

## 3.5 Hydrology and Water Quality

This section describes the regulatory and environmental settings for hydrology and water quality in the Plan Area. Impacts that would result from implementing the proposed action and alternatives are described in Chapter 4, *Environmental Consequences*, along with mitigation measures to reduce impacts, where appropriate.

### 3.5.1 Regulatory Setting

#### Federal

##### Clean Water Act

The federal Clean Water Act (CWA) is the primary federal law that establishes regulations relating to water resource issues and protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit. Permit review is the CWA's primary regulatory tool.

In California, the State Water Resources Control Board (State Water Board) is the agency with partial responsibility for implementing the CWA, in conjunction with the U.S. Army Corps of Engineers (USACE). Typically, all regulatory requirements are implemented by the State Water Board through nine Regional Water Quality Control Boards (Regional Water Boards) established throughout the state. The Plan Area is within Region 5, the Central Valley Regional Water Quality Control Board (Central Valley Water Board).

The following CWA sections pertain to the Plan Area.

##### Section 303: Impaired Waters

California adopts water quality standards to protect beneficial uses of state waters as required by CWA Section 303 and the Porter-Cologne Water Quality Control Act of 1969 (discussed below). Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of water quality-limited segments. In California, the State Water Board develops the list of water quality-limited segments; the U.S. Environmental Protection Agency (USEPA) approves each state's list. Waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology.

Section 303(d) also establishes the total maximum daily load (TMDL) process to guide the application of state water quality standards. A TMDL defines the maximum amount of a pollutant that a water body can receive and still meet water quality standards. TMDL is measured as the sum of the individual waste load allocations from point sources, load allocations from nonpoint sources, and background loading, plus an appropriate margin of safety. TMDLs can lead to more stringent National Pollutant Discharge Elimination System (NPDES) permits (CWA Section 402). Section 303(d) impaired waters in the Plan Area are described for each major surface water feature in Section 3.5.2, *Environmental Setting*, below.

### **Section 401: Water Quality Certification**

Under CWA Section 401, applicants for a federal permit or license to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a CWA Section 404 permit, discussed below) must comply with CWA Section 401. In California, the authority to grant water quality certification has been delegated to the State Water Board, and certification is issued by one of the nine geographically separated Regional Water Boards. Water quality certifications require evaluation of potential effects in light of water quality standards and CWA Section 404 criteria governing discharge of dredged and fill materials into waters of the United States. Under the CWA, the Regional Water Board must issue or waive a Section 401 water quality certification for a project to be permitted under CWA Section 404.

### **Section 402: Permits for Discharge to Surface Waters**

CWA Section 402 regulates point- and nonpoint-source discharges to surface waters through the NPDES program, administered by EPA. In California, the State Water Board is authorized by EPA to oversee the NPDES program through the Regional Water Boards (see related discussion in this section under *Porter-Cologne Water Quality Control Act*). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES Stormwater Program regulates municipal, construction, industrial, and California Department of Transportation (Caltrans) stormwater discharges.

#### ***Municipal Stormwater Activities***

CWA Section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4). MS4s are synonymous with stormwater collection, conveyance, and treatment facilities, including open channel and piped flow that is routed through pretreatment vaults, treatment basins, and possibly other treatment structures prior to discharge into surface waters or land. Phase I MS4 regulations cover municipalities with populations greater than 100,000, certain industrial processes, or construction activities disturbing an area of 5 acres or more. Phase II (Small MS4) regulations require that stormwater management plans be developed by municipalities with populations smaller than 100,000 and construction activities disturbing 1 or more acres of land. Placer County is a designated municipal permittee under the NPDES. Placer County shares a permit with El Dorado County and the City of South Lake Tahoe under the Phase 1 NPDES program. The west slope of Placer County outside of the incorporated cities in the Plan Area is permitted under the Phase II NPDES program.

MS4 permits require that cities and counties develop and implement programs and measures to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures, as appropriate. As part of permit compliance, these permit holders have created stormwater management plans for their respective locations. These plans outline the requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects under the program, project

applicants will be required to follow the guidance contained in the stormwater management plans as defined by the permit holder in that location.

The State Water Board is advancing low impact development in California as a means of complying with municipal stormwater permits. Low impact development incorporates site design, including using vegetated swales and retention basins and minimizing impermeable surfaces to manage stormwater to maintain a site's predevelopment runoff rates and volumes.

