3.12 WATER RESOURCES

INTRODUCTION

This section describes the existing water resources in the SCAG region, identifies the potential impacts of the RTP on these resources, includes mitigation measures for the impacts and evaluates the residual impacts.

ENVIRONMENTAL SETTING

The existing water resources in the SCAG region are described in terms of climate, water supply and demand, water quality, and water safety and hazard issues.

Climate

Much of California enjoys a Mediterranean-like climate with cool, wet winters and warm, dry summers. An atmospheric high-pressure belt results in fair weather for much of the year with little precipitation in the summer. Most of the region's moisture originates in the Pacific Ocean as the high-pressure belt shifts southward in the winter. Climate within the SCAG region varies significantly depending on topographical conditions. The coastal areas have mild rainy winters and warm dry summers, while the inland areas experience more extreme temperatures and little precipitation. Most precipitation within the SCAG region occurs as rainfall, although snowfall is common at higher elevations. Approximately 80 percent of the annual precipitation occurs between December and March, mostly during a few major storms. Severe flooding can occur during these major storm events. For the entire region, annual rainfall can range from 2 to 5 inches in the inland deserts, 10 to 15 inches on the coastal plains, and 20 to 45 inches in the mountains. Table 3.12-1 and Figure 3.12-1 show the disparity of average precipitation within the region.

Table 3.12-1: Average Total Precipitation for Selected Areas Within the SCAG Region (1960-2001, in inches)

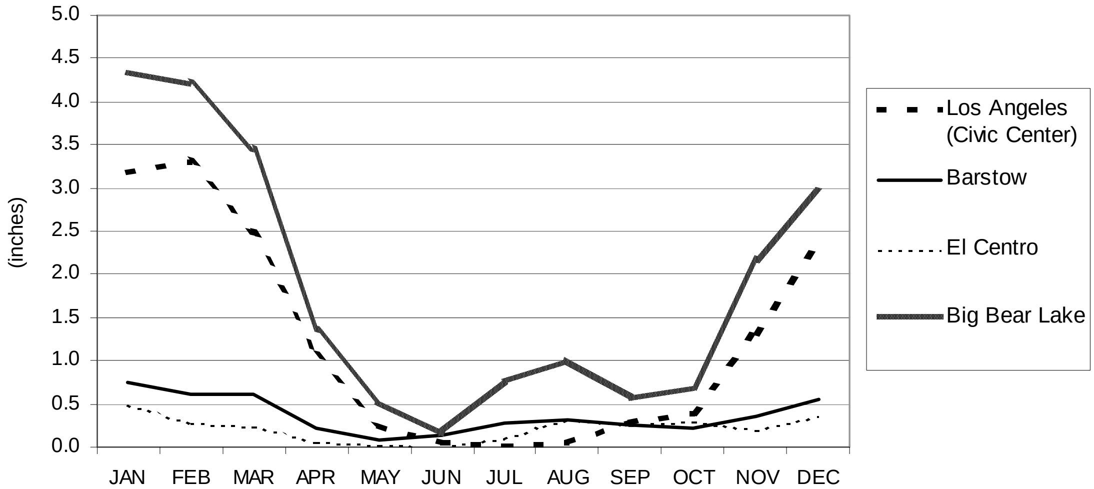
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Los Angeles (Civic Center)	3.19	3.31	2.48	1.07	0.26	0.06	0.01	0.06	0.29	0.40	1.32	2.34	14.79
Barstow	0.75	0.61	0.62	0.22	0.08	0.13	0.28	0.32	0.26	0.21	0.36	0.55	4.40
El Centro	0.49	0.28	0.23	0.06	0.02	0.00	0.09	0.31	0.26	0.29	0.20	0.36	2.60
Big Bear Lake	4.35	4.21	3.45	1.35	0.53	0.15	0.76	1.00	0.57	0.69	2.17	2.96	22.20

Source: Western Region Climate Center. (2001). www.wrcc.wri.edu. Accessed March 2003.

Water Supply and Demand

The acre-foot is a common measure of volume in discussions of water supply. An acre-foot (af) is the amount of water required to fill an acre-sized area with one foot of water.

Figure 3.12-1 Average Monthly Precipitation for Selected Areas within the SCAG Region (1960-2001)



Source: Western Regional Climate Center. www.wrcc.wri.com. Accessed March 2003.

Local Water Supply

Local sources of water account for approximately 26 percent of the total volume consumed annually in the SCAG region.[1] Local sources include surface water runoff, groundwater and water reclamation. Water balance summaries for each of the hydrologic regions in the SCAG region are provided in Table 3.12-2 in the Technical Appendices. Below the following descriptions of local and imported water supply sources is a section describing water suppliers.

<u>Groundwater</u>

Groundwater accounts for most of the region's local (i.e., non-imported) supply of fresh water. In California, groundwater typically provides 30 percent of the urban and agricultural water used. This proportion increases to 40 percent in dry years.[2] The hydrologic regions vary in their dependence on groundwater for urban and agricultural uses. These differences are reflected in Table 3.12-3. Figure 3.12-4 (in Chapter 8.0 Figures) shows the groundwater basins within the SCAG Region. The California Department of Water Resources (DWR) estimates that the state has a groundwater overdraft (meaning that more groundwater is used than is restored) of approximately 1 to 2 million acre-feet (maf) in average years.[3] Changes in groundwater storage

[1] California Department of Water Resources. (1998). *The water plan*. Sacramento, CA.

[2] California Department of Water Resources. (2003). DRAFT bulletin 118: Draft California groundwater update. Sacramento, CA.

[3] California Department of Water Resources. (2003). *DRAFT California Water Plan Update*. Sacramento, CA.

for the hydrologic regions included in the SCAG region are shown in Table 3.12-2 in the Technical Appendices.

Table 3-12-3: Groundwater Dependence in the SCAG Region

Hydrologic Region	Percentage of the Total Urban and Agricultural Water Supply Provided by Groundwater
Central Coast[1]	83%
South Coast[2]	23%
South Lahontan[3]	50%
Colorado River[4]	8%

Source: Department of Water Resources. (2003). *DRAFT Bulletin 118. Draft California Groundwater Update.* Sacramento, CA.

[1] Includes part of Ventura County. The remainder is outside of the SCAG Region.

[2] Includes Orange County, most of San Diego and Los Angeles Counties, parts of Riverside, San Bernardino, Ventura, Kern and Santa Barbara Counties.

[3] Includes most of San Bernardino County, as well as Inyo, and parts of Mono, Kern and Los Angeles Counties.

[4] Includes all of Imperial County, most of Riverside, and parts of San Bernardino and San Diego Counties.

Recent efforts to store recycled water and surplus water in groundwater basins for use during drought periods have proven successful. The Metropolitan Water District of Southern California (MWD) has entered into 22 agreements with various water agencies for groundwater storage, resulting in more than 80,000 af of added supply per year.[4] A number of agencies within the region are also active in the recharge of surface water, including the Orange County Water District, Los Angeles County Department of Water and Power, Foothill Municipal Water District, San Bernardino County Water and Flood Control District, Coachella Valley Water District, the Water Replenishment District of Southern California, the San Gabriel Valley Municipal Water District and the Calleguas Municipal Water District.[5]

Surface Runoff

The infiltration of surface runoff augments groundwater and surface water supplies. However, the regional water demand exceeds the current natural recharge of runoff water. The arid climate, summer drought and increased urbanization contribute to this reduction in natural recharge. Runoff captured in storage reservoirs varies widely from year to year depending on the amount of local precipitation. On average precipitation contributes 55,000 acre-feet per year (afy) within the MWD service area (not including San Diego County).[6] Within the desert regions, the amount is considerably less, owing to weather and the absence of surface storage facilities.

[4] Metropolitan Water District. (2003). Appendix A: Metropolitan water demands. In *Report on Metropolitan water supplies*. Los Angeles, CA.

[5] California Department of Water Resources. (2003). *DRAFT California Water Plan Update.* Sacramento, CA.

[6] Metropolitan Water District. (2003). Appendix A: Metropolitan water demands. In *Report on Metropolitan water supplies*. Los Angeles, CA..

Storage Capacity

Water agencies in the region are also modifying existing reservoirs or creating new reservoirs to accommodate the expected future growth in water demand. MWD completed filling Diamond Valley Lake near Hemet in Riverside County in early 2002. This reservoir provides approximately 800,000 af of storage. In addition to surface storage, MWD is implementing various groundwater storage projects both within the SCAG region and in other areas of California. These "conjunctive use" projects store excess water during wet years in underground basins and can be accessed during dry years when surface water supplies are limited.

Imported Water Supply

Imported sources of water (including the Colorado River Aqueduct, the State Water Project's California Aqueduct, and the Los Angeles Aqueduct) currently supply more than 6 maf of water to the SCAG region annually, accounting for nearly three quarters of the total water used in the region.[7]

Since local supplies alone have not been sufficient to serve Southern California's rapidly growing population, imported water supplies have historically been developed to accommodate projected demands. Beginning with the completion of the Los Angeles Aqueduct in 1913, the region has imported water from other parts of the state to supplement local supplies.

The All-American Canal and Coachella Canal were completed in 1940, supplying water to irrigation districts in the Imperial and Coachella Valleys for agricultural operations. The Colorado River Aqueduct completed in 1941 by MWD brings Colorado River water to the urban coastal areas, ranging from Ventura County to San Diego County. The California Aqueduct completed in the 1970s delivers water from the Sacramento Delta to MWD for distribution to retail agencies throughout southern California. Figure 3.12-5 (in Chapter 8.0 Figures) depicts the areas served by these imported water supplies.

Colorado River

Under water delivery contracts with the United States for permanent service, California entities have enjoyed certain entitlements to Colorado River water. Prior to 1985, California generally received about 6 maf per year. The regularity of this delivery changed with implementation of the Central Arizona Project in 1985 when California's firm apportionment was reduced to 4.4 maf per year. However California is entitled to one half of the surplus water available when the Secretary of the Interior declares a surplus condition on the River. Typically the River's surplus has allowed California entities to take an additional 800,000 af annually.

However, with increased urbanization in the Colorado River Basin states and recent agreements among the Basin states and the California water agencies, the availability of surplus water for California will steadily decline over the next fifteen years. California water agencies are pursuing

[7] California Department of Water Resources. (1998). *The water plan*. Sacramento, CA.

various strategies to offset this gradual, but certain loss of future water. Examples of these strategies include additional reservoir and storage agreements, new water transfers between agricultural and urban users, and more water conservation and recycling.[8]

State Water Project

The State Water Project (SWP) supplies water to Southern California via the California Aqueduct, with delivery points in Los Angeles, San Bernardino, and Riverside counties. SWP has historically provided 25 to 50 percent of MWD's water.[9] Southern California's maximum SWP contractual entitlement is about 2.0 maf per year, and the reliable yield is much less.

