

## 4.8 HYDROLOGY AND WATER QUALITY

This chapter discusses hydrology and water quality in Butte County and evaluates the potential impacts resulting from the spatial location of development that would be allowed by General Plan 2030. Water quality, groundwater, drainage, stormwater and flood hazards are assessed.

### A. *Regulatory Framework*

This section summarizes key federal, State, and local agencies, plans, programs, policies and regulations that address hydrology and water quality in Butte County.

#### 1. **Federal Agencies, Programs, and Regulations**

##### a. Federal Emergency Management Agency<sup>1</sup>

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection is established by FEMA. FEMA's minimum level of flood protection for new development is the 100-year flood event, also described as a flood that has a 1percent chance of occurring in any given year.

##### b. Clean Water Act

The US Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) of 1972 is the primary federal law that governs and authorizes water quality control activities by the EPA as well as individual states. Various elements of the CWA address water quality, and they are discussed below. Wetland protection elements administered by the US Army Corps of Engineers under Sec-

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<sup>1</sup> Federal Emergency Management Agency's website. <http://www.fema.gov/hazard/flood/index.shtm>, accessed on September 8, 2009.

tion 404 of the CWA, including permits to dredge or fill wetlands, are discussed in Section 4.4, Biological Resources, of this EIR.

Under Section 401 of the CWA, an applicant for a Section 404 permit to discharge dredged or fill material into waters of the United States must first obtain a certificate from the appropriate State agency stating that the fill is consistent with the State's water quality standards and criteria. In California, the authority to either grant water quality certification or waive the requirement is delegated by the State Water Resources Control Board (SWRCB) to the nine Regional Water Quality Control Boards (RWQCBs). Butte County is within the Central Valley RWQCB (Region 5).

Under federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question and (2) criteria that protect the designated uses. Section 304(a) requires the EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, the EPA has designated the SWRCB and its RWQCBs with authority to identify beneficial uses and adopt applicable water quality objectives.

c. National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States. Federal NPDES permit regulations have been established for broad categories of discharges, including point-source municipal waste discharges and nonpoint-source stormwater runoff. NPDES permits generally identify effluent and receiving water limits on allowable concentrations and/or mass emissions of pollutants contained in the

discharge; prohibitions on discharges not specifically allowed under the permit; and provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring and other activities.

d. National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers Act was established in 1968 to maintain the natural beauty, biology and wildness of designated “wild,” “scenic,” or “recreational” rivers threatened by the construction of dams, diversions and canals. The Act seeks to preserve these designated rivers in their free-flowing condition and protect their immediate environments for the benefit and enjoyment of present and future generations.<sup>2</sup>

A 77.6-mile portion of the Middle Fork of the Feather River has federal Wild and Scenic River status. This river is located within the boundaries of the Plumas National Forest. The wild and scenic designation covers 24,000 acres, generally within a 1/8- to 1/4-mile band along the river, and extends from Beckworth in the Sierra Valley (Plumas County) to Lake Oroville. Approximately 10.5 miles of this wild and scenic river flow through Butte County. The river represents a unique free-flowing stream that is the only charter member of the National Wild and Scenic River System in California.

In addition, a 7-mile segment of the Fall River, entirely located in Butte County between Nelson’s Crossing and Lake Oroville, is eligible for Wild and Scenic River status. This segment of the Fall River meets the Wild and Scenic criteria, and suitability for official designation will be made based on a future study to be conducted by the Plumas National Forest.

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<sup>2</sup> Cornell University Law School’s website. [http://www.law.cornell.edu/uscode/html/uscode16/usc\\_sec\\_16\\_00001271----000-.html](http://www.law.cornell.edu/uscode/html/uscode16/usc_sec_16_00001271----000-.html), accessed on September 8, 2009.

## 2. State Plans, Policies, and Regulations

### a. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) of 1969 is California's statutory authority for the protection of water quality. Under the Act, the State must adopt water quality policies, plans and objectives that protect the State's waters for the use and enjoyment of the people. The Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans). Basin Plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives and implementation programs are established for each of the nine regions in California. Butte County falls under the Basin Plan for the Sacramento River and San Joaquin River Basins.

The Act also requires waste dischargers to notify the RWQCBs of their activities through the filing of Reports of Waste Discharge (RWD) and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals.<sup>3</sup>

### b. State Regulatory Agencies

In California, the SWRCB has broad authority over State water quality control. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the CWA. Other State agencies with jurisdiction over water quality regulation in California include the California Department of Public Health for drinking water regulations, the California Department of Pesticide Regulation, the California Department of Fish and Game (DFG), and the Office of Environmental Health and Hazard Assessment.

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<sup>3</sup> Porter-Cologne Water Quality Act's website. <http://ceres.ca.gov/wetlands/permitting/porter.html>, accessed September 8, 2009.

Regional authority for planning, permitting and enforcement is delegated to the nine RWQCBs. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. As noted above, Butte County is within the jurisdiction of the Central Valley RWQCB.

The RWQCBs also run the Irrigated Lands Regulatory Program, which regulates discharges from irrigated agricultural lands. Its purpose is to prevent agricultural discharges from impairing the waters that receive the discharges. To protect these waters, RWQCBs have issued conditional waivers of waste discharge requirements to growers that contain conditions requiring water quality monitoring of receiving waters and corrective actions when impairments are found.

c. California Fish and Game Code

The DFG protects streams, water bodies and riparian corridors through the streambed alteration agreement process under Section 1601 to 1606 of the California Fish and Game Code. The Fish and Game Code stipulates that it is “unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake” without notifying the Department, incorporating necessary mitigation and obtaining a streambed alteration agreement. DFG’s jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

d. Flood Control Legislation

New State regulations require protection from the 200-year flood event in specific areas as defined in Government Code Section 65007. According to recent legislation as part of Senate Bill (SB) 5 (Machado and Walk), SB 17 (Florez) and Assembly Bill (AB) 162 (Wolk), urban and urbanizing areas in the Sacramento Valley and San Joaquin Valley will be required to achieve, or make adequate progress toward achieving, 200-year protection by the year 2015 to continue to approve development in the floodplain. Specifically, AB 162 requires that each local jurisdiction’s Safety Element include 200-year floodplain maps. Maps must be based on the best available data on flood pro-

tection, including areas protected by State and federal project levees, and areas outside of these areas. Maps are being prepared by the California Department of Water Resources.<sup>4</sup>

### 3. Butte County Programs and Regulations

#### a. Integrated Water Resources Plan

Butte County adopted an Integrated Water Resources Plan (IWRP) that establishes water management policies and priorities, as well as programs and projects to implement those policies. The policies focus on local water resource issues and cooperative water management with other entities. The IWRP sets the stage for many of the County's water planning efforts.

#### b. Groundwater Management Plan

Butte County adopted a county-wide Groundwater Management Plan pursuant to AB 3030. The policy goals of the Groundwater Management Plan include minimizing the long term draw down of groundwater levels, protecting groundwater quality, preventing land surface subsidence, minimizing the effect of groundwater pumping on surface water flows and evaluating groundwater replenishment projects.