#### *California Department of Transportation Municipal Stormwater Permit*

The State Water Board has identified Caltrans as an owner/operator of an MS4 pursuant to federal regulations. This MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state.

The Caltrans MS4 Permit contains three basic requirements.

1. Caltrans must comply with the requirements of the Construction General Permit (see below).
2. Caltrans must implement a year-round program in all parts of the state to effectively control stormwater and non-stormwater discharges.
3. Caltrans stormwater discharges must meet water quality standards through implementation of permanent and temporary (construction) best management practices (BMPs), to the Maximum Extent Practicable, and other measures as the State Water Board determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the *Statewide Storm Water Management Plan* (SWMP) to address stormwater pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing stormwater management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in stormwater and non-stormwater discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs.

#### **Construction Activities**

The General NPDES Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ) (Construction General Permit) regulates stormwater discharges for construction activities CWA Section 402. Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the Construction General Permit. The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must list BMPs that the discharger will use to protect stormwater runoff and document the placement and maintenance of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants, to be implemented in case of a BMP failure; and a monitoring plan for turbidity and potential of hydrogen (pH) for projects that meet defined risk criteria (State Water Resources Control Board 2013). The requirements of the SWPPP are based on the construction design specifications detailed in the final design plans of a project and the hydrology and geology of the site expected to be encountered during construction.

### ***Dewatering Activities***

While small amounts of construction-related dewatering are covered under the Construction General Permit, the Central Valley Water Board has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and likely would apply to the proposed PCCP if construction related to the Covered Activities required dewatering in greater quantities than that allowed by the Construction General Permit and discharged the effluent to surface waters. The General Dewatering Permit contains waste discharge limitations and prohibitions similar to those in the Construction General Permit. To obtain coverage, the applicant must submit a notice of intent and a Pollution Prevention and Monitoring Program (PPMP) to the Central Valley Water Board. The PPMP must include a description of the discharge location, discharge characteristics, primary pollutants, receiving water, treatment systems, spill prevention plans, and other measures necessary to comply with discharge limits. A representative sampling and analysis program must be prepared as part of the PPMP and implemented by the permittee, along with recordkeeping and quarterly reporting requirements during dewatering activities. For dewatering activities that are not covered by the General Dewatering Permit, an individual NPDES permit and waste discharge requirements (WDRs), which regulate point discharges with preconditions that make them exempt and not subject to the Federal Water Pollution Control Act, must be obtained from the Central Valley Water Board.

### **Section 404: Permits for Fill Placement in Waters and Wetlands**

CWA Section 404 regulates the discharge of dredged and fill materials into “waters of the United States,” which are defined at 33 Code of Federal Regulations (CFR) 328.3, 40 CFR 230.3. Section 404 permits must be issued by USACE for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. While USACE is the permitting authority, the USEPA also has responsibilities under CWA Section 404, including review and approval of jurisdictional determinations and exemptions, commenting on applications for permits, CWA Section 401 water quality certification for some tribes, and enforcement.

Applicants must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. As part of the wetland delineation and verification process, USACE may conduct an approved jurisdictional determination to determine whether aquatic resources in the Plan Area are considered waters of the United States and therefore regulated under Section 404. The Section 404 permits are linked to the issuance of Section 401 water quality certifications. If no waters of the United States are located within a survey area, a Section 404 permit is not required. However, WDRs are required by the State Water Board or a Regional Water Board in lieu of a Section 401 water quality certification because aquatic resources that are not considered to be waters of the United States may be waters of the State.

Compliance with Section 404 requires compliance with other environmental laws and regulations. USACE cannot issue an individual permit or verify the use of a general permit until the requirements of NEPA, the federal Endangered Species Act, and the National Historic Preservation Act have been met. In addition, USACE cannot issue or verify any permit that may result in a discharge of a pollutant into waters of the United States until a Section 401 water quality certification or a waiver of certification has been issued by the State Water Board or a Regional Water Board. USACE must also ensure compliance with the USEPA’s Section 404(b)(1) *Guidelines for Specification of Disposal*

*Sites for Dredged or Fill Material*, which, in part, states that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences” (40 CFR 230.10[a]). Certain activities identified at 33 United States Code (USC) 1344 are exempt from the Section 404 of the CWA.

