

## **4.5 WASTEWATER, STORM DRAINAGE, AND FLOODING**

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### **INTRODUCTION**

This section addresses the potential wastewater, storm drainage, and flooding impacts resulting from development under the Draft General Plan. The discussion is focused on how development intensities specified in the Draft General Plan would affect the need for new wastewater and storm drainage facilities and potential impacts resulting from installation of new facilities that may be required. The potential wastewater and storm drainage impacts of development under the Draft General Plan are assessed against the background of existing conditions, and are also compared with potential impacts of growth through 2020 without the Proposed Project. The analysis also considers potential flood hazards. Surface and groundwater quality issues associated with wastewater and stormwater runoff are addressed in Section 4.8, Water Resources. Other water-related issues, such as water supply and distribution, are also addressed in Section 4.8.

### **WASTEWATER**

#### **ENVIRONMENTAL SETTING**

Detailed background information on wastewater collection and treatment is provided in Chapter 5.5, Public Facilities and Services, Wastewater Collection and Treatment in the *General Plan Update Background Report (Background Report)*, which is hereby incorporated by reference. This information is summarized below.

Cities and special districts own and operate numerous wastewater collection and treatment systems throughout the County. All these agencies must obtain permits from the Regional Water Quality Control Board (Regional Board) to discharge treated plant effluent and dispose of biosolids (sludge). Likewise, industries that are not connected to centralized systems are required to provide treatment of their wastewater and obtain individual discharge permits from the Regional Board. Residents in rural areas that are not served by centralized systems use on-site septic systems subject to regulation by the County. There are 362 permitted dischargers in Fresno County, not including individual residential septic systems.

All incorporated cities within Fresno County are served by local sewage collection and treatment systems. The majority of treated wastewater is domestic, with a small amount generated by industrial discharges. Most treatment plants provide secondary treatment, but some smaller cities still rely on primary treatment facilities only. Most of the cities in Fresno County generally have adequate treatment capacity for the foreseeable future. However, Firebaugh and Sanger typically experience wastewater flows that meet or exceed current design capacities for their systems. Efforts are currently underway in both of these cities to upgrade facilities to accommodate anticipated flows. The Fresno-Clovis

Regional Wastewater Treatment and Reclamation Facility was recently upgraded and now has a treatment capacity of approximately 80 millions gallons per day (mgd). The current average flows of 68 to 70 mgd are well within this design capacity.

Many unincorporated communities have elected to form special districts to provide sewage collection and treatment services. Approximately 30 of these districts provide wastewater services. The County owns and operates 11 wastewater treatment facilities on behalf of water works districts and County service areas.

Most treatment facilities currently use evaporation/percolation ponds for effluent disposal. Percolation ponds achieve some level of nutrient reduction and disinfection by filtering effluent through soil. The Regional Board recognizes this as a viable disposal solution, although reclamation and recycling of treated effluent for irrigation purposes is preferred in order to reduce potential impacts to groundwater. Effluent recycling requires tertiary treatment, however, and the cost of this advanced level of treatment is prohibitive to most small communities.

Industries in the unincorporated areas, which primarily consist of food processing plants, also provide wastewater treatment subject to discharge permits issued by the Regional Board. These systems also typically discharge to evaporation/percolation ponds. Other agricultural wastewater is also disposed of in this manner.

Rural residential development that is not served by centralized wastewater systems relies on individual septic systems for wastewater treatment and disposal. Septic systems are regulated by the Fresno County Planning & Resource Management Department, which enforces standards and criteria for on-site systems.

## **REGULATORY SETTING**

Federal, State, and local governments have developed programs and regulations designed to ensure protection of water quality in conjunction with private development. These programs and regulations are briefly described below.

### **Federal and State**

The federal *Clean Water Act (CWA)* established the *National Pollutant Discharge Elimination System (NPDES)* to regulate municipal and industrial discharges (point sources) to surface waters of the United States. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB/Regional Board) are responsible for ensuring implementation of and compliance with the provisions of the federal CWA, including administration of the NPDES permitting process for point source discharges.

In 1967, California's *Porter-Cologne Water Quality Control Act* established the SWRCB and nine regional boards as the primary state agencies with regulatory authority over water quality. The Porter-Cologne

Act provides authority to establish *Water Quality Control Plans (Basin Plans)* which designate beneficial uses for specific surface water and groundwater resources, and establish water quality objectives and implementation programs to meet the stated objectives and to protect the beneficial uses of water. The water quality objectives of the San Joaquin River and its tributaries are set forth in the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin. The Kings River and its tributaries are subject to the basin plan for Tulare Hydrologic Basin.

The Regional Boards issue Waste Discharge Requirements (permits) in compliance with the applicable basin plans for the major point-source dischargers such as municipal wastewater treatment plants and industrial facilities. Fresno County is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB).

### **Local**

The installation of individual septic systems in the unincorporated areas of the County is regulated under *Fresno County Ordinance Title 15*, which adopts the provisions of the *Uniform Plumbing Code* for septic systems. Applicants for septic system permits must also comply with the *Manual of Septic Tank Practice*. These requirements are intended to preclude the creation of health hazards and nuisance conditions and to protect surface and groundwater quality. Percolation tests are required to determine the suitability of on-site soils to accept wastewater effluent to determine the amount of lineal feet of leach line required. The systems are required to be set back a minimum distance from well, creeks, reservoirs, and springs. In problem soils, individual septic systems must be designed by an engineer and include an expansion area that is equivalent in size to at least 100 percent of the required original system.