Los Angeles Aqueduct

The Los Angeles Aqueduct, originally built in 1913, carries water 233 miles south from Owens Valley to Los Angeles. The original aqueduct project was later supplemented by a second project built to transfer water from Mono Basin to Los Angeles. These two aqueducts have historically supplied an average of about 300,000 afy. However, in drier periods, deliveries have been reduced to less than 150,000 afy.[10]

Currently, the supply has been reduced because of litigation aimed at protecting Owens Valley and Mono Basin by reducing the City's diversion of water from these environmentally impaired ecosystems. For planning purposes, an average supply of 380,000 afy and a dependable supply of 310,000 afy are used. During severe droughts, these supplies can be reduced to 125,000 afy.

Water Suppliers

Numerous wholesale and retail water suppliers serve the SCAG region. Largest of these regional suppliers is MWD, serving the urbanized coastal plain from Ventura County to the Mexican border. Other suppliers in the desert regions of Southern California mainly serve agricultural interests and individual cities. These water wholesalers provide water to local water agencies for retail distribution. As an example of this distribution, MWD supplies 26 member agencies, 12 of which wholesale water to local cities and 14 of which are individual cities that directly serve water to their residents.

Metropolitan Water District

MWD was organized in 1928, as a result of the Metropolitan Water District Act adopted by the State Legislature. The agency was created to develop, store, and distribute water at wholesale rates to its member agencies. Member agencies include individual cities and local water

[8] Metropolitan Water District. (2003). Report on Metropolitan's water supplies. Los Angeles, CA.

[9] Metropolitan Water District. (2003). Appendix C: California aqueduct deliveries. In Report on Metropolitan's Water Supplies. Los Angeles, CA.

[10] Metropolitan Water District. (2003). Appendix A: Demand projections. In Report on Metropolitan Water Supplies. Los Angeles, CA.

agencies within the service area, supplying municipal, industrial, and agricultural uses. Municipal and industrial demand within the MWD service area constitutes approximately 90 percent of the total demand. As urbanization has increased and water prices have risen, agricultural demand has declined from 14 percent of the total MWD demand in 1980 to 8 percent in 1997.[11] Table 3.12-4 summarizes dry-year supply and demand to the year 2025 for the MWD service area. Figure 3.12-6 (in Chapter 8.0 Figures) depicts the MWD service area within the SCAG Region.

Table 3.12-4: Water Supply[1] Multiple Dry Year Projections for the MWD Service Area (acre-feet per year)

	2005	2010	2015	2020	2025
Current supplies					
Colorado River[2]	721,330	833,292	833,292	833,292	833,292
California Aqueduct	1,290,300	1,376,100	1,146,100	1,120,300	1,120,300
In-Basin Storage	455,300	531,700	530,400	513,000	499,200
Supplies Under Development					
Colorado River[2]	167,300	416,708	416,708	416,708	416,708
California Aqueduct	20,000	195,000	390,000	390,000	390,000
In-Basin Storage	-	89,000	200,000	200,000	200,000
Maximum Supply Capability[1]	**2,654,230**	**3,441,800**	**3,516,500**	**3,473,300**	**3,459,500**
Total Demands on MWD (firm and replenishment)	**2,245,200**	**2,175,600**	**2,320,900**	**2,534,100**	**2,688,500**
Potential Reserve and System Replenishment Supply	**409,030**	**1,266,200**	**1,195,600**	**939,200**	**771,000**

Source: Metropolitan Water District, 2003. Report on Metropolitan's Water Supplies
[1] Represents expected supply capability for resource programs.
[2] Total Colorado River Aqueduct Deliveries limited to 1,250,000 acre-feet per year.

In 2005, MWD projects delivery of 1.97 maf of water to its member agencies (including San Diego County Water Authority), increasing to 2.4 maf in 2025 in normal year weather.[12] Projections are not available for 2030. Projections for multiple dry years are used as planning targets, since in those years supplies are restricted and demand generally increases. The annual multiple dry-year demand is projected to increase to 2.7 maf by 2025, not including agricultural demand.[13] The “Report on Metropolitan’s Water Supplies” identifies strategies to meet projected future demand, including increased storage, conjunctive use (groundwater storage), conservation, desalination, water transfers, and recycling. The Plan also outlines a plan of local projects in

[11] *Ibid.*

[12] Metropolitan Water District. (2003). Appendix A: Demand projections. In *Report on Metropolitan’s water supplies*. Los Angeles, CA.

[13] *Ibid.*

which these efforts would be coordinated with local agencies, sharing the costs and providing an incremental approach to meeting demand.

With the local projects planned and currently underway, MWD estimates that water supplies will be reliable for the next 20 years, even in severe drought conditions similar to 1990. Through enhanced conservation efforts, MWD expects a 7 to 12 percent reduction in demand this year.

Suppliers Outside MWD Service Area

Other districts within the SCAG area access water from the same sources as MWD: the Colorado River, the SWP, and local sources. Water use in these areas is predominantly for agricultural purposes. Water Districts outside the MWD service area are listed in Table 3.12-5 and shown in Figure 3.12-9 (in Chapter 8.0 Figures).

Table 3.12-5: Major Water Suppliers Outside the MWD Service Area

Water Agency	Land Area (square miles)	Sources of Water Supply
Antelope Valley and East Kern District	2,350	SWP, groundwater, reclaimed water
Bard Irrigation District (and Yuma Project Reservation Division)	23	Colorado River
Casitas Municipal Water District	150	Groundwater
Castaic Lake Water Agency	125	SWP
Coachella Valley Water District	974	SWP, Colorado River, and local
Crestline Lake Arrowhead	53	SWP
Desert Water Agency	324	SWP and groundwater
Imperial Irrigation District	1,658	Colorado River
Littlerock Creek Irrigation District	16	SWP, groundwater, and surface water
Mojave Water Agency	4,900	SWP and groundwater
Palmdale Water Agency	187	SWP and groundwater
Palo Verde Irrigation District	188	Colorado River
San Bernardino Municipal Water	328	SWP and groundwater
San Gorgonio Pass Water Agency	214	Groundwater

Source: Environmental Science Associates. (2000). Los Angeles, CA.

Many of these Districts are located in the arid regions of Imperial and Riverside Counties within the Colorado River Hydrologic Unit, and supply predominantly agricultural interests with Colorado River water.

The Imperial Irrigation District (IID) has diverted and delivered more than 3.1 maf of Colorado River water to nine cities and nearly 500,000 acres of agricultural lands in Imperial Valley. Ninety-eight percent of that water is used for agricultural purposes. The remaining two percent is treated to safe drinking water standards and distributed to residential water customers. The district maintains an extensive gravity flow drainage system and maintains ten fully operational reservoirs. IID recently agreed to a water transfer with the San Diego County Water Authority in which up to 200,000 afy will be delivered to coastal urban consumers via the Colorado River Aqueduct.[14]

<u>CALFED</u>

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary (the Bay Delta) is the largest estuary on the West Coast. It supplies drinking water for two-thirds of the people in California and irrigation water for over 7 million acres of agricultural land. The Bay-Delta is the hub of California's two largest water distribution systems: the Central Valley Project (CVP) operated by the U.S. Bureau of Reclamation and the SWP operated by the California Department of Water Resources. MWD has a SWP contractual entitlement of more than 2 maf annually that is moved through the Bay Delta water system and the California Aqueduct.

For decades, the Bay-Delta has been the focus of competing interests: economic, ecological, urban, and agricultural. These conflicting demands have resulted in a changing outlook for uses of Bay-Delta water. As ecological claims have grown, the prospects for full use of urban entitlements have suffered. Increasingly, greater supplies to meet urban and agricultural demand have become doubtful.

Since 1995 State and Federal agencies with regulatory or management responsibility in the Bay-Delta have been working together as CALFED to develop a long-term comprehensive plan that will improve water management of the Bay-Delta system and better meet competing goals. The Draft Environmental Impact Report for management alternatives of the Bay-Delta was completed in 1999.

Wastewater Treatment Facilities

Much of the urbanized areas of Los Angeles and Orange Counties are serviced by three large publicly owned treatment works (POTWs): the City of Los Angeles Bureau of Sanitation Hyperion Facility, the Joint Outfall System of the Los Angeles County Sanitation Districts, and the Orange County Sanitation District treatment plant. These three facilities handle more than 70 percent of the wastewater generated in the entire SCAG region, serving a population of approximately 12 million people.

In addition to these large facilities, medium sized POTWs (greater than 10 million gallons per day or mgd) and small treatment plants (less than 10 mgd) service smaller communities in Ventura County, southern Orange County, and in the inland regions (see Table 3.12-6). Many of these treatment systems recycle their effluent through local landscape irrigation and groundwater

[14] Imperial Irrigation District. (n.d.). Water. Retrieved August 28, 2003 and November 5, 2003, from <u>http://www.iid.com/water/</u>.

Table 3.12-6: Wastewater Flow and Capacity in the SCAG Region

Wastewater Agency	Current Flow (mgd)	Capacity Flow (mgd)
Imperial County		
City of El Centro	3.9	8.0
City of Brawley	3.7	6.0
City of Calexico	2.2	4.3
Los Angeles County		
Los Angeles County Sanitation Districts	514.9	642.8
City of Los Angeles	430.0	560.0
Las Virgenes Municipal Water District	9.5	16.0
City of Burbank	9.0	9.0
Orange County		
Orange County Sanitation District	234.0	480.0
Irvine Ranch Water District	18.1	25.5
South Orange County Wastewater Authority (SOCWA)	26.5	35.7
El Toro Water District	6.0	6.0
Moulton Niguel Water District	All wastewater goes to SOCWA treatment facilities	
Santa Margarita Water District*	6.5	
Riverside County		
Eastern Municipal Water District	31.3	49.0
City of Riverside	30.0	40.0
San Bernardino County		
Inland Empire Utilities Agency	60.0	76.0
City of San Bernardino	25.5	33.0
Victor Valley Wastewater Reclamation Authority	8.7	11.0
City of Redlands	6.0	9.5
Ventura County		
City of Oxnard	31.7	39.7
City of Simi Valley	12.5	18.0
City of Thousand Oaks	10.3	12.0
City of Ventura	9.0	14.0
Camarillo Sanitation District	4.5	6.8

* capacity flow data not available
Source: SCAG research. (May 2003).

recharge projects. Other treatment systems discharge to local creeks on a seasonal basis, effectively matching the natural conditions of ephemeral and intermittent stream habitats.

