of paints, solvents, cleaning agents, and metals during construction. Pesticide use (including herbicides, fungicides, and rodenticides) associated with site preparation is another potential source of stormwater contamination. Larger pollutants, such as trash, debris, and organic matter could also be associated with construction activities. Water quality degradation could result in health hazards and aquatic ecosystem damage associated with bacteria, viruses, and vectors.

Sediments and contaminants may be transported throughout site runoff to downstream drainages and ultimately into the collecting waterways, and potentially into the Pacific Ocean, thereby affecting surface water and offshore water quality.

Construction activities in the Transit Zoning Code (SD 84A and SD 84B) area could include road improvements and realignments, installation and realignment of utilities, demolition of existing structures for new development or replacement and new development. Areas that disturb one or more acres of land surface are subject to the Construction General Permit, 99-08-DWQ adopted by the SWRCB. Preparation of a Stormwater Pollution Prevention Plan (SWPPP) is required for compliance with the NPDES General Construction Stormwater Activity Permit. Compliance with the permit would involve filing a Notice of Intent with the SWRCB and preparing and submitting a SWPPP prior to construction activities. The SWPPP must describe the site, the facility, erosion and sediment controls, runoff water quality monitoring, means of waste disposal, implementation of approved local plans, control of construction sediment and erosion control measures, maintenance responsibilities, and non-stormwater management controls. Inspection of construction sites before and after storms is required to identify stormwater discharge from the construction activity and to identify and implement controls where necessary. The Construction General Permit requirements would need to be satisfied prior to beginning construction on any project located on a site greater than one acre.

Water quality degradation from construction would be specific to each site within the Transit Zoning Code (SD 84A and SD 84B) area, and depend largely on the areas affected and the length of time soils are subject to erosion and construction activities on site. All development would be subject to regional and local regulations, including the City's Water Pollution Ordinance, adopted to ensure compliance with federal requirements for the control of urban pollutants to stormwater runoff which enters the network of storm drains throughout the Orange County. Contractors constructing new development or redevelopment projects are required to comply with the conditions of the City's Local Implementation Plan (LIP) and the DAMP, including the implementation of appropriate BMPs to control stormwater runoff so as to prevent any deterioration of water quality.

Typical BMPs that could be incorporated into the SWPPP would include, but are not limited to, the following:

- Diversion of off-site runoff away from the construction site
- Vegetation of proposed landscaped/grassed swale areas as soon as feasible following grading activities
- Revegetation of exposed soil surfaces as soon as feasible following grading activities
- Perimeter straw wattles to prevent off-site transport of sediment
- Drop inlet protection (filters and sand bags or straw wattles), with sandbag check dams within paved roadways
- Regular watering of exposed soils to control dust during construction
- Specifications for construction waste handling and disposal
- Contained equipment wash-out and vehicle maintenance areas
- Erosion and sedimentation control measures maintained throughout the construction period
- Stabilized construction entrances to avoid trucks from imprinting debris on City roadways
- Training of subcontractors on general site housekeeping

In order to ensure compliance with existing regulations, implementation of mitigation measure MM4.6-1 would be required for future development projects in the Transit Zoning Code (SD 84A and SD 84B) area.

MM4.6-1 *In order to comply with the current version of the DAMP, future development projects in the Transit Zoning Code (SD 84A and SD 84B) area shall prepare Storm Drain Plans, Stormwater Pollution Prevention Plans (SWPPP), and Water Quality Management Plans (WQMP) conforming to the current National Pollutant Discharge Elimination System (NPDES) requirements, prepared by a Licensed Civil Engineer or Environmental Engineer, shall be submitted to the Public Works Agency for review and approval.*

a. A SWPPP shall be prepared and updated as needed during the course of construction to satisfy the requirements of each phase of the development. The plan shall incorporate all necessary Best Management Practices (BMPs) and other City requirements to eliminate polluted runoff until all construction work for the project is completed. The SWPPP shall include treatment and disposal of all dewatering operation flows, and for nuisance flows during construction. The SWPPP may include, but would not necessarily be limited to, the following applicable measures:

- *Minimum required pavement widths for residential streets needed to comply with all zoning and applicable ordinances*
- *Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces*
- *Reduce the overall imperviousness associated with parking lots by using pervious materials in spillover parking areas*
- *Direct rooftop runoff to pervious areas and avoid routing rooftop runoff to the roadway or the stormwater conveyance system*
- *Biofilters including vegetated swales and strips*
- *Extended/dry detention basins*
- *Infiltration basin*
- *Infiltration trenches or vaults*
- *Catch basin inserts*
- *Continuous flow deflection/separation systems*
- *Storm drain inserts*
- *Media filtration*
- *Foundation planting*
- *Catch basin screens*
- *Normal flow storage/separation systems*
- *Clarifiers*
- *Filtration systems*
- *Primary waste water treatment systems*
- *Dry Wells*
- *Cistern*

b. *A WQMP shall be prepared, maintained, and updated as needed to satisfy the requirements of the adopted NPDES program. The plan shall incorporate water quality measures for all improved phases of the project.*

Compliance with mitigation measure MM4.6-1 and applicable permit requirements for construction conditions would ensure that construction water quality effects for future development in the Transit Zoning Code (SD 84A and SD 84B) area would be reduced to the maximum extent practicable and would be considered ***less than significant***.

Operation

Operation of future developments in the Transit Zoning Code (SD 84A and SD 84B) area could result in the addition of contaminants into the stormwater runoff entering the City's drainage system. The major source of pollution to runoff and infiltrating groundwater would be contaminants that have accumulated on the land surface over which stormwater passes. Between rainstorms, material would be deposited on the streets, paved areas, rooftops, and other surfaces from debris dropped or scattered by individuals, wastes and dirt from construction and renovation or demolition, fecal droppings from animals, oil and various residues contributed by vehicular traffic, and fallout of air-borne particles.

It is possible that future developments would increase the amount of impervious surfaces within the Transit Zoning Code (SD 84A and SD 84B) area, which could potentially increase stormwater runoff. However, because a majority of the Transit Zoning Code (SD 84A and SD 84B) area is already built-out, any increase in impervious surfaces is anticipated to be minor in relation to existing conditions. As part of the implementation of the Transit Zoning Code (SD 84A and SD 84B) and the Developer project 15 residential structures on 11 unique Assessor's Parcels are proposed to be demolished (refer to Figure 3-8 (Demolitions) There are an additional 19 properties, which the Agency/City may consider acquiring (refer to Figure 3-6 (Potential New Santa Ana Redevelopment Agency Acquisitions). The potential acquisition and subsequent development of these properties may require some level of demolition of existing structures. These properties are assumed to have associated yards, which currently provide pervious surfaces that could be replaced with impervious surfaces, were they to be removed. However, the Transit Zoning Code (SD 84A and SD 84B) contains standards related to the provision of landscaping which will serve to mitigate the loss of any existing landscaped areas. Therefore, the potential net change in pervious/impervious surfaces is anticipated to be minimal. Further, the potential for infill development to contribute to polluted runoff would be minimal, and it is assumed that annual pollutant loads would remain similar under future developed conditions compared to existing conditions.

Discretionary projects would require the preparation of a WQMP. A WQMP would be specific to the expected pollutants that would be present in the stormwater flow from project sites after completion of construction. The WQMP would incorporate the requirements of DAMP Section 7, including all feasible recommended BMPs. It would include site design, source control, and treatment control BMPs to address the specific pollutants anticipated from the project and project site, and would detail the specific operation and maintenance of each BMP. The WQMP would outline a routine maintenance schedule for each BMP, in compliance with the DAMP and local regulations.

In addition, as discussed previously, developments within the City would be subject to the provisions of the City's Water Pollution Ordinance. Further, as is required for construction activities, operation of new development or redevelopment projects are required to comply with provisions set forth the City's LIP and the DAMP, including the implementation of appropriate BMPs to control stormwater runoff so as to prevent any deterioration of water quality.

