4.8 WATER RESOURCES

INTRODUCTION

This section describes the impacts on County water resources associated with development anticipated to occur under the General Plan. This section focuses on how development at the intensities assumed in the General Plan could affect water supply and water quality. Other water-related issues, such as wastewater, storm drainage, and flooding are discussed in Section 4.5, Wastewater, Storm Drainage, and Flooding.

ENVIRONMENTAL SETTING

Water Resources

Water resources in Fresno County include a number of rivers and streams, artificial waterways, and groundwater. Detailed information about surface water and groundwater resources is contained in Chapter 5.3, Public Facilities and Services, Storm Drainage and Flood Control, Chapter 5.4, Water Supply and Distribution Facilities, Chapter 5.5, Wastewater Collection, Treatment, and Disposal, Chapter 7.2, Natural Resources, Water Resources, and Chapter 7.3, Water Quality Condition in the *General Plan Background Report* (*Background Report*). That information is hereby incorporated by reference and is summarized below.

Surface Water Resources

The San Joaquin River originates in the Sierra Nevada and flows westerly forming the border between Fresno and Madeira Counties downstream from Mammoth Pool Reservoir. The North and Middle Forks originate in Madeira County near Devils Postpile National Monument. The South Fork begins at Martha Lake in northern Kings Canyon National Park within Fresno County. Average annual precipitation in the upper reaches of the river falls mainly in the form of snow and is as high as 70 inches. By comparison, the arid San Joaquin Valley to the west, average annual rainfall is as low as six inches near Mendota. Friant Dam is the most significant of the several dams on the San Joaquin River. It was completed in 1942 by the U.S. Bureau of Reclamation (USBR) for the purposes of agricultural irrigation and is part of the Central Valley Project (CVP). There are several dams upstream of Friant owned and operated by Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) for power generation. The combined storage capacity of the dams upstream of Friant is 609,530 acre-feet and the storage capacity of Millerton Lake (formed by Friant Dam) is 520,500 acre-feet.

The Kings River originates high in the Sierra Nevada Mountains near the Inyo County line. It has a large drainage basin including most of Kings Canyon National Park and most of the area between

Shaver and Florence Lakes in the north to the Fresno/Tulare County border in the south. The average annual precipitation for the mountain region has not been consistently recorded but, it is probably greater than the 43 inches that falls in Grant Grove on the southern reaches of the Kings River watershed. Downstream average precipitation is approximately 7 to 10 inches per year. The major portions of the upper reaches feed into Pine Flat Lake, a 1,000,000 acre-feet reservoir constructed by the U. S. Army Corps of Engineers (Corps) in 1944 for flood control purposes. There are additional reservoirs upstream of Pine Flat that are owned and operated by PG&E for the purpose of hydroelectric power generation. These facilities have a combined storage capacity of about 252,000 acre-feet.

There are many creeks and lakes in the high Sierra Nevada within Fresno County, all of which eventually feed into either the Kings River or the San Joaquin River. In addition, several creeks drain the foothill areas and flow into developed areas in central Fresno County. Most of these streams (i.e., Redbank, Fancher, Dry and Dog Creeks) have been controlled by efforts of the Corps and the Fresno Metropolitan Flood Control District (FMFCD).

Stream systems in western Fresno County are prone to high flows and flooding because they drain very large watersheds. The soils in the Coast Range are subject to erosion. As a result, stormwater runoff typically carries large volumes of sediment and naturally occurring minerals, such as selenium, arsenic, boron and asbestos, which may be undesirable to downstream users. Some creeks are seasonal and may be plowed into local fields. The California Department of Water Resources (DWR) is currently working with landowners to improve watershed management practices and reduce erosion. Western Fresno County contains five major stream systems: Little Panoche Creek, Panoche Creek, Tumey Gulch and Arroyo Ciervo, Cantua Creek, and Arroyo Pasajero.

Groundwater Resources

Groundwater conditions vary considerably from eastern to western Fresno County. Aquifers east of the valley trough are generally semi-confined to unconfined, while aquifers west of the valley trough are generally semi-confined to confined. Most pumping occurs below a naturally occurring subterranean clay, although considerable pumping also occurs above the layer, depending upon location and water quality issues. This layer is several hundred feet below the ground surface, and pumping costs are high.

As a consequence of the heavy reliance on groundwater to meet urban and agricultural demand, groundwater overdraft is widespread. Groundwater overdraft occurs when the amount of water withdrawn due to pumping exceeds the amount of water that replenishes the groundwater basin. Groundwater overdraft is a problem in western Fresno County, especially in the Westlands Water District and in the Pleasant Valley Water District near Coalinga, because of limited groundwater recharge, periodic droughts, and inadequate surface water supplies. Long-term recharge is inadequate to maintain water table elevations. The California Department of Water Resources (DWR) has estimated groundwater overdraft at 650,000 acre-feet for 1990 in the Tulare Lake Region, which generally includes Fresno County. Groundwater overdraft conditions vary annually based on demand, surface water availability, and climate. Long-term projections indicate a continuing annual overdraft

of the basin underlying most of Fresno County. Overdraft can result in a number of undesirable effects such as land subsidence, which has been a problem in the valley trough and parts of western Fresno County. Overdraft can also result in an increased risk of cross-contamination of aquifers as a result of well-deepening or drilling of new wells, and the spreading of groundwater contamination associated with new or expanded cones of depression. Nearly every water agency in Fresno County is currently reporting overdraft conditions, and the DWR has designated the Kings Groundwater Basin, located in the central area of the County, as "critically overdrafted."

The county-wide groundwater overdraft condition is being exacerbated by increasing water demand by the agriculture industry. This increased demand is the result of a trend in cropping patterns from less water-consumptive crops such as grains and hay to higher value crops like fruits, tree nuts, and vegetables, which require substantially more water. This trend is particularly evident in the western side of the valley. In some instances this has increased per acre water demand from one acre-foot to over three acre-feet per year.

Subsidence

In some areas along the valley trough and in parts of western Fresno County, groundwater pumping has caused subsidence of the land surface. This usually occurs in areas where the groundwater basin has historically been subject to overdraft and long-term recharge is inadequate to maintain the water table elevation. Subsidence can impact conjunctive use programs by reducing storage capacity and changing transmissivity. In general, subsidence in Fresno County has stabilized, except during droughts. Areas in Fresno County where subsidence has been a problem generally include the Westlands Water District and the Pleasant Valley Water District.

Groundwater Recharge

Surface and groundwater resources are closely managed in Fresno County in an effort to maintain groundwater balance. Artificial recharge programs have been in place since at least the 1930s. The largest recharge program in the County, which has been in place since the 1970s, is implemented through the combined efforts of the Fresno Irrigation District (FID), the Fresno Metropolitan Flood Control District (FMFCD), and the cities of Fresno and Clovis. The major element of this program is the joint recharge effort by the City of Fresno and FID, whereby the City's surface water allocations of San Joaquin River water are conveyed by FID to recharge basins in the Fresno area. This serves to replenish groundwater pumped by the City's municipal wells. In addition, the FMFCD operates 135 ponding basins, which serve the dual purposes of retaining stormwater drainage for flood protection and capturing surface water flows for groundwater recharge. These efforts have addressed the overdraft problem to the point where groundwater in the in Fresno-Clovis area is almost in a state of balance (the average annual overdraft in the Fresno-Clovis area is currently 10,000 to 20,000 acre-feet per year, representing approximately 10 percent of annual pumping). In addition, treated effluent produced by the Fresno-Clovis Regional Wastewater Treatment and Reclamation Facility is conveyed to large evaporation/percolation ponds. Percolation ponds achieve some level of nutrient reduction

and disinfection by filtering effluent through soil and extracting the treated, soil-filtered effluent by means of reclamation wells at the perimeter of the reclamation area. This reclaimed water is used for agricultural irrigation only since it does not meet drinking water requirements for municipal use. The recharging effect of this effluent percolation has resulted in the formation of a groundwater mound under the percolation ponds southwest of Fresno.

Most other cities in the County also utilize ponding basins for flood control and incidental groundwater recharge. The cities and special districts also dispose of treated wastewater effluent through evaporation/percolation ponds that provide groundwater recharge. While this effluent is not suitable for irrigation of food crops, some of the effluent is used directly in the irrigation of cotton. The Regional Water Quality Control Board would prefer to have as much effluent as possible used for agricultural irrigation (and recharge), but such use would require advanced treatment which is prohibitively expensive for small communities. Large agricultural operations and food processing industries located in the rural areas also utilize evaporation/percolation ponds to dispose of treated effluent, which provides additional recharge. Agricultural irrigation also provides a significant amount of groundwater recharge as a portion of the applied water moves below the root zone.

Water Supply

Water supply in Fresno County is provided through complex systems of local groundwater and surface water management and delivery. Water supply management is accomplished through a combination of public and private water agencies, including the U.S. Bureau of Reclamation (USBR), cities, water and flood control districts, local irrigation districts, and utility companies, which are all governed by state and federal regulations. The 15 incorporated cities all have municipal water systems, and there are approximately 370 entities providing domestic water in the unincorporated County, of which about 20 serve more than 200 connections. In the Fresno-Clovis metropolitan area, annual demand for domestic water in 1995 was 146,542 acre-feet, representing 71 percent of the County-wide total for municipal and irrigation (M&I) uses. The other 13 incorporated cities in Fresno County had a combined annual water demand of 30,868 acre-feet in 1995, representing 15 percent of the County-wide total for M&I use. County-wide annual demand for domestic water supply in Fresno County was 205,614 acre-feet in 1995.

The San Joaquin River and the Kings River are the major sources of surface water for agricultural and urban purposes in Fresno County. Water from both river systems is controlled upstream by numerous dams and reservoirs, which are used for water storage, flood control, and power generation. The largest dam in terms of storage is the Pine Flat Dam on the Kings River, a facility operated by the U.S. Army Corps of Engineers (Corps), which impounds Pine Flat Lake. The second major dam is the Friant Dam, a facility of the federal Central Valley Project (CVP) or operated by USBR on the San Joaquin River, which impounds Millerton Lake. Both rivers are subject to extreme variations in annual runoff resulting from annual changes in mountain precipitation. At present, reservoir storage capacity on the Kings and San Joaquin rivers is inadequate to make full use of available runoff, and an average of almost 700,000 acre-feet per year is released as a result. This is partially due to the constraints placed

on reservoir operations involving their other functions for flood control and power generation. Rights to San Joaquin River and Kings River water have been fully appropriated, except for excess winter flows which are unavailable due to inadequate storage capacity.

Another important source of water supply for Fresno County is CVP surface water imported from the Sacramento-San Joaquin River Delta (Delta). This water is delivered to agricultural and M&I (municipal and industrial) water users located in the western portion of the County adjacent to and west of Fresno Slough. The delivery of Delta water is controlled under water service contracts and water rights exchange agreements between the water users, the state, and the U. S. Bureau of Reclamation (USBR). Surface waters are delivered through the USBR's San Luis Canal as far as the San Luis Reservoir, and via the California Aqueduct (a joint state and federal facility) south of San Luis Reservoir. Delta water is already fully appropriated. In recent years, CVP contractors in Fresno County have received substantially less water deliveries than their contract entitlements due to mandated seasonal restrictions on Delta pumping plants to protect fisheries and to control water quality in the Delta. This situation has become referred to as a "regulatory drought," and has had a significant impact on growers in the west County area.