#### c. Groundwater Conservation Ordinance

In November 1996, Butte County voters approved the Groundwater Conservation Ordinance (Chapter 33 of the Butte County Code), which is intended to conserve groundwater by regulating water transfers outside of the county that have a groundwater component. It requires a permit for both exportation of groundwater outside the county and groundwater pumping as a substitute for surface water exported outside the county. It prohibits permits for water transfers outside of the county if the proposed activity would adversely affect the groundwater resources in the county, including causing or increasing overdraft of the groundwater, causing or increasing saltwater intrusion, exceeding the safe yield of the aquifer or related subbasins within the county,

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<sup>4</sup> Best Available Maps can be found at the California Department of Water Resources website at [http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best\\_available\\_maps/](http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best_available_maps/).

causing subsidence, or resulting in uncompensated injury to overlying groundwater users or other users.

d. Groundwater Management Ordinance

The Groundwater Management Ordinance (Chapter 33A of the Butte County Code) includes the development and monitoring of basin management objectives (BMOs) associated with groundwater levels, groundwater quality, and land subsidence. The BMO concept is an important component to Butte County's groundwater management planning. The BMOs consist of locally-developed guidelines for acceptable groundwater conditions (i.e. elevation, quality and land subsidence). The BMO program is built on a foundation of scientific data and analysis, and therefore monitoring historic and current groundwater elevations, water quality and subsidence data are key components of the program.

e. Stormwater Management Program

Butte County operates under a Small Municipal Separate Storm Sewer Systems (Small MS4) permit as required by Phase II of the NPDES, and which currently covers the urbanized area around the City of Chico. In order to fulfill the requirements of the permit, Butte County developed and implemented a Stormwater Management Program in 2003. The program is managed at the State level by the SWRCB under a permit from the EPA. The program includes the following core elements:

- ◆ Public education and outreach.
- ◆ Public participation and involvement.
- ◆ Illicit discharge detection and elimination.
- ◆ Construction site stormwater runoff control.
- ◆ Post-construction stormwater management in new development and re-development.
- ◆ Pollution prevention for County operations and facilities.

The program also includes descriptions of Best Management Practices (BMPs) to address specific activities identified in the regulations, such as illicit discharge. The Department of Public Works and the Development Services De-

partment are responsible for planning, inspection, enforcement, and permit clearances for construction projects in the county. The Department of Public Works is responsible for the County's stormwater drainage system.

f. Butte County Well-Spacing Ordinance (Chapter 23B)

The Well-Spacing Ordinance identifies procedures for the proper construction and placement of water wells, as well as appropriate techniques for retiring out of commission wells. To reduce the risk of depleting the county's groundwater resources, the Ordinance requires that wells of an engineered pumping capacity of 1,000 gallons per minute or greater must be located no closer to another well than the distances provided in Table 4.8-1, below. The Ordinance also makes clear that retired wells must be sealed to reduce the risk of shallow water contamination into a deep aquifer. Sealing a retired well must be sufficient to exclude water from 50 feet below ground to the surface.

g. Stormwater Management and Discharge Control Ordinance

Butte County adopted the Stormwater Management and Discharge Control Ordinance under Chapter 50 of the Butte County Code. The Ordinance provides the County with the legal authority to enforce various stated goals regarding water pollution to protect and enhance public health and the environment.

h. Butte County Wastewater Ordinance

The Butte County Division of Environmental Health is responsible for permitting and inspection of on-site wastewater systems. Butte County's Wastewater Ordinance regulates individual on-site wastewater treatment and disposal systems within unincorporated areas of the county. However, to help address failing wastewater systems, and improve the practices and requirements for new construction, the County is in the process of updating its On-Site Wastewater Ordinance. The proposed Ordinance would update and replace existing regulations in order to be more consistent with applicable requirements of the Central Valley Regional Water Quality Control Board (Basin Plan) and to incorporate other changes based on the current state of knowledge and advances in practices and technologies for on-site wastewater

TABLE 4.8-1 **WELL SPACING REQUIREMENTS IN BUTTE COUNTY**

Engineered Pumping Capacity (Gallons per Minute)	Well Spacing Requirement (Feet)
1,000	450
2,000	1,150
3,000	1,700
4,000	2,200
5,000	2,600
Greater than 5,000	Variance shall be required

Source: Butte County Code, Chapter 23B-5c.

treatment and dispersal. In particular, the proposed Ordinance would establish minimum requirements for soil suitability in the locations of proposed wastewater systems. It would also provide a broader range of treatment and dispersal technologies to overcome limiting soil and groundwater constraints. The updated Ordinance has been developed and is currently undergoing public and environmental review. It would become effective when and if adopted by the County Board of Supervisors.

i. Flood Mitigation Plan

The Butte County Flood Mitigation Plan was prepared by the Butte County Office of Emergency Services (OES) and adopted in 2006. The overall purpose of the Plan is to provide guidance to agencies and the public responsible for and interested in protecting life, property and livestock, land use planning, administering the FEMA NFIP, and responding to flood emergencies within Butte County.

j. Flood Hazard Prevention Ordinance

The Butte County Flood Hazard Prevention Ordinance (Chapter 26, Article IV of the Butte County Municipal Code) requires the Department of Devel-

opment Services to review all applications for new construction or subdivisions within flood hazard areas, and requires that the lowest floor of any new construction or substantial improvement within Flood Zones A, AE, AH, and shaded Zone X be elevated 1-foot or more above the regulatory flood elevation. Applicants must also show that development within the floodplain will not raise the existing flood level in a manner that adversely affects any neighboring property.

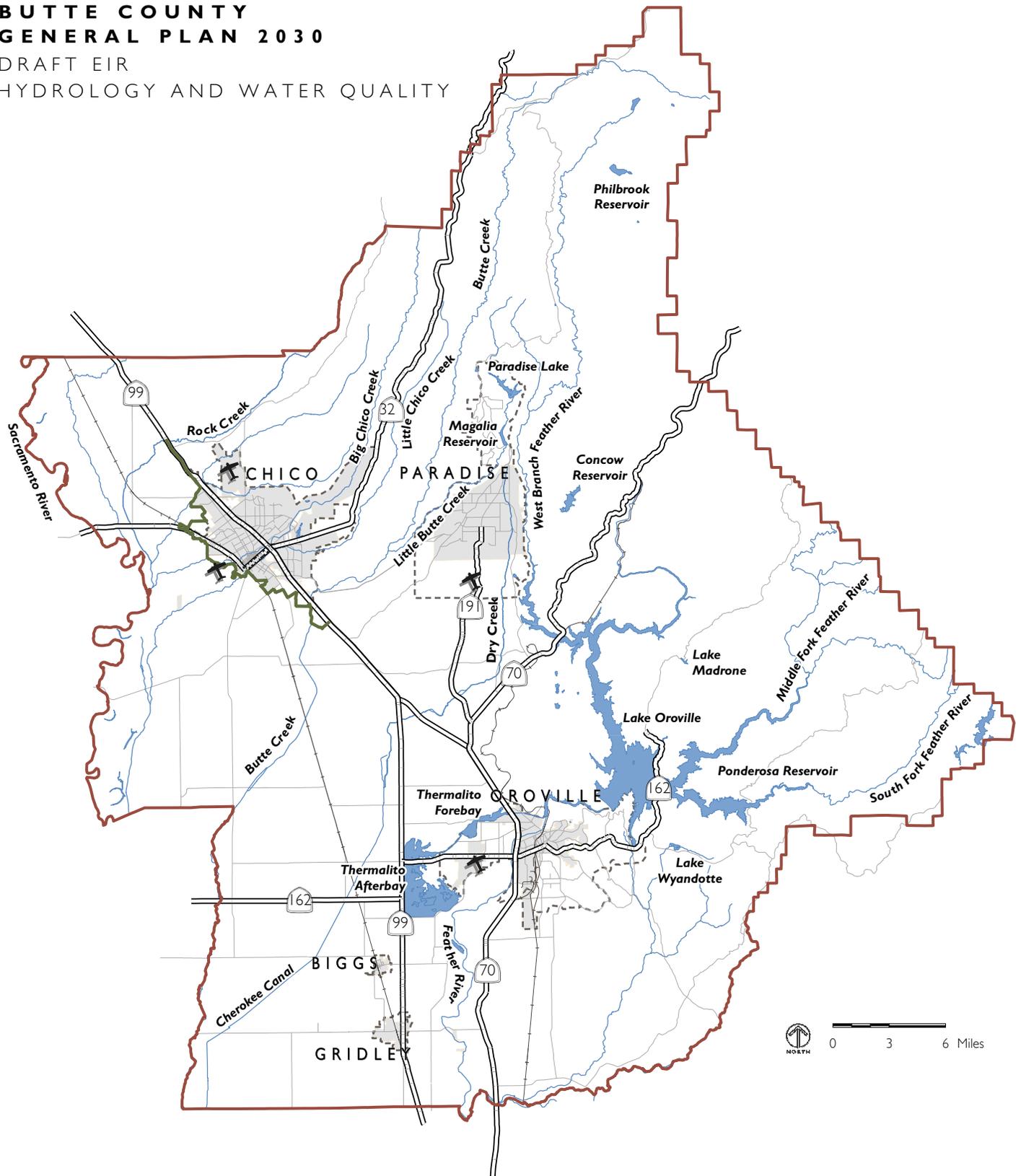
### *B. Existing Conditions*

Butte County is located in the Sacramento River Hydrological Region, which covers approximately 17 million acres (27,000 square miles) and extends from the Modoc Plateau and Cascade Range at the Oregon border south to the Sacramento-San Joaquin Delta. The region includes Sacramento River, the longest river system in California, and its tributaries. The Sacramento River Hydrological Region is the main water supply for many of California's urban and agricultural areas. Figure 4.8-1 provides an overview of the major surface water features in Butte County.