Many rural communities utilize individually owned and operated septic tanks rather than centralized treatment plants. The RWQCB generally delegates oversight of septic systems to local authorities. However, Waste Discharge Requirements (WDRs) are generally required for multiple-dwelling units and in areas where groundwater is used for drinking water.

Water Demand

Water demand in California can generally be divided between urban, agricultural, and environmental uses. In the SCAG area, 74 percent of potable water is provided from imported sources. Annual water demand fluctuates in relation to available supplies and according to the rainfall of a particular year. During prolonged periods of drought, water demand can be reduced significantly through conservation measures. In 1995 (the year for which data was provided in DWR's 1998 Water Plan Update)[15], the demand for water in the State of California was 80 million maf. Of this total, the SCAG region accounted for approximately 9.8 maf.[16]

California's water demand has grown along with population. According to the Draft California Water Plan Update 2003, water demand in California will increase by 2 to 3 maf by 2030.[17] If SCAG maintains its share of 12% of the state's water demand, the SCAG region could be expected to require an additional 245,000 to 370,000 af in 2030.

Demographics, Land Use, and Water Use

Water demand is influenced not only by population size, but also by socio-economic characteristics, geographical distribution of the population, and water conservation practices. The MWD estimates that average residential per capita use ranges from 97 gallons per person per day in coastal areas to 162 gallons per person per day in the desert areas.[18] Table 3.12-7 provides factors that influence water demand. Table 3.12-2 (in Chapter 8.0 Figures) provides information on the supply sources for each of the hydrologic regions in the SCAG region.

Table 3.12-7: Factors Influencing per Capita Water Use

Factors that increase per capita water use	Factors that decrease per capita water use
Increased household income	Increased household size
Increased labor force	Increased proportion of multi-family housing
Increased commercial development	Changes in the industrial mix
Growth in the inland region	Urban water conservation

Source: SCAG. (1996). *Regional Comprehensive Plan and Guide*. Los Angeles, CA.

[15] California Department of Water Resources. (1998). *California Water Plan Update*. Sacramento, CA.

[16] *Ibid.*

[17] California Department of Water Resources. (2003). DRAFT California Water Plan Update. Sacramento, CA.

[18] Southern California Association of Governments. (1996). *Regional comprehensive plan and guide*. Los Angeles, CA.

Water Conservation

Urban conservation measures include reducing landscape water use and installing low flow toilets and showerheads in new development. In September of 1991, during a state-wide drought, the MWD and other California water agencies signed a Memorandum of Understanding Regarding Urban Water Conservation Best Management Practices. Best Management Practices (BMPs) to conserve water in commercial, institutional, and industrial uses could further reduce demand by an estimated 3 to 5 percent. Encouragement of the use of native and drought-proof plants, increased water conservation credits, funding for innovative conservation ideas in industry, tiered water rate structures, "smart" irrigation controllers and rebates for conservation hardware are all methods being implemented for increased conservation.[19]

Agricultural water conservation options are growing as irrigation techniques improve and as water transfer agreements create new incentives for more efficient water management and the growth of higher value crops. As a result of these developments DWR expects agricultural water consumption to decline materially by 2030 throughout the SCAG area.

Water Reclamation and Recycling

Water reclamation and recycling involves the treatment of polluted groundwater and wastewater effluent for reuse. New beneficial purposes include landscape irrigation, surface water amenities in public parks and places, industrial process water, and groundwater recharge. The use of recycled water for these various purposes augments the region's water supplies and reduces the demand for water imports.

<u>Water Quality</u>

The quality of the SCAG region's surface waters, groundwater, and coastal waters are discussed below.

Surface Waters

Surface water resources in the SCAG region (as shown in Table 3.12-8 below and Figure 3.12-2 (in Chapter 8.0 Figures)) include creeks and rivers, lakes and reservoirs, and the inland Salton Sea. Reservoirs serving flood control and water storage functions exist throughout the region. Because the climate of Southern California is predominantly arid, many of the natural rivers and creeks are intermittent or ephemeral, drying up in the summer or flowing only in reaction to precipitation. For example, annual rainfall amounts vary depending on elevation and proximity to the coast. Some waterways such as Ballona Creek and the Los Angeles River maintain a perennial flow due to agricultural irrigation and urban landscape watering.

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[19] Metropolitan Water District. (2003). *Report on Metropolitan's water supplies*. Los Angeles, CA.

Table 3.12-8: Major Surface Waters

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
Los Angeles Basin		
Ventura River Estuary Santa Clara River Estuary McGrath Lake Ormond Beach Wetlands Mugu Lagoon Trancas Lagoon Topanga Lagoon Los Cerritos Wetlands Ballona Lagoon Los Angeles River Ballona Wetlands	Sespe Creek Piru Creek Ventura River Santa Clara River Los Angeles River Big Tujunga Canyon San Gabriel River Ballona Creek	Lake Casitas Lake Piru Pyramid Lake Castaic Lake Bouquet Reservoir Los Angeles Reservoir Chatsworth Reservoir Sepulveda Reservoir Hansen Reservoir San Gabriel Reservoir Morris Reservoir Whittier Narrows Reservoir Santa Fe Reservoir
Lahontan Basin		
	Mojave River Amargosa River	Silver Lake Silverwood Lake Mojave River Reservoir Lake Arrowhead Soda Lake
Colorado River Basin (7)		
	Colorado River Whitewater River Alamo River New River	Lake Havasu Gene Wash Reservoir Copper Basin Reservoir Salton Sea Lake Cahulla
Santa Ana Basin (8)		
Hellman Ranch Wetlands Anaheim Bay Bolsa Chica Wetlands Huntington Wetlands Santa Ana River Laguna Lakes San Juan Creek Upper Newport Bay San Joaquin Marsh Prado Wetlands	Santa Ana River San Jacino River	Prado Reservoir Big Bear Lake Lake Perris Lake Matthews Lake Elsinore Vail Lake Lake Skinner Lake Hemet Diamond Valley Lake
San Diego Basin (9)		
	Santa Margarita River Aliso Creek	Vail Lake Skinner Reservoir

Source: Regional Water Quality Control Boards, as amended as of 2003. Water Quality Control Basin Plans for Regions 4,6, 7,8,9. Includes major waterbodies only, not all waterbodies listed for the SCAG region.

The Colorado River watershed includes seven states on the western slope of the Rocky Mountains, traversing the arid southwest to the Gulf of California in Mexico. The river supplies water to 25 million people in both the U.S. and Mexico and forms the eastern border of the SCAG region. The Salton Sea, the largest inland body of water in California, was formed around 1906 when the Colorado River was accidentally diverted from its natural course. At present, the Sea is fed by agricultural runoff from the Imperial Valley and Mexico. The Salton Sea is also fed by the New River and Alamo River and would dry up entirely without agricultural runoff.

Other major natural surface waters in the SCAG region include the Ventura River, Santa Clara River, Los Angeles River, San Gabriel River, Santa Ana River, San Jacinto River, and upstream portions of the Santa Margarita River.

The Los Angeles River is a highly disturbed system due to the flood control features along much of its length. Due to the high urbanization in the area around the Los Angeles River, runoff from industrial and commercial sources as well as illegal dumping contribute to reduce the channel's water quality. The San Gabriel River is similarly altered with concrete flood control embankments and impacted by urban runoff.

The Santa Ana River drains the San Bernardino Mountains, cuts through the Santa Ana Mountains, and flows onto the Orange County coastal plain. Recent flood control projects along the river have established reinforced embankments for much of the river's path through urbanized Orange County. The Santa Margarita River begins in Riverside County, draining portions of the San Jacinto Mountains and flowing to the ocean through northern San Diego County. Complete lists of surface water resources within the SCAG region along with the beneficial uses associated with them are contained in the Basin Plans prepared by the five RWQCBs of the region.

Approximately two-thirds of California's waterbodies assessed in the State's Water Quality Assessment Report (1992) are threatened or impaired by non-point sources of pollution. Much of this pollution is transported to surface waters by stormwater. Figure 3.12-3 (in Chapter 8.0 Figures) the impaired water bodies in the SCAG Region.

Urban Runoff

Urbanization generally increases pollutant loads in stormwater. Many of the pollutants in urban runoff are attributable to landscape irrigation, highway runoff, and illicit dumping. The SWRCB identifies the following pollutants of concern found in urban runoff:

- *Sediment*. Excessive sediment loads in streams can interfere with photosynthesis, aquatic life respiration, growth, and reproduction.
- *Nutrients*. Nitrogen and phosphorus can result in eutrophication of receiving waters (excessive or accelerated growth of vegetation or algae), reducing oxygen levels in the water for other species.
- *Bacteria and viruses*. Pathogens introduced to receiving waters from animal excrement in the watershed and by septic systems can limit water contact activities.

- *Oxygen demanding substances*. Substances such as lawn clippings, animal excrement, and litter can reduce dissolved oxygen levels as they decompose.

- *Oil and grease*. Hydrocarbons resulting from automobile use are toxic to some aquatic life.

- *Metals*. Lead, zinc, cadmium, and copper are the heavy metals found most commonly in stormwater. Other metals introduced by the use of automobiles include chromium, iron, nickel and manganese. These metals can enter waterways through storm drains along with sediment, or as atmospheric deposition.

- *Toxic pollutants*. Pesticides, phenols, and polynuclear aromatic hydrocarbons (PAHs) are toxic organic chemicals found in stormwater.

- *Floatables*. Trash in waterways increases metals and toxic pollutant loads in addition to creating aesthetic impacts.

Groundwater

The general quality of groundwater in the SCAG region is degraded as a result of land uses and water management practices in the Basins. Fertilizers and pesticides typically used on agricultural lands infiltrate and degrade groundwater. Septic systems and leaking underground storage tanks can also impact groundwater quality. Urban runoff is also a significant source of pollutants. In addition to these impairments, excessive groundwater pumping allows saltwater intrusion from the ocean to further degrade groundwater quality.

