4.11 Hydrology and Water Quality

This section describes generalized water quality, groundwater supply, drainage, runoff, flooding, and dam inundation impacts of development facilitated by the 2018 RTP/SCS.

4.11.1 Setting

San Joaquin County (County) encompasses approximately 1,440 square miles in central California, and includes rivers, streams, sloughs, marshes, wetlands, channels, harbors, and underground aquifers.

The extensive Delta Basin waterway system is one of the County's most valuable water resources. Over 700,000 acres of agricultural land and 700 miles of interlacing waterways form the Sacramento-San Joaquin Delta. The San Joaquin River Hydrologic Region encompasses San Joaquin County and other parts of the San Joaquin Valley. The San Joaquin Valley comprises the southernmost portion of the Great Valley Geomorphic Province of California. The Great Valley is a broad structural trough bounded by the tilted block of the Sierra Nevada on the east and the complexly folded and faulted Coast Ranges on the west.

a. Surface Water

The major rivers in this hydrologic region are the San Joaquin, Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno. The Calaveras, Mokelumne, and Stanislaus Rivers flow through or border San Joaquin County and discharge directly into the Delta or into the San Joaquin River which in turn flows to the Delta. The west and southwestern portion of the County is part of the Delta (Eastern San Joaquin IRWMP 2014).

San Joaquin River

The San Joaquin River is approximately 330 miles long and originates on the western slopes of the Sierra Nevada Mountains. It drains an area of approximately 13,500 square miles including most of the area from the southern border of Yosemite, south to Kings Canyon National Park. It flows northwest through the County before entering the Delta.

Cosumnes River

The Cosumnes River is a tributary to the Mokelumne River, with the confluence of these two rivers located just north of the San Joaquin-Sacramento County line, near the town of Thornton.

Mokelumne River

The Mokelumne River flows westward from its headwaters in the high Sierra Nevada to the eastern edge of the Delta, where it combines with the Cosumnes River.

Calaveras River

The Calaveras River flows southwest for approximately 80 miles and originates in northeast Calaveras County. The Calaveras River flows through San Joaquin County and the City of Stockton before entering into the San Joaquin River.

Stanislaus River

The Stanislaus River is approximately 65 miles long and is extensively dammed. It drains an 1,075-square- mile watershed, and is one of the largest tributaries to the San Joaquin River. It has a North, Middle, and South Fork and originates in the Sierra Nevada. The Stanislaus River forms the southern boundary of San Joaquin County, just north of Modesto.

Tuolumne River

The Tuolumne River originates in the Sierra Nevada Mountains and is the largest tributary to the San Joaquin River. It has a watershed of approximately 1,500 square miles and an unimpaired annual runoff of approximately 1.8 million acre-feet. Flows in the lower reaches of the Tuolumne River are regulated by the New Don Pedro Dam, which was constructed in 1971 and is owned by Turlock and Modesto Irrigation Districts. New Don Pedro Reservoir has a capacity of approximately 2 million acre-feet and is operated for irrigation, hydroelectric generation, fish/wildlife protection, recreation, and flood control. Irrigation water is diverted downstream from New Don Pedro at La Grange into the Modesto Main Canal and Turlock Main Canal. The City and County of San Francisco operate O'Shaughnessy Dam in the Hetch Hetchy Valley, Lake Eleanor, and Cherry Lake in the upper watershed of the Tuolumne. These facilities are operated for municipal and industrial supply as well as hydropower (Eastern San Joaquin IRWMP 2014).

Dry Creek

Dry Creek is a minor tributary to the Mokelumne River and forms the northern boundary between San Joaquin and Sacramento Counties.

County Reservoirs

The County has eight significant reservoirs, including Camanche Reservoir which is located at the juncture of Amador, Calaveras, and San Joaquin counties. Table 28 provides the water source, reservoirs size, and operating agency of each reservoir.

Table 28 Reservoirs in San Joaquin County

Reservoir	River	Size (acre/feet)	Owning/Operating Agency
Pardee Reservoir	Mokelumne River	197,950	East Bay Municipal Utility District
Camanche	Mokelumne River	417,120	East Bay Municipal Utility District
New Hogan Lake	Calaveras River	317,000	US Bureau of Reclamation, US Army Corp. of Engineers, Stockton East Water District, Calaveras County Water District
New Melones Reservoir	Stanislaus River	2,400,00	US Bureau of Reclamation, Central Valley Water Project
Beardsley Reservoir	Stanislaus River	77,600	Oakdale Irrigation District and South San Joaquin Irrigation District
Donnells Reservoir	Stanislaus River	56,893	Oakdale Irrigation District and South San Joaquin Irrigation District
Tulloch Reservoir	Stanislaus River	68,400	Oakdale Irrigation District and South San Joaquin Irrigation District
Friant Dam	San Joaquin River	520,500	US Bureau of Reclamation

Source: State of California, California Statistical Abstract, 2002 presented in the 2014 Eastern San Joaquin IRWMP.

b. Ground Water

Three groundwater subbasins fall within the County, including the Eastern San Joaquin, Tracy, and Cosumnes.

Eastern San Joaquin Subbasin

Measurements over the past 40 years show a fairly continuous decline in groundwater levels in Eastern San Joaquin County. Groundwater levels have declined at an average rate of 1.7 feet per year and have dropped as much as 100 feet in some areas. It is estimated that groundwater overdraft during the past 40 years has reduced storage in the basin by as much as 2 million acre feet (af). Due to the continued overdraft of groundwater within the subbasin, significant groundwater depressions are present below the City of Stockton, east of Stockton, and east of Lodi. Several of these groundwater depressions extend to depths of about 100 feet below ground surface (or more than 40 feet below mean sea level)

The total available groundwater storage capacity from a depth of 20 feet to the base of the groundwater basin is about 42,400,000 af based on a total aquifer material volume of 579,900,000 af and an average specific yield of 7.3 percent (DWR 1967). This estimate was based on a study area that encompassed approximately 586,000 acres. Since the currently defined subbasin size is over 707,000 acres, the storage value mentioned above underestimates the total storage capacity for the subbasin as defined in Bulletin 118 (California Department of Water Resources 2006)[8].

Tracy Subbasin

Review of hydrographs for the Tracy Subbasin indicate that, except for seasonal variation resulting from recharge and pumping, the majority of water levels in wells have remained relatively stable over at least the last 10 years. There are no published groundwater storage values for the entire basin; however it is estimated that the groundwater storage capacity for the Tracy-Patterson Storage Unit at 4,040,000 af. This storage unit includes the southern portion of the currently defined Tracy Subbasin from approximately one-mile north of Tracy to the San Joaquin-Stanislaus County line. Since the Tracy Subbasin comprises roughly one third of the Tracy-Patterson Storage Unit, it can be inferred that the approximate storage capacity of the southern portion of the Tracy Subbasin is on the order of 1,300,00 af (California Department of Water Resources 2006)[9].

Cosumnes Subbasin

A review of 23 long-term hydrographs dating back to the early 1960s shows a fairly consistent pattern of water level trends through much of the subbasin. Wells outside the influence of the Cosumnes River declined on the order of 20 to 30 feet from the mid-1960s to about 1980. From 1980 through 1986, water levels recovered on the order of 5 to 10 feet. During the 1987 through 1992 drought, water levels once again declined by 10 to 15 feet. From 1993 through 2000, much of the basin recovered by 15 to 20 feet, leaving water levels at about the same elevation or slightly higher than they were in the mid-1980s. One exception is along the eastern subbasin margin where water levels remained fairly constant during the 1993 through 2000 recovery period. Prior to that, those eastern wells behaved similarly to other wells in the subbasin.

[8] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.01.pdf

[9] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.15.pdf

Groundwater storage capacity is estimated to be on the order of 6,000,000 af based on data from DWR 1967 and DWR 1974. This estimate is based on a surface area of 281,000 acres, an aquifer thickness of 290 feet (20 to 310 feet depths), and an average specific yield of 7.4 percent (California Department of Water Resources 2006)[10].

c. Water Quality

Water quality is a concern because of its potential effect on human health, aquatic organisms, and ecosystem conditions. Quality is determined by factors such as native condition of groundwater and surface water, and sources of contamination (natural and human induced).

In addition, the County is largely characterized by impervious surfaces, such as buildings, roads, sidewalks, parking lots, and other impervious surfaces. These features alter the natural hydrology of the region, preventing infiltration, augmenting hydromodification, and ultimately increase the risk of pollutant discharge and flooding.

Surface Water

Impaired surface waters within San Joaquin County are those listed by the Central Valley Regional Water Quality Control Board (CVRWQCB) as impaired due to one or more pollutants. Table 29 lists all 303(d) listed waterbodies within San Joaquin County. Contamination of these waterbodies is largely due to urban and agriculture runoff, as well as resource extraction.