#### **1. Climate and Topography**

Surface water flows in Butte County and the Sacramento Basin are extremely variable, both seasonally and annually, although their partial dependence on annual snow melt tends to mitigate the seasonal variability. Butte County includes the geographic provinces of the Sacramento Valley, and the foothill and mountain areas of the Sierra Nevada and Cascade ranges. The mountainous portions of the county comprise approximately a third of the County's land area and function as the major watershed area, though the foothill areas also collect considerable precipitation. Precipitation in different portions of the county ranges from less than 20 inches of annual rainfall in the western valley area to over 80 inches in the eastern Cascades and Sierra Nevada mountains. Up to 4,000 feet above sea level, most of the precipitation falls as rain.

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Source: Butte County GIS, 2009.

- |  |                      |  |                     |
|--|----------------------|--|---------------------|
|  | Airports             |  | Railroad            |
|  | Greenline            |  | Major Roads         |
|  | Highways             |  | Sphere of Influence |
|  | Major Streams        |  | City/Town Limits    |
|  | Lakes and Reservoirs |  | County Boundary     |

FIGURE 4.8-1  
**SURFACE WATER FEATURES**

Above 4,000 feet, a considerable portion of winter precipitation occurs as snow. The precipitation pattern in Butte County varies by area of the county as well as by time of the year. Over half of the precipitation occurs between November and February.

In addition to seasonal variances, surface water flow is highly variable on a year-to-year basis. The Sacramento River Water Supply Index is an indicator of annual surface flow variability in the region. Based on the calculated runoff in million acre-feet (MAF), each year of the index is classified as wet, above normal, below normal, dry or critical. The annual variability for the northern Sacramento Valley is very pronounced, with wet years, dry years, and critically dry years occurring frequently.

## **2. Water Quality**

All land uses, whether undeveloped, agricultural, industrial or urban, have some type of water quality impacts. The most common water quality problems are erosion, sedimentation, and contamination.

### **a. Erosion and Sedimentation**

Erosion can be defined as the wearing away of the land surface by flowing water, waves, wind, or by such process as mass wasting and corrosion. Erosion leads to soil loss, degraded water quality, property damage, and increased danger from flooding. Erosion is directly related to slope steepness, and therefore the mountainous eastern portions of the county are most susceptible to erosion when heavy precipitation leads to significant stormwater runoff. Sediment eroded from these slopes is carried by creeks, streams, and rivers, and leads to increased murkiness in the water, known as turbidity. Once the waterway reaches a shallower gradient, the sediment is deposited.

Downstream impacts of soil erosion include sedimentation and degradation of water quality, such as increased turbidity and suspended sediment concentrations. Eroded soil contains nitrogen, phosphorous and other nutrients. When deposited in water bodies, these nutrients can trigger algal blooms that reduce water clarity, deplete oxygen, and create odors. Eroded sediments

may blanket fauna. The increased cloudiness from suspended sediments may also reduce photosynthesis that produces food supply and natural aquatic habitats. Eroded soil could also be deposited in local drainageways, possibly interfering with the natural flow of storm waters, causing or exacerbating flooding, or accelerating channel erosion.

b. Groundwater Contamination<sup>5</sup>

There are two large groundwater contamination plumes in Butte County: the Central Plume and the Southwest Plume. Both of these plumes are in the Chico area, originated from former dry cleaners, and involve perchloroethylene (PCE) groundwater contamination. Other groundwater contaminants of concern in Butte County include arsenic, chromium, copper, dioxin, and polynuclear aromatic hydrocarbons.

The Southwest Plume extends about 2 miles in length and seven blocks in width in the southwest portion of Chico. In 1991, 14 private wells were shut down due to PCE contamination. In 1992, a carbon treatment unit was installed in Well 46 near the center of the plume. At the initial installation, groundwater samples showed PCE concentrations as high as 38 parts per billion (ppb), which is significantly higher than California Department of Public Health Maximum Contaminant Level for Drinking Water of 5 ppb;<sup>6</sup> recent raw groundwater samples averaged concentrations of approximately 10 ppb, and samples of treated water detected no PCE. Treatment is expected to continue.

The Central Plume is the largest groundwater plume in Butte County, measuring approximately 1 by 1.5 miles in size, and located in Chico's downtown area. PCE concentrations have been as high as 2,900 ppb, causing two public

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<sup>5</sup> Department of Toxic Substance Control, Envirostor website, <http://www.envirostor.dtsc.ca.gov/public/>, accessed October 2, 2009.

<sup>6</sup> California Department of Public Health, November 2008, *Maximum Contaminant Levels and Regulatory Dates for Drinking Water, US EPA vs California*, available at <http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>.

wells to be closed by the California Water Service Company in 1990. In July of 1995, the California Department of Toxic Substances Control (DTSC) installed a well and pump, which continue to remove a significant amount of PCE from the groundwater. A Final Remediation Action Plan for the Central Plume was approved by DTSC on June 21, 2007.

Nitrate contamination of groundwater can be caused by septic tank discharges, as has been documented in the Chico area of Butte County. A Nitrate Action Plan was developed by the County in the mid-1980s, later superseded by the Nitrate Compliance Plan, which was adopted by the Board of Supervisors on September 25, 2001. The Plan provides for case-by-case evaluation of non-residential septic systems and recognizes that sewer connection may not be practical or feasible in all cases.

### **3. Groundwater Supply and Recharge**

Approximately 75 percent of the County's residential water supply is extracted from groundwater. The availability of groundwater in an area depends largely upon its geologic, hydrologic, and climatic conditions. In Butte County, reserves of groundwater are found in the thick sedimentary deposits of the Sacramento Valley and the mountainous areas to the east and north. Groundwater is found in perched, unconfined and confined zones in the valley portion of Butte County. Perched groundwater zones are most common in shallow, consolidated soils with low permeability. Major portions of groundwater are unconfined or semi-confined, occurring in floodplain and alluvial fan deposits. High permeability in these soils yields large amounts of water to shallow domestic and irrigation wells. The Tuscan Formation contains an important deep aquifer that is theorized to underlie most of the valley area. Confined water occurs in the Tuscan and Laguna Formations, and in the younger alluvium, where it is overlain by flood basin deposits. Although moderate amounts of water are yielded from the fine-grained strata of the Laguna Formation, permeable sand and gravel zones are infrequent and minor in extent and thickness. The highest producing well in alluvial uplands occur when older alluvium or the deeper Tuscan volcanic rocks are tapped. Groundwater can also be found in more limited amounts in mountainous

areas of the county within volcanic, metamorphic, and granitic rock with a total volume of water stored estimated to be less than 2 percent of the rock volume. Figure 4.8-2 illustrates the groundwater basin and subbasins within Butte County.