In Fresno County, nearly all M&I water demands are met by the exclusive use of groundwater. Currently, more than 95 percent of the County's total population is directly dependent upon groundwater for domestic and industrial purposes. Groundwater also plays a significant role in sustaining the County's agricultural production. In the major urban areas, the reliance on groundwater for municipal supply is necessary because untreated surface water supplies do not meet drinking water standards. Instead of treating the surface water supply, it has been more cost-effective to use surface waters for groundwater recharge and then pump the groundwater after it has filtered through the soil. Most appropriately-designed water wells provide drinking water quality without treatment other than mandated chlorination to control bacteria in the distribution systems. Some domestic wells require wellhead treatment facilities to remove specific contaminants to drinking water standard levels. However, surface water treatment does occur in some smaller cities such as Coalinga, Huron, and Orange Cove, where very poor groundwater quality makes it unsuitable for domestic use. The City of Fresno will have a small 20 million gallon per day (mgd) surface water treatment plant online in 2002, which will provide approximately 10 percent of the city's water supply in summer and 40 to 50 percent of its water supply in winter months. This treatment plant is intended to address existing problems in northeast Fresno where the groundwater production is inadequate due to the relatively shallow depth to bedrock, and due to the general lack of surface water entitlements for agricultural uses (which would provide incidental groundwater recharge through irrigation). The treatment plant will be expandable to a treatment capacity of 60 mgd.

Agricultural water demands in Fresno County are met primarily by surface water supplemented by groundwater. The exception is the area along the trough of the valley, between Fresno and Fresno Slough, which does not have access to a reliable surface water supply. Since all sources of surface water in the County are fully appropriated, increased agricultural demand may result in additional groundwater pumping.

In the area of the County northeast of the Fresno-Clovis metropolitan area, water supply is very limited due to relatively shallow depth to bedrock and lack of surface water entitlements for agricultural irrigation and recharge. This area has been subject to historic rural residential development and there are several large development projects that are approved or pending in this area. In other areas, such as Fresno and Clovis, water supplies for urbanizing areas are provided from surface water entitlements. However, due to the lack of surface water entitlements in the northeast County area, the conversion from agriculture to rural residential development in this area results in a net increase in groundwater consumption, resulting in water quantity problems. In addition, the increased groundwater pumpage in this area tends to reduce groundwater flowing down-gradient to the southeast, and has decreased groundwater available for municipal pumping in the northeast areas of Fresno and Clovis. In response to poor well production in northeast Fresno, the City is constructing a surface water treatment plant to supplement water supplies in this part of the city, as discussed above. The City of Clovis is also considering construction of a surface water treatment plant.

In the foothill and mountain areas of eastern Fresno County, the availability of groundwater is limited to water contained in rock fractures and voids. Finding water can be difficult and yields are generally low. This groundwater limitation has restricted development in these areas as alternative water supplies are not available at this time.

External Factors Affecting Water Supply

An important factor affecting future water supplies is the possibility of individual growers selling groundwater and/or surface water entitlements for export to areas outside the County. This is particularly true since passage of the Central Valley Project Improvement Act (CVPIA) in 1992, as well as new state laws, which provide individuals with the right to transfer their water entitlements or rights to others. Since urban buyers are willing to pay far more than agricultural users can afford for water, this provides a substantial incentive for transfers of water out of agricultural areas. Loss of this water could also result in increased groundwater pumping and worsening of long-term overdraft conditions. These effects may be ameliorated by converting to less water-intensive crops, seasonal fallowing, or land retirement. Conversely, the liberalized transfer rules would enable urban centers of the County to purchase water entitlements outside the County to augment local supplies. Under the CVPIA, existing surface water contractors have the right of first refusal for purchase of CVP water proposed for transfer.

The CVPIA could also reduce contract water allocations to the County under its mandate that a certain portion of CVP water be allocated to habitat restoration and other environmental purposes. It is anticipated that the U.S. Fish and Wildlife Service will request increases in instream flows in the San Joaquin River under CVPIA provisions for fish and wildlife habitat restoration and enhancement. These increases could be implemented by terminating some junior water rights, such as the FID's Class 2 water from the San Joaquin River. (FID has the County's only contract allocation for Class 2 water, in the amount of 75,000 acre-feet, which is typically available only in wet years.) These requirements could also reduce imported CVP surface water deliveries from the Delta. No formula or mechanism

for allocating water for environmental purposes has been established to date. Current proposals include a tiered pricing structure whereby higher rates would be charged for higher rates of water use.

Also of significance to the cities are the CVPIA water conservation provisions that require water metering. Since the City of Fresno's charter contains a provision forbidding water metering, this conflict places Fresno's CVP contract water allocation of 60,000 acre-feet per year in severe jeopardy. Fresno's CVP contract is due for renewal in 2006, and local officials are working to reach a solution to this problem, including the possibility of placing the metering issue on the ballot.

Water Quality

Water quality is generally defined in terms of salinity and concentrations of harmful trace elements. In Fresno County, most water sources have excellent quality and are available for most uses after conventional treatment. Many communities are able to pump and use groundwater, although groundwater in certain areas contain contaminants from both natural and introduced sources and is unsuitable for irrigation and municipal and industrial (M & I) uses. Bacterial counts (coliform bacteria) and parasite cyst loads of surface water sources is an emerging concern, and regulations for managing and monitoring these contaminants have been promulgated. The following summarizes surface water and groundwater quality characteristics and issues in the County.

Surface Water Quality

The quality of local surface water from the Kings and the San Joaquin Rivers is excellent for both irrigation and municipal and industrial (M&I) uses. The concentration of total dissolved solids (TDS) and other mineral constituents is typically low and harmful levels of trace elements are not present. Because of the excellent quality of water from these sources, conventional water treatment processes can be used.

The TDS of water at Mendota Pool tends to be higher than the other surface water sources because the USBR allows water from groundwater pumping to be discharged into the Delta-Mendota Canal and Mendota Pool. The Exchange Contract contains provisions that set forth requirements that the USBR must meet regarding the quality (salinity) of water delivered through the Delta-Mendota Canal and Mendota Pool. These contractual water quality standards include daily, monthly, annual, and 5-year TDS concentration limits. The Delta Mendota Canal and Mendota Pool are not used to provide water for M&I uses in Fresno County.

Streams draining the western portion of the County carry large volumes of sediment and naturally occurring minerals, such as selenium, arsenic, boron and asbestos, which may be undesirable to downstream users. In particular, Panoche Creek is known to carry high levels of selenium and arsenic. Arroyo Pasajero contains high levels of sulfates, boron, and TDS. Arroyo Pasajero also carries asbestos. Several studies have been conducted on asbestos levels in soil and water samples from

Arroyo Pasajero and other streams and retention basins. These studies indicate that although some samples contain elevated asbestos levels, in general, the asbestos levels in the Arroyo Pasajero detention basin are not any higher than those in the rest of the watershed area.

Groundwater Quality

Groundwater quality is generally affected by withdrawals, recharge, and agricultural and industrial practices. Groundwater quality in Fresno County is generally very good, although past herbicide use in the eastern portions of the County has resulted in groundwater contamination. This has resulted in the closure of some municipal wells in the cities of Fresno and Clovis which are down-gradient from the contamination. Concentrations of dibromochloropropane (DBCP), a pesticide banned from use since 1977, have exceeded the maximum contaminant level (MCL) in groundwater in many locations in eastern Fresno County. Concentrations of DBCP are generally decreasing, and the compound has been diluted and extracted from the aquifer since then. Communities like Fresno and Clovis have begun to construct well head treatment facilities to reduce DBCP levels to acceptable concentrations. As long as DBCP concentrations decline and do not exceed the MCL, the cities of Fresno and Clovis will be able to manage the problem. Contaminants such as petroleum products and industrial solvents also occur in groundwater in localized areas in Fresno County. In other areas of the County, other naturally-occurring elements such as uranium, radon, iron, and manganese are sometimes found.

Nitrate levels in rural groundwater wells have been increasing from fertilizers used in agriculture. Many of these wells have nitrate concentrations that exceed the MCL for nitrate in drinking water. Nitrate levels may also be elevated in areas served by domestic septic systems, on-site industrial wastewater disposal facilities (when processes involve nitrogen-containing materials), and in areas where dairy operations do not have state-of-the-art treatment for cattle waste. There also appear to be areas in the County where native soil or rock strata have imparted nitrogenous compounds to the aquifer.

Most poor quality groundwater is located along the western side of Fresno County. Concentrations of TDS, sodium, sulfate, boron, chloride and carbonate/bicarbonate, and trace elements (such as selenium) limit the beneficial use of groundwater in this area. Agricultural lands in western Fresno County are becoming increasingly degraded by rising saline in shallow groundwater. This is a result of irrigation with imported surface water primarily from the Central Valley Project (CVP) and caused by a combination of geologic and soil conditions, soil salinity, and inefficient irrigation water management. The San Luis Drain project, which began in 1968, was halted in 1975 due to funding problems and environmental concerns over drainage water discharge impacts to the Delta. Following disclosure of bird mortalities in the Kesterson Reservoir caused by selenium from the introduced drainage waters and concern for public health, the U.S. Department of the Interior (USDI) in a March 1985 agreement with Westlands Water District called for the cessation of drainage flows to Kesterson Reservoir. A long-term solution to the subsurface drainage problem is needed to sustain agricultural crop production in western Fresno County.

There are currently a wide variety of programs and activities in the County devoted to protecting groundwater quality and/or remediating identified groundwater contamination.

REGULATORY SETTING

Federal, state, and local governments have developed numerous programs and regulations designed to ensure adequate and safe water supply for urban and agricultural use. The programs and regulations that are most important to water resources in Fresno County are briefly described below. Additional information regarding water conveyance projects is described in detail in Chapter 5, Public Facilities and Services, in the *Background Report*.

Federal

Water Supply

The primary federal legislation currently affecting water supply in Fresno County is the *Central Valley Project Improvement Act (CVPIA*) of 1992, which is jointly administered by the USBR and the U.S. Fish and Wildlife Service (USFWS). The Act includes provisions intended to: place limitations on CVP contracts, improve and facilitate water transfers, implement water conservation actions, provide for fish and wildlife restoration actions, and establish an environmental restoration fund. The CVPIA requires that 800,000 acre-feet of CVP water be dedicated to general fish and wildlife purposes annually, and sets a goal of doubling the anadromous fish population of Central Valley rivers and streams. The Act also sets a goal for restoring the fishery and riparian habitat of the San Joaquin River, which may require additional water in certain reaches of the river. The CVPIA also provides for enhancement of water supplies to wildlife refuges in the Central Valley. No formula or mechanism for allocating water for environmental purposes as been established to date. Current proposals include a tiered pricing structure whereby rates would increase with higher usage. It is expected that the end result will likely be a reduction of surface water deliveries to existing CVP contractors, and some surface water allocation currently used for agricultural and M&I uses in the County could be terminated.