The County of Fresno's *Mandatory Sewer Connection Ordinance* requires connection to public sewer systems, where they are available, and precludes the issuance of permits for installation individual septic systems in such areas. In areas where public systems become available where they did not previously exist, structures served by individual septic systems must be connected to the public system within three years, or sooner if the existing facilities pose a health risk. In the event that required connections are not made within the required three year period, the County may cause such a connection to be made, with the cost of the connection assessed to the landowner.

### **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 portion of this new development would consist of rural residential development served by individual septic systems for wastewater treatment, and some would consist of agricultural industries that are also responsible for their own wastewater treatment and disposal. The remainder of this new development would increase demands on centralized wastewater collection and treatment facilities in the urbanized areas of the County, and would result in the need for localized installation and/or expansion of facilities such as sewage collection pipelines, pump stations, treatment plants, and evaporation/percolation ponds.

The Draft General Plan Public Facilities and Services Element, Open Space and Conservation Element, and Land Use Element contains the following policies to ensure the safe disposal of wastewater by promoting efficient water use and reduced wastewater system demand and ensuring safe development, operation, and maintenance of on-site disposal systems.

#### **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 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.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.29 The County shall, in order to reduce excessive water usage, require tiered water pricing within County Service Areas and County Waterworks Districts.

#### **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.4 The County shall limit the expansion of unincorporated, urban density communities to areas where community wastewater treatment facilities can[not] [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.

### **Water Quality**

- 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.
- 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.

### **Land Use**

- Policy LU-A.9 The County may allow creation of homesite parcels smaller than the minimum parcel size required by Policy LU-A.6, if the parcel involved in the division is at least twenty (20) acres in size, subject to the following criteria:
- a. The minimum lot size shall be sixty thousand (60,000) square feet of gross area, except that a lesser area shall be permitted when the owner submits evidence satisfactory to the Health Officer that the soils meet the Water Quality Control Board Guidelines for liquid waste disposal, but in no event shall the lot be less than one (1) gross acre; and
  - b. One of the following conditions exists:
    1. A lot less than twenty (20) acres is required for financing construction of a residence to be owned and occupied by the owner of abutting property; or
    2. The lot or lots to be created are intended for use by persons involved in the farming operation and related to the owner by adoption, blood, or marriage within the second degree of consanguinity, there is only one (1) lot per related person, and there is no more than one (1) gift lot per parcel of twenty (20) acres or more; or
    3. The present owner owned the property prior to the date these policies were implemented and wishes to retain his/her homesite and sell the remaining acreage for agricultural purposes.

Each homesite created pursuant to this policy shall reduce by one (1) the number of residential units otherwise authorized on the remainder parcel created from the original parcel.

- Policy LU-B.7 The County may allow creation of homesites smaller than the minimum parcel size required by Policy LU-B.5 in areas designated Westside Rangeland if the parcel involved in the division is at least forty (4) acres in size and subject to the following criteria:
- a. The minimum lot size shall be sixty thousand (60,000) square feet of gross area, except that a lesser area shall be permitted when the owner submits evidence satisfactory to the Health Officer that the soils meet the Water Quality Control Board Guidelines for liquid waste disposal, but in no event shall the lot be less than one (1) gross acre, and
  - b. One of the following conditions exists:
    1. A lot less than forty (40) acres is required for financing construction of a residence to be owned and occupied by the owner of abutting property, or

2. The lot or lots to be created are intended for use by persons involved in the farming or ranching operations and related to the owner by adoption, blood, or marriage within the second degree of consanguinity, there is only one (1) lot per related person, and there is no more than one (1) gift lot per each forty (40) acres, or
3. The present owner owned the property prior to the date that these policies were implemented by adoption of the exclusive agriculture zone district and wishes to retain his homesite and sell the remaining acreage for grazing or other agricultural purposes.

Each homesite created pursuant to this policy shall reduce by one (1) the number of residential units otherwise authorized on the remainder parcel created from the original parcel.

Policy LU-E.6 The County shall allow planned residential developments consisting of a minimum two (2) acre lot in areas designated for rural residential development subject to the following conditions:

- a. The buildable portion of the lot shall be a minimum of thirty-six thousand (36,000) square feet.
- b. Dwellings shall be limited to single family structures.
- c. The ratio of lot depth to width shall not exceed four (4) to one (1).
- d. Individual wells and septic systems shall be required.
- e. The size and configuration of the buildable portion of the lot shall be based on sufficient geological and hydrological investigations.
- f. Common open space areas that provide a portion of the two-acre lot should not include road and canal rights-of-way, reservations, permanent water bodies, and common use areas that are occupied by buildings, streets, maintenance sheds, tennis courts, parking lots, and similar uses that are not of an open character.
- g. Common open space areas that provide a portion of the two-acre lot shall be vested in fee title ownership to each individual property owner, but may be used for common use purposes.