The major sources of groundwater recharge in Butte County are percolation of rainfall, infiltration from streams, subsurface inflow, and deep percolation of applied irrigation water in agricultural areas. Subsurface inflow from higher elevations and percolation of precipitation are the major sources of groundwater recharge in the mountain areas. Some recharge probably occurs adjacent to through-flowing streams in areas of deeper soils or alluvial deposits. Deep subsurface inflow occurs in mountainous areas, flowing west to recharge the adjacent valley area. Most of this recharge occurs on alluvial fans where streams have sustained flow and the soil is highly permeable. Of the 3.77 MAF of annual rainfall, less than half is used.<sup>7</sup> Therefore, more than 2 MAF are currently available for recharge or discharge via surface and subsurface outflow, although this amount will not always be available.

In areas with clay soils or buried hardpan layers, high rates of surface runoff and ponding of water indicate locations where infiltration rates are low. Infiltration of surface runoff does occur at the basin margin where Tuscan and fanglomerate rocks are overlain by valley deposits.

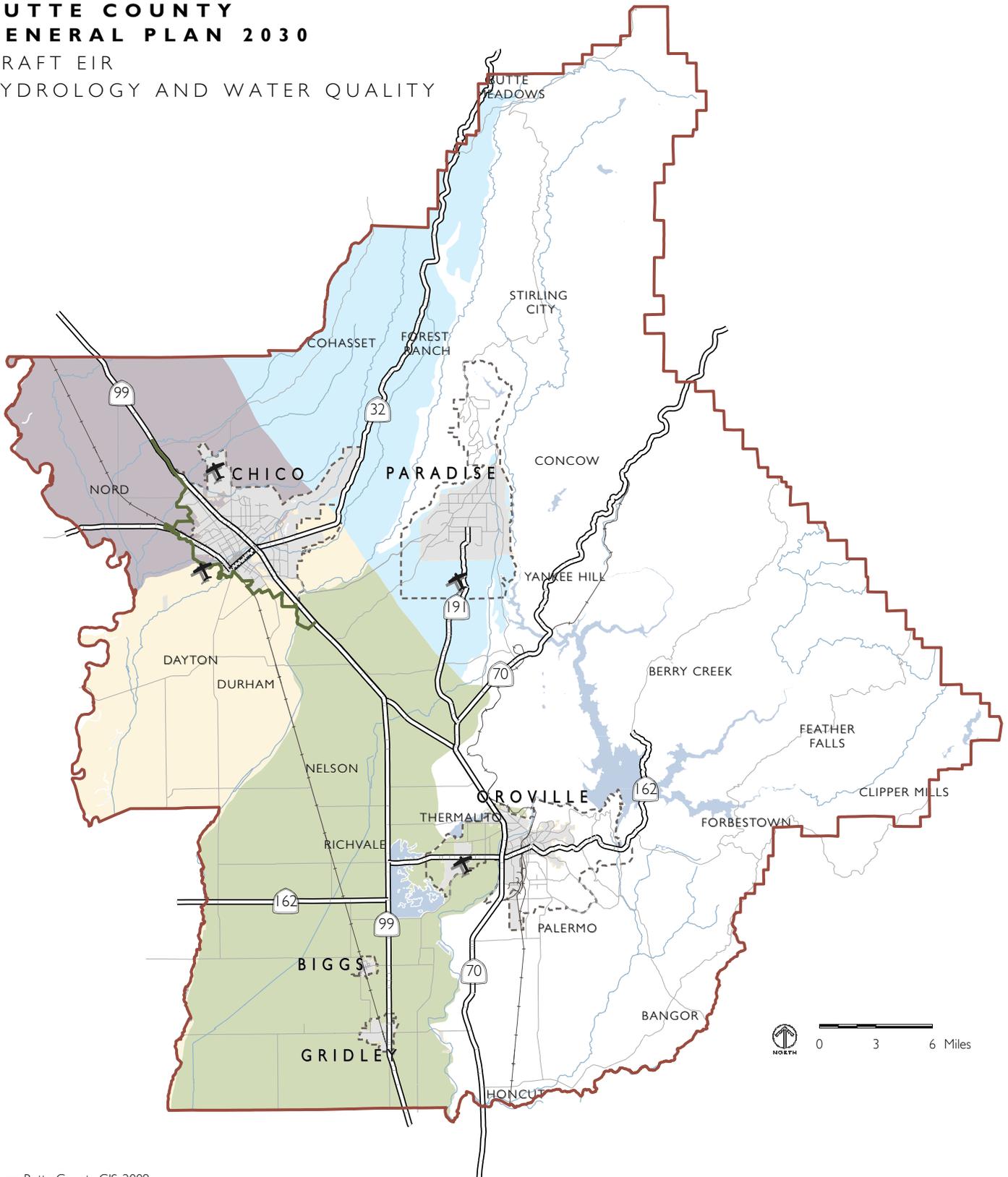
#### **4. Stormwater**

When precipitation falls onto the ground surface, it naturally infiltrates into the ground, and when the ground is saturated, it runs off as surface flow. Stormwater in Butte County is currently conveyed through a system of ditches, culverts and underground storm sewers to regional waterways. Stormwater that falls on impervious surfaces such as roads, driveways and parking lots picks up residual pollution such as oil, sediment, and trash. These materials are then washed into waterways and pollute the rivers and

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<sup>7</sup> Butte County, August 8, 2005, *General Plan Technical Update Background Report*, page 12-16.

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Source: Butte County GIS, 2009.  
Note: Groundwater in the eastern portion of the county is found in limited amounts within volcanic, metamorphic, and granite rock.

- |   |           |                     |
|---|-----------|---------------------|
| <b>Sacramento Valley Groundwater Basins</b> | Airports  | Major Roads         |
| East Side Basin                             | Greenline | Sphere of Influence |
| East Butte Subbasin                         | Highways  | City/Town Limits    |
| Vina Subbasin                               | Railroad  | County Boundary     |
| West Butte Subbasin                         |           |                     |



FIGURE 4.8-2  
**GROUNDWATER BASINS AND SUBBASINS**

reservoirs of Butte County and other downstream receiving waters. In addition, stormwater runs off impervious surfaces at a faster rate than off of soil or natural surfaces. Increased rates stormwater runoff can result in hydro-modification of downstream waterways through eroded streambanks and deeply cut creek channels.

Annual runoff in the Sacramento River Hydrologic Region averages about 22.4 MAF, which is nearly one-third of the State's total natural runoff. Major water supplies in the region are provided through surface storage reservoirs. Annually, municipal, industrial, and agricultural water usage in the region is about 8 MAF, with about 5.5 MAF coming from surface water sources, and groundwater providing about 2.5 MAF. A substantial portion of the remainder of the total runoff goes to dedicated natural flows, including in-stream fishery flows and flushing flows in the Sacramento Delta.

## 5. Flooding Hazards

### a. Surface water

Butte County has historically been subject to flooding from various rivers and creeks, most particularly from the Feather and Sacramento Rivers. The County completed an assessment of flood hazards as part of the Butte County Flood Mitigation Plan. The following are the principal flood hazard areas in Butte County:

- ◆ Butte Creek
- ◆ Little Chico Creek
- ◆ Little Chico Creek Diversion
- ◆ Mud Creek
- ◆ Ruddy Creek and Ruddy Creek Tributary
- ◆ Sycamore Creek
- ◆ Wyman Ravine and Tributaries
- ◆ Comanche Creek

In addition to the hazard areas listed above, flooding in Rock Creek and Keefer Slough, located north of Chico, occurred on several occasions in the 1980s, 1990s, and 2000s, inundating State Routes 99 and 32 and several

County roadways, as well as impacting extensive residential and agricultural areas around Chico and the unincorporated community of Nord.