Table 29 2010 303(d) List of Impaired Water Bodies – San Joaquin County

Water Body Name	Water Body Type	Pollutant
Avena Drain	River and Stream	Ammonia Pathogens
Bear Creek; partly in Delta Waterways, eastern portion)	River and Stream	Copper Diazinon, Escherichia coli, Low Dissolved Oxygen
Calaveras River, Lower (from Bellota Weir to Stockton Diverting Canal)	River and Stream	Unknown Toxicity
Calaveras River, Lower (from Stockton Diverting Canal to the San Joaquin River; partly in Delta Waterways, eastern portion)	River and Stream	Chlorpyrifos Diazinon Mercury Organic Enrichment/Low Dissolved Oxygen Pathogens
Camanche Reservoir	Lake and Reservoir	Copper Mercury Zinc
Delta Waterways (Stockton Ship Channel)	Estuary	Chlorpyrifos, DDT (Dichlorodiphenyltrichloroethane) Diazinon, Furan Compounds Group A Pesticides Invasive Species Mercury Organic Enrichment/Low Dissolved Oxygen PCBs (Polychlorinated biphenyls) Pathogens Unknown Toxicity
Delta Waterways (Central portion)	Estuary	Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Diazinon Group A Pesticides Invasive Species Mercury Unknown Toxicity

[10] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.16.pdf

Water Body Name	Water Body Type	Pollutant
Delta Waterways (eastern portion)	Estuary	Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Diazinon Group A Pesticides Invasive Species Mercury Unknown Toxicity
Delta Waterways (export area)	Estuary	Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Diazinon Electrical Conductivity Group A Pesticides Invasive Species Mercury Unknown Toxicity
Delta Waterways (southern portion)	Estuary	Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Diazinon Electrical Conductivity Group A Pesticides Invasive Species Mercury Unknown Toxicity
Duck Creek (San Joaquin County)	River & Stream	Chlorpyrifos Escherichia coli (E. coli) Mercury
Five Mile Slough (Alexandria Place to Fourteen Mile Slough; in Delta Waterways, eastern portion)	River & Stream	Chlorpyrifos Diazinon Organic Enrichment/Low Dissolved Oxygen Pathogens
French Camp Slough (confluence of Littlejohns and Lone Tree Creeks to San Joaquin River, San Joaquin Co; partly in Delta Waterways, eastern portion)	River & Stream	Chlorpyrifos Diazinon Escherichia coli (E. coli) Oxygen, Dissolved Sediment Toxicity Unknown Toxicity
Hospital Creek (San Joaquin and Stanislaus Counties)	River & Stream	DDE (Dichlorodiphenyldichloroethylene) Dieldrin Dimethoate Escherichia coli (E. coli) Pyrethroids Salinity Sediment Toxicity Trifluralin Unknown Toxicity
Little Johns Creek	River & Stream	Escherichia coli (E. coli) Unknown Toxicity
Middle River (in Delta Waterways, southern portion)	River & Stream	Low Dissolved Oxygen
Mokelumne River, Lower (in Delta Waterways, eastern portion)	River & Stream	Chlorpyrifos Copper Mercury Oxygen, Dissolved Unknown Toxicity Zinc
Mormon Slough (Commerce Street to Stockton Deep Water Channel; partly in Delta Waterways, eastern portion)	River & Stream	Organic Enrichment/Low Dissolved Oxygen Pathogens Chlorpyrifos Unknown Toxicity
Mormon Slough (from Stockton Diverting Canal to Bellota Weir--Calaveras River)	River & Stream	Chlorpyrifos Unknown Toxicity
Mosher Slough (downstream of I-5; in Delta Waterways, eastern portion)	River & Stream	Chlorpyrifos Diazinon Mercury Organic Enrichment/Low Dissolved Oxygen Pathogens
Mountain House Creek (from Altamont Pass to Old River, Alameda and San Joaquin Counties; partly in Delta Waterways, southern portion)	River & Stream	Chloride Salinity

Water Body Name	Water Body Type	Pollutant
Pixley Slough (San Joaquin County; partly in Delta Waterways, eastern portion)	River & Stream	Chlorpyrifos Diazinon Escherichia coli (E. coli) Oxygen, Dissolved Oxygen, Dissolved
San Joaquin River (Bear Creek to Mud Slough)	River & Stream	Arsenic Boron Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Electrical Conductivity Escherichia coli (E. coli) Group A Pesticides Mercury Unknown Toxicity
San Joaquin River (Tuolumne River to Stanislaus River)	River & Stream	Chlorpyrifos DDT (Dichlorodiphenyltrichloroethane) Diazinon Electrical Conductivity Group A Pesticides Mercury Temperature, water Unknown Toxicity
San Joaquin River (Stanislaus River to Delta Boundary)	River and Stream	Chlorpyrifos DDE (Dichlorodiphenyldichloroethylene) DDT (Dichlorodiphenyltrichloroethane) Diuron Electrical Conductivity Escherichia coli (E. coli) Group A Pesticides Mercury Temperature, water Toxaphene Unknown Toxicity
Smith Canal (in Delta Waterways, eastern portion)	River and Stream	Organic Enrichment/Low Dissolved Oxygen Organophosphorus Pesticides Pathogens
Stanislaus River, Lower	River and Stream	Chlorpyrifos Diazinon Group A Pesticides Mercury Temperature, water Unknown Toxicity
Sutter Bypass	River & Stream	Mercury
Temple Creek	River and Stream	Ammonia
Tom Paine Slough (in Delta Waterways, southern portion)	River & Stream	Chloride Oxygen, Dissolved Salinity
Walker Slough (partly in Delta Waterways, eastern portion)	River and Stream	Pathogens

Groundwater

Localized impairments including total dissolved solids (TDS), sodium chloride, nitrate, and inorganic compounds are common in the County's groundwater, impairing the water quality. A brief water quality description for each of the County's subbasins is provided below.

Eastern San Joaquin Subbasin

As a result of declining water levels, poor quality water has been moving east along a 16-mile front on the east side of the Delta. The degradation was particularly evident in the Stockton area where the saline front was moving eastward at a rate of 140 to 150 feet per year. Data from 1980 and 1996 indicate that the saline front has continued to migrate eastward up to about one mile beyond its 1963 extent. Large areas of elevated nitrate in groundwater exist within the subbasin located

southeast of Lodi and south of Stockton and east of Manteca extending towards the San Joaquin – Stanislaus County line (California Department of Water Resources 2006)[11].

Tracy Subbasin

Areas of poor water quality exist throughout the subbasin. Areas of elevated chloride occur in several areas including: along the western side of the subbasin; in the vicinity of the City of Tracy; and along the San Joaquin River. Areas of elevated nitrate occur in the northwestern part of the subbasin and in the vicinity of the City of Tracy. Areas of elevated boron occur over a large portion of the subbasin from south of Tracy and extending to the northwest side of the subbasin (California Department of Water Resources 2006)[12].

Cosumnes Subbasin

Groundwater contained in the water-bearing deposits underlying most of Sacramento County is of excellent mineral quality for irrigation and domestic use. Within the subbasin, calciummagnesium and calcium-sodium bicarbonate water types are most common. Groundwater from wells in the San Joaquin County portion of the subbasin typically show specific conductance values of less than 500 µmhos/cm. Based on analyses of 20 water supply wells in the subbasin, TDS ranges from 140 to 438 mg/L and averages about 218 mg/L. No significant impairments were identified (California Department of Water Resources 2006)[13].

Sustainable Groundwater Management Act

In September 2014 the state passed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act (SGMA) gives local agencies the power to sustainably manage groundwater and requires Groundwater Sustainability Plans (GSPs) to be developed for medium- and high-priority groundwater basins. The RTP/ SCS region is part of a collaborative effort to implement SGMA and form groundwater sustainability agencies (GSA). GSAs for medium- and high-priority groundwater basins in the SJCOG region include:

- Banta-Carbona Irrigation District
- Byron-Bethany Irrigation District
- California Water Service Company
- Central Delta Water Agency
- Central San Joaquin Water Conservation District
- City of Lathrop
- City of Lodi
- City of Manteca
- City of Stockton GSA
- City of Tracy
- DM-II
- Linden County Water District
- Lockeford Community Service District
- North San Joaquin Water Conservation District Oakdale Irrigation District Eastern San Joaquin Sub-basin Ground
- San Joaquin County
- San Joaquin County Flood Control and Water Conservation District
- South Delta Water Agency
- South San Joaquin Groundwater Sustainability Agency
- South San Joaquin Irrigation District
- Stockton East Water District
- West Side Irrigation District
- West Stanislaus Irrigation District
- Woodbridge Irrigation District

[11] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.01.pdf

[12] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.15.pdf

[13] http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/5-22.16.pdf

These agencies will be preparing the required sustainability plans for their respective groundwater basins.

d. Water Supply

Water delivery in San Joaquin County is provided by several agencies and projects including federal, state, regional, and local water projects; special districts (e.g., irrigation, water, and water conservation); and private water systems. Irrigation and domestic water systems within San Joaquin County are operated and maintained by irrigation districts, water districts, and water conservation districts. The County's main water resources are provided in Table 30, presenting the primary users of these resources, and the beneficial uses associated with each source.

Table 30 San Joaquin County Water Resources

Water Source	A	B	C	D	E	Primary Users
San Joaquin River	X		X	X	X	Riparian Farmers Shipping Industry Irrigation Industry
Mokelumne River	X		X		X	Irrigation Industry
Camanche Reservoir	X		X			Local Residents
Calaveras River	X	X			X	Water Districts
Stanislaus River	X		X		X	Irrigation Districts
Delta	X		X	X	X	Recreation Wildlife Shipping Industry DWR USBR
Delta-Mendota Canal	X	X	X		X	City of Tracy Irrigation Districts Commercial Businesses
California Aqueduct	X	X	X		X	Commercial Businesses Irrigation Districts
Lodi Lake			X			Local Residents
Groundwater	X	X				Private Individuals Cities Towns

Source: 2009 San Joaquin County General Plan Update, Natural Resources Element Notes:

DWR= California Department of Water Resources

USBR= US Bureau of Reclamation

Beneficial Uses: A=Irrigation, B=Municipal/Industrial, C=Recreation, D=Transportation, E= Estuary/Wildlife Area.