Also of significance to the cities is the CVPIA water conservation provisions that require water metering. Since the City of Fresno's charter contains a provision forbidding water metering, this conflict places Fresno's CVP contract water allocation of 60,000 acre-feet per year in severe jeopardy. Fresno's CVP contract is due for renewal in 2006, and local officials are working to reach a solution to this problem.

Agricultural lands served by CVP water or non-project waters delivered through CVP facilities are subject to the provisions of the *Reclamation Reform Act (RRA)* of 1982. The RRA restricts the acreage under one ownership that can be irrigated with federally-subsidized water or facilities. Generally, the amount of land that can be owned and irrigated with subsidized water is 960 acres, although additional lands under one ownership may be irrigated with project water if the full cost of such additional water is paid.

Water Quality

Under the *Safe Drinking Water Act,* the U.S. Environmental Protection Agency (EPA) has the authority to set standards for contaminants in drinking water supplies. The Act is administered and enforced by the California Department of Health Service (DHS). The *National Primary Drinking Water Standards* establish maximum contaminant levels (MCLs) which set the maximum permissible levels of contaminants that are allowed in public water distribution systems. The *National Secondary Drinking Water Standards,* or secondary MCLs, apply at the point of delivery to the customer and generally involve protecting aesthetic aspects of drinking water such as taste, odor, and appearance. Additional water quality standards are included in the *Trihalomethane Regulations* and the *Lead and Copper Rule.*

The EPA has proposed a new drinking water requirement called the *Radon Rule.* This rule would require that radon levels in drinking water not exceed 300 picocuries, which is well below the existing radon levels in groundwater being pumped by municipal users such as the cities of Fresno and Clovis. Available mitigation includes installation of costly aerators at each well. The alternative is to close wells exceeding the radon MCL and convert to treated surface water supply, which would also be very expensive. The new MCL is expected to be promulgated in 2000, and the cities will have a three-year phase-in period for compliance. The City of Fresno is actively evaluating alternatives for bringing their system into compliance with the proposed MCL.

The federal *Surface Water Treatment Rule (STWR)* was promulgated by the EPA to protect against disease-causing organisms *Giardia lamblia, Legionella,* and viruses in surface drinking water sources and in groundwater sources influenced by surface water. The STWR requires all utilities with surface water supply, or groundwater supply influenced by surface water, to provide adequate disinfection and, under most conditions, filtration. The *Enhanced Surface Water Treatment Rule (ESTWR)* provides additional protection against organisms including *Cryptosporidium parvum.* Other amendments to the drinking water standards have included the *Disinfectants/Disinfection By-Products Rule* and the *Total Coliform Rule.*

State

Water Supply

The State Water Resources Control Board (SWRCB) has authority over all water rights in California under the common law public trust doctrine to protect public trust uses. The SWRCB is authorized under *Water Code* Section 1394 to include a reservation for jurisdiction in a water rights permit when issues related to the protection of vested rights and the public interest cannot be resolved when the application is approved.

The *California Water Code* Section 1735 provides authority for long-term water transfers, subject to the requirements of the Environmental Quality Act (CEQA). Under the terms of the Water Code, long-term transfers cannot injure vested water rights or cause any unreasonable impact to fish and wildlife.

Two California water use efficiency laws require local suppliers to plan for water conservation activities. The first is the *Urban Water Management Planning Act,* which requires every public or private water supplier who meets certain operational criteria to prepare, adopt, and submit to the state Department

of Water Resources (DWR) an urban water management plan, and to update the plan at least every five years. The second law is the *Agricultural Water Conservation and Management Act*, which provides that agricultural water suppliers may institute water conservation and management programs. DWR assists agricultural water suppliers in implementing efficient water management practices to improve agricultural water use efficiency.

Assembly Bill 225 and AB 3030 authorized local agencies which provide water service to adopt and implement groundwater management plans. Consequently, the County of Fresno and other local agencies have adopted groundwater management plans. AB 3030 provides local agencies with broad police powers to implement groundwater management programs including the enactment and enforcement of ordinances. (This is significant for agencies that do not otherwise have police powers, such as FID.) The use of groundwater management authority under AB 3030 is precluded in basins whose wells produce an average yield of 100 gallons per minute, which would apply to the foothill and mountain areas of the County. The Fresno County Groundwater Management Plan is described below under 'Local.'

Water Quality

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) are responsible for ensuring implementation and compliance with the provisions of the federal Clean Water Act (CWA) and California's Porter-Cologne Water Quality Control Act. Fresno County is situated within the jurisdiction of the Central Valley Region of the RWQCB (Region 5). The Central Valley RWQCB (CVRWQCB) has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction.

Water quality objectives for the San Joaquin River and its tributaries are specified in the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (Basin Plan) prepared by the CVRWQCB in compliance with the federal CWA and the State Porter-Cologne Water Quality Control Act. The Kings River lies within a different basin (Tulare Hydrologic Basin) and is subject to Basin Plan requirements adopted for that area. Each Basin Plan establishes water quality objectives, and implementation programs to meet stated objectives and to protect the beneficial uses of water in the Sacramento-San Joaquin River Basin and Tulare Basin. All discharges to surface water or groundwater within Fresno County are subject to the Basin Plan requirements.

National Pollutant Discharge Elimination System (NPDES)

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the CWA to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that EPA must consider in setting effluent limits for priority pollutants.

Nonpoint sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff but is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such nonpoint sources are generally exempt from federal NPDES permit program requirements. However, two types of nonpoint source discharges are controlled by the NPDES program - nonpoint source discharges caused by general construction activities and the general quality of stormwater in municipal stormwater systems (either as part of a combined system or as a separate system in which runoff is carried through a developed conveyance system to specific discharge locations).

Construction Site Runoff Management

In accordance with NPDES regulations, to minimize the potential effects of construction runoff on receiving water quality, the State requires that any construction activity affecting five acres or more must obtain a General Construction Activity Stormwater Permit. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement Best Management Practices (BMPs) to reduce construction effects on receiving water quality by implementing erosion control measures.

In 1997, EPA proposed revisions to the 1992 general permit to clarify that all construction activity, including small construction sites that are part of a larger common plan (e.g., sites under five acres), would be eligible for coverage under the revised permit. The State Water Resources Control Board (SWRCB) adopted a revised and updated general permit in August 1999. Because construction of the Proposed Project through buildout would collectively disturb more than five acres, the project would be subject to permit requirements both now and if the revised permit is adopted. Implementation of such measures would be included in contract specifications. As noted above, Phase 2 regulations cover construction sites ranging in size from one to five acres.

Examples of typical construction BMPs include: using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan; installing traps, filters, or other devices at drop inlets to prevent contaminants from entering stormdrains; and using barriers, such as straw bales or plastic, to minimize the amount of uncontrolled runoff that could enter drains or surface water.

Construction Dewatering

Clean or relatively pollutant-free wastewater that poses little or no threat to water quality may be discharged directly to surface water under certain conditions. In addition to the State General Construction Activity Permit, the CVRWQCB has also adopted a general NPDES permit for short-term discharges of small volumes of wastewater from certain construction-related activities. Permit conditions for the discharge of these types of wastewaters to surface water are specified in Waste Discharge Requirements (WDR) "General Order for Dewatering and Other Low-Threat Discharges to Surface Waters." Discharges may be covered by the permit provided they are (1) either four months

or less in duration, or (2) the average dry weather discharge does not exceed 0.25 million gallons per day. Construction dewatering, well development water, pump/well testing, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the permit. The general permit also specifies standards for testing, monitoring, and reporting, receiving water limitations, and discharge prohibitions.

Urban Runoff Management

The 1987 amendments to the CWA directed the federal EPA to implement an urban runoff stormwater management program in two phases. Phase 1 addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) municipalities and certain industrial activities. Phase 2 addresses all other discharges defined by EPA that are not included in Phase 1, including small municipalities and construction site runoff for projects ranging from one to five acres in size.

The goal of urban runoff management regulations is to improve the quality of stormwater discharged to receiving waters to the "maximum extent practicable" through the use of BMPs. Post-construction BMPs would require projects to implement structural and non-structural BMPs that would mimic pre-development quantity and quality runoff conditions from new development and redevelopment areas. Structural BMPs include engineered features that provide some treatment, such as vegetative drainage ways, detention infiltration ponds, constructed wetlands, or filtration basins and sand filters. A BMP may be drainage area-wide or site-specific. Non-structural BMPs are typically non-engineered management measures such as administrative and education programs focused on pollution prevention and source control. Development projects would be required to incorporate structural BMPs appropriate to the type of development and land uses in the project site, taking into account local and regional drainage and water quality considerations.

Urban runoff within the Fresno-Clovis metropolitan area is managed according to an NPDES Municipal Stormwater Permit issued under the federal Phase 1 program. However, other cities and communities in unincorporated areas do not currently operate under a NPDES Municipal Stormwater Permit because the jurisdictions do not meet the federal EPA criteria for Phase 1 compliance. Discharges from municipal separate storm sewer systems ("MS4s") in smaller urbanized areas are also a concern because of the high concentration of pollutants found in those discharges. Additional federal legislation, referred to as the Storm Water Phase 2 program, has been promulgated under the NPDES program to include small municipalities with populations of 1,000 to 100,000. Although similar regulations at the State level have not been prepared to implement the federal standards, discharges of urban runoff from some smaller municipalities in Fresno County are now regulated under the federal Phase 2 program.

The federal regulations implementing the Phase II program were published in the *Federal Register* on December 8, 1999. The regulations become effective February 7, 2000. The NPDES permitting authority (in this case, the State Water Resources Control Board) would issue general permits for Phase 2-designated small MS4s and construction activity within 3 years from the date of publication of the final regulations. Owners and operators of Phase 2-designated small MS4s and construction activity would obtain general permit coverage within 3 years and 90 days of publication of the final federal rule

(early 2003). The regulated small MS4s would be required to fully implement their stormwater management programs by the end of the first permit term, typically a 5-year period. Assuming this schedule, jurisdictions subject to Phase 2 requirements would need to have a fully implemented program in place by the end of 2008. The Phase 2 regulations require that MS4s develop, implement, and enforce a stormwater management program that would, at a minimum, implement the following six management measures:

- Public Education and Outreach Management
- Public Involvement/Participation Management
- Illicit Discharge Detection and Elimination Management
- Construction Site Storm Water Runoff Management
- Post-Construction Storm Water Management in New Development and Redevelopment Management
- Pollution Prevention/Good Housekeeping for Municipal Operations Management

The post-construction management measure requires structural and/or non-structural BMPs that would mimic pre-development quantity and quality runoff conditions from new development and redevelopment areas. There is no regulatory requirement for either site-specific or city/drainage-wide BMPs. The Phase 2 program also requires that a plan is developed to ensure adequate long-term operation and maintenance of the BMPs, that controls are in place that would prevent or minimize water quality impacts, and to determine the appropriate BMPs and measurable goals for minimum control measures.