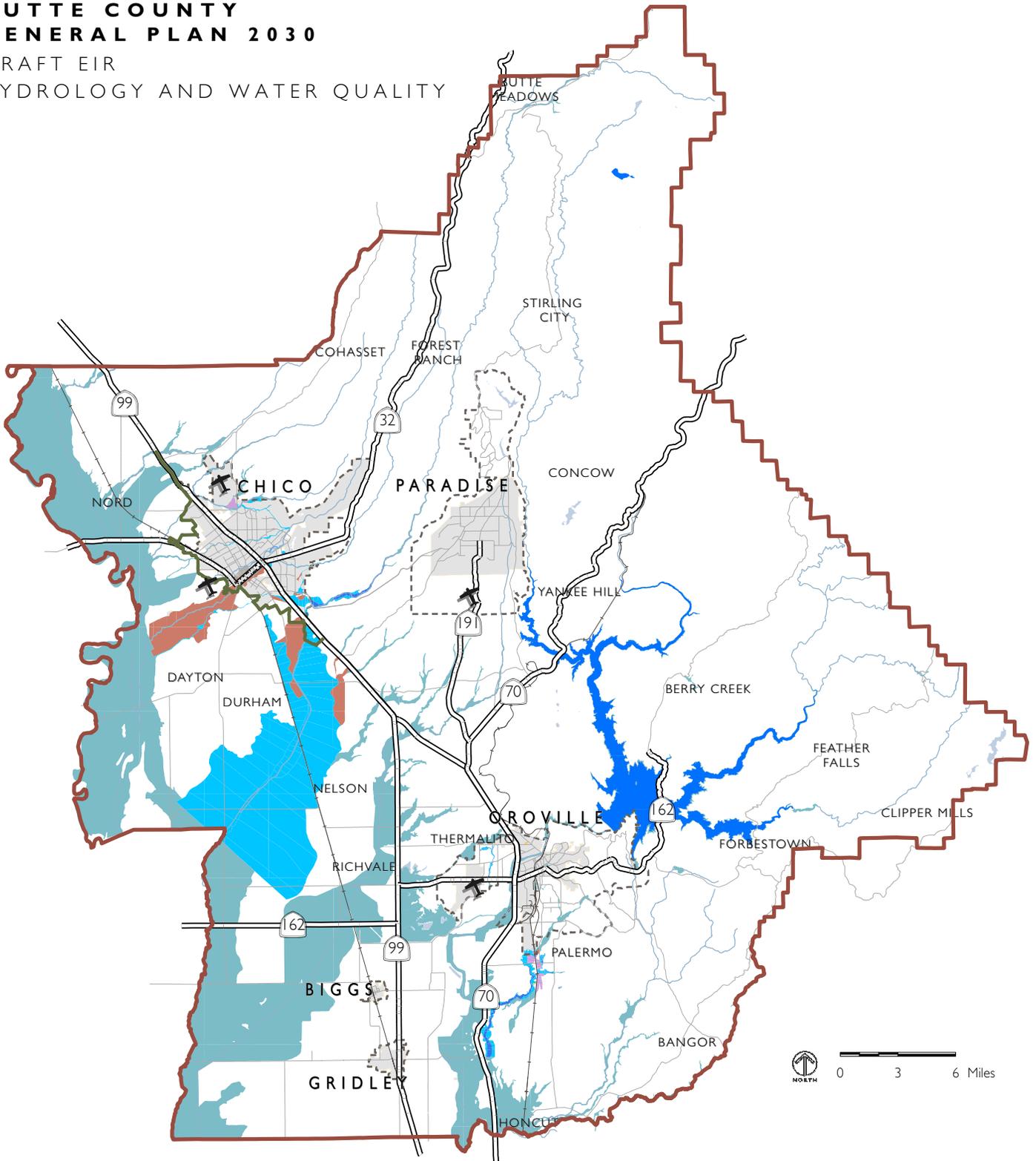
Figure 4.8-3 shows the current FEMA FIRM map for Butte County. FEMA mapping of flood hazards for all of Butte County has been completed with the most accurate and up-to-date information derived from the 2006 Butte County Flood Mitigation Plan. The Flood Mitigation Plan uses information from year 2000 FEMA data. As of March 2010, FEMA is the process of providing an updated FIRM.

b. Dam Inundation

Any dam poses a potential risk of failure, which would most likely be caused from seismically induced ground shaking or other seismic events, and which threatens the area below the dam with inundation. Since 1972, the State has required inundation maps for most dams, showing those areas within the potential dam failure inundation zone. Major dam inundation areas in Butte County are shown in Figure 4.8-4. Most of the dams in and around Butte County would affect a relatively small local inundation area. However, the failure of the Oroville Dam or Thermalito Afterbay Dam, although considered unlikely, would have the potential to inundate a substantial portion of southwestern Butte County. In addition, the western edge of the county is within the inundation areas of the Shasta, Black Butte, and Whiskeytown Dams.

In 1992, Harlan Tate Associates studied the Magalia Dam and found the upstream slope of the dam to have inadequate stability under seismic loading conditions. As of 2003, the water level in the reservoir was lowered 25 feet due to seismic stability concerns. The County is undertaking preliminary engineering on a project to widen the Skyway across Magalia Dam. The Paradise Irrigation District's preferred alternative for the widening project involves stabilizing the dam and would permit the restoration of the design water level behind Magalia Dam.

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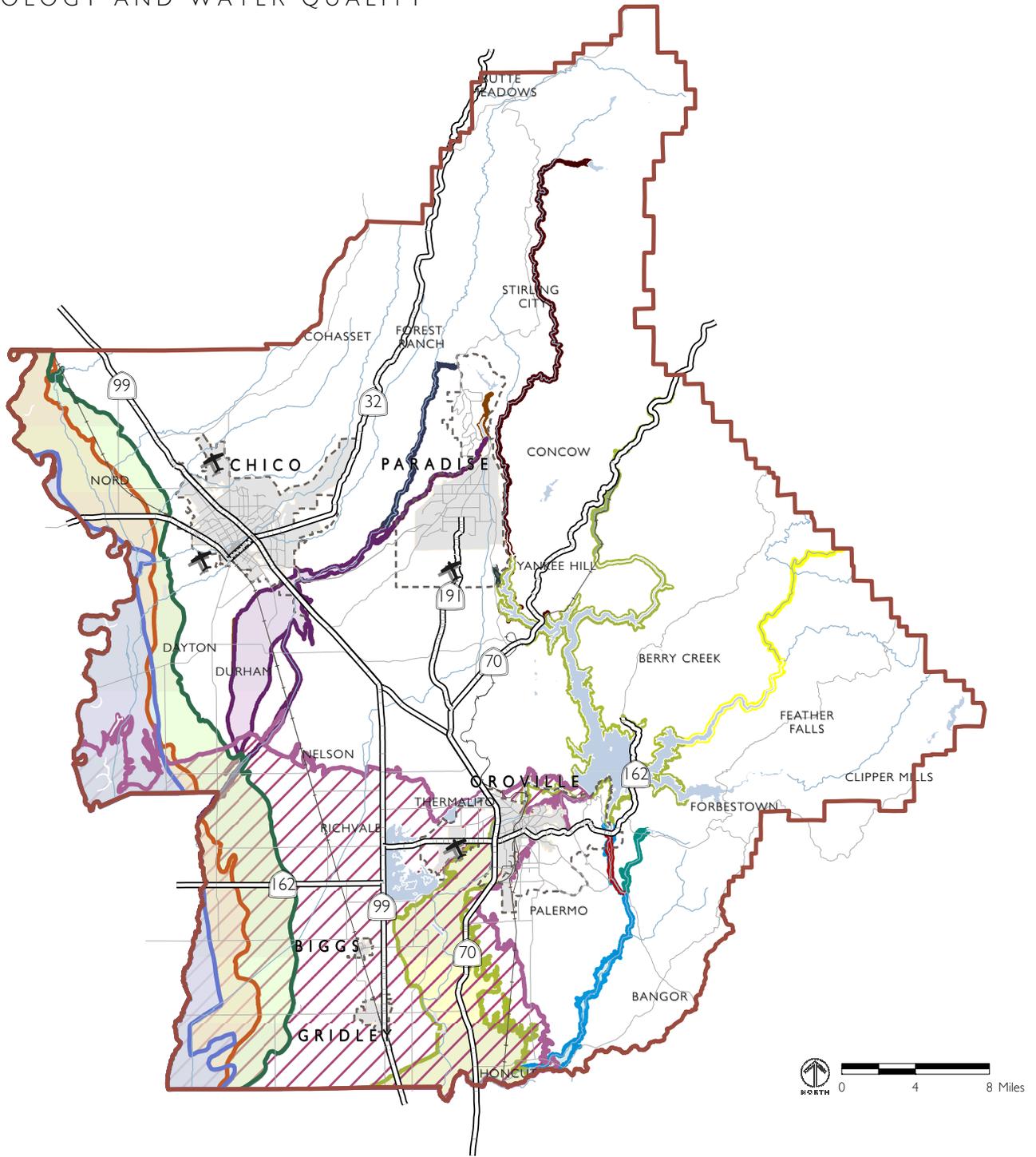
- |                     |  |
|---------------------|--|
| County Boundary     | A: No base flood elevations determined.  |
| Airports            | AE: Base flood elevations determined.  |
| Greenline           | AE-F: Floodway base flood elevation determined.  |
| Highways            | AH: Flood depths of 1 to 3 feet (usually areas of pondings); base flood elevations determined.   |
| Railroad            | AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.  |
| Major Roads         | X (500): Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. |
| Sphere of Influence |  |
| City/Town Limits    |  |
| Lakes               |  |