Surface Water

Water supplies in the County are subject to the complex system of riparian and appropriative rights and are further complicated by numerous agreements and water service contracts. It is estimated that the County has approximately 1.2 million acre-feet per year (afy) of surface water available. This amount includes approximately 500,000 afy applied by farmers in the Delta (Northeastern San Joaquin County Groundwater Banking Authority, Eastern San Joaquin Groundwater Management Plan, Section 2.6 Water Supplies).The actual quantity of water delivered varies significantly from year to year due to contractual and water rights conditions. The actual quantities utilized within the County also vary significantly with climatic fluctuations, infrastructure limitations, and facility operation.

Surface water supplies are likely to decrease in the future. Several current contracts are for "interim" supplies, which are available subject to requirements of upstream or senior rights holders.

As development increases in areas with senior water rights, County surface water supplies will be reduced.

Groundwater and Groundwater Banking

Beginning in 1850 the development of groundwater for agriculture expanded rapidly. Within the Central Valley irrigated agriculture has grown from less than 1 million acres to an estimated 7 to 8 million acres at present over the last 100 hundred years. In average years almost 870,000 acre-feet of groundwater is pumped per year from the Regional Planning Area. In Bulletin 118-80, DWR designated the Eastern San Joaquin Basin as "critically overdrafted" (2014 Eastern San Joaquin Integrated Regional Water Management Plan, Section 6.5 Groundwater Conditions).

Long-term overdraft has created opportunities for groundwater banking to the benefit of regional and statewide interests. Groundwater banking is the storage/recharge of excess water supplies into aquifers during wet periods for later withdrawal/recovery for use during dry periods. Historically, during wet periods, surface water imports have been substantial enough to satisfy irrigation and urban water needs and thus, excess water has been recharged to groundwater aquifers. The groundwater is then pumped/ extracted through private and publicly owned wells located throughout the region during dry periods when local or imported surface water supplies are insufficient.

e. Water Demand

The demand for water in San Joaquin County appears to have peaked in the 1990s and is projected to continue to decline as more efficient urban and irrigation practices are adopted (2014 Eastern San Joaquin Integrated Regional Water Management Plan). Demand within the County is serviced by a variety of water purveyors, including the County's 14 irrigation districts and 22 domestic water districts, investor-owned water companies, mutual water companies, municipalities and private well owners. The water demand summarized below represents the data presented in the 2014 Eastern San Joaquin IRWMP.

Urban Demand

Table 31 summarizes the 2010 water demands for the urban areas in the County. Annual water was summarized based on current Urban Water Management Plans, water production data obtained from water service providers, or other general planning documents. Urban water demand for the County's CSAs is not included in the table. Various factors determine how these unincorporated portions of the County receive their water. Some unincorporated areas are located close enough to one of the cities and have connected to the cities' water infrastructure.

Table 31 San Joaquin County Urban Water Demand

Urban Areas	2010 Urban Water Demand (afy)
Escalon	2,705
Lathrop	19,043
Lodi	21,109
Manteca	29,588
Ripon	8,235
Stockton	73,886
Total	**154,566**

Source: 2014 Eastern San Joaquin Integrated Regional Water Management Plan, Section 6.2 Urban Land and Water Use

Agricultural Demand

Agricultural water use is based on various crop Evapotranspiration (ET) and efficiency data collected by DWR. The ET of a crop represents the total amount of water transpired by the plant, retained in the plant tissue, and evaporated from adjacent soil surfaces during the growing period. In dry years, the effective precipitation (EP) is less than normal, thus, the amount of applied water (AW) must be increased to meet the total ET of the crop. Also, the irrigation efficiency of applied water varies due to cultural practices, canal or ditched delivery, pressurized delivery systems, and soil drainage conditions. Table 32, provides the approximate 2010 water demand for agricultural use in the entire County (most recent water demand data available).

Table 32 San Joaquin County Applied Water Demands for Agricultural Use

Agricultural Areas	2010 Estimated Agriculture Water Demand (afy)
Central Delta Water Agency	108,440
Central San Joaquin Water Conservation District	159,988
North San Joaquin Water Conservation District	181,906
Oakdale Irrigation District	19,059
South Delta Water Agency	37,596
South San Joaquin Irrigation District	155,237
Stockton East Water District	197,956
Woodbridge Irrigation District	70,921
Other Agriculture	120,752
Total	**1,051,855**

Source: 2007 Eastern San Joaquin Integrated Regional Water Management Plan, Section 4.3.2 Agricultural Water Use

f. Flooding and Dam Inundation

The risks of flooding hazards in the County are related to the failure of levees in the Delta, dam failures, and 100-year flood events. These risks of flooding are greatest during the rainy season, between November and April, yet snowmelt from the Sierra Nevada can also extend the period of time for water flows, typically between April and June. A majority of levees within the County have

not been built and/or maintained in accordance to federal standards as either federal flood control project levees or by local districts. Most levees are privately constructed and maintained by local landowners or local agencies. Many of these levees are in poor condition and have been identified for reconstruction or improvement to meet to higher standards (2014 Eastern San Joaquin Integrated Regional Water Management Plan).

The 100-Year floodplain denotes an area that has a one percent chance of being inundated during any particular 12-month period. The risk of this area being flooded in any century is one percent but statistically the risk is almost 40 percent in any 50-year period.

Floodplain zones are determined by the Federal Emergency Management Agency (FEMA) and used to create Flood Insurance Rate Maps (FIRMs). These tools assist communities in mitigating flood hazards through land use planning. FEMA also outlines specific regulations for any construction located within a 100-year floodplain, whether residential, commercial, or industrial. San Joaquin County's FIRM number is 06077C0470F and was last updated in October of 2009.

A description of each FEMA flood zone is provided below:

- **Zone A:** This zone is listed as a high risk and special flood hazard area; in addition, FEMA has designated these lands as within the 100-year floodplain. Further, these areas are subject to inundation by the 1-percent-annual-chance flood event.
- **Zone AE:** This zone is listed as a high risk and special flood hazard area. Further, these areas are subject to inundation by the 1-percent-annual-chance flood event. Base Flood Elevations (BFEs) have been established for this zone.
- **Zone AH:** This zone is listed as a high risk and special flood hazard area. Further, these areas are subject to inundation by the 1-percent-annual-chance shallow flooding (usually in areas of ponding) where average depths of water are 1-3 feet.
- **Zone AO:** This zone is listed as a high risk and special flood hazard area. Further, these areas are subject to inundation by the 1-percent-annual-chance shallow flooding (usually caused by sheet flow on sloping terrain) where average depths of water are 1 to 3 feet. Average flood depths have been derived from detailed hydraulic analyses.
- **Zone X:** This zone is listed as a moderate and minimal risk area. These areas include: moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual- chance flood by a levee.

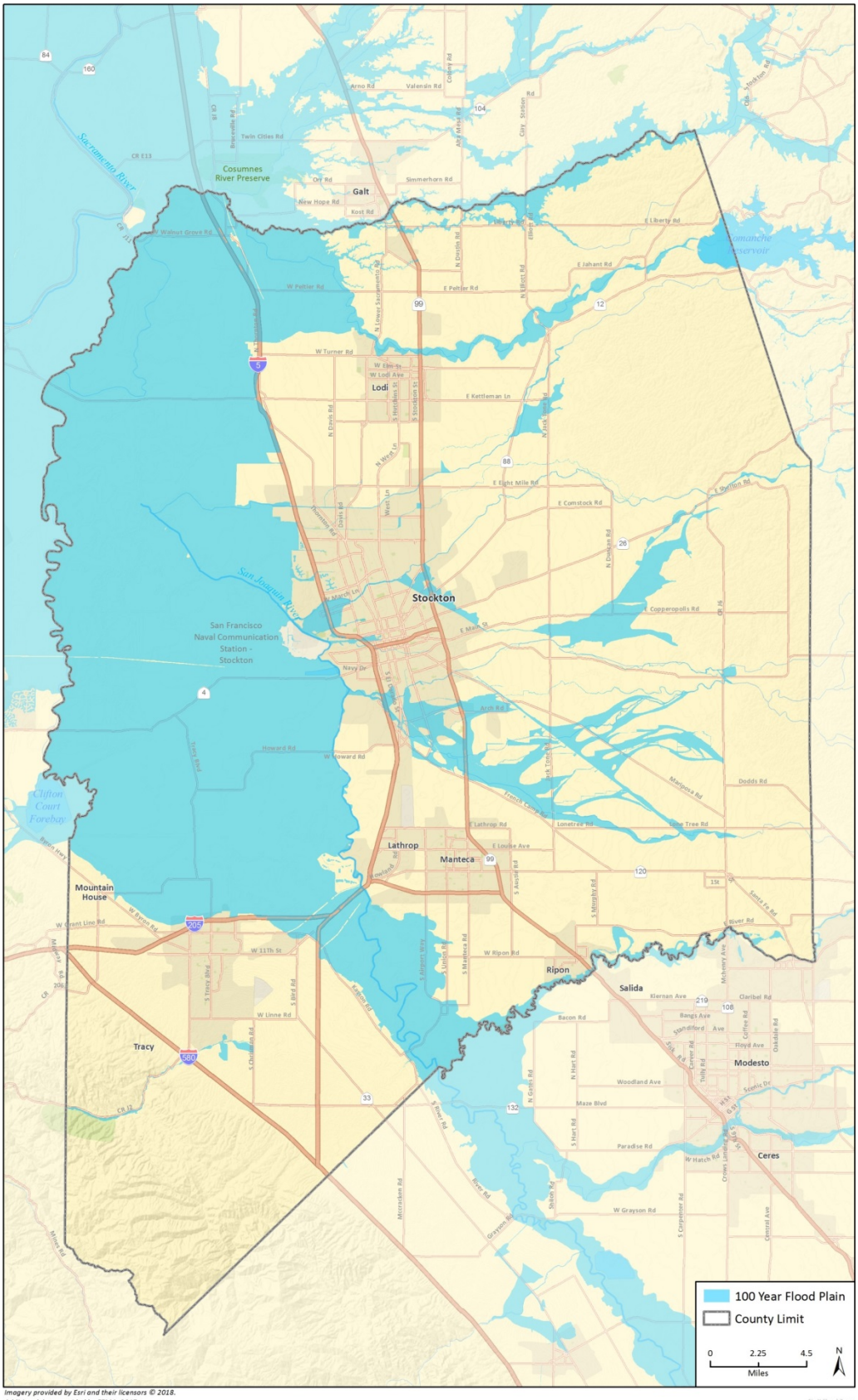
Figure 14 illustrates the 100-year flood zone located throughout San Joaquin County.