Policy LU-E.22 The County may approve land divisions in areas designated Rural Settlement Area when the following criteria are met:

- a. The minimum net lot size shall be two (2) acres, except as allowed by LU-E.22c below.
- b. The ratio of lot dept width shall not exceed four (4) to one (1).
- c. A minimum of thirty-six thousand (36,000) square feet per lot shall be permitted if community water facilities are available and soils are suitable for individual septic systems.

## **IMPACTS AND MITIGATION MEASURES**

### **Method of Analysis**

This analysis is programmatic and largely qualitative in nature, because the specific projects resulting from development of the Draft General Plan can only be approximated and cannot be predicted with precision. However, the analysis is based on the overall quantitative allocation of land use development between urban and rural areas, which allows a meaningful comparison of potential impacts with development impacts with and without the Proposed Project through the year 2020.

## **Standards of Significance**

For purposes of this EIR, an impact is considered significant if the implementation of the Proposed Project would:

- result in the construction of new or expanded wastewater collection or treatment facilities, the construction or operation of which would cause potentially significant environmental effects.

## **Impacts and Mitigation Measures**

### **4.5-1 Increased development intensity in urban areas and added industrial users under the Draft General Plan could increase sewage treatment demand beyond the capacities of existing wastewater treatment facilities. This could result in the construction of new or expanded wastewater collection and treatment facilities.**

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 or the development of new facilities. Likewise, the Draft General Plan economic development goal of increasing food processing industry in the County would result in increased wastewater flows because these users generally are high-volume wastewater dischargers. The demand on existing systems, as well as the need for future systems would be minimized through implementation of Draft General Plan Policy PF-D.1, which encourages the installation of public wastewater treatment facilities in existing communities that are experiencing repeated septic system failures, Policy PF-D.2, which requires that any new community sewer and wastewater treatment facilities be maintained by a County Service Area or other public entity approved by the County, and Policy OS-A.26, which only allows the approval of new wastewater treatment facilities that will not result in the degradation of surface and groundwater.

Policies PF-A.2 and PF-A.3 include requirements for new industrial, urban commercial, and urban-density residential development to be served by community sewer systems, where such systems are available or can be provided. Policy PF-D.7 requires preparation of a sewer master plan for areas undergoing rapid growth. This would provide a coordinated approach to managing wastewater in unincorporated areas within the County. Similarly, Policy PF-D.4 would limit the expansion of unincorporated, urban-density communities to areas where community wastewater collection and treatment systems can be provided. In addition, Policies PF-C.25, PFF-C.27, PF-C.29, and PF-D.5 encourage efficient water use and water conservation, which would help reduce wastewater inflow. Such measures would reduce impacts to less-than-significant levels for areas within the County's jurisdiction.

The need for additional wastewater facilities would occur with or without the Proposed Project and would not, in and of itself, result in any significant effects. However, because the nature and magnitude of urban growth or future siting of industrial, commercial, and residential users relative to existing wastewater facilities cannot be predicted with accuracy, the specific wastewater system improvements (e.g., sanitary sewers, pump stations, new or expanded treatment facilities, percolation/evaporation ponds) that would be required cannot be identified at this time. It should be noted, however, the vast

majority of the demand for new facilities would occur in the incorporated cities. Consequently, the environmental impacts of such improvements cannot now be determined. To the extent that wastewater facility modifications or new construction could be necessary to accommodate future growth under the Draft General Plan, the potential physical impacts resulting from expansion of wastewater collection and treatment facilities resulting from Draft General Plan implementation would be considered **significant**. In addition, wastewater management programs similar to those that would be implemented in accordance with the Draft General Plan policies described above may not exist or have not been fully implemented within all incorporated areas where most of the future growth, with or without the project, would occur.

#### Mitigation Measures

4.5-1 *No mitigation is available beyond Draft General Plan Policies PF-C.25, PF-C.27, PF-C.29, PF-D.1, PF-D.2, PF-D.4, PF-D.6, PF-D.7, PF-A.2, PF-A.3, and OS-A.26. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Although Draft General Plan policies would provide for a coordinated approach to managing wastewater flows in the unincorporated areas through a combination of planning and water use and would reduce impacts to less-than-significant levels for the County, the effects of expansion or construction of wastewater facilities to accommodate future growth under the Proposed Project cannot be determined at this time. In addition, implementation of the measures addressed in the Draft General Plan policies within the incorporated areas is not within the County's jurisdiction to monitor and enforce. Therefore, the impact would remain significant and unavoidable.

#### **4.5-2 Development under the Draft General Plan would increase the number of individual septic systems.**

Development under the Draft General Plan would result in increased development in the incorporated and unincorporated areas. Such growth would occur with or without the project. Most new development would occur within planned urban areas that would be served by municipal sewer and wastewater treatment facilities, as directed by Draft General Plan Policies PF-A.2, PF-A.3, PF-D.2, PF-D.4, and PF-D.7. However, in the unincorporated areas not served by community systems, or within SOIs where development not served by community systems could occur, development under the Draft General Plan would increase the number of individual septic systems, as compared to existing conditions. Draft General Plan Policies PF-D.6, LU-A.9, LU-B.7, LU-E.9, and LU-E.22, and OS-A.20 supports continued use of individual septic systems in areas where groundwater quality would not be affected by their use. The overall number of lots where individual septic systems could be installed would be reduced, as compared to growth that would occur without the Proposed Project, because the Draft General Plan would prohibit the designation of new Rural Residential areas where septic systems would otherwise be used, but there would still be an increase in individual septic systems.