The natural infiltration of surface waters has an effect on groundwater. These effects decrease with a growth in urban development and the creation of impervious surfaces. Recent studies from across the country report that roads, parking lots, and sidewalks comprise 55 to 75 percent of existing impervious surface areas. Residential, commercial, and industrial structures constitute the remaining 25 to 45 percent. There is an inverse relationship between water quality and impervious areas, especially where impervious surfaces within a watershed exceed 10 percent of land area. Where this percentage is greater than 25 percent, water quality is generally poor and inhospitable for habitat or for recreation activities.[20]

Coastal Waters

Coastal waters in the region include bays, harbors, estuaries, beaches, and open ocean. Deep draft commercial harbors include the Los Angeles/Long Beach Harbor complex and Port Hueneme. Shallower small craft harbors are prevalent along the coastline including Dana Point Harbor, Newport Beach Harbor, Huntington Harbor, Marina Del Rey Harbor, and Ventura Harbor. Several small estuaries and saltwater marshes along the coast are generally considered sensitive ecological areas. These include Newport Bay, Bolsa Chica Wetlands, La Ballona Wetlands,

[20] Center for Watershed Protection. (1988). *Rapid watershed planning handbook – A resource guide for urban subwatershed management.* Ellicott City, MD.

Malibu Lagoon, and Mugu Lagoon. These coastal waters are impacted by previously described wastewater discharges, non-point source runoff, dredging, bilge water discharges, illicit discharges, and spills. Impaired coastal areas are shown in the map of State Water Resources Control Board (SWRCB) impaired waterbodies (Figure 3.12-3 in Chapter 8.0 Figures).

Water Safety and Hazards

Flooding is an important ecological function in California, and floodplains provide many economic, ecological, agricultural, and societal benefits. However, floods can also cause loss of life and property. Since 1950, all 58 counties in California have been declared flood disaster areas at least three times.[21] Southern California flood hazards occur with extreme weather phenomena, such as El Niño. When the storms deliver more precipitation than the soils and the basin can absorb, flooding occurs.[22]

In addition to riverine flooding, the mountain range and foothill topography in the SCAG region allow for "alluvial fan" flooding. Alluvial fans are gently sloping fan-shaped landforms created by thousands to millions of years of deposition of eroded sediment. Debris flows and flash floods occur episodically in these environments and place many communities at risk during intense rainfall events.[23] California's highest growth areas are in counties with extensive alluvial fan environments, such as the SCAG region.[24]

Mapping flood hazard areas and implementing land use regulations are tools that can be used to minimize damage from floods. Mapping alluvial fan flood hazard zones is difficult, as the direction of flow is not predictable. The California Floodplain Management Task Force has recommended that more extensive mapping of alluvial floodplains be undertaken.[25] Figure 3.12-7 (in Chapter 8.0 Figures) identifies federally designated flood hazard zones in the SCAG region.

REGULATORY SETTING

Relevant federal, State, regional and local regulations pertaining to water quality, water supply and demand, and water safety and hazards are discussed below.

[21] California Department of Water Resources, Floodplain Management Task Force. (2003). California floodplain management report. Sacramento, CA: Author.

[22] United States Geological Survey. (1997). Some perspectives on climate and floods in the southwestern United States. Reston, VA: Author.

[23] United States Geological Survey. (1999). Natural hazards on alluvial fans. Reston, VA: Author.

[24] URS. (2002). Alluvial fan flooding. Presentation for the California Floodplain Management Task Force.

[25] California Department of Water Resources, Floodplain Management Task Force. (2003). California floodplain management report. Sacramento, CA.

Federal Agencies and Regulations

The U.S. Environmental Protection Agency (EPA)

The EPA is the federal agency responsible for water quality management and administration of the federal CWA. The EPA has delegated most of the administration of the CWA in California to the SWRCB. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine RWQCBs. (See "State Agencies and Regulations," and "Regional and Local Agencies and Regulations" below). The SCAG region encompasses portions of five separate RWQCB's as shown in Figure 3.12-8 (in Chapter 8.0 Figures): Los Angeles Region #4, Lahontan Region #6 (the southern basin only), Colorado River Region #7, Santa Ana Region #8, and the San Diego Region #9 (a small portion of southeastern Orange County).

Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES). The USEPA authorized the SWRCB to issue NPDES permits in the State of California in 1974. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. Non-point source NPDES permits, including Storm Water Management Plans (SWMPs), are also required for municipalities and unincorporated communities with populations greater than 100,000. Urban communities with populations less than 100,000 are subject to a different regulatory implementation schedule known as "Phase II" permitting.

The Federal Safe Drinking Water Act, enacted in 1974, amended in 1986, and implemented by the EPA, imposes water quality and infrastructure standards for potable water delivery systems nationwide. The primary standards are health-based thresholds established for numerous toxic substances. States are required to ensure that potable water retailed to the public meets primary standards. Standards for a total of 81 individual constituents have been established under the Safe Drinking Water Act as amended in 1986. The USEPA may add additional constituents in the future. State primary and secondary drinking water standards are promulgated in CCR (California Code of Regulations) Title 22 Section 64431-64501.

Regulation of wastewater treatment includes disposal and reuse of biosolids. The CWA as amended in 1987 obligated the EPA to develop regulations concerning biosolid disposal. Part 503 of Title 40 of the Code of Federal Regulations established standards for the re-use or disposal of biosolids generated during the treatment of domestic wastewater. The regulations for the management of biosolids vary, depending on biosolids uses or applications such as soil enhancement, landfill disposal or incineration. The land application regulations include provisions for pathogen reduction, pollutant reduction, and vector attraction reduction.

The U.S. Department of the Interior

Through water delivery contracts, laws, and regulations, the Secretary of the Interior rebulates the supply of Colorado River water in Colorado.

The U.S. Army Corps of Engineers

Section 404 of the CWA obligates the USACE to issue permits for the movement of dredge and fill material into and from “waters of the United States.”

Additionally, Section 404 requires permits for activities affecting hydrologically important areas. For example, alterations of wetlands, rivers, or ephemeral creek beds resulting from construction activities require Section 404 permits.

The Federal Emergency Management Agency (FEMA)

The U.S. Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 in order to restrict certain types of development on floodplains and provide for a national flood insurance program. The purpose of these programs is to reduce the need for large publicly funded flood control structures and disaster relief.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program. Figure 3.12-7 (in Chapter 8.0 Figures) identifies federally designated flood hazard zones in the SCAG region.

FEMA classifies flood hazard zones as follows:

- Zone A. Areas of 100-year flood. Base flood elevations and flood hazard factors are not determined.
- Zone B. Areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to the 100-year flooding with average depth of less than one foot; or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
- Zone C. Areas of minimal flooding not requiring flood insurance.

State Agencies and Regulations

The California State Water Resources Control Board (SWRCB)

As described above, the EPA has delegated most of the administration of the CWA in California to the SWRCB. In turn, much of the responsibility for implementation of the SWRCB’s policies is delegated to the nine RWQCBs.

Section 303(d) of the CWA requires the SWRCB to list impaired water bodies in the State and determine total maximum daily loads (TMDLs) of pollutants or other stressors that are contributing excessively to these impaired waters. The California 303(d) list was updated in March of 2003 and includes several hundred rivers, creeks, beaches, and wetland resources within the SCAG region. Each of these resources is listed with specific pollutants or other stressors, such as flood control diversions, which contribute to the degrading of the water quality.

A priority schedule has been established by a federal court consent decree to develop the pollution control measures necessary to eliminate these water impairments by the year 2012.

Department of Water Resources (DWR)

The DWR manages the SWP and compiles planning information on supply and demand within the state. The California Safe Drinking Water Act enacted in 1976 is codified in Title 22 of the CCR. Potable water supply is managed through local agencies and water districts, DWR, the Department of Health Services (DHS), the SWRCB, the EPA, and the U.S. Bureau of Reclamation.

The 1991 Water Recycling Act established water recycling as a priority in California. The Act encourages municipal wastewater treatment districts to implement recycling programs in order to help locally meet future water demands. Wastewater treatment and water pollution control laws in the State of California are codified in the California Water Code and the CCR Titles 22 and 23.

Regional and Local Agencies and Regulations

Regional Water Quality Control Boards (RWQCB)

As described above, the SWRCB delegates implementation of its policies to the nine RWQCBs in California. Five of these Boards have jurisdiction within the SCAG Region and are shown in Figure 3.12-8 (in Chapter 8.0 Figures).

The RWQCBs are responsible for developing pollution control plans (otherwise known as TMDLs) to eliminate the water impairments identified in the 303(d) listings. Figure 3.12-3 (in Chapter 8.0 Figures) shows the location of Section 303(d) listed Impaired Water Bodies located within the SCAG Region. TMDLs are being prepared in the various watersheds of the region. In the Los Angeles Basin, however, a court-mandated schedule for TMDL adoptions must be completed by 2012.

The RWQCBs also coordinate the State Water Quality Certification program, or Section 401 of the CWA. Under Section 401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction, to ensure that the actions will be consistent with the state's water quality requirements.

In addition, the federal Clean Water Action Plan (CWAP) requests that states and tribes, with assistance from federal agencies and input from stakeholders and private citizens, convene a collaborative process to develop Unified Watershed Assessments (UWA). The CWAP organizes watersheds within the following categories:

Category I –	Watersheds that are candidates for increased restoration because of poor water quality or the poor status of natural resources.
Category II –	Watersheds that have good water quality but can still improve.
Category III –	Watersheds with sensitive areas on federal, state, or tribal lands that need protection.

Category IV – Watersheds for which there is insufficient information to categorize them.

Watersheds and watershed priorities or activities have been identified for each of California's nine RWQCBs. A partial list of the major targeted watersheds and watershed priorities or activities in the SCAG region are listed in Table 3.12-9.

Table 3.12-9: Partial List of Targeted Watersheds in the SCAG Region

RWQCB	Watershed	Targeted Watershed Priorities/ Activities
Region 4	Calleguas Creek	Reduce nutrients, pesticides, and sediments in irrigation water; restore aquatic and riparian habitats; flood control; enhance recreational uses.
	Ventura River	Restore aquatic habitats; implement flood control; enhance recreational uses.
	Los Angeles River	Restore aquatic and riparian habitats; enhance recreational uses; reduce pollutants.
	Santa Monica Bay	Reduce pollutants from boatyards and marinas; enhance recreational uses; restore wetlands.
Region 7	Imperial Valley	Agricultural pollution control.
	Coachella Valley	Agricultural pollution control; groundwater protection.
Region 8	Chino Basin	Agricultural and dairy runoff; salt build-up in groundwater.
	Newport Bay	Toxics, nutrients, pathogens, and sediments
Region 9	Aliso Creek	Coliform contamination
	Santa Margarita River	Nitrogen and phosphorous loading from agriculture.