## **General Bridge Act**

The General Bridge Act of 1946 gives the U.S. Coast Guard authority over the location and plans for bridges over navigable waters of the United States that are “subject to the ebb and flow of the tide” and which may be used as a means to transport interstate or foreign commerce. Under the act, the Coast Guard may place conditions on such bridges in the interest of public navigation.

## **Executive Order 11988—Floodplain Management**

Executive Order 11988, Floodplain Management, requires federal agencies to prepare floodplain assessments for proposed projects located in or affecting floodplains. An agency proposing to conduct an action in a floodplain must consider alternatives to avoid adverse effects and incompatible development in the floodplain. If the only practicable alternative involves siting in a floodplain, the agency must minimize potential harm to or development in the floodplain and explain why the action is proposed in the floodplain.

## **National Flood Insurance Program**

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. The Federal Emergency Management Agency (FEMA) manages the NFIP. FEMA creates Flood Insurance Rate Maps (FIRMs) that designate 100-year floodplain zones and delineate flood hazard areas. A 100-year floodplain zone is the area that has a 1 in 100 (1%) chance of being flooded in any 1 year based on historical data.

Projects may have to demonstrate compliance with FEMA regulations. A Conditional Letter of Map Revision (CLOMR) is FEMA's comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA). The letter does not revise an effective NFIP map; it indicates whether the project, if built as proposed, would be recognized by FEMA. FEMA charges a fee for processing a CLOMR to recover the costs associated with the review. Building permits cannot be issued based on a CLOMR, because a CLOMR does not change the NFIP map.

A Letter of Map Revision (LOMR) is FEMA's modification to an effective FIRM, or Flood Boundary and Floodway Map (FBFM), or both. The LOMR officially revises the FIRM or FBFM, and sometimes the Flood Insurance Study (FIS) report, and when appropriate, includes a description of the modifications. The LOMR is generally accompanied by an annotated copy of the affected portions of the FIRM, FBFM, or FIS report. All requests for changes to effective maps, other than those initiated by FEMA, must be made in writing by the chief executive officer (CEO) of the community or an official designated by the CEO. Because a LOMR officially revises the effective NFIP map, it is a public

record that the community must maintain. Any LOMR should be noted on the community's master flood map and filed by panel number in an accessible location.

## State

### The Porter–Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act), passed in 1969, complements the CWA. It established the State Water Board and divided the state into nine regions, each overseen by a Regional Water Board. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, although much of its daily implementation authority is delegated to the Regional Water Boards, which are responsible for implementing CWA Sections 401, 402 and 303(d). In general, the State Water Board manages both water rights and statewide regulation of water quality, while the Regional Water Boards focus exclusively on water quality within their regions.

The Porter-Cologne Act provides for the development and periodic review of Water Quality Control Plans (basin plans) for each region. The *Basin Plan for the Sacramento and San Joaquin Rivers Basin* (Basin Plan) (California Regional Water Quality Control Board 2011) identifies beneficial uses of the river and its tributaries and water quality objectives to protect those uses. Basin plans are implemented primarily by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met (see discussion of the NPDES system under *Clean Water Act* section above). Basin plans are updated every 3 years and provide the technical basis for determining WDRs and taking enforcement actions.

A basin plan must do the following.

- Identify beneficial uses of water to be protected.
- Establish water quality objectives for the reasonable protection of the beneficial uses.
- Establish a program of implementation for achieving the water quality objectives.

The Central Valley Water Board is responsible for implementing its basin plan for the Sacramento and San Joaquin Rivers Basin, which covers the Plan Area (California Regional Water Quality Control Board 2011).

Beneficial uses represent the services and qualities of a water body (i.e., the reasons the water body is considered valuable). The Central Valley Water Board Basin Plan describes beneficial uses for the waters in the Sacramento River watershed. Table 3.5-1 lists the beneficial uses for water bodies that are within or have influence on the hydrology of the Plan Area and could be affected by Covered Activities.

**Table 3.5-1. Designated Beneficial Uses for Water Bodies within the Plan Area**

Beneficial Uses	Bear River	North Fork American River	Folsom Lake
Municipal and Domestic	E	E	E
Agriculture—Irrigation	E	E	E
Agriculture—Stock Watering	E		
Industrial Process Water			
Industrial Service Supply			P
Hydropower	E		E
Rec-1—Contact	E	E	E
Rec-1—Canoeing & Rafting	E	E	
Rec-2—Other Non-Contact	E	E	E
Freshwater Habitat—Warm	E	P	E
Freshwater Habitat—Cold	E	E	E
Migration—Warm	P		
Migration—Cold	P		
Spawning—Warm	P		E
Spawning—Cold	P	E	
Wildlife Habitat	E	E	E
Navigation			

Source: California Regional Water Quality Control Board 2011.