Septic system use may affect groundwater quality, as further discussed in Impact 4.8-7 in Section 4.8, Water Resources. However, the installation (construction) of individual septic systems does not involve the types of activities or extent of ground disturbance that could result in significant adverse



environmental effects, and the use of individual septic systems would not preclude the continued use of existing or construction of new wastewater collection and treatment systems in the incorporated and unincorporated areas. Therefore, impacts related to the increased use of septic systems as part of wastewater collection and treatment service related to growth that would occur without or without the project in both the unincorporated and incorporated areas is considered a ***less-than-significant impact***.

#### Mitigation Measure

4.5-2 *None required.*

## **STORM DRAINAGE AND FLOODING**

### **ENVIRONMENTAL SETTING**

Chapter 5.3, Public Facilities and Services, Storm Drainage and Flood Control in the *Background Report* contains additional background information on storm drainage and flood control. Chapter 9.3, Safety, Flood Hazards, describes dam failure flood inundation hazards. Chapter 5.3 and 9 of the *Background Report* are hereby incorporated by reference, and information from the *Background Report* is summarized below.

#### **Storm Drainage and Flooding**

During winter and spring months, river and stream flows in Fresno County increase with heavy rainfall and snow-melt runoff. Flood protection efforts include active management of a complex system of flood control facilities operated by local, state and federal agencies. This includes strategic management of reservoir releases and the use of canals to reduce likelihood of flooding by rerouting stormwater around populated areas. The urban areas of the County include storm drainage systems composed of street gutters, underground storm drains, retention/detention basins, pumping stations, and open channels to collect and control stormwater runoff.

Most of Fresno County's 15 cities operate their own storm drainage and flood control systems. However, for the cities of Fresno and Clovis, storm drainage and flood control is managed by the Fresno Metropolitan Flood Control District (FMFCD). Some cities also rely on levee maintenance by the U.S. Army Corps of Engineers (Corps) and irrigation districts to provide flood protection from certain creeks and rivers.

The western area of Fresno County between the Coast Range and Fresno Slough is sparsely populated, with land uses primarily consisting of agriculture and grazing land. A complex system of streams drain the eastern slope of the Coast Range toward the Fresno Slough on the valley floor. Due to their large drainage areas, many small creeks are prone to high flows and contribute to flooding in the western area of the valley. Urban areas in western Fresno County that are subject to flooding include the cities of Coalinga, Huron, and Mendota. Major facilities such as the California Aqueduct and I-5 are also subject

to flooding during large storm events and can sustain physical damage as a result. The stormwater runoff typically carries high volumes of sediment and naturally-occurring minerals such as selenium, arsenic and asbestos, which can also be washed into the Aqueduct. Important wetland habitat in the Mendota Wildlife Management Area is also subject to flooding and may be adversely affected by sediments and naturally-occurring minerals carried by flood flows.

The central area of Fresno County on the valley floor is the most heavily populated, so storm drainage and flood control facilities are largely designed to protect urban development. The major flood issues are associated with the San Joaquin River, the Kings River, and their tributaries. Three major dams have been constructed to control flows on the rivers, including Friant and Mendota Dams on the San Joaquin River and Pine Flat Dam on the Kings River. In addition, a number of reservoirs, detention basins, and canals have been constructed on streams east of the Fresno-Clovis area to prevent flooding and to convey flows around developed areas.

The storage capacity at Millerton Lake (impounded by Friant Dam) is inadequate for full flood protection during wet years, and emergency releases have resulted in levee breaks and flooding along the San Joaquin River. From Friant Dam to Gravelly Ford, the San Joaquin River is part of the Designated Floodway Program administered by the State Reclamation Board. Land use restrictions and river management practices allow the river to meander, flood over the banks, and remain in a relatively natural state. Between Gravelly Ford and the Chowchilla Bypass, the river is confined by a levee system. Erosion, seepage, and prolonged high water levels compromise levee integrity. Downstream of the Chowchilla Bypass, the river is not confined by levees and has limited capacity, resulting in uncontrolled flooding north into Madera County.

Pine Flat Dam on the Kings River is operated by the Corps for the primary purpose of flood control and emergency spillage is usually avoided. During storm events, excess flows are diverted to sloughs and irrigation canals. Flow management on the Kings River is carefully coordinated and considers factors such as anticipated weather, upstream flows, and the ability of downstream users to receive water.

The flooding potential from creeks and streams between the San Joaquin and Kings Rivers in the east has been substantially eliminated in the last few years with the completion of the Redbank-Fancher Creeks Flood Control Project. Constructed by the Corps and managed by the FMFCD, this project consists of two dams and three detention basins located in the Fresno-Clovis vicinity. The FMFCD also manages a system of 135 stormwater ponding basins, 350 miles of storm drain pipelines, and 44 pumping plants.