Municipal Supply Water Quality

The *California Surface Water Treatment Regulations* were derived from amendments to the federal SWTR and require multi-barrier treatment for microbiological contaminants. Unlike the federal requirements, the regulations require all public water systems in California to filter their surface water and groundwater influenced by surface water. Due to high start-up costs, this aspect of the regulations was amended to allow qualifying systems to avoid filtration, similar to the federal requirements. California has also adopted total coliform regulations, analogous to the federal regulations.

Assembly Bill 21 was adopted to reduce MCLs for various groundwater contaminants to the point where there are no known adverse health effects. Of greatest local concern is the proposed MCL for dibromochloropropane (DBCP), a pesticide that was used extensively in the eastern area of the County until 1977, when it was banned. DBCP exceeded the previous MCL of 0.2 parts per billion (ppb) of groundwater in many locations. This has resulted in the closure and subsequent installation of wellhead treatment facilities at some municipal wells in Fresno and Clovis that are down-gradient from the contamination. Mitigation would consist of adding granulated-active charcoal (GAC) filters to affected wells to provide treatment. Although not enforceable, the adopted maximum contaminant goal for DBCP is 0.02 ppb, which is one order of magnitude lower than the old MCL. DHS is currently proposing to lower the MCL to 0.1 ppb. Although the newer, lower MCL has not yet been implemented by DHS, once implemented it will likely affect many of Fresno's and Clovis' production wells by virtually doubling the amount of GAC required for treatment.

Local

The *San Joaquin River Management Plan (SJRMP)* was mandated by Assembly Bill 3603 to address the needs of the San Joaquin River system. The provisions of the plan include: the creation of a forum where information can be developed and exchanged to provide for the orderly development and management of the resources of the San Joaquin River system; identification of actions which can be taken to benefit legitimate uses of the San Joaquin River system; and the development of solutions compatible with water supply, water quality, flood protection, fisheries, wildlife habitat, and recreational needs.

The *Fresno/Clovis Metropolitan Area Water Resources Management Plan* is a joint document adopted by the cities of Fresno and Clovis in 1993. The primary goal of the plan is to provide a safe, dependable, reliable and economical water supply that will accommodate existing and future development in the two cities until the year 2050. To achieve this goal, the plan includes policies encouraging using groundwater as the primary water source, providing wellhead treatment to ensure that domestic supply meets safe drinking water standards, supplementing the groundwater supply with surface water, constructing plants to treat surface water and large-diameter transmission water mains, continuing with an active recharge program, and continuing with appropriate water conservation measures.

The *Fresno County Groundwater Management Plan* was adopted in 1997 and presents a comprehensive strategy to enhance and maintain the quantity and quality of local groundwater resources. The plan document states that the County's groundwater-related issues can be addressed through currently available means without intrusive regulation and/or restrictions on groundwater pumping. If implemented, efforts related to conservation, water recycling, groundwater banking, management of groundwater contamination, and development of additional surface water storage can provide means to meet future increases in demand while reducing or eliminating overdraft within the County. These and other initiatives contained in the County's Groundwater Management Plan are summarized below.

- Groundwater banking would involve the use of unused storage capacity in local aquifers, which could be used for the intentional recharge of excess flood flows which are currently released and leave the County. The County currently manages one banking program in County Service Area Number 34 and will seek to implement one or more additional groundwater banking programs.

- As a CVP contractor, the County intends to explore the feasibility of developing a program to exercise its right of first refusal for purchase of CVP water proposed for transfer. The County will also seek to acquire other water should additional supplies become available.

- An increase in overall reservoir storage capacity would allow greater capture of spring flood flows for increased water supply. Limited storage also reduces the amount of surface water imported under USBR contracts, and limits the ability to provide carryover storage for use in drought years. The County intends to participate, whenever feasible and possible, in the development of new water storage projects.

- The County may implement an ordinance prohibiting groundwater for export outside the County, and prohibiting uncontrolled groundwater pumping to replace surface water leaving the County as a result of a transfer. However, such an ordinance would not interfere with existing water rights.

- The County intends to develop a program to monitor groundwater quantity and quality to provide an early warning of potential future groundwater-related problems. The County intends to implement programs and policies directed toward the maintenance and enhancement of water quality, preventing groundwater contamination, and preventing the spread of groundwater contamination.

- The County intends to implement a groundwater recharge ordinance to acquire unused surface waters formerly used on converted agricultural lands and use those waters for recharge. The County intends to construct its own recharge facilities to implement this provision. The County also intends to explore the feasibility of acquiring surface water entitlements to urbanized lands.

- The County may explore the feasibility of establishing groundwater protection areas, whereby areas of good recharge capability, shallow groundwater, or existing groundwater contamination would be designated for protection. The County also intends to explore the feasibility of implementing an ordinance to require all new wastewater treatment plants to provide advanced treatment so that the treated effluent can be used for irrigation, recharge, and non-potable domestic uses.

PLAN ELEMENTS

Development under the Draft General Plan would result in additional development in the urban and rural areas of the County. It is estimated that a total of approximately 24,100 acres of additional residential development and 13,700 acres of additional non-residential development would be accommodated under the Draft General Plan. Of these totals, approximately 1,500 acres of residential and 540 acres of non-residential development would occur in the unincorporated areas of the County. Some proportion of this new development will consist of rural residential development and agricultural industries served by private wells. The remainder of this new development will increase demands on centralized water supply and distribution facilities in the urbanized areas of the County, and would result in the need for localized installation of additional facilities such as municipal wells, treatment facilities, pump stations, storage facilities, and water mains.

The Draft General Plan contains the following policies from the Public Facilities and Services Element that are applicable to water resources:

General Public Facilities and Services

Policy PF-A.2 The County shall require new industrial development to be served by community sewer, stormwater, and water systems where such systems are available or can feasibly be provided.

Policy PF-A.3 The County shall require new urban commercial and urban-density residential development to be served by community sewer, stormwater, and water systems.

Water Supply and Distribution - General

Policy PF-C.1 The County shall actively engage in efforts and support the efforts of others to retain existing water supplies within Fresno County.

Policy PF-C.2 The County shall actively engage in efforts and support the efforts of others to import flood, surplus, and other available waters for use in Fresno County.

Policy PF-C.3 To reduce demand on the County's groundwater resources, the County shall encourage the use of surface water to the maximum extent feasible.

Policy PF-C.4 The County shall support efforts to expand groundwater and/or surface water storage that benefits Fresno County.

Policy PF-C.5 The County shall develop a County water budget to determine long-term needs and to determine whether existing and planned water resource enhancements will meet the County's needs over the twenty (20) year General Plan horizon.

Policy PF-C.6 The County shall support water banking when the program has local sponsorship and involvement and provides new benefits to the County.

Policy PF-C.7 The County shall recommend to all cities and urban areas within the County that they adopt the most cost-effective urban best management practices (BIPs) [sic] published and updated by the California Urban Water Agencies, California Department of Water Resources, or other appropriate agencies as a means of meeting some of the future water supply needs.

Policy PF-C.8 The County shall require preparation of water master plans for areas undergoing urban growth.

Policy PF-C.9 The County shall work with local irrigation districts to preserve local water rights and supply.

Policy PF-C.10 The County shall require any community water system in new residential subdivisions to be owned and operated by a public entity.

Policy PF-C.11 The County shall assure an on-going water supply to help sustain agriculture and accommodate future growth by allocation of resources necessary to carry out the water resource management programs.

Domestic Water Supply

Policy PF-C.12 The County shall approve new development only if an adequate sustainable water supply to serve such development is demonstrated.

Policy PF-C.13 The County shall limit development in areas identified as having severe groundwater level declines or limited groundwater availability to uses that do not have high water usage or can be served by a surface water supply.

Policy PF-C.14 The County shall require that water supplies serving new development meet US Environmental Protection Agency and California Department of Health Services and other water quality and quantity standards.

Policy PF-C.15 The County shall require that surface water used to serve new development be treated in accordance with the requirements of the California Surface Water Treatment Rule.

Policy PF-C.16 If the cumulative effects of more intensive land use proposals are detrimental to the water supplies of surrounding areas, the County shall require approval of the project to be dependent upon adequate mitigation. The County shall require that costs of mitigating such adverse impacts to water supplies be borne proportionately by all parties to the proposal.

Policy PF-C.17 The County shall, prior to consideration of any discretionary project related to land use, undertake a water supply evaluation. The evaluation shall include the following:

a. A determination that the water supply is adequate to meet the highest demand that could be permitted on the lands in question. If surface water is proposed, it must come from a reliable source and the supply must be made "firm" by water banking or other suitable arrangement. If groundwater is proposed, a hydrogeologic investigation may be required to confirm the availability of water in amounts necessary to meet project demand. If the lands in question lie in an area of limited groundwater, a hydrogeologic investigation shall be required.

b. A determination of the impact that use of the proposed water supply will have on other water users in Fresno County. If use of surface water is proposed, its use must not have a significant negative impact on agriculture or other water users within Fresno County. If use of groundwater is proposed, a hydrogeologic investigation may be required. If the lands in question lie in an area of limited groundwater, a hydrogeologic investigation shall be required. Should the investigation determine that significant pumping-related physical impacts will extend beyond the boundary of the property in question, those impacts shall be mitigated.

c. A determination that the proposed water supply is sustainable or that there is an acceptable plan to achieve sustainability. The plan must be structured such that it is economically, environmentally, and technically feasible. In addition, its implementation must occur prior to long-term and/or irreversible physical impacts, or significant economic hardship, to surrounding water users.

Policy PF-C.18 In the case of lands entitled to surface water, the County shall only approve land use-related projects that provide for or participate in effective utilization of the surface water entitlement such as:

a. Constructing facilities for the treatment and delivery of surface water to lands in question;
b. Developing facilities for groundwater recharge of the surface water entitlement;
c. Participating in the activities of a public agency charged with the responsibility for recharge of available water supplies for the beneficial use of the subject lands.

Policy PF-C.19 The County shall discourage the proliferation of small community water systems.

Policy PF-C.20 The County shall not permit new private water wells within areas served by a public water system.

Agricultural Water Supply

Policy PF-C.21 The County shall promote the use of surface water for agricultural use to reduce groundwater table reductions.

Water Transfer Policies

Policy PF-C.22 The County supports short-term water transfers as a means for local water agencies to maintain flexibility in meeting water supply requirements. The County shall support long-term transfer, assignment, or sale of water and/or water entitlements to users outside of the County only under the following circumstances:

a. The impacts of the transfer on Fresno County are mitigated;
b. The transfer is part of a long-term solution to the region's water supply shortfall; and
c. The transfer will not result in a net decrease in the availability of surface and/or groundwater to water users within Fresno County.

Policy PF-C.23 The County shall regulate the transfer of groundwater for use outside of Fresno County. The regulation shall extend to the substitution of groundwater for transferred surface water.

Policy PF-C.24 The County shall encourage the transfer of unused or surplus agricultural water to urban uses within Fresno County.

Water Conservation

Policy PF-C.25 The County shall require that all new development within the County use water conservation technologies, methods, and practices as established by the County.