Source: California Department of Water Resources. (1998). *California Water Plan Update, Bulletin 160-99.* Sacramento, CA.

In recent years, watershed planning efforts have become a more prevalent means of protecting regional water resources. Certain areas in California have developed community-based authorities that involve disparate stakeholders within a watershed effort. Stakeholder interests may include municipalities, county, state and federal government entities, agricultural interests, industrial interests, private property owners with water rights, and environmental or conservation groups. When these initiatives operate in conjunction with the support and participation of a diverse range of stakeholders, water quality protection and other benefits can result. One of the advantages of these kinds of initiatives is the potential for achieving some regional consensus without regulatory sanctions or costly (and time-consuming) litigation.

RWQCBs issue WDRs for discharges of privately or publicly treated domestic wastewater. The RWQCB also issues waste reclamation requirements (WRRs) for treated wastewater used exclusively for reclamation projects such as irrigation and groundwater recharge. Title 22 of the CCR lists allowable reclamation uses including landscape irrigation, recreational impoundments, and groundwater recharge.

Other Local Agencies and Regulations

Where local jurisdictions regulate development within flood plains, construction standards are used to reduce flood impedance, safety risks, and property damage. Historic floods in the region have been devastating. In response, local flood control agencies and the USACE have established extensive flood control projects including dams and engineered channels. The use of concrete and riprap levees and hard river bottoms have significantly reduced riparian habitats throughout the region.

Groundwater basins in California and their uses are generally subject to various management authorities, including adjudication and agency systems that are designed to create fairness between groundwater claimants. Adjudicated groundwater basins are managed by a watermaster designated by the court for the purpose of managing the distribution of extracted water and maintaining water quality and supply. Table 3.12-10 lists the adjudicated water basins in the SCAG region.

TABLE 3.12-10: California Adjudicated Groundwater Basins and Watermasters

County	Basin	Watermaster
Los Angeles	Central	DWR
	West Coast	DWR
	Upper Los Angeles River Area	Superior Court appointee
	Raymond	Raymond Basin Management Board
	Main San Gabriel	Nine-member Board
	Puente	Three Appointees
San Bernardino	Warren Valley	Hi-Desert Water District
	San Bernardino Basin Area	One representative each from Western Municipal Water District of Riverside County and San Bernardino Valley Municipal Water District
	Cucamonga	Cucamonga County Water District and San Antonio Water Company
	Mojave Basin Area	Mojave Water Agency
Riverside and San Bernardino	Chino	Nine-member Board
Riverside and San Diego	Santa Margarita Watershed	District Court Appointee
Ventura	Santa Paula	Three-person Technical Advisory Committee

Source: Department of Water Resources. (2001). *"Water Facts," No. 3.* Sacramento, CA

In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. These ordinances generally require treatment system designs to be reviewed and approved by the City prior to construction.

METHODOLOGY

The PEIR identifies the potential impacts of the proposed 2004 RTP on water resources. The water quality analysis evaluates the regional-scale impact of the RTP and the cumulative impact of the RTP projects and the associated growth on water quality. The analysis includes a programmatic-level assessment of the expected urbanized land use and the associated impervious surfaces. In addition, the PEIR identifies transportation projects that are located in targeted watersheds, adjacent to impaired water bodies, or in flood hazard areas and considers the potential environmental effects of associated housing and employment growth. Subsequent, project-specific water quality assessments will be conducted by implementing agencies to determine site-specific water quality impacts for individual transportation projects, as projects in the 2004 RTP are implemented.

The methodology for determining the significance of the impacts on water quality, water supply, and wastewater compares the future Plan conditions to the existing setting, as required in CEQA Guidelines Section 15126.2(a). The analysis uses the most recent and appropriate regional-scale data for the existing setting.

Determination of Significance

Direct impacts to water quality were evaluated using GIS to overlay the proposed projects of the 2004 RTP and associated growth on maps of the SCAG region's water resources. Additional data relating to water resources compiled within the GIS format included surface hydrology, 100-year flood plains, impaired water bodies identified by the SWRCB, and regional groundwater basins.

Long-term, regional-scale, cumulative impacts of the RTP on water quality were evaluated based on estimates of vacant land consumption based on the long-term regional growth forecast for 2030.

Impacts to water supply were assessed by comparing the existing water supplies to the expected water demand in 2030 with the Plan, in accordance with the CEQA Guidelines. Likewise, the PEIR analyzes impacts to wastewater services by comparing existing capacity of wastewater systems to the expected demand in future Plan conditions.

Comparison with the No Project

The analysis of water resources includes a comparison of the expected future conditions with the 2004 RTP to the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts; however, it provides a meaningful perspective on the expected effects of the 2004 RTP.

SIGNIFICANCE CRITERIA

A potentially significant adverse impact on water resources would occur if the proposed Plan would:

- Substantially degrade water quality compared to the existing conditions;
- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- Substantially alter the existing drainage patterns, 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;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems;
- Place within a 100-year flood hazard area structures that 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;
- Substantially alter the existing drainage patterns, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation;
- Generate a substantial amount of wastewater that exceeds the region's available infrastructure's capacity to handle and dispose of the wastewater;
- Generate a substantial increase in the amount of potable water demand that exceeds the region's existing available supply and/or infrastructure capacity to provide water service; or;
- Result in the need to construct new water supply infrastructure.

IMPACTS AND MITIGATION MEASURES

Project-specific studies would be necessary to determine the actual potential for significant impacts on water resources resulting from implementation of the Plan. However, the following analysis identifies some general program-level impacts. Below are descriptions of the types of direct impacts foreseeable from new transportation projects proposed in the 2004 RTP. Indirect impacts due to the changes in population distribution expected to occur due to the 2004 RTP's transportation investments, and transportation and land use policies are also discussed.

All mitigation measures shall be included in project-level analysis as appropriate. The lead agency for each individual project in the Plan shall be responsible for ensuring adherence to the mitigation measures prior to construction. SCAG shall be provided with documentation of compliance with mitigation measures through its Intergovernmental Review Process.

Impact 3.12-1: Local surface water quality would potentially be degraded by increased roadway runoff created by RTP projects, potentially violating water quality standards associated with wastewater and stormwater permits. These projects would potentially alter the existing drainage patterns in ways that could result in substantial erosion or siltation.

Projects that increase impervious surface areas increase urban runoff, resulting in the transport of greater quantities of contaminants to receiving waters that may currently be impaired. Construction activities related to Plan projects may increase pollutant loads carried by stormwater runoff. For example, road cut erosion can increase long-term siltation in local receiving waters.

Highway runoff is a component of urban runoff contributing oil and grease, sediment, nutrients, heavy metals, and toxic substances. Table 3.12-11 lists the pollutants commonly associated with transportation.

Table 3.12-11: Pollutants Associated with Transportation

Pollutant	Source
Asbestos	Clutch plates, brake linings
Cadmium	Tire wear and insecticides
Copper	Thrust bearing, bushing, brake linings, and fungicides and insecticides
Chromium	Pavement materials, metal plating, rocker arms, crankshafts, rings, and brake linings
Cyanide	Anti-caking compounds in deicing salt
Lead	Leaded gasoline, motor oil, transmission babbitt metal bearings, tire wear
Iron	Auto body rust, steel highway structures, moving engine parts
Manganese	Moving engine parts
Nickel	Diesel fuel and gasoline, pavement materials, lubricating oil, metal plating, bushing wear, and brake linings
Nitrogen and Phosphorous	Motor oil additives, the atmosphere, fertilizer applications
Sulphates	Roadway beds, fuel and deicing salts
Zinc	Motor oil and tires
Grease and hydrocarbons	Spills and leaks of oil and n-paraffin lubricants, antifreeze, hydraulic fluids
Rubber	Tire wear
Sediment particulates	Pavement wear, the atmosphere, maintenance activities

Source: U.S. EPA, Office of Water. (1995). *Controlling Nonpoint Source Runoff Pollution from Roads, Highways and Bridges*. (EPA-841-F-95-008a). Washington D.C.

Figure 3.12-3 shows the impaired water bodies identified within the SCAG region. The SWRCB has begun the process of assigning TMDLs for each pollutant impacting currently impaired water bodies, allowing for pollution interactions that may be unique to each water body. A TMDL will provide a numerical threshold for each pollutant within each watershed to be used for regulating both point and non-point source discharges. Future methods for quantifying highway runoff will assist regulators with applying appropriate management practices in areas where highway runoff impacts impaired water bodies. The inclusion of runoff control measures in the design of future roadway projects will improve water quality and eliminate further impairments of the local receiving waters.

As discussed above, the proposed highway, arterial and other improvement projects proposed in the 2004 RTP would increase impervious surfaces in the SCAG region. Table 3.12-12 provides the lane mile additions planned for each county. Assuming an average lane width of 12 feet, approximately 9,800 additional acres of impervious surface could be added. Some of the lane additions may be constructed using re-striping and existing right of way, reducing the contribution to increased impervious surfaces, so this estimate is conservative for these types of facilities. Rail lines and their associated structures would be expected to increase the amount of impervious surfaces as well. SCAG expects the proposed goods movement enhancement projects to consist of approximately 140 center lane miles of new facilities. The Maglev projects would add 275 elevated route miles, along with associated stations and other maintenance structures. The precise routes and the number and width of lanes are not yet determined. The CETAP corridors (described in 2.0 Project Description) would include additional route miles of unknown alignment and width.

Table 3.12-12: New Regional Lane Miles by County*

County	Imperial	Los Angeles	Orange	Riverside	San Bernardino	Ventura	SCAG total
Freeway Lane Miles	26	404	441	272	735	62	**1,940**
Principal Arterial Lane Miles	0	325	487	490	421	49	**1,772**
Minor Arterial Lane Miles	32	332	23	431	637	40	**1,495**
Major Collector Lane Miles	0	124	16	344	249	4	**737**
HOV Lane Miles	7	270	41	189	235	3	**745**
Freeway Link Lane Miles	0	17	9	3	8	0	**37**
Total Lane Miles in each County	65	1,472	1,017	1,729	2,285	158	**6,726**
Average Potential Additional Impervious Acreage**	130	2,145	1,482	2,520	3,330	230	**9,837**

Source: SCAG. (2003). Regional Travel Demand Model. Los Angeles, CA.

*This analysis does not include transit projects, MagLev projects, goods movement enhancement projects, or CETAP corridors with unknown routes, widths and lane miles.