Dam Failure

According to the County's Office of Emergency Services (OES) Dam Failure Plan, there are 14 dams located in and around San Joaquin County. Each of these dams has the potential to inundate portions of the County if they were to fail. The failure of any one of these dams could result from structural instability caused by improper design or construction, instability resulting from seismic shaking, or overtopping and erosion of the dam.

Larger dams that are higher than 25 feet or with storage capacities over 50 acre-feet of water are regulated by the California Dam Safety Act, which is implemented by the California Department of Water Resources, Division of Safety of Dams (DSD). The DSD is responsible for inspecting and

Figure 14 San Joaquin County Flood Map



monitoring these dams. The Act also requires that dam owners submit to the California Office of Emergency Services inundation maps for dams that would cause significant loss of life or personal injury as a result of dam failure. The County Office of Emergency Services is responsible for developing and implementing a Dam Failure Plan that designates evacuation plans, the direction of floodwaters, and provides emergency information.

g. Regulatory Setting

Federal

A number of federal regulations, agencies and programs are pertinent to the 2018 RTP/SCS and shall be considered as part of this PEIR as well as in the analysis of proposed individual projects.

Clean Water Act (CWA)

Enacted by Congress in 1972, the Clean Water Act mandates cooperative efforts by federal, state, and local governments to implement its pollution control measures. The National Pollutant Discharge Elimination System (NPDES) was established by the Clean Water Act to regulate point source discharges into "navigable waters" of the United States. The Act also established Storm Water Management Plans, municipal authority for non-point source NPDES permits, in communities with populations greater than 100,000 to control urban storm water runoff.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) ensures the quality of Americans' drinking water. The law requires actions to protect drinking water and its sources—rivers, lakes, reservoirs, springs and groundwater wells—and applies to public water systems serving 25 or more people. It authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and manmade contaminants. In addition, it oversees the states, municipalities, and water suppliers that implement the standards.

US Army Corps of Engineers

The USACE regulates placement of dredged or fill material in waters of the United States, and regulates work in its navigable waters. 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.

US Environmental Protection Agency

The US Environmental Protection Agency (EPA) is the federal agency responsible for water quality management and administration of the federal Clean Water Act (CWA). In California, the EPA has delegated most of the administration of the CWA to the State Water Resources Control Board (SWRCB). Much of the responsibility for implementation of the SWRCB's policies is delegated to the RWQCB.

US Fish and Wildlife Service

The US Fish and Wildlife Service (USFWS) administers the Federal Endangered Species Act (FESA) and designates critical habitat for Endangered species to carry out its mission to conserve, protect,

and enhance the nation's fish and wildlife and their habitats for the continuing benefit of people. Critical habitat areas cannot be disturbed without permission from the USFWS or other federal agencies, depending on land ownership. The USFWS also manages a system of land and waters for the conservation of wildlife and associated ecosystems. These National Wildlife Refuges are primarily managed for the preservation and protection of unique or important resources and ecosystems.

Federal Emergency Management Agency

The US 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 US Bureau of Reclamation

The US Bureau of Reclamation (USBR) operates the Colorado River project, an extensive network of dams, canals, and related facilities. The USBR serves as Water master, overseeing contentious water rights issues, and runs drought protection programs.

State

A number of state regulations, agencies and programs are pertinent to the 2018 RTP/SCS and shall be considered as part of this PEIR as well as in the analysis of proposed individual projects.

California State Water Resource Control Board (SWRCB)

The SWRCB was established through the California Porter Cologne Water Quality Act of 1969. It is the primary state agency responsible for water quality management issues. 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. SWRCB is also responsible for granting water rights permits, approving water right transfers, investigating violations, and may reconsider or amend water rights.

Regional Water Quality Control Board Central Valley Region (RWQCB)

The RWQCB is responsible for implementing policies of the SWRCB, such as ensuring compliance with discharge thresholds and operating standards. The County is located within the RWQCB's Central Valley Region. 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 the implementation of the SWRCB's policies is delegated to the nine RWQCBs. The nine RWQCBs develop and enforce water quality objectives and implementation plans.

California Department of Fish and Wildlife

The mandate of the California Department of Fish and Wildlife (CDFW) is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for public use and enjoyment. In particular, CDFW is required under the California Endangered Species Act, the California Native Plant Protection Act, the California Environmental Quality Act (CEQA), and the Natural Community Conservation Planning Act to conserve species through listing, habitat acquisition, and protection, review of local land use

planning, multi-species conservation planning, stewardship, recovery, research, and education. The CDFW protects Rare, Threatened and Endangered species by managing habitat in legally designated ecological reserves or wildlife areas.

Delta Stewardship Council

In November 2009, the California Legislature enacted the Sacramento-San Joaquin Delta Reform Act (Delta Reform Act) of 2009, also known as Sen. Bill No. 1 (Stats. 2009, 7th Ex. Sess., ch. 5) (SB X7-1). The Delta Reform Act created the Delta Stewardship Council (DSC). The DSC is made up of seven members that are advised by a 10-member board of scientists. The DSC is tasked with addressing the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. According to the Delta Reform Act, the coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. The DSC regulates covered actions, as statutorily defined, to address the coequal goals.

Delta Water Agency

The Delta Agency was established in 1965 to maintain agricultural water quality throughout the Delta. In 1973, the agency was replaced by three distinctive agencies: North, Central, and South Delta Water Agencies.

The Delta Protection Act of 1992

The Delta Protection Act of 1992 (Act) refined the definition of the Legal Delta by designating a primary zone and a secondary zone. It also established the Delta Protection Commission for the purpose of developing a long-term management plan for the primary zone, which constitutes approximately two- thirds of the Delta's area. The Act recognizes the importance of maintaining agricultural uses in the primary zone, and the difficulty of providing flood protection for the islands in the primary zone, and for these and other reasons, states that the primary zone "should be protected from the intrusion of nonagricultural uses." The Legal Delta includes two zones – the Primary Zone and the Secondary Zone.

Delta Protection Commission

The Delta Protection Act of 1992 (Pub. Resources Code § 29760 et seq.) recognized the Sacramento-San Joaquin Delta as a natural resource of statewide, national, and international significance, containing irreplaceable resources. It created the policy to recognize, preserve, and protect those resources, and established the Delta Protection Commission. The Delta Protection Commission was charged with creating the Land Use and Resources Management Plan for the Delta Primary Zone, which was adopted in 1995. The management plan provides direction for local jurisdictions in the Delta region on land use decisions. Local jurisdictions with lands in the primary zone have amended their general plans to incorporate the management plan.

Bay Delta Conservation Plan

The Bay Delta Conservation Plan (BDCP) is a part of California's overall water management portfolio, and develops a 50-year habitat conservation plan with the goals of restoring the Sacramento-San Joaquin Delta ecosystem and securing California water supplies. The BDCP would secure California's water supply by building new water delivery infrastructure and operating the system to improve the ecological health of the Delta.

The BDCP is a Habitat Conservation Plan (HCP) under the federal Endangered Species Act, and a Natural Community Conservation Plan (NCCP) under the California Natural Community Conservation Planning Act. The BDCP would result in long-term permits from regulatory agencies in return for meeting the Delta's ecological needs. The regulatory nature of the HCP/NCCP creates a durable regulatory framework that would allow for fundamental and systematic improvements in the Delta. This reflects a significant departure from the species-by-species approach utilized in previous efforts to manage Delta-specific species and habitats. Instead, the BDCP seeks to improve the health of the ecological system as a whole.

Delta-Vision Blue Ribbon Task Force

California Executive Order S-17-06 created the Delta Vision Blue Ribbon Task Force and directed it to develop a vision statement for sustainable management of the Delta and a management plan for the long term restoration and maintenance of identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well-being of the people of California.

The Department of Water Resources

The DWR is responsible for the planning, construction, and operation of State Water Project (SWP) facilities, including the California Aqueduct, and sets conditions on use of SWP facilities. In addition, DWR is responsible for statewide water planning, evaluating urban water management plans, overseeing dam safety and flood control, and transfer of certain water rights permits (e.g., pre-1914).