Policy PF-C.26 The County shall encourage the use of reclaimed water where economically, environmentally, and technically feasible.

Policy PF-C.27 The County shall adopt, and recommend to all cities that they also adopt, the most cost-effective urban best water conservation management practices circulated and updated by the California Urban Water Agencies, California Department of Water Resources, or other appropriate agencies.

Policy PF-C.28 The County shall encourage agricultural water conservation where economically, environmentally, and technically feasible.

Policy PF-C.29 The County shall, in order to reduce excessive water usage, require tiered water pricing within County Service Areas and County Waterworks Districts.

Policy PF-C.30 The County shall generally not approve land use-related projects that incorporate a man-made lake or pond that will be sustained by the use of groundwater.

Wastewater Collection, Treatment, and Disposal

Policy PF-D.1 The County shall encourage the installation of public wastewater treatment facilities in existing communities that are experiencing repeated septic system failures and lack sufficient area for septic system repair or replacement and/or are posing a potential threat to groundwater.

Policy PF-D.2 The County shall require that any new community sewer and wastewater treatment facilities serving residential subdivisions be owned and maintained by a County Service Area or other public entity approved by the County.

Policy PF-D.3 The County shall require that any new community wastewater treatment facility meet the policy standard of Policy OS-A.26.

Policy PF-D.4 The County shall limit the expansion of unincorporated, urban density communities to areas where community wastewater treatment facilities cannot [sic] be provided.

Policy PF-D.5 The County shall promote efficient water use and reduced wastewater system demand by:

a. Requiring water-conserving design and equipment in new construction;
b. Encouraging retrofitting with water-conserving devices; and
c. Designing wastewater systems to minimize inflow and infiltration, to the extent economically feasible.

Policy PF-D.6 The County shall permit individual on-site sewage disposal systems on parcels that have the area, soils, and other characteristics that permit installation of such disposal facilities without threatening surface or groundwater quality or posing any other health hazards and where community sewer service is not available and cannot be provided.

Policy PF-D.7 The County shall require preparation of sewer master plans for wastewater treatment facilities for areas experiencing urban growth.

Storm Drainage and Flood Control

Policy PF-E.11 The County shall encourage project designs that minimize drainage concentrations and maintain, to the extent feasible, natural site drainage patterns.

Policy PF-E.12 The County shall coordinate with the local agencies responsible for flood control or storm drainage to ensure that future drainage system discharges comply with applicable State and Federal pollutant discharge requirements.

Policy PF-E.13 The County shall encourage the use of natural storm water drainage systems to preserve and enhance natural drainage features.

Policy PF-E.14 The County shall encourage the use of retention-recharge basins for the conservation of water and the recharging of the groundwater supply.

Policy PF-E.16 The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

Policy PF-E.17 The County shall encourage the local agencies responsible for flood control or storm drainage retention-recharge basins located in soil strata strongly conducive to groundwater recharge, where practical, be developed and operated in such a way as to facilitate year-round groundwater recharge.

Policy PF-E.18 The County shall encourage the local agencies responsible for flood control or storm drainage to plan retention-recharge basins on the principle that the minimum number will be the most economical to acquire, develop, operate, and maintain.

Policy PF-E.19 The County shall encourage the local agencies responsible for flood control or storm drainage discharge of runoff from local drainage areas directly into major canals and other natural water courses within the limits of the capacity of the channels to carry such runoff in cases where areas are so highly urbanized as to not permit the acquisition and use of retention-recharge basins or where drainage areas are otherwise not suited to the use of retention-recharge basins.

Policy PF-E.20 The County shall require new development of facilities near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in flood waters, flowing rivers, streams, creeks, or reservoir waters.

Policy PF-E.21 The County shall require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities, and shall encourage the urban storm drainage systems and agricultural activities to use BMPs.

In addition to policies included in the Public Facilities and Services Element, the Open Space and Conservation Element of the Draft General Plan contains the following water supply and water quality policies:

Water Resources

Policy OS-A.1 The County shall develop, implement, and maintain a plan for achieving water resource sustainability, including a strategy to address overdraft and the needs of anticipated growth.

Policy OS-A.2 The County shall provide active leadership in the regional coordination of water resource management efforts affecting Fresno County and shall continue to monitor and participate in, as appropriate, regional activities affecting water resources, groundwater, and water quality.

Policy OS-A.3 The County shall provide active leadership in efforts to protect, enhance, monitor, and manage groundwater resources within its boundaries.

Policy OS-A.4 The County shall update, implement, and maintain its Groundwater Management Plan.

Policy OS-A.5 The County shall support efforts to create additional water storage that benefits Fresno County, and is economically, environmentally, and technically feasible.

Policy OS-A.6 The County shall develop a repository for the collection of County water resource information and shall establish and maintain a centralized water resource database. The database shall incorporate surface and groundwater data and provide for the public dissemination of water resource information.

Policy OS-A.7 The County shall develop and maintain a water budget (i.e., an accounting of all inflows and outflows of water into a specified area) for the County to aid in the determination of existing and future water resource needs. The water budget shall be incorporated into the County Geographic Information System (GIS) and included in the water resource database.

Policy OS-A.8 The County shall develop, implement, and maintain a program for monitoring groundwater quantity and quality within its boundaries. The results of the program shall be reported annually and shall be included in the water resource database.

Policy OS-A.9 The County shall develop and maintain an inventory of sites within the County that are suitable for groundwater recharge. The sites shall be incorporated into the County GIS and included in the water resource database.

Policy OS-A.10 The County shall develop and implement public education programs designed to increase public participation in water conservation and water quality awareness.

Groundwater Recharge

Policy OS-A.11 The County shall encourage, where economically, environmentally, and technically feasible, efforts aimed at directly or indirectly recharging the County's groundwater.

Policy OS-A.12 The County shall support and/or engage in water banking (i.e., recharge and subsequent extraction for direct and/or indirect use on lands away from the recharge area) based on the following criteria:

a. The amount of extracted water will never exceed the amount recharged;
b. The water banking program will result in no net loss of water resources within Fresno County;
c. The water banking program will not have a negative impact on other water users within Fresno County;
d. The water banking program will not create, increase, or spread groundwater contamination; and
e. The water banking program includes sponsorship, monitoring, and reporting by a local public agency;
f. The groundwater banking program will not cause or increase land subsidence;
g. The water banking program will not have a negative impact on agriculture within Fresno County; and
h. The water banking program will provide a net benefit to Fresno County.

Policy OS-A.13 The County shall, to the maximum extent possible, maintain local groundwater management authority and pursue the elimination of unwarranted institutional, regulatory, permitting, and policy barriers to groundwater recharge within Fresno County.

Policy OS-A.14 The County shall permit and encourage, where economically, environmentally, and technically feasible, over-irrigation of surface water as a means to maximize groundwater recharge.

Policy OS-A.15 The County shall directly and/or indirectly participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the County. The program shall make use of flood and other waters to offset existing and future groundwater pumping.

Land Use

Policy OS-A.16 The County shall require that natural watercourses are integrated into new development in such a way that they are accessible to the public and provide a positive visual element and a buffer area between waterways and urban development in an effort to protect water quality and riparian areas.

Policy OS-A.17 The County shall require the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access, and recreation.

Policy OS-A.18 The County shall support the policies of the San Joaquin River Parkway Plan to protect the San Joaquin River as an aquatic habitat, recreational amenity, aesthetic resource, and water source. (See Policy OS-H.12)

Policy OS-A.19 The County shall, where economically, environmentally, and technically feasible, encourage the multiple use of public lands, including County lands, to include groundwater recharge.

Policy OS-A.20 The County shall not approve the creation of new parcels that rely on the use of septic systems of a design not found in the California Plumbing Code.

Water Quality

Policy OS-A.21 The County shall protect groundwater resources from contamination and overdraft by pursuing the following efforts:

a. Identifying and controlling sources of potential contamination;
b. Protecting important groundwater recharge areas;
c. Encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible;
d. Encouraging the use of treated wastewater for groundwater recharge and other purposes (e.g., irrigation, landscaping, commercial, and non-domestic uses);
e. Supporting consumptive use where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface. water supply to the same area;
f. Considering areas where recharge potential is determined to be high for designation as open space; and
g. Developing conjunctive use of surface and groundwater.

Policy OS-A.22 The County shall require new development near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in storm waters, flowing river, stream, creek, or reservoir waters.

Policy OS-A.23 The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season unless adequately mitigated to avoid sedimentation of creeks and damage to riparian habitat.

Policy OS-A.24 The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and urban runoff.

Policy OS-A.25 The County shall monitor water quality regularly and take necessary measures to prevent contamination, including the prevention of hazardous materials from entering the wastewater system.

Policy OS-A.26 The County shall only approve new wastewater treatment facilities that will not result in degradation of surface water or groundwater. The County shall generally require treatment to tertiary or higher levels.

Policy OS-A.27 In areas with increased potential for groundwater degradation (e.g., areas with prime percolation capabilities, coarse soils, and/or shallow groundwater), the County shall only approve land uses with low risk of degrading groundwater.

Policy OS-A.28 The County shall support efforts to require the U.S. Bureau of Reclamation to provide San Joaquin Valley agricultural drainage facilities as intended in the authorization of the Central Valley Project.

Water quality protections is also addressed in the following Health and Safety Element policies in the Draft General Plan:

Policy HS-F.4 For redevelopment or infill projects or where past site uses suggest environmental impairment, the County shall require that an investigation be performed to identify the potential for soil or groundwater contamination. In the event soil or groundwater contamination is identified or could be encountered during site development, the County shall require a plan that identifies potential risks and actions to mitigate those risks prior to, during, and after construction.

Policy HS-F.6 The County shall work cooperatively with the State Department of Toxic Substances Control and Regional Water Quality Control Board to promote the timely and efficient cleanup of contaminated sites under the regulatory oversight of these agencies.

IMPACTS AND MITIGATION MEASURES

Method of Analysis

The issue of water resources is regional in nature, and depends on many interconnected variables that largely operate irrespective of jurisdictional boundaries. Therefore, this analysis is mainly County-wide in scope, with a view that regional water supply constraints and programs will affect the water resources available to serve growth in both the unincorporated and incorporated areas of the County. However, the potential effects of planned growth in the unincorporated areas upon water resources is also addressed.

This analysis is programmatic and largely qualitative in nature, although the numeric increments of growth planned under the Proposed Project are the primary basis for the impact analysis. Additionally, the comparison of potential Draft General Plan impacts with development impacts through the year 2020 without the Draft General Plan is based on the overall quantitative allocation of land use development between urban and rural areas under each respective scenario.

The effects of Draft General Plan development are evaluated in the context of existing programs and regulations that address protection and enhancement of water supply resources. An important consideration is the potential effectiveness of Draft General Plan policies in supporting and enhancing such programs and regulations through its land use directives and policies.