In eastern Fresno County, located primarily in the Sierra Nevada, precipitation falls mainly as snow. The region is characterized by smaller local watersheds draining to reservoirs upstream of Millerton and Pine Flat Lakes. Due to relatively low levels of population and urban development, flooding is not a major issue in this area. However, streamflows originating from this area contribute significantly to flooding potential on the valley floor.

### **Dam Failure Inundation**

Four major dams that could cause substantial flooding in Fresno County in the event of a failure are Friant Dam, Big Dry Creek Dam, Pine Flat Dam and Redbank-Fancher Creek Project Dam. Identified dam failure-flood inundation areas in Fresno County are shown in Figure 9-8 in the *Background Report*.

An inundation study completed in 1997 by the Bureau of Reclamation redefined a worst-case scenario dam break of Friant Dam to include inundation of a significant portion of the City of Fresno and a much larger portion of Fresno County than previously described. In addition, failure of upstream dams such as Shaver Lake, Lake Thomas A. Edison, Huntington, and Florence, and Mammoth Pool Reservoir, Wishon, and Courtright Reservoir, could contribute to flooding conditions on the San Joaquin and Kings Rivers, respectively, if downstream dam capacity of the major dams is exceeded.

However, comprehensive analysis of the potential for dam failure and possible downstream effects for these upstream dams has not been undertaken. Dam failure evacuation plans are in the preparation process for 23 dams located within Fresno County.

### **REGULATORY SETTING**

Federal, State, and local governments have developed programs and regulations designed to ensure control of stormwater and protection against flooding hazards in conjunction with private development. These programs and regulations are briefly described below.

#### **Federal**

The primary federal involvement with local flood control is in the preparation of *Flood Insurance Rate Maps (FIRMs)* by the Federal Emergency Management Agency (FEMA). These maps classify flood-prone areas according to degree of susceptibility to flooding during the 100-year event, with 'Zone A' representing the most flood-prone areas. The FIRMs are used to set insurance rates for property lying within flood-prone areas, and are also used by local jurisdictions, including Fresno County, in implementing flood control ordinances which govern new development.

Another federal directive, *Executive Order 11988 (Floodplain Management)* applies only to projects undertaken by federal agencies or constructed with federal funding or subject to major federal permitting. EO 11988 requires that such projects reduce the risks of flood losses, restore and preserve the natural and beneficial values served by floodplains, and minimize flood impacts on human safety, health, and welfare.

#### **State**

Portions of the San Joaquin River in Fresno County are part of the Designated Floodway Program administered by the State Reclamation Board. Section 8710 of the *California Water Code* requires that a Reclamation Board permit be obtained prior to start of any work, including excavation and construction activities, if projects are located within floodways or project levee sections. Structures for human habitation are not permitted within designated floodways.

The State Division of Safety of Dams has specific requirements pertaining to dam operation, including inspections and implementation of corrective actions to correct deficiencies, and the California Government Code requires contingency plans for dam failure and evacuation. Fresno County has the responsibility for developing such plans for State-designated dams affecting unincorporated areas. The incorporated cities are responsible for preparing plans for State-designated dams affecting incorporated city areas. The plans should be updated every two years and submitted to the State Office of Emergency Services for review and comment.

### **Local**

The County requires that flooding issues for new development proposals be addressed in the planning and design stage of development review. The *Fresno County Flood Plain Management Ordinance* applies to all development proposed within any area of special flood hazard. This ordinance requires that a development permit be obtained from the Director of the Planning & Resources Management Department prior to construction. Information required with the permit application includes base flood elevations, whether watercourses would be altered, and interpretation of Flood Insurance Rate Map (FIRM) boundaries. The County requires that certain construction standards be met in order to reduce flood hazards (e.g., finished floor elevations must be above 100-year flood elevations; development may not result in a net reduction of flood conveyance capacity or obstruct flood flows).

The design of drainage and flood control facilities in the County is governed by the *Fresno County Drainage and Flood Control Design Standards*, which is part of the *Improvement Standards for Fresno County*. This document contains criteria for storm design capacities for artificial surface drainage facilities, underground storm sewers, and roadway culverts, and specifies other criteria for natural drainage channels.

The Fresno Metropolitan Flood Control District has adopted a *Storm Drainage and Flood Control Master Plan* which is intended to mitigate the impacts of land development in the Fresno-Clovis area in a comprehensive and integrated manner through the District's regional system of flood and stormwater management facilities. The plan sets forth a specific program for the construction of new facilities as needed and the ongoing restoration and maintenance of channel hydrology.

### **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 Proposed Project. 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. This new development would increase the volume and rate of stormwater flows and much of this new

construction would require the installation of additional facilities such as surface drainage channels, underground storm drains, pump stations, and retention basins to control and convey this added drainage. Development under the Draft General Plan would also increase the number of people and structures that could be exposed to hazards associated with 100-year flooding and dam failure inundation.

The Draft General Plan contains the following policies that address potential storm drainage and flooding impacts associated with incremental development under the Proposed Project.