The California Department of Public Health

The California Department of Public Health (DPH) implements the Safe Drinking Water Act. In addition, it oversees the operational permitting and regulatory oversight of public water systems. DPH requires public water systems to perform routine monitoring for regulated contaminants that may be present in their drinking water supply. In addition, DPH conducts water source assessments, oversees water recycling projects, permits water treatment devices, certifies water system employees, promotes water system security, and administers grants under the State Revolving Fund and state bonds for water system improvements.

The California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) is responsible for oversight of hazardous substances and remediation of contaminated sites, including in some cases water sources.

Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act of 1967 (Water Code Section 13000 et seq.) requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative to the applicable and numerical water quality standards, and implementation procedures.

The Porter-Cologne Water Quality Control Act authorizes the state boards to adopt, review, and revise policies for all waters of the state (including both surface and ground waters) and directs the regional boards to develop Basin Plans. The act also authorizes state boards to adopt Water Quality

Control Plans. In the event of inconsistencies among state and regional board plans, the more stringent provisions apply.

California Administrative Code Title 20 and Title 25

Title 20 (Sections 1604 and 1606) and Title 24 (Sections 2-5307 and 2-5352) of the California Administrative Code establishes efficiency standards for all new showerheads, lavatory faucets, and sink faucets. These regulations also prohibit the sale of fixtures that do not comply with the current regulations; prohibit the installation of fixtures unless the manufacturer has certified compliance with the flow rate standards; and address pipe insulation requirements that can reduce water used before hot water reaches fixtures. Other applicable state water conservation laws include the Health and Safety Codes.

State Senate Bills 610 and 221

State Senate Bills (SB) 610 and SB 221 were adopted in 2001, and require lead agencies to obtain an assessment from the local water supplier to determine the sufficiency of the water supply for a proposed development. SB 610 applies at the time an EIR is prepared, while SB 221 applies at the time a Tentative Tract Map or other related project actions are approved. Additionally, water agencies must coordinate with land use planning agencies in the development of their Urban Water Management Plans (UWMPs), which include projections of future water demand and water supply availability during normal and dry periods.

Senate Bill X 7-7

Senate Bill 7 of Special Extended Session 7 (SB X7-7) was signed into law in November 2009, setting a goal of 20 percent reduction in per capita water use statewide by 2020. As a result, the legislation now mandates each urban water retail supplier to develop and report a water use target. DWR has also developed methodologies for calculating base daily per capita water use, baseline commercial, industrial and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use and landscape area water use. Agencies not in compliance with SB X7-7 will be ineligible for state loan and grant funding.

SB X7-7 contains requirements for agricultural water suppliers. All agricultural water suppliers, either publicly or privately owned which irrigate 10,000 or more acres are required by SB X7-7 to implement critical Efficient Water Management Practices (EWMPs) and additional EWMPs if locally cost effective and technically feasible. Affected agricultural water suppliers must implement EWMPs by July 31, 2012.

SB X7-7 also created the Agricultural Water Management Planning Act, which requires affected agricultural water suppliers to adopt Agricultural Water Management Plans (AWMPs). These plans facilitate management and conservation of water suppliers, and also guide and document the implementation of EWMPs. The plans are mandatory for many suppliers and are required to be completed and adopted for affected agricultural water suppliers by December 31, 2012.

Assembly Bill 3616

This bill was enacted in 1990 and authorized the development of Agricultural Water Management Planning Act and the formation of the Agricultural Water Management Council (AWMC). Entities join the AWMC by signing the Agricultural Memorandum of Understanding (MOU) Regarding Efficient Water Management Practices (EWMPs) by Agricultural Water Suppliers in California.

Assembly Bill 1881

AB 1881, the Water Conservation in Landscaping Act of 2006, enacted many landscape efficiency recommendations of the California Urban Water Conservation Council (CUWCC) for improving the efficiency of water use in new and existing urban irrigated landscapes in California. The law requires the Energy Commission to adopt performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

The Model Local Water Efficient Landscape limits the water budget for new landscapes (or rehabilitated landscapes), greater than 2,500 square feet, to 70 percent of the local reference evapotranspiration (ET). The model ordinance lays out the procedures for evaluating potential landscape water use during the land development process. In addition, the ordinance contains requirements for planting as well as the design and maintenance of irrigation systems, all with the intent of limiting outdoor water use and avoiding irrigation runoff.

Assembly Bill 1420

AB 1420, passed in 2007 and in effect as of January 2009, changes the funding eligibility requirements of Section 10631 of the Water Code (Urban Water Management Planning Act). For any urban water supplier to be eligible for grant or loan funding administered by DWR, the SWRCB, or the Bay-Delta Authority (such as Propositions 50 and 84), the supplier must show implementation the 14 water use efficiency demand management measures/best management practices (DMMs/BMPs) listed and described in the UWMP Act and the CUWCC Memorandum of Understanding, or show the schedule by which the supplier will begin implementing the DMMs/BMPs. Any supplier not implementing the measures based on cost-effectiveness must submit proof showing why the measures are not cost-effective.

Assembly Bill 2882

This bill was passed in 2008 and encourages public water agencies throughout California to adopt conservation rate structures that reward consumers who conserve water. Prior to AB 2882 state law authorized water agencies to promote conservation using rate structures; however, some agencies were concerned that such rate structures may be inconsistent with other parts of state law. AB 2882 clarifies the allocation-based rate structures and establishes standards that protect consumers by ensuring a lower base rate for those who conserve water.

California Public Resources Code

As defined in Public Resources Code 10910, a city or county determines whether the projected water demand associated with a proposed project was included as a part of the most recently adopted urban water management plan. If the water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, the water supply assessment for the proposed project must include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry and multiple dry water years during a 20-year projection would meet the projected water demand associated with the proposed project, in addition to the water systems' existing and planned future uses.

California Water Plan

The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The plan, updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the state's water needs.

Urban Water Management Plan

Urban Water Management Plans (UWMPs) are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves more than 3,000 or more connections is required to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple dry years. This assessment is to be included in its UWMP, which are to be prepared every five years and submitted to the Department of Water Resources. DWR then reviews the submitted plans to make sure they have completed the requirements identified in the Urban Water Management Planning (UWMP) Act (Division 6 Part 2.6 of the Water Code §10610 - 10656).

Groundwater Management Act

The Groundwater Management Act of 1992 (Wat. Code § 10750 et seq.), also known as AB 3030 (Stats. 1992, ch. 947), provides guidelines for local agencies to acquire authority over the management of groundwater resources in basins recognized by DWR. Its intent is to promote the voluntary development of groundwater management plans and provide criteria for the plans in order to ensure sustainable groundwater supplies for the future.

Storm Water Pollution Prevention Plans

The purpose of Storm Water Pollution Prevention Plans (SWPPPs) is to develop a strategy for construction projects to comply with Federal and State stormwater regulations. These regulations are put in place to minimize sediment and other pollutants in stormwater runoff commonly associated with construction activities. Typically, SWPPPs are only required for construction projects that disturb more than 1 acre of developed or undeveloped land. Additionally, the California Green Building Code (CalGreen) requires SWPPPs for projects that disturb less than 1 acre.

Standard Urban Stormwater Mitigation Plan

The State Regional Water Quality Control Board adopted the Standard Urban Stormwater Mitigation Plan (SUSMP) in 2000. It was developed as part of the municipal stormwater program to address stormwater pollution from new developments and redevelopment projects. Project applicants falling into specific categories are required to prepare and implement a Standard Urban Stormwater Mitigation Plan.

The County Service Area Law

The County Service Area Law allows residents or county supervisors to initiate the formation of a County Service Area (CSA). A CSA is authorized to provide a wide variety of services, including extended police protection, fire protection, park and recreation facilities, libraries, low power

television and translation facilities and services. CSAs also may provide other basic services such as water and garbage collection if they are not already performed on a countywide basis. A CSA may span all unincorporated areas of a county or only selected portions.

Regional and Local

A number of local regulations, agencies and programs are pertinent to the 2018 RTP/SCS and shall be considered as part of this PEIR as well as in the analysis of proposed individual projects.

Delta Protection Act of 1959

The Delta Protection Act, enacted in 1959, defined the boundaries of the Delta within the Water Code of the State of California. These boundaries are often referred to as the Legal Delta. The Delta Protection Act was passed during the same legislative session as the Burns-Porter Act, which authorized construction of the State Water Project (SWP). The Delta Protection Act guarantees an adequate water supply to Delta water users and protection from increased levels of salinity due to the export of water through the CVP and SWP.

Framework for Delta Legislative Options

On April 14, 2009, the County Board of Supervisors approved a set of goals, conditions, and actions that address the County's legislative interests in the Delta. The framework lays out criteria for the creation of a Delta Plan, requests $51 million for emergency response and levee repair during a flood, expresses the need for a "water master" type of public official position, and calls on the state to allow enough water storage projects in the state to increase water capacity 5 million acre-feet more than the needs of the Delta.

Stockton Urbanized Area NPDES Municipal Permit

The County of San Joaquin includes the City of Stockton, surrounding incorporated and unincorporated urbanized areas (which contain densely settled territory containing 100,000 or more people). Due to the proximity of the County's urbanized areas to the City of Stockton, the urbanized area's physical interconnection to the City's storm drain system, and the locations of their discharges relative to the City's system, the County is designated as a part of the medium Small Municipal Separate Storm Sewer System (MS4). This MS4 designation must comply with the CWA under the NPDES Phase I program.