Compliance with mitigation measure MM4.6-1, NPDES permits requirements, the Orange County DAMP, and the City's LIP and Municipal Code would reduce the risk of water degradation within the Transit Zoning Code (SD 84A and SD 84B) area from the operation of new developments to the maximum extent practicable. Therefore, since violation of waste discharge requirements or water quality standards would be minimized, this impact would be ***less than significant***.

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

Impact 4.6-2 **Long-term cumulative development occurring pursuant to the Transit Zoning Code (SD 84A and SD 84B) would not interfere substantially with groundwater recharge. This is considered a *less-than-significant* -impact.**

Construction

Construction activities would primarily occur as part of future infill development; with the exception of the Developer project proposed for the 49 Agency-owned parcels (refer to Figure 3-5 (Santa Ana Redevelopment Agency Parcels)]. According to the City's General Plan, Santa Ana does not serve as the main spreading basin for groundwater recharge. Depending on the groundwater table at particular project sites within the Transit Zoning Code (SD 84A and SD 84B), pile driving, dewatering, and other construction activities that would encounter groundwater could potentially occur. While the insertion of support and foundation structures in the groundwater may reduce the storage capacity of groundwater, the displaced volume would not be substantial relative to the volume of the Basin. Likewise, while dewatering would remove groundwater, the volume of water removed would not likely be substantial relative to groundwater pumping for water supply. Also, water used during construction for cleaning, dust control, and other uses would be nominal. Thus, construction activities would not substantially deplete groundwater supplies nor interfere substantially with groundwater recharge. This impact is considered ***less than significant***.

Operation

Future development under the Transit Zoning Code (SD 84A and SD 84B) would lead to increases in water consumption, especially to the extent that residential uses, which typically use more water, replace commercial and office uses presently existing in the area). Refer to Section 4.12 (Utilities and Service Systems) for an analysis of available water supplies and the proposed project's potential impact on water

supplies. Because the majority of the project area is presently developed with existing uses and the project does not serve as the main spreading basin for groundwater recharge, the potential future development would not substantially reduce areas of ground percolation and recharge because the existing uses would simply be replaced with new uses.

As discussed previously, the City does not serve as the main spreading basin for groundwater recharge. Thus, any development on the limited undeveloped land within the Transit Zoning Code (SD 84A and SD 84B) area, groundwater recharge would not substantially affect groundwater recharge.

Therefore, because the majority of the Transit Zoning Code (SD 84A and SD 84B) area is already developed and because the project area is not used for groundwater recharge, the operation of future development under the proposed project would not interfere substantially with groundwater recharge. This impact is considered ***less than significant***.

Threshold	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site?

Impact 4.6-3 **Development under the Transit Zoning Code (SD 84A and SD 84B) could alter the existing drainage pattern of the area and potentially result in erosion and siltation. Compliance with mitigation measure MM4.6-1 and existing regulations would ensure that this would be a *less-than-significant* impact.**

Construction

Construction activities under the proposed Transit Zoning Code (SD 84A and SD 84B) would involve stockpiling, grading, excavation, paving, and other earth-disturbing activities, which could result in the alteration of existing drainage patterns. These types of activities would constitute a temporary alteration of drainage patterns. However, future development would be required to comply with the 2003 DAMP and the City's corresponding Local Implementation Plan (LIP), which serves as the primary policy and implementation document for compliance with the NPDES Stormwater permits.[13] As described above in Impact 4.6-1, compliance with NPDES regulations and the City's Municipal Code would reduce the risk of short-term erosion resulting from drainage alteration during construction to a ***less-than-significant*** impact.