**Assumes an average lane width of 12 feet

Additional impervious surfaces would increase the potential for highway and other runoff pollutants to enter impaired receiving waters. Each project contributing to new impervious area would be subject to a Municipal Separate Storm Sewer System (MS4) permit requiring that pollutants be removed from the runoff to the maximum extent practicable. It is expected that TMDL requirements would be included in future MS4 permits, further strengthening a permit's controls of runoff.

Most of the proposed Plan projects would occur within watersheds that have impaired water bodies. Any increase in contaminant loading in these water bodies by constituents of concern appearing in a 303(d) list and contributed by a Plan project would be considered a significant Plan impact. Table 3.12-13 lists many of the impaired water bodies located within 150 feet of freeway, transit and freight rail projects proposed in the 2004 RTP. Maglev, goods movement

Table 3.12-13: Impaired Water Bodies (303(d)) Occurring Within 150 feet of a Freeway, Transit, or Freight Rail Project in the 2004 RTP

Impaired Water Body	Pollutant Constituents of Concern
Pico Kenter Drain	Ammonia, Copper, Enteric Viruses, High Coliform Count
Alamo River	Pesticides, Selenium
New River	1,2,4-trimethylbenzene, Chloroform, Dissolved Oxygen, m,p,-Xylenes, o-Xylenes, p-Cymene, p-DCB, Toluene, Trash
Coachella Valley Storm Channel	Pathogens
Imperial Valley Drains	Pesticides, Sedimentation, Selenium
Coyote Creek	Algae, Dissolved Copper, High Coliform Count, Dissolved Lead, Total Selenium, Dissolved Zinc
San Gabriel River	Algae, Dissolved Copper, High Coliform Count, Lead, Dissolved Zinc
San Jose Creek	Algae, High Coliform Count,
Walnut Creek Wash	pH, toxicity
Ballona Creek	Cadmium, ChemA, Chlordane, Dissolved Copper, DDT, Dieldrin, Enteric Viruses, High Coliform Count, Dissolved Lead, PCBs, pH, Sediment Toxicity, Selenium, Silver, Toxicity, Dissolved Zinc
Dominguez Channel	Aldrin, Ammonia, Benthic Community Effects, ChemA, Chlordane, Chromium, Copper, DDT, Dieldrin, High Coliform Count, Lead, PAHs, PCBs, Zinc
Medea Creek	Algae, High Coliform Count, Sedimentation/Siltation, Selenium, Trash
Las Virgenes Creek	High Coliform Count, Nutrients (algae), Orgnaic Enrichment/Low Dissolved Oxygen, Scum/Foam-unnatural, Sedimentation/Siltation, Selenium, Trash
Lindero Creek	Algae, High Coliform Count, Scum/Foam-unnatural, Selenium, Trash
Palo Comado Creek	High Coliform Count
Los Angeles River	Aluminum, Ammonia, Dissolved Cadmium, Dissolved Copper, High Coliform Count, Dichloroethylene/1,1-DCE, Lead, Nutrients (algae), Odors, Oil, pH, Scum/Foam-unnatural, Tetrachlroethylene/PCE, Trichloroethylene/TCE, Dissolved Zinc,
Compton Creek	Copper, High Coliform Count, Lead, pH
Rio Hondo	Copper, High Coliform Count, Lead, pH, Trash, Zinc
Arroyo Seco	Algae, High Coliform Count, Trash
Verdugo Wash	Algae, High Coliform Count, Trash
Burbank Western Channel	Algae, Ammonia, Cadmium, Odors, Scum/Foam-unnatural, Trash
Tujunga Wash	Ammonia, Copper, High Coliform Count, Odors, Scum/Foam-unnatural, Trash
Conejo Creek	Algae, Ammonia, Cadmium, ChemA, Chloride, Dacthal, DDT, Endosulfan, Nickel, Nutrients, Silver, Sulfates, TDS, Toxaphene
Ballona Creek Estuary	Chlordane, DDT, High Coliform Count, Lead, PAHs, PCBs, Sediment Toxicity, Zinc
Fox Barranca	Boron, Nitrate and Nitrite, Sulfates, Total Dissolved Solids
San Gabriel River Estuary	Abnormal Fish Histology
Cucamonga Creek	High Coliform Count
Lytle Creek	Pathogens
San Diego Creek	Chlorides, Metals, Nutrients, Pesticides, Salinity, Sedimentation, Total Dissolved Solids
Santa Ana River	Chlorides, Nutrients, Pathogens, Salinity, Total Dissolved Solids,

Source: SCAG analysis of State Water Resources Control Board. (2003). *2002 Clean Water Act Section 303(d) List of Water Quality Limited Segment*.

enhancement, and arterial projects would potentially affect impaired water bodies as well; however, the alignments for these projects are not developed, and the impacts to particular water bodies cannot be reliably identified.

Fill Materials

Several projects may impact water bodies by placing fill material within a stream channel. For example, several of the lane widening projects and new facilities could cross existing creeks or be expanded into wetland areas. These potential intrusions would be subject to permitting by the USACE and a RWQCB pursuant to Sections 404 and 401 of the CWA.

Construction

Construction activities can be a major source of sediment loading and hydrocarbon contamination in local waterways. Unprotected soil easily erodes with rain water. In addition, fueling procedures and maintenance of heavy equipment on construction sites can spill diesel and oil and grease. The SWRCB has adopted a state-wide stormwater permit for construction sites over one acre. By 2003, a new construction permit requires compliance by construction projects one acre or more in size. Prior to commencement of construction activities, a project applicant must submit a Storm Water Pollution Prevention Plan (SWPPP) to the SWRCB that identifies the BMPs that will be used in the planned project construction. The applicant must receive approval of the SWPPP and submit a Notice of Intent prior to initiating construction. Each individual project in the 2004 RTP is expected to adopt BMPs appropriate to local conditions and to the proposed construction techniques that will reduce pollution runoff.

The proposed Plan's new roadway projects would create new impervious areas. Without mitigation, the runoff from these new impervious areas would contribute to local water impairments by degrading the water quality of the receiving waters, both in the short term (during project construction) and in the long term (during the project's operation). This would be a significant impact.

Mitigation Measures

In addition to **MM 3.7-7a** and **MM 3.9-2a**, the following mitigation measures are recommended:

MM 3.12-1a: Transportation improvements shall comply with federal, state, and local regulations regarding stormwater management. State-owned highways and other transportation facilities are subject to compliance with a statewide stormwater permit issued to Caltrans.

MM 3.12-1b: Project implementation agencies shall ensure that new facilities include water quality control features such as drainage channels, detention basins, and vegetated buffers to prevent pollution of adjacent water resources by polluted runoff. Wherever feasible, detention basins shall be equipped with oil and grease traps and other appropriate, effective and well maintained control measures.

MM 3.12-1c: Project implementation agencies shall ensure that operational best management practices for street cleaning, litter control, and catch basin cleaning are implemented to prevent water quality degradation.

MM 3.12-1d: SWPPPs shall be submitted to the SWRCB when proposed transportation improvement projects require construction activities. In these activities BMPs shall be followed to manage site erosion and spill control.

MM 3.12-1e: Projects requiring the discharge of dredged or fill materials into U.S. waters, including wetlands, shall comply with sections 404 and 401 of the CWA including the requirement to obtain a permit from the U.SACE and the governing RWQCB.

MM 3.12-1f: Long-term sediment control shall include an erosion control and revegetation program designed to allow reestablishment of native vegetation on slopes and undeveloped areas.

MM 3.12-1g: Drainage of roadway runoff should, wherever possible, be designed to run through vegetated median strips, contoured to provide adequate storage capacity and to provide overland flow, detention and infiltration before it reaches culverts. Detention basins and ponds, aside from controlling runoff rates, can also remove particulate pollutants through settling.

Significance After Mitigation

The mitigation measures would not fully mitigate water quality degradation, violation of water quality standards, or prevent erosion or siltation. The impact remains **significant.**

Impact 3.12-2: Increased impervious surfaces due to transportation projects would reduce groundwater infiltration. The proposed 2004 RTP would include additional impervious surfaces installed through new roadway projects. Table 3.12-12 provides information on the lane mile additions expected in each county. With the implementation of the 2004 RTP, approximately 6,700 new lane miles would be added to the region. These additions would include new facilities, additional right-of-way on existing facilities and/or re-striping of existing facilities. Conservatively, each lane addition was assumed to have an average width of 12 feet. The area of additional impervious surface has been calculated and appears in Table 3.12-12. Rail projects involving construction of new rail lines, new stations, and upgrades to existing stations are not included in this calculation. SCAG expects the proposed goods movement enhancement projects to consist of approximately 140 center lane miles of new facilities. The route alignments and the number and width of lanes are not yet determined. The CETAP corridors (described in 2.0 Project Description) would include additional route miles of unknown alignment and width. Where these projects involve installation of additional impervious surfaces, they would potentially have adverse impacts on groundwater infiltration.

Under natural conditions, vegetation intercepts and retains rainfall before infiltration or runoff occurs. Without hard-surfaced land areas, this hydrology cycle favors groundwater recharge. With the hard surface of a roadway this infiltration dynamic is significantly impeded. The magnitude of this effect is reported by studies indicating that the volume of stormwater washed off one-acre of roadway is about sixteen times greater than that of a comparably sized meadow.[26]

The increase in impervious surfaces due to additional miles of roadway, in addition to urban development associated with the population distribution in 2030 would increase runoff and potentially affect groundwater recharge rates.

Mitigation Measures

MM 3.12-2a: Project implementation agencies shall avoid designs that require continual dewatering where feasible.

MM 3.12-2b: Project implementation agencies shall ensure that projects that do require continual dewatering facilities implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes adverse impacts on groundwater for the life of the project. Construction designs shall comply with appropriate building codes and standard practices including the Uniform Building Code.

MM 3.12-2c: Detention basins, infiltration strips, and other features to control surface runoff and facilitate groundwater recharge shall be incorporated into the design of new transportation projects.