The water demand estimates were obtained from the infrastructure cost estimates prepared as part of the Draft General Plan program. These estimates were based on the following sources: the 1995 water use figures (surface and groundwater) for the incorporated areas were taken from Table 5-7 in the *Background Report* (the original source is State Department of Health Services, *Annual Reports to the Drinking Water Program*). The 1995 groundwater figures for the unincorporated areas were calculated by multiplying the population by a per capita consumption figure of 0.23 acre-feet per year for all unincorporated areas. This per capita consumption figure was derived from the average per capita groundwater usage in the incorporated areas. The 2020 water use estimates were derived from existing

(1995) use rates for each area or city (i.e., the 1995 per capita use rates were sed as a multiplier that was applied to 2020 population estimates for each area or city to calculate 2020 water use rates). It was assumed that 1995 per capita consumption rates would also apply in 2020.

Standards of Significance

For purposes of this EIR, an impact is considered significant if development under the Draft General Plan would:

- exceed available water supplies from existing entitlements and resources;
- result in potential worsening of groundwater overdraft conditions, subsidence, or otherwise adversely affect the availability of water supplies;
- require or result in the construction of new water supply, treatment, storage, conveyance, or distribution facilities, the construction of which would cause significant environmental effects; or
- substantially degrade surface water or groundwater quality.

Water Supply Impacts and Mitigation Measures

4.8-1 Development under the Draft General Plan could result in the demand for water exceeding available supply, resulting in overdraft conditions and potential adverse effects on groundwater recharge potential.

Overview of Potential Effects

By 2020, the overall annual demand for domestic water supply in Fresno County will increase from 205,614 acre-feet in 1995, to 285,887 acre-feet in 2020, an increase of about 39 percent (see Table 4.8-1). Approximately 7.5 percent of this increase will be attributable to growth in the unincorporated areas of the County. Agricultural demand for water is also expected to increase due to shifts in cropping to more water-intensive crops such as fruits, tree nuts and vegetables. There would also be significant increases in water demands from agricultural industries such as food processing, partially resulting from the County's encouragement of such industries for economic development. As discussed under "Environmental Setting," above, groundwater resources are in an overall state of overdraft in the County, and surface water supplies have been fully allocated. Unless water supply sources are managed to meet overall growth demand, the increased groundwater pumping and installation of new wells would exacerbate current overdraft conditions. Long-term groundwater pumping would be unsustainable and would ultimately result in an inability to meet water demands. Water supply and demand effects for specific areas and uses are presented in more detail below.

Unincorporated Areas

In the unincorporated areas of the valley floor, the overall annual water demand by unincorporated urban centers and rural development was 23,085 acre-feet in 1995, representing 13.3 percent of the County-wide total. By 2020, this demand is projected to increase to 28,386 acre-feet per year, an increase of 23 percent. This will represent only 6.6 percent of the overall increase in County-wide demand through 2020. This growth in demand will partially occur in unincorporated urban centers with centralized services, partially on individual lots in the rural areas, and partially as a result of new agricultural industries. This will result in the drilling of new municipal wells, as well as new wells for high volume agricultural users, in addition to possibly thousands of new individual wells. Most of this development will occur on the valley floor where overdraft conditions prevail. While some recharge would occur from flood control and effluent basins in the unincorporated urban centers, and from industrial and agricultural effluent ponds, there would likely be a net withdrawal of groundwater in these areas. In the rural areas, development on individual lots would withdraw groundwater without replenishing it. In many instances, development in the unincorporated area would remove an area currently being recharged through agricultural irrigation. Given that the groundwater basin in a large part of the County is designated as "critically overdrafted," the increased overdraft resulting from incremental development in the unincorporated areas under the Draft General Plan would have an adverse effect on groundwater supplies.

The unincorporated area located northeast of Fresno and Clovis merits specific discussion since it is the subject of intense development pressure with limited groundwater or surface water supply. In the absence of effective groundwater management or a secure source of surface supply (which must be treated), such growth is unsustainable and would result in significant impacts to groundwater resources. However, the effective implementation of the Draft General Plan policies requiring avoidance of impacts to water supplies in adjacent areas and the demonstration of sustainable water supply prior to approval of increased development intensity could avoid this impact.

In the unincorporated foothill and mountain areas of the County, the overall annual water demand by unincorporated urban centers and rural development was 4,238 acre-feet in 1995, representing about 2.1 percent of the County-wide total. By 2020, this demand is projected to increase to 4,892 acre-feet per year under the Proposed Project, an increase of 15.4 percent. This would represent 0.8 percent of the overall increase in County-wide demand under the Draft General Plan through 2020. In the foothill and mountain areas, most domestic demands are currently met by groundwater. The effects of existing groundwater pumping is not currently being monitored and is, therefore, unknown. In these areas, it may be necessary to drill to significant depths to obtain a well yield that is adequate for domestic purposes. The higher costs involved may pose a significant burden on area landowners.

Incorporated Areas

In the Fresno-Clovis metropolitan area, annual demand for domestic water in 1995 was 146,542 acre-feet, representing 71 percent of the County-wide total for M&I uses. By 2020, this demand is projected to increase to 210,300 acre-feet per year under the Draft General Plan, an increase of 43.5 percent. In the Fresno-Clovis area, the use of former agricultural water to serve lands converted to urban uses, combined with the joint efforts of local agencies to maintain groundwater levels through continuing development of recharge facilities to meet the demands of urban growth, has resulted in the maintenance of an approximate balance of groundwater conditions. The cities of Fresno and Clovis both acquire rights to FID water as former agricultural lands are converted to urban uses, and Fresno has surplus Kings River water allocation which it currently does not fully utilize. With continuing acquisition of surface water allocation, combined with continuing efforts to expand their recharge and/or surface water treatment capabilities to meet the needs of urban growth, it is anticipated that adequate water supply will be available in the Fresno-Clovis urban area to accommodate growth through 2020 anticipated under the Draft General Plan. However, there is a possibility that the City of Fresno could lose its CVP surface water entitlement due the potential inability to meet CVPIA water conservation requirements. This presents an element of uncertainty to the future ability of the City of Fresno to meet rising demands for water over the next 20 years.

Exclusive of Fresno and Clovis, the other 13 incorporated cities in Fresno County had a combined annual water demand of 30,868 acre-feet in 1995, representing 15 percent of the County-wide total for M&I use. By 2020, this demand is projected to increase to 42,308 acre-feet per year, an increase of 37.1 percent. Growth in the smaller urban centers will be subject to varying water supply conditions depending on location and source of supply. The cities of Coalinga, Orange Cove, and Huron rely exclusively on CVP contract water for M&I needs, and their contract allocations will be more than sufficient to meet growth demands under the Draft General Plan through 2020. The remaining 10 cities do not have surface water allocations and will have to rely on increased groundwater pumping to support future growth. Considering that most of these cities have no intentional recharge programs beyond percolation of stormwater and treated wastewater, the net effect would be increased overdraft. When combined with the increased pumping in the adjacent agricultural areas, discussed below, these increased overdraft conditions would further exacerbate groundwater supply problems. To the extent that this growth is accelerated by Draft General Plan policies encouraging growth in the urban centers, this impact could be attributed to development under the Draft General Plan.

Agricultural Uses

Agricultural water use comprises over 80 percent of overall water use in the County, and agricultural consumption is subject to limited institutional control and regulation. Under current conditions, groundwater supplies are being further depleted by increased agricultural extraction to support conversion to high-value water-intensive crops, a trend which is expected to continue. Agricultural pumping could be further exacerbated by curtailed surface water deliveries due to institutional factors,

as well as water transfers out of the County by individual farmers. Significant further improvements in efficiency of agricultural water use are not expected. While some growers will likely respond to these exigencies by land retirement, seasonal fallowing, or conversion to less water-intensive crops, the net effect is expected to be increased pumping and further overdraft along with the related physical impacts described above. Unless agricultural practices are modified in response to water supply limitations, the result could further deplete groundwater resources. However, this impact would largely occur independent of the Proposed Project because it is not growth related. The Draft General Plan policies aimed at the preservation of agricultural lands would help protect the recharge function provided by agricultural irrigation. However, taken as a whole, the Draft General Plan policies would not prevent increasing overdraft in the rural areas of the valley floor anticipated to occur through 2020.

Discussion

The impacts of growth upon water supply resources will vary depending on location. In the Fresno-Clovis metropolitan area, it appears that growth can be accommodated without significant impacts to groundwater resources. In the other urban centers and rural areas of the valley floor, it is likely that continued heavy reliance on groundwater for M&I and agricultural use, in the absence of effective measures to significantly replenish groundwater, would result in increased overdraft. In the foothill and mountain areas of the County, the effects of groundwater pumping have not been monitored and are largely unknown. Therefore, the groundwater impacts resulting from development under the Draft General Plan are difficult to evaluate. However, given that groundwater impacts have been reported in those areas in the past, it is reasonable to conclude that at least some localities would be subject to groundwater impacts due to additional pumping associated with growth under the Draft General Plan.

The provision of water supply outside the Fresno-Clovis area is highly decentralized and the adequacy of water supplies to accommodate growth will depend on localized conditions as well as many decisions by numerous agencies, entities and individuals. The County's Groundwater Management Plan includes a number of initiatives for increasing water supply while protecting groundwater resources. Although there has been a great deal of discussion and study of the problem, it appears that there are no clear alternatives being actively pursued to increase overall water supplies to meet Draft General Plan growth demands. As described in "Regulatory Setting," above, to date, no groundwater management programs have been implemented by the County, and no funding commitments have made for future program implementation. Additionally, there is significant institutional uncertainty surrounding water resources issues, particularly given the threats to existing water supplies from potential transfers out of the County, and potential curtailment of existing entitlements due to impending environmental water allocations.

The County of Fresno has limited authority to influence water supply. However, with the adoption of the Groundwater Management Policy, the County has initiated a serious effort to solve the problem, although implementation has not yet commenced and cannot be assumed. Draft General Plan Policies PF-C.1 through P-C.9, PF-C.11 through PF-C.13, PF-C.16 through PF-C.18, PF-C.21 through PF-C.24,

PF-C.30, PF-E.14, PF-E.17, OS-A.1 through OS-A.9, OS-A.11 through OS-A.15, OS-A.17 through OS-A.19, OS-A.21, and OS-A.28 provide a comprehensive approach to support, to protect, and to enhance overall water supplies through water conservation and efficient water use efforts, identification of recharge areas, review of proposed water transfers, support of water banking efforts, and the preparation of water master plans for areas undergoing rapid growth. Significant among these are Draft General Policies PF-C.12, PF-C.16, and PF-C.17, which require that sustainable water supply be demonstrated for any proposed change in the intensity of land use. Other policies require that the detrimental effects of any project upon the water supplies of surrounding areas be mitigated, which is particularly important for protecting groundwater resources in areas of the County experiencing development pressure, such as the northeast area of the County. In addition to these policies are several draft policies in the Land Use Element that would also protect water resources through effective land use planning. Focused urban growth is more likely to be subject to comprehensive groundwater management programs, particularly in the Fresno-Clovis area, and would be less likely to contribute to overdraft conditions. Various policies preclude the designation of new rural residential areas, which tend to be relatively heavy water users, and which remove agricultural irrigation/recharge from an area and increase groundwater pumping. Other policies encourage the redesignation of undeveloped rural residential areas to higher density residential or agricultural use.