Source: FEMA FIRM designations. FEMA is in the process of updating this information. This map reflects the most current available data as of the publication of the Draft EIR 2030 in December 2009.

FIGURE 4.8-3

**CURRENT FEMA FLOOD ZONES**

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Sources: Butte County Geographic Information Systems, 2009; California Office of Emergency Services, 2006.



FIGURE 4.8-4  
**DAM INUNDATION AREAS**

### *C. Standards of Significance*

General Plan 2030 and the ALUCP override would have a significant hydrology or water quality impact if they would:

- ◆ Violate any water quality standards or waste discharge requirements.
- ◆ Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a significant lowering of the local groundwater table level.
- ◆ Substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion, siltation or flooding on- or off-site.
- ◆ Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

Provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality.

- ◆ Place occupied development within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- ◆ Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- ◆ Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- ◆ Potentially be inundated by seiche, tsunami, or mudflow.

### *D. Impact Discussion*

The following discussion provides an analysis of potential project and cumulative hydrology and water quality impacts that could occur as a result of implementation of General Plan 2030. Implementation of the ALUCP override

would have no hydrology or water quality impact in Butte County, and is not discussed further in this section.

### **1. Project Impacts**

#### **a. Violate any water quality standards or waste discharge requirements.**

Development allowed by General Plan 2030 could degrade water quality in Butte County. An increase in non-point-source pollution could result from covering undeveloped land with impervious surfaces such as pavement and buildings. Construction activities could expose bare ground to the erosive forces of wind and water, which could lead to increased sediment loads in downstream receiving waters. The additional traffic anticipated within Butte County would mean increased potential for oil, grease, and other contaminants to accumulate on road surfaces and in roadside gutters. Some development allowed by General Plan 2030 is likely to use solvents, lawn chemicals, paint, petroleum products, metals, and other materials which could potentially accumulate on parking lots and other paved surfaces. All of these materials may be carried to rivers and other water bodies by surface runoff during rainstorms. In addition, agricultural activities, including livestock operations, can adversely affect water quality through excess fertilizer, pesticides, and animal waste. Recreational activities, such as boating, can lead to minor impacts on water quality.

However, General Plan 2030 contains policies that address water quality standards and waste discharge requirements. Water Resources Element Goal W-1 and its associated policies seek to maintain and enhance water quality. Specifically, Policy W-P1.2 directs the County to cooperate with State and local agencies in efforts to identify and eliminate or minimize all sources of existing and potential point and non-point sources of pollution to ground and surface waters, including leaking fuel tanks, discharges from storm drains, auto dismantling, dump sites, sanitary waste systems, parking lots, roadways, and logging and mining operations. Policy W-P1.8 requires agriculture, logging, mining, recreational vehicle use, and other open space uses to follow best management practices to minimize erosion and protect water resources. Pol-

icy P1.11 requires enforcement of grading and construction regulations to minimize erosion and urban stormwater runoff pollution.

In addition, policies under Goal W-5 protect water quality through effective stormwater management. Specifically, Policy W-P5.2 requires that new development identify and adequately mitigate its water quality impacts from stormwater runoff, and Policy W-P5.4 requires that temporary facilities be installed as necessary during construction activities in order to adequately treat stormwater runoff from construction sites.

The General Plan policies discussed above, in conjunction with the Butte County Stormwater Management Program, Butte County Stormwater Management and Discharge Control Ordinance, and other State and federal regulations discussed in Section A, would reduce water quality impacts to a *less-than-significant* level.

- b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a significant lowering of the local groundwater table level.

Some urban development and agricultural uses allowed by General Plan 2030 would use groundwater. In addition, new construction could include impervious surfaces, which would decrease the amount of land area available for rainfall to infiltrate into the ground and recharge the underlying water table.

However, General Plan 2030 contains actions and policies designed to maintain groundwater supplies and sustain groundwater resources. Water Resources Element Policy W-P2.9 requires that applicants for new major development projects demonstrate adequate water supply to meet the needs of the project, including an evaluation of potential cumulative impacts to surrounding groundwater users and the environment. Policy W-P3.1 directs the County to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, through a basin management objective program that relies on management at the local level, utilizes sound scientific data, and assures compliance. Policy

W-P3.1 is being implemented through the Groundwater Management Ordinance (Chapter 33A of the Butte County Code). Policy W-P3.2 requires that groundwater transfers and substitution programs be regulated to protect the sustainability of the county's economy, communities, and ecosystem. Policy W-P3.2 is being carried out through the Groundwater Conservation Ordinance (Chapter 33 of the Butte County Code). Policy W-P4.6 requires that new development adopt best management practices for water use efficiency and demonstrate specific water conservation measures, and Policy W-P4.7 requires that County facilities adopt water conservation measures and, when appropriate, retrofit existing facilities. Finally, Action W-A3.5 directs the County to continue to seek funding for and conduct scientific analysis of the costs and water supply impacts of increased groundwater pumping.

General Plan 2030 also contains policies and actions designed to promote groundwater recharge and minimize impervious land cover. Policy W-P3.3 protects groundwater recharge and groundwater quality in new development projects. Action W-A3.1 directs the County to seek funding for and conduct comprehensive, countywide mapping of water resources and groundwater recharge areas, and Action W-A3.2 directs the County to develop standards to preserve groundwater recharge and protect groundwater quality. In addition, Policy W-P1.4 encourages Low Impact Development, which minimizes impervious surfaces, minimizes runoff and pollution, and incorporates best management practices. Conservation and Open Space Element Policy COS-P1.4 encourages new development to provide above-ground and natural stormwater facilities and use building designs and materials that promote groundwater recharge.

The General Plan policies and actions discussed above, in conjunction with the Butte County Integrated Water Resource Plan, Butte County Groundwater Management Plan and other State and federal regulations discussed in Section A, would reduce groundwater impacts to a *less-than-significant* level.

- c. Substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion, siltation or flooding on- or off-site.

Alterations to drainage patterns during and following construction allowed by General Plan 2030 have the potential to result in construction-related increased runoff and erosion problems. In addition, increased stormwater runoff resulting from increased impervious surfaces can create erosive velocities and higher bank shear stress, which can ultimately cause bank and bed erosion and/or sedimentation in drainages and streams. Minor increases in tributary flows can also exacerbate creek bank erosion and/or cause destabilizing channel incision by altering the so-called “channel-forming” flow. Bank instability and bank failure often occurs in urban drainage systems where the “channel-forming” flow has been substantially altered.