Significance After Mitigation

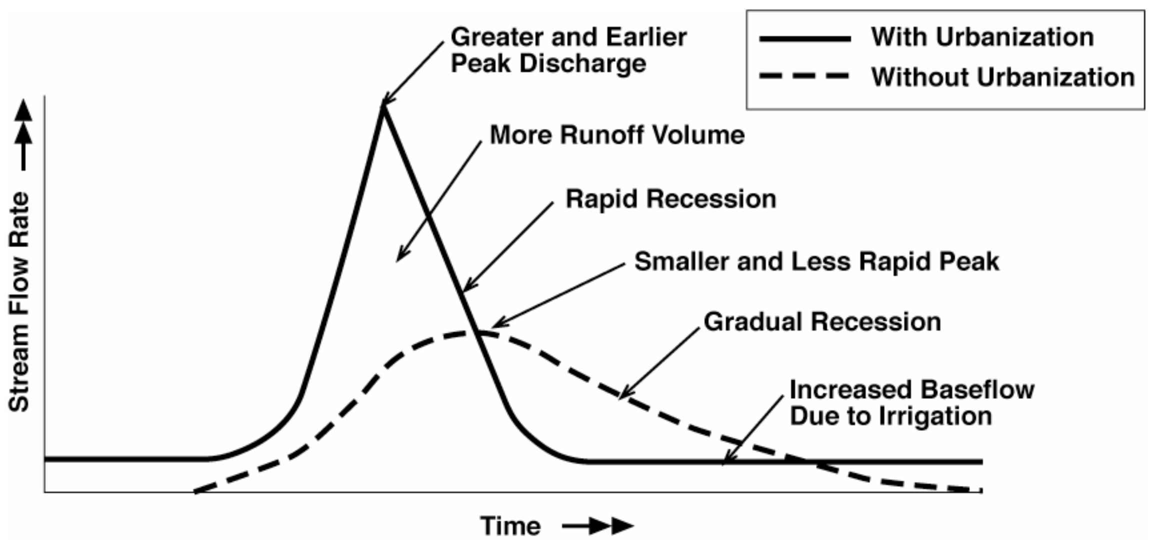
Implementation of these mitigation measures would reduce the regional impact to **less than significant.**

Impact 3.12-3: The 2004 RTP would potentially increase flooding hazards by placing structures such as transportation investments on alluvial fans and within 100-year flood hazard areas. The proposed 2004 RTP could alter existing drainage patterns or substantially increase the rate or amount of surface runoff in a manner that would result in flooding or produce or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

[26] Schueler, T.R. (1994). The importance of imperviousness. *Watershed Protection Techniques 1(3)*: 100-111. Retrieved August 28, 2003, from http://www.stormwatercenter.net/Practice/1-Importance%20of%20Imperviousness.pdf.

Storm water runoff is influenced by rainfall intensity, ground surface permeability, watershed size and shape, and physical barriers. The introduction of impermeable surfaces greatly reduces natural infiltration, allowing for a greater volume of runoff. In addition, paved surfaces and drainage conduits can accelerate the velocity of runoff, concentrating peak flows in downstream areas faster than under natural conditions. Significant increases to runoff and peak flow can overwhelm drainage systems and alter flood elevations in downstream locations. Increased runoff velocity can promote scouring of existing drainage facilities, reducing system reliability and safety. Figure 3.12-10 depicts a typical hydrograph showing the effects of urbanization on peak flow rates.

Figure 3.12-10: Comparison of Typical Urbanized and Non-Urbanized Hydrographs



Source: Schueler, Thomas. (1997). *Controlling urban runoff: A practical manual for planning and designing urban BMPs.* Metropolitan Washington Council of Governments, Washington, D.C.

The 2004 RTP transportation projects would result in increased impervious surfaces. Additional impervious surfaces increase stormwater runoff volumes and peak flow rates. This increase has the potential to create or contribute runoff flows that would exceed the capacity of existing or planned stormwater drainage systems. In addition, placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream.

Natural desert conditions promote runoff that can cause flash flooding. In those areas of the SCAG region where soils have naturally low permeability and are subject to quick saturation, high rain volumes remain on the surface as runoff. When highways are placed within these areas of an existing flood plain, the public is exposed to the hazards of flash flooding. Figure 3.12-7 (in Chapter 8.0 Figures) shows the location of the major floodplains in the SCAG region. Many of the proposed highway projects would pass through these floodplain areas as currently delineated.

The highway and arterial projects proposed in the 2004 RTP mostly include widening existing highways and constructing new interchanges, new highway segments, new rail lines and the Maglev projects. Table 3.12-12 summarizes additional lane miles proposed for each county and provides a conservative calculation (as some lane additions may be accomplished through lane re-striping) of increased impervious surfaces proposed by the projects based on lane miles only. Some of the proposed transit projects would involve construction of new rail lines, new stations, and upgrades to existing stations, and are not included in the calculation presented in Table 3.12-12. SCAG expects the proposed goods movement enhancement projects to consist of approximately 140 center lane miles of new facilities. The route alignments and the number and width of lanes are not yet determined. The CETAP corridors (described in 2.0 Project Description) would include additional route miles of unknown alignment and width. These projects would increase the amount of impervious surfaces in the SCAG region, adding to the existing runoff of stormwater.

Placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. Road improvements in the Plan are located within 150 feet of approximately 4,500 acres of identified 100-year flood zones and 7,200 acres of identified 500-year flood zones. The flooding risks associated with projects located in these flood zones can be modified with appropriate design and alignment considerations.

Placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. Road improvements in the Plan are located within 150 feet of approximately 4,500 acres of identified 100-year flood zones and 7,200 acres of identified 500-year flood zones. The flooding risks associated with projects located in these flood zones can be modified with appropriate design and alignment considerations.

Mitigation Measures

In addition to Mitigation Measures 3.7-6a through 3.7-6d, the following mitigation measures are recommended:

MM 3.12-3a: Natural riparian conditions near projects shall be maintained, wherever feasible, to minimize the effects of stormwater flows at stream crossings.

MM 3.12-3b: Prior to construction, a drainage study shall be conducted for each new project. Drainage systems shall be designed to maximize the dissipation of storm flow velocities with the use of detention basins and vegetated areas, measures that will reduce storm flow risks to areas downstream of a project. Projects shall consider designs for the lateral transmission of stormwater and other similar means to minimize the risks of upstream flooding.

MM 3.12-3c: All roadbeds for new highway and rail facilities should be elevated at least one foot above the 100-year base flood elevation. Since alluvial fan flooding is not often identified on FEMA flood maps, the risk of alluvial fan flooding shall be evaluated and projects shall be sited to avoid alluvial fan flooding where feasible.

MM 3.12-3d: Transportation improvements shall comply with local, state, and federal floodplain regulations. Projects requiring federal approval or funding shall comply with Executive Order 11988 on Floodplain Management, which requires avoidance of incompatible floodplain development, restoration and preservation of the natural and beneficial floodplain values, and maintenance of consistency with the standards and criteria of the National Flood Insurance Program.

MM 3.12-3e: Improvement projects on existing facilities shall include upgrades to stormwater drainage facilities to accommodate any increased runoff volumes. These upgrades may include the construction of detention basins or structures that will delay peak flows and reduce flow velocities. System designs shall be completed to eliminate increases in peak flow rates from current levels.

Significance After Mitigation

After implementation of the mitigation measures, the 2004 RTP projects would regionally have a **less than significant** impact.

Cumulative Impacts

A cumulative impact consists of an impact that is created as a result of the combination of the 2004 RTP together with other projects causing related impacts.

IMPACTS AND MITIGATION MEASURES

Cumulative Impact 3.12-4: Urbanization in the SCAG region will increase substantially by 2030. The 2004 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2004 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to water quality.

The growth projection associated with the 2004 RTP would substantially increase the amount of urbanized land in the SCAG region. The amount of new urbanized acreage (consuming previously vacant land) would be on the order of several hundred thousands of acres. Pollutant loading in surface and groundwater correlates closely with land use patterns. Suspended sediments, oxygen-demanding substances, and oil and grease would constitute a substantial part of these pollutant loads. Total nitrogen and total phosphorous would increase less than these other pollutants, but would have the potential for influencing algal growth, reducing dissolved oxygen, and affecting aquatic species abundance and composition.[27]

Mitigation Measures

Mitigation Measures 3.12-1a through 3.12-1g shall be applied to all urban development projects, as feasible, in addition to the following measure.

[27] Keller, Arturo A. and Yi Zheng. (2003). Personal communication. University of California. Santa Barbara, CA.

MM 3.12-4a: SCAG shall continue to work with local jurisdictions and water quality agencies, through its Water Policy Task Force and other means, to encourage regional-scale planning for improved water quality management and pollution prevention. Future impacts to water quality shall be avoided through cooperative planning, information sharing, and comprehensive pollution control measure development within the SCAG region. This cooperative planning shall occur during the update of the Water Resources and Water Quality chapters of SCAG's *RCPG* and through SCAG's Water Policy Task Force. This task force offers an opportunity for local jurisdictions and water agencies to share information and strategies to plan for water quality in the region.

Significance After Mitigation

The urban development expected by 2030 would create adverse water quality and waste discharge conditions and/or unfavorably alter existing drainage patterns in a manner that would result in substantial erosion or siltation. The 2004 RTP's influence on growth distribution is a cumulatively considerable contribution to this **significant** impact.

Cumulative Impact 3.12-5: Urbanization in the SCAG region will increase substantially by 2030. The 2004 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2004 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in impacts to stormwater infiltration and groundwater recharge.

The addition of 6 million people to the SCAG region would require increased urban development for housing, employment centers, and other services. The amount of new urbanized acreage (consuming previously vacant land) would be on the order of hundreds of thousands of acres. The enlarged impervious surfaces associated with this urban development would potentially reduce groundwater recharge.

Mitigation Measures

Mitigation Measures 3.12-2a through 3.12-2c shall be applied to all urban development projects, as feasible, in addition to the following measure.

MM 3.12-5a: SCAG shall continue to work with local jurisdictions and water agencies, through its Water Policy Task Force and other means, including the update of the Water Quality and Water Resources chapters for SCAG's *RCPG*, to encourage regional-scale planning for improved stormwater management and groundwater recharge. Future adverse impacts shall be avoided through cooperative planning, information sharing, and comprehensive implementation efforts within the SCAG region. SCAG's Water Policy Task Force offers an opportunity for local jurisdictions and water agencies to share information and strategies for improving regional performance in these efforts.

Significance After Mitigation

The urban development expected by 2030 would potentially affect stormwater infiltration and groundwater recharge. Future planning and implementation efforts may reduce the significance of this impact. **However, given current conditions, the 2004 RTP's effects on stormwater infiltration and groundwater recharge would contribute to a significant impact on regional water resources.**

Cumulative Impact 3.12-6: Urbanization in the SCAG region will increase substantially by 2030. The 2004 RTP, by increasing mobility and including land-use-transportation measures, influences the pattern of this urbanization. The 2004 RTP's influence on growth would contribute to the conversion of undeveloped land to urban uses, resulting in flooding hazard impacts.