Without the Proposed Project, development through 2020 would result in relatively less urban growth and commensurately more rural residential development. This would result in a somewhat less efficient land use pattern than would occur under the Draft General Plan, resulting in less protection of agricultural recharge areas and greater water consumption associated with high water using rural residential development. Less urban development would take place without the Draft General Plan, resulting in relatively fewer users that would be served by centralized water systems with effective groundwater management programs. This low increase in urban growth relative to the Draft General Plan would also result in the need for less water system infrastructure. Without the Draft General Plan, there would be fewer agricultural industries located in rural areas with their high water pumping rates and consequent impacts on groundwater levels. In this respect, the Proposed Project would result in relatively greater impacts than growth through 2020 without the Proposed Project. However, growth without the Draft General Plan would not be subject to the many policies aimed at protecting water resources and enhancing adequate water supply. Overall, development under the Draft General Plan would result in a lower level of impacts to water resources than would occur under growth without the Draft General Plan.

In view of current conditions, it does not appear that overall water supplies would be available to meet Draft General Plan growth demands through 2020, and that development of the Proposed Project would therefore have an overall significant impact on groundwater resources in the County. Draft General Plan policies cannot in and of themselves ensure the provision of adequate water supplies to support Draft General Plan growth in the incorporated or unincorporated areas of Fresno County, and

it cannot be demonstrated at this time that such efforts would reduce effects on water supplies to less-than-significant levels. This is considered a ***significant impact*** that would occur with or without the Proposed Project.

Mitigation Measures

4.8-1 *No mitigation is available beyond Draft General Plan Policies PF-C.1 through P-C.9, PF-C.11 through PF-C.13, PF-C.16 through PF-C.18, PF-C.21 through PF-C.24, PF-C.30, PF-E.14, PF-E.17, OS-A.1 through OS-A.9, OS-A.11 through OS-A.15, OS-A.17 through OS-A.19, OS-A.21, and OS-A.28 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of the policies cited above would reduce potential adverse water supply impacts for development that occurs within the County's jurisdiction, but not to a less-than-significant level. Similar measures are available to, and required by some of the cities in the County. However, the County cannot ensure similar measures would be enforced for development (whether related to the Proposed Project or not) that occurs within other jurisdictions. For these reasons, the impact would remain significant and unavoidable.

4.8-2 Development of future water supplies would require additional water treatment and delivery systems.

In general, urban development under the Draft General Plan would increase the number of wells needed because the converted agricultural lands cannot directly use surface water formerly used for irrigation due to lack of treatment facilities to meet drinking water standards. Therefore, surface water supplies from converted agricultural lands must be applied to groundwater recharge before being pumped for domestic and industrial uses. Increasing overall water supplies would require installation of water system improvements such as new wells, treatment facilities, pipelines, and recharge facilities. Although some surface water treatment facilities would be constructed within the General Plan horizon, water treated at these facilities would likely comprise a small proportion of overall domestic supply by 2020. The need for additional facilities to treat and deliver water to accommodate future growth would occur with or without the Proposed Project.

Draft General Plan Policies PF-A.2, PF-A.3, PF-C.10, PF-C.14, PF-C.15, PF-C.19, and PF-C.20 would provide a coordinated approach to deliver water that meets applicable standards in an efficient manner. However, the precise nature and location of water treatment and delivery system improvements has not been determined, so the impacts resulting from installation of such improvements cannot be identified at this time. Further, although similar measures are available to, and in many cases required by city governments (which also must comply with applicable standards to ensure a safe water supply), the County cannot ensure that such measures would be enforced for development (whether related to the Proposed Project or not) within cities under whose jurisdiction most of the future growth would occur. Therefore, the impact is considered ***significant***.

Mitigation Measures

4.8-2 *No mitigation is available beyond Draft General Plan Policies PF-A.2, PF-A.3, PF-C.10, PF-C.14, PF-C.15, PF-C.19, and PF-C.20 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of the policies cited above would reduce water treatment and delivery impacts for development that occurs within the County's jurisdiction, but not to a less-than-significant level. The impacts resulting from installation of treatment and delivery system improvements cannot be identified at this time, and the County cannot ensure similar measures would be implemented within the cities' jurisdictions. For these reasons, the impact would remain significant and unavoidable.

4.8-3 Development under the Draft General Plan could exacerbate groundwater overdraft conditions, resulting in secondary effects such as subsidence, lowering of water tables, or altering the rate or direction of contaminated groundwater.

As discussed in Impact 4.8-1, groundwater resources are in an overall state of overdraft in the County, and surface water supplies have been fully allocated. Unless water supply sources are managed to meet overall growth demand, the increased groundwater pumping and installation of new wells would exacerbate current overdraft conditions. Long-term projections indicate a continuing annual overdraft of the basin underlying most of Fresno County. In addition, increases in impervious surfaces as undeveloped lands are converted to urban uses would reduce the area available for recharge. These activities could result in changes in aquifer characteristics, as summarized below.

Subsidence has been found in areas where the groundwater basin has historically been subject to overdraft and long-term recharge is inadequate to maintain the water table elevation. Areas in Fresno County where subsidence has been a problem generally include the Westlands Water District and the Pleasant Valley Water District. Subsidence can impact conjunctive use programs by reducing storage capacity and changing transmissivity of the aquifer. In general, subsidence in Fresno County has stabilized, except during droughts. In the future subsidence will resume only if renewed pumping is sufficiently heavy to cause groundwater levels to drop below previous lows.[1] Other potential impacts to groundwater users include: the need to deepen existing wells or drill new wells; damage to existing pumps; the need for larger, more expensive pumps; increased costs due to increased energy demand from deeper pumping; the spreading of groundwater contamination associated with new or expanded cones of depression, and the resulting necessity to treat contaminated groundwater.

The comprehensive approach to managing water supplies that would occur with implementation of the Draft General Plan policies listed in Impact 4.8-1, above, with Draft General Plan Policies PF-C.18, PF-E.14, PF-E.17 through PF-E.20, OS-A.11 through OS-A.15, OS-A.17, OS-A.19, OS-A.21, and OS-

[1] Gilbert L. Bertoldi and others, "Ground Water in the Central Valley, California – A Summary Report," *U.S. Geological Survey Professional Paper 1401-A*, 1991, p. A34.

A.22 providing a mechanism to identify and control, where necessary, potential effects on aquifer characteristics by managing groundwater recharge. In particular, tasks included in Draft General Plan Policies OS-A.12 (groundwater banking program) direct that a water balance be maintained. Such policy-based efforts would help reduce the potential for land subsidence, inadvertent spread of contamination, and lowering of water tables within the unincorporated areas. As noted in Impact 4.8-1, in the Fresno-Clovis area (where most of the future growth with or without the Proposed Project would occur), the use of former agricultural water to serve lands converted to urban uses, combined with the joint efforts of local agencies to maintain groundwater levels through continuing development of recharge facilities to meet the demands of urban growth, has resulted in the maintenance of an approximate balance of groundwater conditions. However, there is a possibility that changes in future water supply sources could result in increased demand on groundwater resources, which could affect aquifer characteristics. Therefore, impacts would be significant for the County. Although similar measures are available to, and in many cases already implemented or planned by local jurisdictions, the County cannot ensure that such measures would be enforced for future development within cities under whose jurisdiction most of the future growth would occur. Therefore, the impact is considered ***significant***.

Mitigation Measures

4.8-3 *No mitigation is available beyond Draft General Plan Policies PF-C.18, PF-E.14, PF-E.17 through PF-E.20, OS-A.11 through OS-A.15, OS-A.17, OS-A.19, OS-A.21 and OS-A.22 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of the policies cited above would reduce secondary impacts related to groundwater withdrawal, but not to a less-than-significant level. In addition, the County cannot ensure similar measures would be implemented within the cities' jurisdictions. For these reasons, the impact would remain significant and unavoidable.

Water Quality Impacts and Mitigation Measures

4.8-4 Stormwater runoff from areas under construction could affect receiving water quality.

Development under the Draft General Plan would involve the construction of buildings and structures, roadways, parking lots, and infrastructure, which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. All of these activities have the potential to affect water quality if stormwater runoff from construction sites enters receiving water. Such effects would occur as part of development with or without the Proposed Project.

Construction activities such as grading, excavation, and trenching for site improvements would result in disturbance of soils at the project site or at offsite locations. Construction site runoff can contain soils and sediments from these activities. Dust from construction sites can also be transported to other nearby locations, where it can enter runoff or water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites can also enter runoff. Typical pollutants could include petroleum products and heavy metals from equipment and products such as paints, solvents, and

cleaning agents that could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment entered receiving waters in sufficient quantities to exceed water quality objectives. Impacts would generally be short-term, limited to the duration of construction.

Future projects would also be required by State law to obtain and comply with the State General Construction Activity Stormwater Permit. If any elements of the projects are developed in increments of less than five acres, a permit would still be required, assuming the construction activity is part of the larger common plan of development (e.g., a specific plan). Compliance with the permit would involve filing a Notice of Intent (NOI) with the SWRCB and preparing a Storm Water Pollution Prevention Plan (SWPPP) prior to construction. These requirements apply equally to locations in the unincorporated and incorporated areas.

To ensure compliance with adopted regulations, construction Best Management Practices (BMPs) would be implemented. BMPs can include a variety of methods to eliminate or reduce non-storm water discharges to receiving waters, including: scheduling or limiting activities to certain times of year, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution (i.e. straw bales, dikes, silt fences, sediment traps, mulching or vegetation maintenance, or equally effective methods).

Draft General Plan Policies PF-E.20, PF-E.21, and OS-A.22 through OS-A.24, which reinforce compliance with federal and State laws and regulations for water quality protection, direct that potential construction pollutant sources be controlled to minimize effects on receiving water. Compliance with the State General Construction Activity Permit, Draft General Plan policies, and County standards pertaining to grading and erosion control would ensure that future development within the unincorporated areas would not substantially degrade surface water quality as a result of construction by exceeding adopted RWQCB Basin Plan water quality objectives, applicable NPDES permit requirements, or local standards. This would reduce potential impacts to less-than-significant levels within unincorporated areas in the County. Within the incorporated Fresno-Clovis area, where most of the future growth, with or without the Proposed Project would occur, similar measures to ensure compliance with federal and State laws and regulations have been adopted and implemented. For other incorporated areas, construction projects greater than five acres are required to comply with the State General Permit. With the publication of the federal Phase 2 regulations for small municipalities, smaller incorporated and unincorporated communities must also develop and implement programs that address how construction site runoff for projects less than five acres in size will be managed. Assuming compliance with federal and State laws and regulations, this impact is considered ***less than significant.***

Mitigation Measures

4.8-4 *None required.*

4.8-5 Runoff from new impervious surfaces would contain urban contaminants that could affect receiving water quality.

Although much of the planned development would occur in urbanized areas, where stormwater runoff is already generated, conversion of undeveloped land to urban uses would increase the amount of impervious surface. Additional analysis of this issue as it relates to storm drainage and flooding issues is presented in Impact 4.5-1 in Section 4.5, Wastewater, Storm Drainage, and Flooding.