However, General Plan 2030 includes policies designed to minimize the impact of erosion, siltation and flooding as a result of site drainage alteration. The Water Resources Element addresses construction-related impacts through Policy W-P5.4, which requires that temporary facilities be installed as necessary during construction activities in order to adequately treat stormwater runoff from construction sites. In addition, Policy W-P1.7 requires that agriculture, logging, mining, recreational vehicle use, and other open space uses follow best management practices to minimize erosion and protect water resources. Policy W-P6.1 requires that any alteration of natural channels for flood control retain and protect riparian vegetation to the extent possible while still accomplishing the goal of providing flood control. Where removing existing riparian vegetation is unavoidable, the alteration must allow for reestablishment of vegetation without compromising the flood flow capacity. Policy W-P6.2 requires that, where streambanks are already unstable, proponents of new development prepare a hydraulic and/or geomorphic assessment of on-site and downstream drainageways that are affected by project area runoff.

In addition, the Health and Safety Element addresses the impact of development on drainage through Policy HS-P3.1, which requires that watersheds be

managed to minimize flooding by minimizing impermeable surfaces, retaining or detaining stormwater, and controlling erosion. Furthermore, Policy HS-P3.2 requires that applicants for new development provide plans detailing existing drainage conditions and specifying how runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility and provide that there will be no increase in the peak flow runoff to said channel or facility. Policy HS-P3.3 requires that all development include stormwater control measures and site design features that prevent any increase in the peak flow runoff to existing drainage facilities, and Policy HS-P3.4 requires that developers pay their fair share for construction of off-site drainage improvements necessitated by their projects. In addition, Action HS-A2.3 directs the County to work with municipalities, special districts, the farming community, and property owners to jointly prepare and implement a Basin-Wide Master Storm Drainage Plan to address downstream flooding and to protect properties and the public from flooding.

The General Plan policies discussed above, in conjunction with the Butte County Stormwater Management Program, Butte County Stormwater Management and Discharge Control Ordinance, and other State and federal regulations discussed in Section A, would reduce drainage impacts to a *less-than-significant* level.

- d. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

Development allowed by General Plan 2030 would result in more impervious surfaces, thereby increasing stormwater runoff to levels that could exceed the capacity of existing or planned stormwater drainage systems.

However, General Plan 2030 Water Resources Element contains policies that address stormwater runoff capacity. Policy W-P1.4 encourages Low Impact Development, which minimizes impervious area, minimizes runoff and pollution, and incorporates best management practices. Policy W-P5.3 allows and encourages pervious pavements. Policy W-P5.5 requires that stormwater collection systems be installed concurrently with construction of new roadways

to maximize efficiency and minimize disturbance due to construction activity.

In addition, as described in Section D.1.c, the Health and Safety Element addresses stormwater impacts through Policies HS-P3.1 through HS-P3.4. In particular, Policy HS-P3.2 requires that applicants for new development provide plans detailing existing drainage conditions and specifying how runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility, without increasing the peak flow runoff to said channel or facility. Policy HS-P3.3 requires that all development include stormwater control measures and site design features that prevent any increase in the peak flow runoff to existing drainage facilities.

The General Plan policies discussed above, in conjunction with the Butte County Stormwater Management Program, Butte County Stormwater Management and Discharge Control Ordinance, and other State and federal regulations discussed in Section A, would ensure that any development leading to increased stormwater runoff would be required to provide sufficient stormdrain infrastructure, reducing stormwater capacity impacts to a *less-than-significant* level.

e. Provide substantial additional sources of polluted runoff, or otherwise substantially degrade water quality.

As discussed in Section D.1.a, development and land uses allowed by General Plan 2030 could degrade water quality in Butte County. However, General Plan 2030 Water Resources Element contains policies that address water quality, including Policies W-P1.2, W-P1.7, W-P5.2 and W-P5.4. These General Plan policies, in conjunction with the Butte County Stormwater Management Program, Butte County Stormwater Management and Discharge Control Ordinance, and other State and federal regulations discussed in Section A, would reduce water quality impacts to a *less-than-significant* level.

- f. Place occupied development within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Butte County contains areas currently designated as 100-year flood zones, and the General Plan 2030 land use map allows occupied development within these flood hazard areas. However, General Plan 2030 includes policies designed to prevent flooding of occupied developments. Specifically, Health and Safety Element Policy HS-P2.4 prohibits development on lands within the 100-year flood zone, as identified on the most current available maps from FEMA, unless the applicant demonstrates that it will not:

- ◆ Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads and intended use.
- ◆ Create difficult emergency vehicle access in times of flood.
- ◆ Create a safety hazard due to the height, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.
- ◆ Create excessive costs in providing governmental services during and after flood conditions, including maintenance and repair of public facilities.
- ◆ Interfere with the existing water conveyance capacity of the floodway.
- ◆ Substantially increase erosion and/or sedimentation.
- ◆ Contribute to the deterioration of any watercourse or the quality of water in any body of water.
- ◆ Require storage of material or any substantial grading or substantial placement of fill.
- ◆ Conflict with the provisions of the applicable requirements of Government Code Sections 65865.5, 65962 or 66474.5.

In addition, Policy HS-P2.5 requires that the lowest floor of any new construction or substantial improvement within Flood Zones A, AE, AH, and shaded Zone X, as shown in Figure 4.8-3 or the most current maps available from FEMA, be elevated 1 foot or more above the 100-year flood elevation.

General Plan 2030 policies and actions that respond to the recent State legislation described in Section A.2.d will provide additional precautions against placing habitable structures within areas prone to floods. Policy HS-P2.6 requires that the County make specific findings related to flood safety prior to development approval that would result in the construction of a new residence. Under this policy, the County must find that it has imposed conditions that will protect the property to the urban level of flood protection, as defined in Government Code Section 65007, in urban and urbanizing areas, or to the FEMA standard of flood protection in nonurbanized areas. In addition, Action HS-A2.1 directs the County to update General Plan 2030 within 24 months of the adoption of the Central Valley Flood Protection Plan (CVFPP) to appropriately reflect the CVFPP and to identify State and local flood management facilities and flood hazard zones.

Although implementation of General Plan 2030 could allow development within the 100-year flood hazard zone, General Plan 2030 policies discussed above, in combination with the Butte County Flood Hazard Prevention Ordinance, Butte County Flood Mitigation Plan, and other State and federal regulations discussed in Section A, would reduce 100-year flood hazard zone impacts to a *less-than-significant* level.

- g. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

As discussed in Section D.1.f, Butte County contains areas currently designated as 100-year flood zones, and General Plan 2030 land use map allow development within these flood hazard areas. However, General Plan 2030 includes policies that would mitigate flood flow impacts. As noted, Health and Safety Element Policy HS-P2.4 prohibits development on lands within the 100-year flood zone, as identified on the most current available maps from FEMA, unless the applicant demonstrates that it will not, among other criteria:

- ◆ Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads and intended use.
- ◆ Interfere with the existing water conveyance capacity of the floodway.

- ◆ Contribute to the deterioration of any watercourse or the quality of water in any body of water.

Therefore, although General Plan 2030 could allow the placement of structures in the 100-year flood hazard zone, General Plan 2030 policies discussed above, in combination with the Butte County Flood Hazard Prevention Ordinance, Butte County Flood Mitigation Plan, and other State and federal regulations discussed in Section A, would ensure that the impact of impedance and redirection of flood waters would be *less than significant*.

- h. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Floods can occur as a result of extreme precipitation, whereby water levels of drainage ways, such as streams, creeks and rivers, are overwhelmed by the stormwater runoff, exceed banks, and inundate the surrounding area. There are a number of levees in Butte County that provide various levels of protection for the citizens and property in the county from flooding hazards. There are also dams that serve as water storage features in the county and surrounding areas. Failure of these flood control and water storage features could lead to inundation of populated areas of Butte County.

Butte County has a number of levees constructed by both private individuals and government agencies. Many of these are aging and may need repair and maintenance in order to adequately control flood flows. Recently, FEMA adopted a new policy that would de-certify a number of levees in Butte County and would not consider these levees when developing FIRMs. This policy has led to significantly larger areas being designated as flood zones.