- Policy PF-E.1      The County shall coordinate with the agencies responsible for flood control or storm drainage to assure that construction and acquisition of flood control and drainage facilities are adequate for future urban growth authorized by the County General Plan and city general plans.
- Policy PF-E.2      The County shall encourage the agencies responsible for flood control of storm drainage to coordinate the multiple use of flood control and drainage facilities with other public agencies.
- Policy PF-E.3      The County shall encourage the Fresno Metropolitan Flood Control District to spread the cost of construction and acquisition of flood control and drainage facilities in the most equitable manner consistent with the growth and needs of this area.
- Policy PF-E.4      The County shall encourage the local agencies responsible for flood control or storm drainage to require that storm drainage systems be developed and expanded to meet the needs of existing and planned development.
- Policy PF-E.5      The County shall only approve land use-related projects that will not render inoperative any existing canal, encroach upon natural channels, and/or restrict natural channels in such a way as to increase potential flooding damage.
- Policy PF-E.6      The County shall require that drainage facilities be installed concurrently with and as a condition of development activity to insure the protection of the new improvements as well as existing development that might exist within the watershed.
- Policy PF-E.7      The County shall require new development to pay its fair share of the costs of Fresno County storm drainage and flood control improvements within unincorporated areas.
- Policy PF-E.8      The County shall encourage the local agencies responsible for flood control or storm drainage to precisely locate drainage facilities well in advance of anticipated construction, thereby facilitating timely installation and encouraging multiple construction projects to be combined, reducing the incidence of disruption of existing facilities.
- Policy PF-E.9      The County shall require new development to provide protection from the 100-year flood as a minimum.
- Policy PF-E.10     In growth areas within the jurisdiction of a local agency responsible for flood control or storm drainage, the County shall encourage to design drainage facilities as if the entire areas of service were developed to the pattern reflected in the adopted General Plan to assure that the facilities will be adequate as the land use intensifies.
- 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.13     The County shall encourage the use of natural storm water drainage systems to preserve and enhance natural drainage features.

- 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 HS-C.1 The County should control foreign waters originating in streams of the Fresno County Stream Group generally located east and north of the Fresno urban area by check dams or other means prior to entering the Fresno-Clovis Metropolitan area.
- Policy HS-C.2 The County shall require that the design and location of dams and levees be in accordance with applicable design standards and specifications and accepted design and construction practices.
- Policy HS-C.3 The County shall promote a floodplain management approach in flood hazard areas that are presently undeveloped by giving priority to regulation of land uses over development of structural controls as a method of reducing flood damage.
- Policy HS-C.4 The County shall encourage the performance of appropriate investigations to determine the 100-year water surface elevations for the San Joaquin River, taking into account recent storm events and existing channel conditions, to identify the potential extent and risk of flooding. New development, including public infrastructure projects, shall not be allowed along the river until the risk of flooding at the site has been determined and appropriate flood risk reduction measures identified.
- Policy HS-C.5 Where existing development is located in a flood hazard area, the County shall require that construction of flood control facilities proceed only after a complete review of the environmental effects and a project cost/benefit analysis.
- Policy HS-C.6 The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams and, to the extent possible, combine flood control, recreation, water quality, and open space functions. Existing irrigation canals shall be used to the extent possible to remove excess stormwater. Retention-recharge basins should be located to best utilize natural drainage patterns.
- Policy HS-C.7 The County shall continue to participate in the Federal Flood Insurance Program by ensuring compliance with applicable requirements.
- Policy HS-C.8 During the building permit review process, the County shall ensure project compliance with applicable Federal Emergency Management Agency (FEMA) standards pertaining to residential and non-residential development in the floodplain, floodway, or floodway fringe.
- Policy HS-C.9 The County shall prohibit the construction of essential facilities in the 100-year floodplain, unless it can be demonstrated that the facility can be safely operated and accessed during flood events.
- Policy HS-C.10 The County shall require that all placement of structures and/or floodproofing be done in a manner that will not cause floodwaters to be diverted onto adjacent property, increase flood hazards to property located elsewhere, or otherwise adversely affect other property.
- Policy HS-C.11 The County shall encourage open space uses in all flood hazard areas. Land Conservation contracts and open space and scenic easements should be made available to property owners.
- Policy HS-C.12 The County shall consider dam failure inundation maps of all reservoirs in making land use and related decisions.

Policy HS-C.13 The County shall continue public awareness programs to inform the general public and potentially affected property owners of flood hazards and potential dam failure inundation.

## **IMPACTS AND MITIGATION MEASURES**

### **Method of Analysis**

This analysis is programmatic and largely qualitative in nature, since the development pattern resulting from implementation of the Proposed Project can only be approximated and cannot be predicted with precision. However, the analysis is based on the overall quantitative allocation of land use development between urban and rural areas, which allows a meaningful comparison of potential impacts with development impacts through the year 2020 without the Proposed Project.

The effects of development under the Draft General Plan are evaluated in the context of existing programs and regulations that address flood control. A primary consideration is the effectiveness of proposed General Plan policies in mitigating drainage and flooding impacts associated with incremental development, and in supporting comprehensive storm drainage and flood control programs implemented by other agencies.

### **Standards of Significance**

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

- substantially change absorption rates, drainage patterns, or the rate and amount of surface runoff, so that existing drainage capacity is exceeded;
- result in the construction of new or expanded storm drainage facilities, the construction or operation of which would cause potentially significant environmental effects; or
- expose people or property to flood hazards due to locating development within the 100-year flood plain as defined by FEMA or within an area subject to inundation due to dam failure.