Operation

The majority of the Transit Zoning Code (SD 84A and SD 84B) is presently developed with a mix of residential, office, commercial and industrial uses. The introduction of new mixes of uses within the Transit Zoning Code (SD 84A and SD 84B) area are not anticipated to result in substantial changes to the existing drainage patterns because existing drainage facilities would continue to be used and the amount of drainage would remain similar to present levels. However, it is possible that future

[13] City of Santa Ana, Local Implementation Plan Executive Summary, 2003.

development in the Transit Zoning Code (SD 84A and SD 84B) area could result in minor alterations to drainage, such as changes in ground surface permeability via paving, or changes in topography via grading and excavation.

Impact 4.6-1 discusses applicable regulations that would limit pollutant discharges from future development in the Transit Zoning Code (SD 84A and SD 84B) area. In addition, all development in the Specific Plan would be subject to the provisions of the City's LIP and Orange County DAMP. These regulations include the implementation of appropriate BMPs including a range of methods that could minimize off-site erosion, including but not limited to hydrodynamic devices, swales/biofilters, basins, and various filters.

In addition, as required by mitigation measure MM4.6-1, future developments would be required to prepare a storm drain plan and WQMP. Implementation of these plans would reduce the volume of sediment-laden runoff discharging from sites within the Transit Zoning Code (SD 84A and SD 84B). Consequently, because future projects, including the Developer project, in the Transit Zoning Code (SD 84A and SD 84B) are not anticipated to substantially alter drainage patterns in comparison to existing conditions in the area, and because adherence to existing requirements would reduce erosion and siltation during operation, this impact is considered ***less than significant***.

Threshold	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site? Would the project 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?

Impact 4.6-4 **Future development in the Transit Zoning Code (SD 84A and SD 84B) could alter the existing drainage pattern and potentially result in increased downstream flooding through the addition of impervious surfaces, or exceeding the capacity of existing or planned stormwater drainage systems. Adherence to mitigation measures MM4.6-2 through MM4.6-4 would reduce this impact to a *less-than-significant* level.**

Future development in the Transit Zoning Code (SD 84A and SD 84B) area would generally consist of infill development or redevelopment. As such, most of the future projects would not result in new development that would substantially alter drainage patterns because these areas are already developed with existing uses and impervious surfaces. However, development of land that is currently vacant and covered with permeable surfaces may occur. Although minimal, increased impervious surfaces would increase stormwater runoff in the Transit Zoning Code (SD 84A and SD 84B) area. In addition, it is presently unknown whether the existing drainage system throughout the Transit Zoning Code (SD 84A and SD 84B) area is adequate.[14] Therefore, in order to provide a conservative assessment, it is possible

[14] Verbal communication with Santa Ana Public Works Department. October 16, 2006.

that this increased runoff could exceed the capacity of existing and planned infrastructure and cause downstream flooding impacts.

Adherence to mitigation measure MM4.6-1 would require the preparation of a WQMP and implementation of appropriate BMPs, which could incorporate stormwater detention facilities, and would reduce the volume of runoff generated (and potential for flooding) in the Transit Zoning Code (SD 84A and SD 84B) area. However, because the existing capacity of the existing storm drain system in the Transit Zoning Code (SD 84A and SD 84B) area is unknown, this is considered a ***potentially significant*** impact. Implementation of mitigation measures MM4.6-2 through MM4.6-4 would be required to address these issues.

MM4.6-2 *Prior to issuance of grading permits for future development projects in the Transit Zoning Code (SD 84A and SD 84B) area, applicants shall submit site-specific Hydrology and Hydraulic Studies to the Public Works Department for review and approval. If existing facilities are not adequate to handle runoff that may be generated by the proposed development, then the applicant shall propose feasible remedies to assure that adequate drainage facilities will be available prior to issuance of occupancy permits. The applicant may propose storm drain improvements to be constructed in order to meet project needs. If necessary storm drain upgrades cannot be implemented prior to issuance of occupancy permits, on site detention facilities or other methods acceptable to the City shall be included with new development projects to ensure that post-construction runoff does not exceed pre-development quantities.*