The City of Stockton, the urbanized areas of the County that are enclosed within the City, and the urbanized areas of the County which surround the City are referred to as the Stockton Urbanized Area and are subject to the NPDES Phase I municipal permit, Order No. RS-2007-0173 (CAS083470). Phase II of the NPDES Stormwater program builds on the Phase I program by requiring smaller communities not covered by Phase I to be permitted to develop and implement a comprehensive stormwater management program. The County is currently completing the permit process for the Phase I portion of the NPDES program.

San Joaquin Stormwater Management Program

The December 2007 update of the City of Stockton and the County of San Joaquin NPDES municipal stormwater permit Stormwater Management Program (SWMP) continues most of the previous program objectives and proposes a range of continuing and enhanced Best Management Practices (BMPs) and control measures. The implementation of the stormwater management program

requires a coordinated management effort by the City of Stockton and the County. While named as co-permittees to one permit, the City and County currently have separate programs and submit documents and reports separately to the CVRWQCB. However, the programs are essentially identical and the co-permittees collaborate with each other to address common issues and to ensure consistency in program development and implementation. Although the co-permittees coordinate with each other, each agency is responsible for implementing within their respective jurisdictions and their storm drains and/or watercourses. The City and County are legal entities with the authority to administer, implement, and enforce the stormwater management program within their separate jurisdictions.

San Joaquin County Department of Public Works

The San Joaquin County Water Resources Division of the Department of Public Works has primary responsibility for the development and implementation of the SWMP.

Stormwater Management and Discharge Control Ordinance No. 3966

In March 1998, the County enacted a Stormwater Management and Discharge Control Ordinance No. 3966 (codified in Title 5, Division 10). This ordinance reorganized the existing County stormwater-related rules into a single document and added new regulations to protect and enhance the water quality of the waters of San Joaquin County consistent with the CWA. It sets forth general discharge prohibitions against wastewater, pollutants, substances or material of any kind into the County storm drainage system that interfere with the operation or performance of the County storm drainage system or that violate any condition of the County NPDES Permit or any other federal, state, or local regulation. (Ord. 3966 § 1 (part), 1998). It also addresses construction activities, new development, redevelopment, and BMPs.

County and City General Plans

General plans can be described as a city or county's "blueprint" for future development. It represents the community's view of its future; a constitution made up of the goals and policies upon which the city council, board of supervisors, or planning commission will base their land use decisions. To illustrate its importance, all subdivisions, public works projects, and zoning decisions (except in charter cities) must be consistent with the general plan. If inconsistent, they must not be approved.

State law requires that each city and each county adopt a general plan containing the following seven components or "elements": land use, circulation, housing, conservation, open-space, noise, and safety (Government Code Sections 65300 et seq.). At the same time, each jurisdiction is free to adopt a wide variety of additional elements covering subjects of particular interest to that jurisdiction such as recreation, urban design, or public facilities. The seven cities included in San Joaquin County have created general plans. The general plans of the County and its local jurisdictions include the following:

- San Joaquin County General Plan
- City of Escalon General Plan
- City of Lathrop General Plan
- City of Lodi General Plan
- City of Manteca General Plan
- City of Ripon General Plan

- City of Stockton General Plan
- City of Tracy General Plan

4.11.2 Impact Analysis

This section presents the programmatic impact analysis regarding hydrology and water quality for the SJCOG 2018 RTP/SCS.

a. Methodology and Significance Thresholds

Appendix G of the State CEQA Guideline identifies the following criteria for determining whether a project's impacts would have a significant impact related to hydrology and water quality:

1. Violate any water quality standards or waste discharge requirements;
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
5. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
6. Otherwise substantially degrade water quality;
7. Place housing within a 100-year flood hazard area;
8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
9. 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;
10. Be subject to inundation by seiche, tsunami, or mudflow; and/or
11. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

The known water resources located within the region were evaluated using the criteria set forth by the California Department of Water Resources, FEMA, and the State CEQA Guidelines. The research analysis includes water resources of local significance.

b. Project Impacts and Mitigation Measures

This section describes generalized water quality, groundwater supply, drainage, runoff, flooding, and dam inundation impacts associated with the 2018 RTP/SCS. Due to the programmatic nature of the 2018 RTP/SCS, a precise, project-level analysis of the specific impacts associated with individual transportation and land use projects is not possible at this time. In general, however, implementation of proposed transportation improvements and future projects under the land use scenario envisioned by the 2018 RTP/SCS could result in the hydrology and water quality conditions as described in the following sections.

Threshold 1:	Violate any water quality standards or waste discharge requirements
Threshold 3:	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site
Threshold 4:	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site
Threshold 6:	Otherwise substantially degrade water quality

IMPACT W-1 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS FACILITATED BY THE LAND USE SCENARIO ENVISIONED IN THE 2018 RTP/SCS COULD RESULT IN SUBSTANTIAL ERODED SEDIMENTS AND CONTAMINANTS IN RUNOFF, AS WELL AS CHANGES IN DRAINAGE PATTERNS WHICH COULD DEGRADE SURFACE AND GROUND WATER QUALITY. IMPACTS WOULD BE SIGNIFICANT BUT MITIGABLE.

Implementation of proposed transportation improvements and future projects facilitated by the land use scenario envisioned in the 2018 RTP/SCS would result in both short-term and long-term impacts to water quality.

Certain transportation improvements would increase overall impervious surface area throughout the SJCOG region. For example, new roadways or road widening projects would introduce pavement in areas that are currently unpaved. Infill development projects envisioned under the land use scenario could also introduce impervious surfaces, if the infill site is currently unpaved. These and other projects that would increase impervious surfaces may generate significant adverse impacts to surface water quality. Pollutants and chemicals associated with urban activities would run off new roadways and other new impervious surfaces flowing into nearby bodies of water during storm events. These pollutants would include, but are not limited to: heavy metals from auto emissions, oil, grease, debris, and air pollution residues. Similarly, any 2018 RTP/SCS projects with landscaping may require fertilizer/pesticide application, which could enter nearby bodies of water and cause adverse effects to water quality. Such contaminated urban runoff may remain largely untreated, thus resulting in the incremental long-term degradation of water quality.

Short-term adverse impacts to surface water quality may also occur during the construction periods of individual improvement projects because areas of disturbed soils would be highly susceptible to water erosion and downstream sedimentation. This impact is of particular concern where projects are located on previously contaminated sites. Without effective erosion and storm water control, contaminated soils exposed during construction activities may result in surface water contamination. In addition, grading and vegetation removal in proximity to creeks for construction, widening, and bridge repair could increase erosion and sedimentation of creek banks. This could affect both water quality and the stability of slopes along the creeks. Regulations under the federal CWA require that a NPDES storm water permit be obtained for projects that would disturb greater than an acre. Acquisition of the General Construction permit is dependent on the preparation of a SWPPP that contains specific BMPs to control the discharge of pollutants, including sediment, into the local surface water drainages. Many of the 2018 RTP/SCS projects, especially new and extended roadways, would disturb more than one acre and would be subject to these regulations. Therefore, compliance with regulations would reduce impacts from project construction by requiring measures to prevent runoff and pollutants from leaving a project site. However, operation of 2018 RTP/SCS projects and projects not under these regulations or under the jurisdiction of SJCOG would not have

such requirements or cannot be required by SJCOG and therefore impacts are considered significant and unavoidable.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2018 RTP/SCS program where applicable for transportation projects that would introduce new impervious surfaces, alter existing drainage patterns, or otherwise degrade water quality. Municipalities in the SJCOG region can and should implement this measure, where relevant to land use projects implementing the 2018 RTP/SCS.

W-1(a)Fertilizer/Pesticide Application Plan

The project sponsor of a 2018 RTP/SCS project shall ensure that fertilizer/pesticide application plans for any new right-of-way landscaping are prepared to minimize deep percolation of contaminants. The plans shall specify the use of products that are safe for use in and around aquatic environments.

W-1(b) Runoff Capture

The project sponsor of a 2018 RTP/SCS project involving construction of a new roadway, or widening or extension of an existing roadway, shall ensure that the improvement directs runoff into subsurface percolation basins and traps which would allow for the removal of urban pollutants, fertilizers, pesticides, and other chemicals.

Significance After Mitigation

The increased development would increase pollutant runoff, but projects would be required to comply with requirements to prepare and implement (SWPPPs and SUSMPs). Compliance with Mitigation Measure W-1(a) through W-1(b) would reduce impacts to less than significant.

Threshold 2:	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level
Threshold 11:	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed

IMPACT W-2 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS FACILITATED BY THE LAND USE SCENARIO ENVISIONED IN THE 2018 RTP/SCS WOULD INCREMENTALLY INCREASE WATER DEMAND ABOVE AND BEYOND EXISTING USE IN THE SJCOG REGION. THIS DEMAND MAY DEPLETE GROUNDWATER SUPPLIES, INTERFERE WITH RECHARGE, AND POTENTIALLY REQUIRE NEW OR EXPANDED WATER SUPPLIES, ENTITLEMENTS, OR FACILITIES. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Implementation of proposed transportation improvements and future projects facilitated by the land use scenario envisioned in the 2018 RTP/SCS would result in both short-term and long-term impacts to water supply throughout the SJCOG region.

During grading and general construction activities, water would be needed to suppress fugitive dust generated by construction equipment. Given the current state of overdraft of many groundwater basins in the study area, and the likelihood that more than one project would be constructed

simultaneously in areas with overdrafted basins, the short-term water impact of the proposed 2018 RTP/SCS is potentially significant.