### **Impacts and Mitigation Measures**

#### **4.5-3 Development under the Draft General Plan would increase potential downstream flooding through the addition of impervious surfaces and resulting increases in stormwater runoff from development sites, which could require expansion or construction of storm drainage facilities.**

Additional development accommodated under the Draft General Plan would increase the rates and volumes and alter the timing of stormwater runoff relative to existing conditions. Unless mitigated, this

increased runoff would result in potential downstream flooding impacts. Because the Draft General Plan would focus growth in existing urban areas, these potential impacts would mainly occur in existing cities and unincorporated communities. The runoff from more intensive urban development would be more concentrated compared with runoff from lower density development in the rural areas.

Draft General Plan Policies PF-E.1 through PF-E.11, PF-E.13, and PF-E.19 provide a comprehensive policy framework for ensuring that private development proposed in the unincorporated areas of the County minimizes incremental volume and rates of stormwater runoff, that flood control facilities be planned in a comprehensive manner and be installed in conjunction with or in advance of private development, and that new development be protected from flood hazard. When applied in conjunction with federal and State flood control efforts, and stormwater management initiatives carried out by local flood control districts, and development standards required in County ordinances, these policies would reduce the potential drainage and flooding impacts of development in the unincorporated areas of the County. Although the major urban centers such as Fresno-Clovis have comprehensive flood control facilities and programs as well as effective development requirements in place to mitigate the increased runoff, some of the other incorporated cities in Fresno County would not be as likely to ensure that increased downstream flooding potential from new development would be mitigated.

Increases in stormwater runoff resulting from incremental development under the Draft General Plan would require installation of stormwater drainage and flood control system improvements such as surface drainage channels, underground storm drains, pump stations, and retention basins. Since the precise nature and location of such improvements have not been established, the secondary impacts resulting from installation and operation of such improvements cannot be identified at this time.

Without the Draft General Plan, development through 2020 would result in relatively less urban growth and commensurately more rural residential development which would result in overall less on-site impervious coverage and greater opportunity for on-site percolation of rainwater and storm drainage. Thus the overall potential for drainage and flooding impacts would be lower without the Proposed Project. However, when effective implementation of urban drainage and flood control programs and development mitigation requirements is considered, along with the Draft General Plan policies that support and enhance those programs, there would be little difference in the net drainage and flooding impacts between the Proposed Project and development through 2020 without the Proposed Project. However, the relative impacts under the Draft General Plan may be slightly greater due to the increase in unmitigated downstream flooding potential from incremental development in some smaller cities, an impact which would not occur with development through 2020 without the Draft General Plan.

The County cannot ensure that similar storm drainage management policies and practices would be enforced for development in some incorporated cities in Fresno County, and the environmental effects of expanded or new storm drainage facilities are uncertain. Therefore, impacts related to the construction and operation of storm drainage facilities are considered **significant**.



### Mitigation Measures

- 4.5-3 *No mitigation is available beyond Draft General Plan Policies PF-E.1 through PF-E.11, PF-E.13, and PF-E.19 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Although Draft General Plan policies would provide for a coordinated approach to managing storm drainage in the unincorporated areas, the effects of expansion or construction of storm drainage facilities to accommodate future growth under the Proposed Project cannot be determined at this time.

In addition, although implementation of the measures addressed in the Draft General Plan policies would reduce impacts to less-than-significant levels for unincorporated areas within the County, implementation of such policies within the incorporated areas to address storm drainage is not within the County's jurisdiction to monitor and enforce. Therefore, the impact remains significant and unavoidable.

#### **4.5-4 Incremental development under the Draft General Plan could potentially expose new development to flood hazard, to the extent that development is sited within flood-prone areas associated with 100-year flooding.**

Any new development proposed within special flood hazard areas as delineated by FEMA on the FIRMs would be subject to the County's Flood Plain Management Ordinance, which specifies development standards to avoid flood damage and minimize loss of flood conveyance or storage volume. The application of this ordinance to new projects, together with the Draft General Policies PF-E.9 and HS-C.1 through HS-C.11 and HS-C.13, which provide a comprehensive approach to managing floodplain risks, and would minimize potential flooding impacts to new development in the unincorporated areas. The relatively greater increment of rural growth that would occur through 2020 without the Proposed Project would also be subject to the County's floodplain management ordinance and policies. There is some potential that siting of development in flood hazard areas could result in minor cumulative losses of flood conveyance and storage capacity. Draft General Plan Policies HS-C.5 and HS-C.10 require that the potential environmental effects of such losses would be accounted for in the sizing of downstream flood control facilities. Therefore, the Proposed Project would not result in any significant impacts with respect to exposure of new development in unincorporated areas to flood hazard or in terms of cumulative losses of flood conveyance and storage capacity due to incremental development in flood hazard areas.