MM4.6-3 *During the design of individual projects, applicants shall minimize impervious area by incorporating landscaped areas over substantial portions of a proposed project area. Furthermore, impervious areas shall be directly connected to landscaped areas or bioretention facilities to promote filtration and infiltration of stormwater.*

MM4.6-4 *During the design of individual projects, applicants shall control structural source through storm drain stenciling and signage, coverage of trash area to minimize direct precipitation, efficient irrigation to minimize runoff into stormwater conveyance system, slope and channel protection to decrease potentials for erosions of slopes, and use of deep-rooted, drought tolerant plant species for erosion control.*

Adherence to mitigation measures MM4.6-2 through MM4.6-4 would ensure that runoff would not exceed the capacity of storm drain systems, and this impact would be reduced to a ***less-than-significant*** level.

4.6.4 Cumulative Impacts

A cumulative impact analysis is only provided for those thresholds that result in a less-than-significant, potentially significant, or significant and unavoidable impact. A cumulative impact analysis is not provided for Effects Found Not to Be Significant, which result in no project-related impacts.

The geographic context for the analysis of cumulative impacts associated with water quality is the San Diego Creek Watershed. Cumulative development would involve construction activities which would result in increases in stormwater runoff from new impervious surfaces. Construction of new development could result in the erosion of soil, thereby cumulatively degrading water quality. In addition,

the increase in impermeable surfaces and more intensive land uses may also adversely affect water quality by increasing the amount of stormwater runoff and common urban contaminants entering the storm drain system. However, new development would be required to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff. Among the various regulations that are applicable include the provisions of NPDES permits, implementation of appropriate BMPs, and compliance with local regulations. This would minimize degradation of water quality at individual project construction sites. As such, cumulative impacts would be ***less than significant***, and the proposed project would not have a cumulatively considerable contribution.

The geographic context for the analysis of cumulative impacts associated with groundwater is the area underlain by the Orange County Groundwater Basin. Cumulative development within the Basin could interfere with groundwater recharge. New development occurring in vacant areas that currently serve as groundwater recharge areas would reduce recharge potential within the Basin. The overall growth within the Basin could directly or indirectly result in the loss of groundwater recharge areas. However, this loss would be mitigated by OCWD via operation of the on-going Groundwater Replenishment System (GRS). Ongoing implementation of the GRS would increase groundwater supplies by injecting reclaimed water into the Basin and protecting it against seawater intrusion. Thus, cumulative impacts associated with groundwater would be ***less than significant***. Because the proposed project would not affect groundwater recharge, it would not have a cumulatively considerable contribution to this effect.

Cumulative development could result in the introduction of new structures and impervious surfaces that would increase stormwater runoff, which could subsequently lead to increased flood hazards. Because the existing condition of the storm drain system is unknown, future development could result in a cumulative impact. However, the proposed project would ensure that post-development runoff from future projects within the Transit Zoning Code (SD 84A and SD 84B) area would not exceed storm drain capacity, and thus, the proposed project's contribution to cumulative impacts associated with flood hazards would be ***less than significant***.

4.6.5 References

CDM. 2005. *City of Santa Ana: GIS Integrated for Drainage Facility Inventory and Analysis*.

FEMA. FEMA Map Service Center. Public Flood Map. Map ID: 06059C0277H.

Orange, County of. 2003. *Drainage Area Management Plan*.

Orange County Water District (OCWD). 2004. *Groundwater Management Plan*.

Orange County Watershed & Coastal Resources Division. 2007. Introduction to San Diego Creek Watershed. http://www.ocwatersheds.com/watersheds/sandiego_creek.asp (accessed July 25, 2007).

Santa Ana, City of. 1982. General Plan Public Safety Element.

———. 1997. Draft EIR No. 97-01 for the Land Use Element.

———. 2000. Land Use Element. *Santa Ana General Plan*.

———. 2003a. Executive Summary. *Local Implementation Plan*.

———. 2003b. *Sewer Master Plan*.

———. 2005. *Urban Water Management Plan*.