The amount of new urbanized acreage (consuming previously vacant land) would be on the order of hundreds of thousands of acres. The additional urbanized acreage expected by 2030 could be located in areas with the potential for alluvial fan flooding or other flood hazards.

Mitigation Measures

Mitigation Measures 3.12-3a through 3.12-3e shall be applied to all urban development projects, as feasible.

Significance After Mitigation

Urban development expected by 2030 would potentially result in additional structures in areas with flood hazards. Future planning efforts may reduce the significance of this impact; however, to assume that all flood hazards would be avoided would be speculative. The 2004 RTP's effects on population distribution and its associated contribution to the impact of flooding hazards are **significant**.

Cumulative Impact 3.12-7: Urbanization in the SCAG region will increase substantially by 2030. The 2004 RTP, by increasing mobility and by including land-use-transportation measures, influences the pattern of this urbanization. The 2004 RTP's influence on growth would contribute to the need for increased wastewater treatment capacity in the region by 2030.

The proposed Plan influences population growth, resulting in an indirect and cumulative impact on wastewater treatment services.

The average wastewater generation rate in each county[28] was applied to the expected population growth in each county and compared to the remaining wastewater treatment capacity derived from the data in Table 3.12-8. Broadly assuming that wastewater capacity can be shared among the agencies in each county, it is estimated that Imperial, Riverside, and San Bernardino counties would outgrow their wastewater treatment capacity by the year 2030.

To determine the significance of the impact, wastewater treatment capacities needed in 2030 must be compared to the existing capacities only in accordance with CEQA Guidelines. (This analysis does not consider existing plans to build new facilities.)

Mitigation Measures

MM 3.12-7a: Local jurisdictions should encourage new development and industry to locate in those service areas with existing wastewater infrastructure and treatment capacity.

MM 3.12-7b: Wastewater treatment agencies are encouraged to have expansion plans, approvals and financing in place once their facilities are operating at 80 percent of capacity. Through the update to the Water Quality and Water Resources chapter of SCAG's *RCPG*, SCAG shall provide opportunities for information sharing and program development.

MM 3.12-7c: Local jurisdictions should promote reduced wastewater system demand by:

- designing wastewater systems to minimize inflow and infiltration to the extent feasible,
- reducing overall source water generation by domestic and industrial users,
- deferring development approvals for industries that generate high volumes of wastewater until wastewater agencies have expanded capacity.

Significance After Mitigation

The mitigation measures would lessen the impacts on wastewater treatment capacity in the region; however, they are not expected to prevent an imbalance between the demand for regional capacity and existing regional capacity. The 2004 RTP would make a cumulatively considerable contribution to this **significant** impact.

Cumulative Impact 3.12-8: Urbanization in the SCAG region will increase substantially by 2030. The 2004 RTP, by increasing mobility and by inclusion of land-use-transportation measures, influences the pattern of this urbanization. The 2004 RTP's influence on growth would contribute to an increased demand for water supply and its associated

[28] Southern California Association of Governments. (1994). *Regional Transportation Plan and Chapters of the Regional Comprehensive Plan Final Environmental Impact Report.* Los Angeles, CA.

infrastructure. Comparing 2030 demands to existing supplies does not fully reflect the ongoing water planning conducted by water agencies in the region. While existing supplies and infrastructure may not be sufficient to meet expected 2030 demands, most water agencies have plans in place to respond to future growth. However, the *existing* water supplies and infrastructure would not be sufficient to meet the expected demand in 2030.

The volume of water and water delivery infrastructure currently available within the SCAG region would not be sufficient to meet the future multiple dry year or average year demand at 2030. As population increases in the SCAG region, the demand for municipal water will increase. Increased commercial and industrial land uses will also increase water demand. Meeting future water demand is the responsibility of local and regional water agencies. Water supplies are either produced locally from groundwater and surface water sources or are imported by the Los Angeles Aqueduct, the California Aqueduct, the Colorado River Aqueduct, the All American Canal, or the Coachella Canal. Other means of providing water without increasing imported supplies include reclamation and recycling, ocean desalination, conservation, water transfers, and groundwater banking.

The Urban Water Management Plan Act of 1990 requires that local water agencies prepare plans showing projected water supplies and demands for average years and multiple dry years. These plans are updated every five years. Some water agencies project average year water deficits by the year 2020 if current management and supply efforts are not augmented. Other agencies project no deficits owing to the development of new supplies. Over 90 percent of the projected population in the SCAG region in 2030 is within the Metropolitan service area.

Supplying the water necessary to meet future demand and/or minimizing that demand would mitigate the effect to less than significant levels. Water districts provide water for the growth planned and authorized by the appropriate land use authority. Nonetheless, since these measures are not yet in place, and some areas currently are reporting future deficits, the impact remains significant.

Each water district develops its own policy for determining its planning horizon and for acquiring and building water facilities. Numerous measures that would mitigate water shortages are currently being implemented, including required planning efforts, water availability assurances to new development, water transfers, groundwater banking projects, recycling projects, desalination projects, conservation programs and tiered water rates. The California State Legislature recently approved two laws (SB 610 and SB 221) that require future development to obtain written assurances from water agencies of reliable future water supplies for a large-scale project prior to project approval. Numerous regional planning efforts are underway to avoid water shortages in the future.

MWD prepared the Report on Metropolitan Water Supplies in March 2003 that updated its 2000 Regional Urban Water Management Plan and provided regional assurances SB 610 and SB 221 requirements will be met. The 2003 report identified existing and projected water supplies for the service area including supplies under development and concluded that the agency had sufficient, reliable water supplies to meet water demand in its service area through the year 2025.

Mitigation Measures

MM 3.12-8a: SCAG shall facilitate local water agencies' informing local jurisdictions of their continued efforts to evaluate future water demands and establish the necessary supply and infrastructure, as documented in their Urban Water Management Plans.

MM 3.12-8b: SCAG shall facilitate local water agencies' informing local jurisdictions of their continued efforts to develop supplies to meet projected demand in 2030.

MM 3.12-8c: SCAG shall facilitate information-sharing about the kind of regional coordination throughout California and the Colorado River Basin that develops and supports sustainable growth policies.

MM 3.12-8d: Future impacts to water supply shall be minimized through cooperation, information sharing, and program development during the update of the Water Resources chapter of SCAG's *RCPG* and through SCAG's Water Policy Task Force. This task force presents an opportunity for local jurisdictions and water agencies to share information and strategies (such as those listed above) about their on-going water supply planning efforts, including the following types of actions:

- Minimize impacts to water supply by developing incentives, education and policies to further encourage water conservation and thereby reduce demand.
- Involve the region's water supply agencies in planning efforts in order to make water resource information, such as water supply and water quality, location of recharge areas and groundwater, and other useful information available to local jurisdictions for use in their land use planning and decisions.
- Provide, as appropriate, legislative support and advocacy of regional water conservation, supply and water quality projects.
- Promote water-efficient land use development.

The Water Policy Task Force and the update to SCAG's *RCPG* present an opportunity for SCAG to partner with the region's water agencies in outreach to local government on important water supply issues. SCAG provides a unique opportunity to increase communication between land use and water planners. The goals of the Task Force would not be to duplicate existing efforts of the water agencies.

Significance After Mitigation

Full implementation of these water supply mitigation measures would provide an adequate and reliable future water supply and infrastructure. The various water agencies update their Urban Water Management Plans to ensure that planning for the water needs of future growth is accommodated in a timely manner. However, CEQA requires the determination of significance to be based on a comparison between *existing* water supply and infrastructure and expected future demand. Although ensuring a reliable water supply for urban and other water demands in 2030 is probable, the current, existing water supply and infrastructure would not be able to support the population in the Plan in 2030. Through its influence on regional growth, the 2004 RTP would make a cumulatively considerable contribution to this **significant** impact.

Comparison with the No Project Alternative

In the No Project alternative, the population of the SCAG region grows by 6 million people, however no regional transportation investments are made above the existing programmed projects. The population distribution follows past trends, uninfluenced by additional transportation investments. The number of households and the employment are less than the Plan due to the absence of the economic benefits conferred by the Plan.

Direct Impacts

With fewer transportation projects than the 2004 RTP, the direct effects of the No Project Alternative on water resources would be reduced when compared with the 2004 RTP. As the currently planned projects included in the No Project alternative (those transportation projects that would occur regardless of the 2004 RTP adoption) are built, the impacts owing to increased roadway runoff and drainage patterns would remain significant. The impacts to groundwater infiltration caused by the increased impervious surfaces of roadway projects, and to increased flooding hazards would be less than significant (with the mitigation measures described for Impacts 3.12-2 through 3.12-3). The proposed Plan's transportation project related impacts to water quality, groundwater recharge, and flooding would be greater than the No Project Alternative.

Cumulative Impacts

Cumulatively, both the Plan and the No Project would potentially impact water quality, groundwater recharge, flood hazards, wastewater treatment capacity, and water supply. In the No Project alternative, new development would occur to accommodate the same increase in population as projected for the proposed Plan. To reduce land consumption, the Plan includes land use measures that encourage centers-based development, redevelopment and infill where feasible. These measures are absent in the No Project alternative. However, the Plan also includes additional households and jobs associated with the economic benefits of the Plan. Since these are offsetting tendencies, it is expected that the No Project alternative would consume approximately the same acreage of vacant land as the Plan.

Because of the similar degree of urbanization and vacant land consumption, the cumulative impacts associated with urban development would be similar between the Plan and the No Project alternative.

The cumulative impacts on wastewater service capacity, due to the growth expected between the base year and 2030, would be approximately the same in the No Project alternative and the Plan. Because the total population in each county is constant between the No Project alternative and the Plan, Imperial, Los Angeles, Riverside and San Bernardino counties would be at or above their existing wastewater treatment capacities. Though it is expected that new treatment capacities will be added as future demand requires, the relation between future growth and current treatment capacities in the No Project alternative and in the Plan creates a finding of significant impact on wastewater services at this time.

The No Project alternative's cumulative impacts to water quality due to urban development patterns would be similar to those associated with the 2004 RTP.

The No Project Alternative would distribute growth among water supply agencies similarly to the Plan (see Table 3.12-5). The *existing* water supply and infrastructure would not be able to support the population in the No Project alternative in 2030. The proposed Plan's impacts on water supply would be approximately the same as the No Project alternative.

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