The County's floodplain management ordinance would apply equally to new development that would occur with or without the Proposed Project. The only possible difference would be that the Draft General Plan would result in relatively more development within the incorporated cities not subject to County jurisdiction. If the community participates in the FEMA flood mapping and insurance program, development would be required to comply with FEMA regulations for development in special flood hazard areas. However, not all incorporated cities may be subject to FEMA regulations and may

not have floodplain management ordinances similar in scope to the County's that would call for flood protection of new development proposed in flood hazard areas. Because the County cannot compel the cities to develop ordinances or adopt policies similar to those identified in the Draft General Plan, people could be exposed to flooding hazards, which is considered a **significant impact**.

#### Mitigation Measure

4.5-4 *No mitigation is required beyond Draft General Plan Policies PF-E.9, and HS-C.1 through HS-C.11, and HS-C.13 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of the measures addressed in the Draft General Plan policies within the incorporated areas to address 100-year floodplain hazards would reduce impacts to less-than-significant levels. However, such measures are not within the County's jurisdiction to monitor and enforce. Therefore, the impact remains significant and unavoidable.

#### **4.5-5 Incremental development under the Draft General Plan could potentially expose new development to flood hazard, to the extent that development is sited within areas subject to dam failure inundation.**

As shown in Figure 9-8 in the *Background Report*, several locations within the unincorporated County (and some cities) are situated within areas that could be subject to flooding in the event of dam failure inundation. In particular, failure or overtopping of Friant Dam, Big Dry Creek Dam, Redbank-Fancher Creek Project Dam, and Pine Flat Dam could cause substantial flooding. For Friant Dam, recent (1997) studies have shown that a much larger portion of Fresno County could be inundated than previously described in the event of a worst-case scenario dam break. Other locations may also be subject to dam failure inundation from other upstream dams, but comprehensive studies to identify the risk and extent of flooding have not been completed.

Dam failure can result from a number of natural or human-made causes such as earthquake, erosion, improper siting, rapidly rising flood waters, and structural or design flaws. Flooding due to dam failure can cause loss of life and injury and damage to property and infrastructure. Dam failure would not be attributable to the Draft General Plan, but development of the Proposed Project would increase the number of people and structures that may be at risk in the unlikely event of dam failure. Such effects would occur with or without the Proposed Project.

The Division of Safety of Dams has specific requirements pertaining to dam operation, including inspections and implementation of corrective actions to correct deficiencies, and the California Government Code requires contingency plans for dam failure and evacuation. Fresno County has the responsibility for developing such plans for State-designated dams affecting unincorporated areas. The incorporated cities are responsible for preparing plans for State-designated dams affecting incorporated city areas. The plans should be updated every two years and submitted to the State Office of Emergency Services for review and comment. In addition, Draft General Plan Policies HS-C.2 and

HS-C.13 reinforce the need to comply with applicable dam safety regulations and related emergency response programs, and Policy HS-C.12 requires that dam failure inundated areas be considered during the development process. These policies, combined with policies that limit placement of structures in identified flood hazard areas along major channels (as described in Impact 4.5-4), would ensure that the number of people and structures that could be at risk of flooding from dam failure inundation would be minimized, regardless of whether development occurs within the cities or unincorporated areas. However, as noted above, not all areas subject to dam failure inundation have been clearly delineated, so it is possible that the siting of new development or adoption of emergency planning actions may not be in place in some locations within the County. Consequently, people could be exposed to increased risk of flood hazard. Therefore, impacts related to dam failure inundation would be considered **significant**.

#### Mitigation Measures

4.5-5 *No mitigation is required beyond Draft General Plan Policies HS-C.2, HS-C.12, and HS-C.13 for Fresno County. No mitigation measures are available to the County to reduce impacts occurring within the cities' jurisdiction.*

Implementation of Draft General Plan policies would reduce impacts in areas within the County's jurisdiction to less-than-significant levels. However, implementation of the Draft General Plan policies to address dam failure inundation hazards within the incorporated areas is not within the County's jurisdiction to monitor and enforce. Therefore, the impact would remain significant and unavoidable.

#### Cumulative Impacts

The cumulative context is county-wide development and adjacent areas with hydrologic connects to Fresno County through the year 2020. Because of the surrounding foothills, most of the Central Valley is hydrologically connected.

**4.5-6 Increased development density, industrial development, and incremental development overall under the Draft General Plan would increase demand for wastewater treatment and conveyance and would increase stormwater runoff from development sites, resulting in increased potential downstream flooding through the addition of impervious surfaces, and could expose new development in flood-prone areas.**

As discussed in Impacts 4.5-1 through 4.5-6, the project would contribute considerably to these impacts. Furthermore, the project and non-project development in Fresno County would contribute to flooding and water quality conditions elsewhere in the Central Valley, Coast Range and Sierra Nevada foothills, and the Sierra Nevada.

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. 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. Because the effect of expansion or construction of wastewater treatment facilities, drainage control facilities, and the concomitant impact on water quality cannot be determined, these impacts are considered **significant**.

#### Mitigation Measure

4.5-6 *None available beyond Draft General Plan Policies PF-A.2, PF-A.3, PF-C-25, PF-C.27, PF-C.29, PF-D.1, PF-D.2, PF-D.4 through PF-D.7, PF E.1 through PF-E.11, PF-E.13, PF-E.19, LU-A.9, LU-B.7, LU-E.9, LU-E.22, HS-C.1 through HS-C.13, OS-A.20, and OS-A.26.*

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.