Key levee systems in the county line creeks, sloughs, and tributaries. The levees on the following creeks were not designed or constructed to provide the FEMA 100-year level of protection: Butte Creek downstream of the Skyway, Hamlin Slough, Little Chico Creek downstream of the Butte Creek Diversion Channel, Comanche Creek, and Cherokee Canal. During intense

storms, water could flow over the top or otherwise breach these levees and break out of the channel, not returning to the main channel for several thousand feet downstream, if at all. Therefore, areas on the landside of these levees are shown on the 1998 and 2000 FIRMs as being subject to inundation in the base flood, or flood that has a 1-percent chance of occurring in any year. FEMA is the process of developing flood plains for potential levee failures along Sycamore Creek, Mud Creek, Big Chico Creek, and the west side of the Feather River.

In addition, as discussed in Section B.5.b, portions of Butte County would be subject to inundation caused by dam failure. The failure of the Oroville Dam or Thermalito Afterbay Dam, although considered unlikely, would have the potential to inundate a substantial portion of southwestern Butte County. A major seismic event, if sufficiently intense, would be the most likely cause of dam failure as a number of geologic faults have been identified in the Oroville area. The Oroville Dam could withstand a 6.5-magnitude earthquake, which is considered to be the largest credible event projected for the region.<sup>8</sup> In addition, the western edge of the county is within the inundation areas of the Shasta Dam, Black Butte Dam, and Whiskeytown Dam. The Magalia Dam has been found to have inadequate stability under seismic loading conditions.

General Plan 2030 includes policies that protect people and property from flooding. As discussed in Sections D.1.f and D.1.g, Health and Safety Element Policies HS-P2.4 and HS-P2.5 protect people and property from flood risks within the 100-year flood hazard zone and ensure that development within this area will not impede or redirect flood flows. As discussed in Section D.1.c, Policies HS-P3.1 through HS-P3.4 work to prevent and reduce flooding. In addition, Policy HS-P2.1 supports the efforts of regional, State and federal agencies to improve flood management facilities along the Sacramento River, and Policy HS-P2.2 supports the efforts of private landowners and public agencies to maintain existing flood management facilities.

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<sup>8</sup> 1995 City of Oroville General Plan, Safety Element, page 8-9.

Furthermore, policies and actions under Goals HS-4 and HS-5 address flooding impacts related specifically to levee or dam failure. Policies HS-P4.3 and HS-P5.1 require that new development in levee and dam inundation areas consider risks from failure of these levees and dams. Policies HS-P4.1 and HS-P4.2 support the efforts of public and private entities to study levee stability and design and reconstruct levees that do not meet flood protection standards. Action HS-A5.1 directs the County to maintain and update emergency response plans that address potential flooding in dam inundation areas, and Action HS-A5.2 directs the County to coordinate with other agencies to seek funding and implement the stabilization of the Magalia Dam.

Although General Plan 2030 policies and actions discussed above would reduce potential impacts related to flooding as a result of levee failure, they do not eliminate the risks to people and property from flooding. In addition, recently-adopted policies by FEMA would de-certify a number of levees in Butte County, which indicates that larger areas of Butte County are subject to levee inundation than realized under previous policies. Given the number of levees in Butte County, and the fact that most are owned or maintained by private individuals or other public agencies, it is not feasible for the County's General Plan to completely address maintenance and improvements to all levees to the extent necessary to eliminate risks from levee failure. The impact is therefore considered *significant and unavoidable*.

In addition, although General Plan 2030 policies and actions discussed above would reduce potential impacts related to flooding as a result of dam failure, they do not eliminate the risks to people and property from flooding. Dams within and around Butte County that pose risks to people and property resulting from dam inundation are owned and/or operated by other agencies, and seismic activity in the region could cause dam failure. It is therefore not feasible for the County's General Plan to completely address improvements to all dams to the extent necessary to eliminate risks from dam failure. The impact is therefore considered *significant and unavoidable*.

- i. Potentially be inundated by seiche, tsunami, or mudflow.

While seiche action has not been observed in Lake Oroville, it could potentially occur, most likely from a landslide or seismically induced landslide from the hills around the lake, which could displace a mass of soil and bedrock that would fall or flow downslope into the lake. This would then displace the water in the lake, creating a seiche wave. The size and orientation of the seiche wave generated would depend upon the size of the landslide mass and the location where it enters the lake. The height of the wave generated could be on the order of several feet to tens of feet.

The current uses on the margins of Lake Oroville are primarily recreation and conservation uses. The current primary uses that could be affected by a seiche occurring in the lake would be the marina, boating, and house boat uses. Nearby residential uses would be set back from the existing recreation and conservation uses and elevated above the lake, similar to the existing development patterns, and outside of areas that would likely be affected by a seiche. Overall, General Plan 2030 would have a *less-than-significant* impact from inundation by seiche.

Butte County has no coastline that could be subject to inundation due to tsunami. Therefore, there is *no impact* associated with tsunamis.

The mountainous eastern portion of the county could be subject to mudflows during periods of heavy precipitation. As discussed in Section D.1.d of Section 4.6, Geology, Soils, and Mineral Resources, General Plan 2030 Health and Safety Element contains policies that reduce the impacts of mudflows. Policy HS-P7.1 requires site-specific geotechnical investigations to assess landslide potential for private development and public facilities projects in areas rated “Moderate to High” and “High” in Figure 4.6-2 or the most current available mapping. In addition, new construction in Butte County is required to comply with the California Building Code, which contains building criteria and standards that are designed to reduce landslide risks to acceptable levels. These General Plan 2030 policies, in combination with the California Building Code, Grading and Erosion Control Ordinances, and other State

and local requirements, would ensure that mudflow impacts would be *less than significant*.

## **2. Cumulative Impacts**

As development proceeds within Butte County, impervious surfaces and the amount of pollutants will increase, thereby impacting surface and groundwater quality. Additional population would also be at risk of flooding. However, cumulative water quality impacts in Butte County and the surrounding region would be reduced by implementing Best Management Practices in accordance with the NDPEs program, and implementation of the water quality policies contained in General Plan 2030 would further reduce Butte County's contribution to cumulative water quality impacts. With General Plan 2030 policies and actions in place and continued compliance with the NPDES and other RWQCB regulation in the region, General Plan 2030 would not have a significant cumulative water quality impact.

General Plan 2030 would minimize potential drainage and flooding impacts. However, the proposed project would contribute to development in levee and dam inundation areas, resulting in a *significant and unavoidable* cumulative impact.

### ***E. Maximum Theoretical Buildout***

The maximum theoretical buildout allowed under General Plan 2030 would include significantly more development than the projected 2030 buildout analyzed in Section D in terms of both the amount and the extent of development. Therefore, the potential for impacts to hydrology and water quality would increase. However, as discussed in Chapter 3, it is extremely unlikely that maximum theoretical buildout would ever occur under General Plan 2030. Therefore, an analysis of maximum theoretical buildout is not required by CEQA.

*F. Impacts and Mitigation Measures*

**Impact HYDRO-1:** Although General Plan 2030 polices and actions reduce risks associated with levee failure, they do not eliminate risks to people and property. In addition, recently-adopted policies by FEMA would de-certify a number of levees in Butte County, which indicates that larger areas of Butte County are subject to levee inundation than realized under previous policies.

As discussed in Section D.1,h, above, it is not within Butte County's power to require or complete maintenance and improvements to levees in the county owned and maintained by private individuals and other public agencies. Therefore, the impact is considered *significant and unavoidable*.

**Impact HYDRO-2:** Although General Plan 2030 polices and actions reduce risks associated with dam failure, they do not eliminate risks to people and property.

As discussed in Section D.1,h, above, it is not within Butte County's power to require or complete maintenance and improvements to dams in and around the county owned and maintained by other agencies. Therefore, the impact is considered *significant and unavoidable*.

**Impact HYDRO-3:** General Plan 2030 would contribute to development in levee and dam inundation areas, resulting in a significant cumulative impact.

It is not within Butte County's power to require or complete maintenance and improvements to levees or dams in the county owned and maintained by private individuals and other public agencies. Therefore, the impact is considered *significant and unavoidable*.

**BUTTE COUNTY GENERAL PLAN 2030**  
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HYDROLOGY AND WATER QUALITY