Projects that require long-term commitments of water, whether from irrigation for landscaping or from development facilitated by the proposed land use scenario, could also generate impacts on water supplies in the SJCOG region. Most transportation improvements involve modification of existing facilities and would not result in a substantial increase in landscaped areas that require irrigation. New and extended roadways could include tree and shrub plantings. In addition, future transit projects with restrooms envisioned by the 2018 RTP/SCS would require potable water, such as Project SJ14-7021 at Tracy Municipal Airport.

Major 2018 RTP/SCS projects, particularly new and extended roadways, and parking facilities could also affect groundwater supplies by incrementally reducing groundwater recharge potential. This reduction in groundwater recharge could occur because the impermeable surfaces associated with the proposed improvements would increase surface water runoff within existing rights-of-way at the expense of natural infiltration. The magnitude of impacts associated with individual 2018 RTP/SCS projects cannot be accurately determined at this programmatic stage of analysis. Nevertheless, given the overdrafted nature of many of the area's groundwater basins, the reduction in groundwater recharge is potentially significant.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2018 RTP/SCS. Municipalities in the SJCOG region can and should implement this measure, where relevant to land use projects implementing the 2018 RTP/SCS.

W-2(a) Monitoring Systems, Long-Term Administrative Procedures, and Uniform Building Code For Dewatering Facilities

Project sponsors shall ensure that projects requiring continual dewatering facilities implement monitoring systems and long-term administrative procedures to ensure proper water management that prevents degrading of surface water and minimizes, to the greatest extent possible, adverse impacts on groundwater for the life of the project. Construction designs can and should comply with appropriate building codes and standard practices including the Uniform Building Code.

W-2(b) Maximize Permeable Surface Areas

Implementing and local agencies shall maximize, where practical and feasible, permeable surface area in existing urbanized areas to protect water quality, reduce flooding, allow for groundwater recharge, and preserve wildlife habitat. New impervious surfaces can and should be minimized to the greatest extent possible, including the use of in-lieu fees and off-site mitigation.

Implementing and local agencies should avoid development in groundwater recharge areas. Where feasible, transportation facilities should not be sited in groundwater recharge areas, to prevent conversion of those areas to impervious surface.

W-2(c) Avoid Development In Groundwater Recharge Areas

Project sponsors shall avoid development in groundwater recharge areas. To the extent practicable, transportation facilities shall be sited away from areas of groundwater recharge in order to prevent impervious surface creation.

W-2(d) Reduce Hardscape To Facilitate Groundwater Recharge

As appropriate, project sponsors shall reduce hardscape to the extent feasible in order to facilitate groundwater recharge.

W-2(e) Bioswale Installation

The project sponsor of a 2018 RTP/SCS project, such as new roads or roadway extensions, that would substantially increase impervious surfaces shall ensure that bioswales are installed, where feasible, to facilitate groundwater recharge using stormwater runoff from the project site while improving water quality.

W-2(f) Porous Pavement

Projects that involve streetscaping, parking, transit, and land use improvements shall ensure that porous pavement materials are utilized, where feasible, to allow for groundwater percolation.

W-2(g) Construction Dust Suppression

Ensure that sponsored 2018 RTP/SCS projects, where economically feasible and available, utilize reclaimed and/or desalinated water is used for dust suppression during construction activities. This measure shall be noted on construction plans and shall be spot checked by the local jurisdiction.

Significance After Mitigation

If the implementing agency adopts these mitigation measures, impacts would be reduced, although not to a level of less than significant level in all cases. Because this document evaluates impacts at the programmatic level, all project circumstances are not foreseeable and therefore, even with implementation of Mitigation Measures W-2(a) through W-2(g), impacts could remain significant and unavoidable. As appropriate, SJCOG will encourage lead agencies to adopt these mitigation measures through its Intergovernmental Review process. However, SJCOG cannot require implementing agencies to adopt these mitigation measures, as it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact remains significant and unavoidable.

Threshold 7:	Place housing within a 100-year flood hazard area
Threshold 8:	Place within a 100-year flood hazard area structures which would impede or redirect flood flows
Threshold 9:	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
Threshold 10:	Be subject to inundation by seiche, tsunami, or mudflow

IMPACT W-3 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS FACILITATED BY THE LAND USE SCENARIO ENVISIONED IN THE 2018 RTP/SCS COULD BE SUBJECT TO FLOOD HAZARDS, DAM FAILURE, OR TSUNAMI, WHICH MAY EXPOSE PEOPLE OR STRUCTURES TO A SIGNIFICANT RISK OF LOSS, INJURY, OR DEATH. IMPACTS WOULD BE SIGNIFICANT BUT MITIGABLE.

The proposed 2018 RTP/SCS assumes the construction of an additional 107,974 housing units (single and multi-family) by 2042 and substantial additional transportation infrastructure.

While the majority of growth will take place outside of flood zones, some new housing could occur within flood zones. The proposed 2018 RTP/SCS could increase the amount of housing in flood hazard areas, but state regulations, in combination with local ordinances and federal regulations, as well as ongoing improvements to flood protection infrastructure, would likely mitigate the risk associated with housing in these areas. Further, individual project sponsors are required by state and federal regulations to obtain necessary approvals for construction within designated floodplains.

A portion of the transportation projects included in the proposed 2018 RTP/SCS could occur within the 100-year flood hazard area, thus increasing the potential to obstruct or exacerbate floodwaters. The construction of projects involving support structures in the floodway could obstruct floodwaters at some locations. Placement of structures within a floodplain can displace floodwaters and alter the base flood elevations in the surrounding areas. Structures can form a backwater effect, resulting in an increase in the flood elevation level upstream and in neighboring areas. Likewise, floodwater can cause scour effects, resulting in erosion and sedimentation problems downstream from structures. Drainage areas could be altered by highway corridors, in which floodwaters could be detained by medians and along the roadside. Proposed bridge supports could block debris in waterways, creating obstructions and further elevating upstream flood levels. The Plan 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 storm water drainage systems.

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.

The 2018 RTP/SCS would result in increased impervious surfaces through transportation projects and development. Additional impervious surfaces increases storm water 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 storm water drainage systems. In addition, placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream.

In areas of San Joaquin County where soils have naturally low permeability and are subject to quick saturation, high rain volumes remain on the surface as runoff, and can cause flash flooding. When impervious surfaces such as highways are placed within these areas of an existing flood plain the public is exposed to the hazards of flash flooding.

The highway and arterial projects proposed in the 2018 RTP/SCS generally include widening existing highways, constructing new interchanges, new highway segments, and new rail lines. 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 of approximately 256 new lane miles.

Placing new structures within an existing floodplain can impede flood waters, altering the flood risks both upstream and downstream. The flooding risks associated with projects located in flood zones can be modified with appropriate design and alignment considerations. The amount of new urbanized acreage (consuming previously vacant land) would be on the order of 18,123 acres. The

additional urbanized acreage expected by 2042 could increase stormwater runoff and therefore require mitigation.

The impacts associated with land use changes and transportation projects from the implementation of the proposed 2018 RTP/SCS are considered potentially significant but mitigable.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2018 RTP/SCS program where applicable for transportation projects that would be exposed to flood hazards. Municipalities in the SJCOG region can and should implement this measure, where relevant to land use projects implementing the 2018 RTP/SCS.

W-3(a) Project-Specific Hydrology Studies

Project sponsors conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains to demonstrate compliance with applicable federal, state, and local agency flood-control regulations. These studies should identify project design features or mitigation measures that reduce impacts to either floodplains or flood flows to a less than significant level. For the purposes of this mitigation, less than significant means consistent with federal, state, and local regulations and laws related to development in the floodplain.

W-3(b) Development In Flood Hazard Areas

Project sponsors shall, to the extent feasible and appropriate, prevent development in flood hazard areas that do not have appropriate protections.

W-3(c) Elevated Structures In Flood Zones

If a 2018 RTP/SCS project is in an area with high flooding potential, project sponsors shall ensure that the structure is elevated at least one foot above the 100-year flood zone elevation and that bank stabilization and erosion control measures are implemented along creek crossings, where applicable.

Significance After Mitigation

If the project sponsor adopts these mitigation measures, impacts would be reduced, although not to a level of less than significant in all cases. Because this document evaluates impacts at the programmatic level, all project circumstances are not foreseeable and therefore, even with implementation of Mitigation Measures W-3(a) through W-3(c), impacts could remain significant and unavoidable. As appropriate, SJCOG will encourage lead agencies to adopt these mitigation measures through its Intergovernmental Review process. With adoption of these mitigation measures, this impact would be significant but mitigable.

Threshold 2:	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level
Threshold 11:	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed

IMPACT W-4 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS INCLUDED IN THE LAND USE SCENARIO ENVISIONED IN THE 2018 RTP/SCS WOULD INCREASE WATER DEMAND IN THE SJCOG REGION. THIS DEMAND MAY POTENTIALLY REQUIRE NEW OR EXPANDED WATER SUPPLIES, ENTITLEMENTS, OR FACILITIES. IMPACTS WOULD BE SIGNIFICANT AND UNAVOIDABLE.

This impact addresses the potential for projects to substantially increase demand for water such that existing supplies and facilities would not be able to accommodate demand. Water agencies that either provide over 3,000 acre-feet of water annually or serve more than 3,000 or more connections in San Joaquin County are required to submit Urban Water Management Plans (UWMPs) to the California Department of Water Resources every five years. Urban water management plans include an estimation of water usage across all sources (commercial, residential, agricultural etc.). Most urban water management plans do not plan for water demand to 2042, therefore, estimates of supply and demand in this EIR are considered approximate.