The increase in impervious surfaces that would occur with or without the Proposed Project would alter the types and levels of pollutants that could be present in runoff. Urban runoff studies throughout the U.S. have shown that the concentration of suspended solids usually decreases as exposed soils are covered by impervious surfaces, although some particulates may still be present due to entrained dust on roadways and parking lots and in runoff from any remaining open space areas. Activities that could increase the types or quantities of pollutants in runoff due to development include motor vehicle operations, residential maintenance, littering, careless material storage and handling, domestic animal and wildlife wastes, and pavement wear. Pollutants typically associated with urban uses, such as those that would be present as a result of the Proposed Project, include oil and grease, coliform bacteria, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), total petroleum hydrocarbons (TPH), nitrogen, phosphorus, heavy metals such as lead, copper, and zinc, and suspended solids. Residues of agricultural chemical products would tend to be replaced by residues from pesticides and other landscape maintenance products typically used in residential developments.

Draft General Plan Policies PF-A.2 and PF-A.3 recognize the need to effectively manage stormwater runoff through developed systems. In addition, Draft General Plan Policies PF-E.20, PF-E.21, OS-A.16, OS-A.22, and OS-A.24 require that future development consider the proximity to receiving water sources and to incorporate feasible and practical best management practices (BMPs) to control pollutants in urban runoff. The selected BMPs would be based on the type of development and land uses in the project site, taking into account local and regional drainage and water quality considerations. Structural BMPs could include engineered features that provide some treatment, such as vegetative drainage ways, detention infiltration ponds, or filtration basins and sand filters. Policy OS-A.16 specifically directs that buffer areas be provided between waterways and urban development to protect the quality of natural watercourses integrated into new development, and Policy OS-A.22 requires new development to mitigate potential runoff effects on surface water. Non-structural BMPs are typically non-engineered management measures such as administrative and education programs focused on pollution prevention and source control, as directed on Policy OS-A.10. The effectiveness of BMPs must be monitored to ensure compliance with water quality regulations.

In summary, the Porter-Cologne Act mandates that water quality objectives ensure the reasonable protection of beneficial uses and the prevention of nuisance, recognizing that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses (California Water Code, Section 13241). Federal antidegradation policy also requires that existing beneficial uses also be maintained as development within a watershed occurs. Accordingly, to the extent

that projects must comply with applicable federal NPDES programs, which would be implemented through BMPs intended to minimize pollutant loading in runoff and to protect the beneficial uses of receiving water, development under the Draft General Plan would not result in any significant adverse effects on receiving water quality. This would reduce potential impacts to less-than-significant levels within unincorporated areas in the County. However, with the exception of the Fresno-Clovis metropolitan area, comprehensive local urban runoff water quality management programs consistent with federal Phase 2 requirements for small municipalities (MS4s), as applicable, may not exist or have not been fully implemented within all incorporated areas or their SOIs. In the absence of Phase 2 programs, and because the County cannot ensure that similar policies or mechanisms implementing the Phase 2 requirements would be enforced for development (whether related to the Proposed Project or not) within cities under whose jurisdiction most of the future growth would occur, this impact is considered ***significant***.

Mitigation Measures

4.8-5 *No mitigation is required beyond General Plan Policies PF-A.2, PF-A.3, OS-A.10, OS-A.16, OS-A.22, PF-E.20, and PF-E.21 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Although Draft General Plan policies, combined with existing regulations, would reduce potentially significant impacts related to urban runoff water quality within unincorporated areas of the County and the Fresno-Clovis metropolitan areas, implementation of such programs within the incorporated areas or their SOIs (exclusive of the Fresno-Clovis metropolitan area) is not within the County's jurisdiction to monitor and enforce. Therefore, the impact would remain significant and unavoidable.

4.8-6 Development under the Draft General Plan would increase the volume of wastewater treated and discharged by publicly owned facilities, which could adversely affect the quality of waters receiving treated effluent.

As discussed in Impact 4.5-1 in Section 4.5, Wastewater, Storm Drainage, and Flooding, the Draft General Plan objective of focusing development in existing urban areas would accelerate growth in those areas and necessitate expansion of existing collection and treatment facilities to accommodate future residential, industrial, and commercial wastewater flows. The Draft General Plan economic development goal of increasing food processing industry in the County would further result in increased wastewater flows because these users generally are high-volume wastewater dischargers. Increased wastewater flows discharged to publicly owned treatment facilities, which would ultimately discharge treated effluent to receiving streams, would occur with or without the Proposed Project. Draft General Plan Policies OS-A.25, OS-A.26, PF-A.2, PF-A.3, and PF-D.1 through PF-D.7 provide strong support for maintaining water quality protection administered at the local level. These policies require advanced treatment of wastewater, encourage the installation of public sewage systems in existing communities which are experiencing repeated septic system failures, and direct the County to prepare sewer master plans for sewer collection and treatment systems for areas undergoing rapid urban

growth. Such policies represent significant new policy initiatives for ameliorating existing water quality problem areas and preventing future problem areas from developing. Further, all discharges from publicly owned facilities would be required to comply with federal and State discharge standards monitored and enforced by the CVRWQCB, regardless of whether the facility is located in the County or within the cities' jurisdiction. Therefore, the water quality impacts resulting from expanded wastewater treatment facilities under the Draft General Plan would be ***less than significant***.

Mitigation Measure

4.8-6 *None required.*

4.8-7 Increased wastewater discharges associated with development under the Draft General Plan could contribute nitrate and other constituents to groundwater through individual septic system use.

The Draft General Plan encourages development in existing urbanized areas served by centralized wastewater treatment facilities subject to effluent quality limits, which minimizes the need for septic systems and reduces receiving water quality effects. However, as discussed in Impact 4.5-2 in Section 4.5, Wastewater, Storm Drainage, and Flooding, development under the Draft General Plan would result in increased development relative to existing conditions, which would increase the number of individual septic systems in communities not served by developed wastewater collection and treatment systems. Such growth and the resulting increase in septic system use would occur with or without the Proposed Project, and both existing and Draft General Plan policies (e.g., Policy PF-D.6) support continued use of individual septic systems in areas not served by a public wastewater treatment system. Because individual septic systems provide only primary treatment of effluent, the discharged water can contain elevated levels of chemical constituents. Increased nitrate levels in groundwater is the most common result of domestic septic system use. The extent to which groundwater quality could be affected by septic system use would depend on underlying soil characteristics (e.g., permeability) and the amount and rate of wastewater discharged to the septic system.

For unincorporated areas, County ordinances would ensure that domestic septic systems would be properly sited, installed, and maintained so that potential impacts to groundwater quality from new development would be minimized. In addition, Draft General Plan Policies PF-D.6, OS-A.20, and OS-A.27 reinforce compliance with applicable water quality protection standards associated with on-site septic system use and to consider site conditions and proposed land uses. Therefore, impacts would be less than significant for areas within the unincorporated County. However, Fresno County ordinances and Draft General Plan policies would not apply to development that would occur in areas outside the County's jurisdiction where development would not be served by a community system. Therefore, increased individual septic system use could potentially affect water quality, and the impact is considered ***significant.***

Mitigation Measure

4.8-7 *No mitigation is required beyond Draft General Plan Policies PF-D.6, OS-A.20, and OS-A.27 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of the policies listed above would reduce impacts related to septic system use in the unincorporated areas to a less-than-significant level. However, the County cannot ensure similar measures would be implemented within the cities' jurisdictions. For this reason, the impact would remain significant and unavoidable.

4.8-8 Continued agricultural practices could affect groundwater or surface water quality.

Groundwater and surface water quality has been affected by agricultural practices and is a County and regional concern. Agricultural lands in western Fresno County are becoming increasingly degraded by rising salinity levels in shallow groundwater. This is a result of irrigation with imported surface water primarily from the Central Valley Project (CVP) and caused by a combination of geologic and soil conditions, soil salinity, and inefficient irrigation water management. Rural residential development can support concentrations of livestock that are a source of nitrate in groundwater. In addition, agricultural operations can discharge nitrates, minerals, and organic compounds (e.g., pesticides and herbicides) that can affect groundwater or surface water quality. However, increased development of agricultural operations is not proposed as part of the Proposed Project, and such activities would occur regardless of whether the Proposed Project is implemented. Moreover, various Draft General Plan policies encourage the County to participate in regional solutions to surface water and groundwater quality problems. Therefore, development under the Draft General Plan would not exacerbate existing groundwater quality conditions as a result of agricultural practices. Therefore, impacts would be ***less than significant***.

Mitigation Measures

4.8-8 *None required.*

Cumulative Impacts

The cumulative context for water resources is development through the year 2020 in the Central Valley, Coast Range and Sierra Nevada foothills, and Sierra Nevada, which are hydrologically connected to Fresno County, sharing common river and stream courses within and surrounding the Tulare Lake Basin, the Sacramento-San Joaquin River Basin, and the San Joaquin Valley Groundwater Basin. Since passage of the Central Valley Project Improvement Act and other related water transfers and water rights agreements, the potential now exists for water entitlements to be exported outside of the County, and presumably, outside of the Central Valley, and for other actions elsewhere in the State to affect the availability of water supplies to serve Fresno County water needs.

4.8-9 Increased development under the Draft General Plan in combination with other cumulative development would increase demand for water exceeding available supply and require additional facilities for water treatment and delivery systems. Secondary effects of long-term groundwater overdraft conditions would increase. Surface and groundwater quality could be affected by increased areas under concurrent construction and increased impervious areas, and from continued agricultural practices. The increase in wastewater treated from increased development intensity and development in new areas could affect the quality of waters receiving treated effluent.

As discussed in Impacts 4.8-1 through 4.8-5, project and non-project development in Fresno County would contribute to water consumption and potential degradation of water quality conditions. The Proposed Project by itself (i.e., the growth attributable directly to the Economic Development Strategy and the Draft General Plan policies) represents a relatively small portion of the growth projected to occur in the County by 2020, because the population growth would be unchanged by the project. However, where a significant and unavoidable impact has been identified for County-wide growth, the project contribution to that impact would be considered cumulatively considerable, even if on a project-specific level, it may be considered less than significant. The growing water demand from increased development intensity and development in new areas elsewhere in the Central Valley, Coast Range and Sierra Nevada foothills, and the Sierra Nevada, the ability for water to be exported, and the potential degradation of surface and groundwater sources could adversely affect water supply and quality. In addition, the effect of expansion or construction of water treatment facilities, and the concomitant impact on water quality cannot be determined, these cumulative impacts are considered ***significant***.

Mitigation Measure

4.8-9 *None available beyond Draft General Plan Policies PF-A.2, PF-A.3, PF-C.1 through PF-C.30, PF-D.1 through PF-D.7, PF-E.1 through PF-E.21, OS-A.1 through OS-A.28, HS-F.4, and HS-F.6.*

Implementation of the Draft General Policies listed above would reduce the project's contribution to this significant cumulative impact, but not to less-than-significant levels, and such measures would not reduce the cumulative effect to less-than-significant levels. Therefore, the cumulative impact would remain significant and unavoidable.