As discussed in the Environmental Setting above, the largest water usage in San Joaquin County is for agricultural resources. Agricultural demand is based on various crop evapotranspiration (ET) and efficiency data collected by DWR. Although the historic trend of agricultural water use has been decreasing, for purposes of the 2018 RTP/SCS analysis, future agricultural water demands are assumed to stay the same at 1,051,855 afy (acre-feet/year). However, by 2042, with the 2018 RTP/SCS, agricultural land would be reduced by approximately 8,000 acres which would be expected to reduce the overall water demand from agricultural lands. Other factors such as crop type, climate, and availability of water are also expected to impact demand from the agricultural sector.

The projected population in San Joaquin County is anticipated to increase by approximately 294,169 people by the year 2042 (San Joaquin County 2016). Water consumption estimated for the new growth is expected to be approximately 274.7 gallons per day per household (San Joaquin COG, 2014). As discussed above, many water service providers have not identified water supplies through 2042 in their plans.

Other sources of water demand include commercial and industrial uses. It is beyond the scope of this EIR to estimate water usage associated with each of these sectors and no sufficient data currently is available to make such estimation. While it is expected there would be an increase among these sectors, due to various state and federal programs, increasing awareness of drought conditions, and water restrictions, it is assumed that each of these areas would become more efficient in water usage.

Reduction in water supply, as well as uncertainty in the reliability of that supply, could result from increased temperatures due to global climate change, as well as regulatory or legislative decisions that affect the availability of imported water. Thus, many agencies are implementing aggressive water conservation, recycling and planning strategies (water transfer and water banking) to reduce demand and even out supply in wet and dry years.

Meeting future water demand is ultimately the responsibility of local and regional water agencies. Water supplies are either produced locally from groundwater and surface water sources or are

imported via the California Aqueduct and the CVP. Other means of providing water without increasing imported supplies include reclamation and recycling, conservation, water transfers, groundwater banking, developing brackish groundwater, and ocean desalination.

Each water district develops its own policy for determining its planning horizon and for acquiring and building water facilities. Further, water districts provide water for the growth planned and authorized by the appropriate land use authority. If water agencies can supply the water necessary to meet future demand and/or minimize that demand, impacts would be less than significant. However, given the challenges to imported water supplies and reducing groundwater depletion, and the uncertainly of water supplies in general meeting future demand is expected to be difficult. Therefore, water demand impacts related to land use and transportation changes from implementation of the proposed 2018 RTP/SCS are considered potentially significant, and Mitigation Measures are required.

Mitigation Measures

For transportation projects under their jurisdiction, SJCOG shall implement, and transportation project sponsor agencies can and should implement, the following mitigation measure developed for the 2018 RTP/SCS program. Municipalities in the SJCOG region can and should implement this measure, where relevant to land use projects implementing the 2018 RTP/SCS.

W-4(a) Coordinated Development And Support Of Sustainable Policies In Accommodating Growth

SJCOG, in coordination with regional water agencies and other stakeholders, shall encourage the kind of regional coordination throughout California that develops and supports sustainable policies in accommodating growth.

W-4(b) Reduce Exterior Uses Of Water And Promote Reductions In Water Consumption

Project sponsors should reduce exterior uses of water in public areas, and promote reductions in private homes and businesses by shifting to drought-tolerant native landscape plantings, using weather-based irrigation systems, educating other public agencies about water use, and installing related water pricing incentives. Local jurisdictions should work with local water retailers to promote the availability of drought resistant landscaping options and provide information on where these can be purchased. Use of reclaimed water especially in median landscaping and hillside landscaping can and should be implemented where feasible.

W-4(c) Minimize Future Impacts To Water Supply

Future impacts to water supply should be minimized through cooperation, information sharing, and program development as part of the SJCOG's ongoing regional planning efforts, in-coordination with regional water agencies, and other stakeholders.

W-4(d) Water Demand/Pressure Requirements

Project sponsors should coordinate with the local water provider to ensure that existing and/or planned water supply and water conveyance facilities are capable of meeting water demand/ pressure requirements. In accordance with state law, a water supply assessment can and should be required for projects that meet the size requirements specified in the regulations. In coordination

with the local water provider, each project sponsor will identify specific on- and off-site improvements needed to ensure that impacts related to water supply and conveyance demand/pressure requirements are addressed prior to issuance of a certificate of occupancy. Water supply and conveyance demand/pressure clearance from the local water provider will be required at the time that a water connection permit application is submitted.

W-4(e) Water Conservation Measures In New Development

Project sponsors should implement water conservation measures in new development that should include but not be limited to the following:

- High efficiency toilets
- Restroom faucets with automatic shut-off
- High efficiency clothes washers
- High efficiency dishwashers
- Use of reclaimed water for appropriate uses
- Water saving irrigation measures including: weather-based irrigation controller with rain shut-off.

W-4(f) Identify Feasible and Reasonable Measures To Reduce Water Consumption

Project sponsors shall consult with the local water provider to identify feasible and reasonable measures to reduce water consumption, including, but not limited to, systems to use reclaimed water for landscaping, drip irrigation, re-circulating hot water systems, water conserving landscape techniques (such as mulching, installation of drip irrigation systems, landscape design to group plants of similar water demand, soil moisture sensors, automatic irrigation systems, clustered landscaped areas to maximize the efficiency of the irrigation system), water conserving kitchen and bathroom fixtures and appliances, thermostatically controlled mixing valves for baths and showers, and insulated hot water lines.

W-4(g) Water Conservation and Recycled Water

Project sponsors should adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water.

W-4(h) Water-Efficient Building Design

Project sponsors should establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof impervious surfaces around the building(s) and menus and check-lists for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, including low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances.

W-4(i) Safe And Effective Use Of Gray Water (On-Site Water Recycling)

Project sponsors should establish criteria and standards to permit the safe and effective use of gray water (on-site water recycling), and review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems.

Significance After Mitigation

If the project sponsor adopts these mitigation measures, impacts would be reduced, although not to a level of less than significant. Because this document evaluates impacts at the programmatic level, all project circumstances are not foreseeable and therefore, even with implementation of Mitigation Measures W-4(a) through W-4(i), impacts could remain significant and unavoidable. As appropriate, SJCOG will encourage lead agencies to adopt these mitigation measures through its Intergovernmental Review process. However, SJCOG cannot require implementing agencies to adopt these mitigation measures, as it is ultimately the responsibility of a lead agency to determine and adopt mitigation. Therefore, this impact remains significant and unavoidable.

Threshold 5:	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff

IMPACT W-5 IMPLEMENTATION OF PROPOSED TRANSPORTATION IMPROVEMENTS AND FUTURE PROJECTS FACILITATED BY THE LAND USE SCENARIO ENVISIONED IN THE 2018 RTP/SCS WOULD INCREMENTALLY INCREASE STORMWATER FLOWS IN THE SJCOG REGION. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Implementation of proposed transportation improvements and future projects facilitated by the land use scenario envisioned in the 2018 RTP/SCS may increase stormwater flows, resulting in increased volume and/or velocity of stormwater runoff. Potential increases in stormwater volume and/or velocity could result in on- or off-site flooding. However, planned transportation projects would be designed to comply with existing jurisdiction requirements related to stormwater runoff and drainages, such as curb and gutter design, and would build drainage infrastructure to control and accommodate the increase in stormwater flows. Therefore, impacts would be less than significant.

Mitigation Measures

No Mitigation Measures are required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

c. Cumulative Impacts

Impacts to hydrology and water quality may be related to: violation of water quality standards, interference with groundwater recharge, increased erosion, increased non-point source pollution, increased runoff, affects to flood zones, and exposure of people to a significant risk of loss, injury, or death involving flooding (including flooding as a result of the failure of a levee or dam), seiche, tsunami, or mudflow.

Cumulative development would increase erosion and sedimentation resulting from grading and construction, as well as changes in drainage patterns which could degrade surface and ground water quality. In addition, new development would increase the generation of urban pollutants that may adversely affect water quality in the long term. As with the 2018 RTP/SCS, individual construction projects within the cumulative impact area would be required to comply with applicable water quality regulations, as discussed in the Regulatory Setting and Impact W-1 above. Compliance with these existing requirements would reduce project-level impacts throughout the cumulative impact

area; as such, cumulative impacts related to water quality would be less than significant, and the 2018 RTP/SCS's contribution to this impact would not be cumulatively considerable.

Water supply in the cumulative impact development area is derived from a variety of sources that vary depending on the location. As in the SJCOG region, both groundwater and surface water supplies in portions of the cumulative impact development area may be limited. Cumulative development would create additional water demand, which may exceed supply in some localized areas. Compliance with SB 610 and SB 221, as well as preparation of GSPs where applicable, pursuant to the Sustainable Groundwater Management Act, would partially limit these cumulative effects. However, given that these regulations would not apply to all projects or all groundwater basins, this cumulative impact would be significant and unavoidable. As discussed in Impact W-2 and impact W-4, the 2018 RTP/SCS may impact groundwater supply in the SJCOG region because of the water required for land use projects and some transportation projects. Even with the implementation of mitigation measures, these impacts would be significant and unavoidable. Therefore, the 2018 RTP/SCS's contribution to cumulative water supply impacts would be cumulatively considerable. There are no feasible mitigation measures to ensure that there is sufficient water supply to support anticipated growth in the region. Given the overdraft conditions of area groundwater basins and other regional water supply concerns, impacts would be cumulatively considerable.

This page intentionally left blank.