E = Existing Beneficial Use.

P = Potential Beneficial Use.

Water quality objectives represent the standards necessary to protect and support designated beneficial uses. The Regional Water Boards have set water quality objectives for all surface waters in their respective regions (including the Sacramento River Basin) for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. Water quality objectives can consist of numerical and/or narrative criteria.

Another method the Central Valley Water Board uses to implement the Basin Plan criteria is by issuing WDRs. WDRs are issued to any entity that discharges to a surface water body and does not meet certain water quality criteria such as those related to sediment. The WDR/NPDES permit also serves as a federally required NPDES permit (under the CWA) and incorporates the requirements of other applicable regulations.

### State Implementation Plan

In 1994, the State Water Board and USEPA agreed to a coordinated approach for addressing priority toxic pollutants in inland surface waters, enclosed bays, and estuaries of California. In March 2000, the State Water Board adopted a State Implementation Plan (SIP) for priority toxic pollutant water quality criteria contained in the California Toxics Rule. The SIP applies to discharges of toxic pollutants into inland surface waters, enclosed bays, and estuaries of California subject to regulation under the state's Porter-Cologne Act (Division 7 of the Water Code) and the federal CWA. Such

regulation may occur through the issuance of NPDES permits or other relevant regulatory approaches. The goal of this policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency. As such, SIP is a tool to be used in conjunction with watershed management approaches and, where appropriate, the development of TMDLs to ensure achievement of water quality standards (water quality criteria or objectives and the beneficial uses they are intended to protect, as well as the state and federal antidegradation policies).

### **Groundwater Planning Legislation Passed in 2014**

This section summarizes important groundwater planning legislation passed in 2014. Since the Sustainable Groundwater Management Act was passed, a Groundwater Sustainability Agency (GSA) has been created in Placer County that covers a majority portion of this plan (West Placer GSA). In addition, a second GSA that covers a portion of this plan was also formed (South Sutter Water District GSA). Both of these agencies are working with other GSAs in the groundwater basin—identified as the North American Subbasin (NASb) by the California Department of Water Resources (DWR)—to develop a groundwater sustainability plan for the NASb by 2022. Until the plan is developed and adopted, only annual monitoring information and groundwater sustainability plan development will be available for use.

#### **Senate Bill 1168**

DWR is responsible for identifying the extent of monitoring of groundwater elevations within each groundwater basin or subbasin and for prioritizing groundwater basins and subbasins based on specified considerations, including any information deemed relevant by DWR. Senate Bill 1168, the Sustainable Groundwater Management Act, specifies that relevant information may include adverse impacts on local habitat and local streamflows. The bill requires DWR to categorize the priority of each basin as high, medium, low, or very low and requires the initial priority for each basin to be established no later than January 31, 2015. This bill authorizes a local agency to request that DWR revise the boundaries of a basin and requires DWR, by January 1, 2016, to adopt regulations on the methodology and criteria to be used to evaluate the proposed revision. This bill requires all groundwater basins designated as high- or medium-priority basins and subject to critical conditions of overdraft to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority basins to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2022, except as specified. This bill requires a groundwater sustainability plan to be developed and implemented to meet the sustainability goal, established as prescribed, and requires the plan to include prescribed components. This bill also encourages and authorizes basins designated as low- or very low priority basins to be managed under groundwater sustainability plans.

#### **Senate Bill 1319**

SB 1319 additionally authorizes the State Water Board to designate certain high- and medium-priority basins as probationary if, after January 31, 2025, prescribed criteria are met, including that the State Water Board determines that the basin is in a condition where groundwater extractions result in significant depletions of interconnected surface waters. This bill adds to the prescribed determinations that would prevent the State Water Board from designating the basin as a probationary basin for a specified time period and requires that the State Water Board exclude from

probationary status any portion of a basin for which a groundwater sustainability agency demonstrates compliance with the sustainability goal.

### **California Fish and Game Code, Sections 1601–1607**

Under Sections 1601–1607 of the California Fish and Game Code, California Department of Fish and Wildlife (CDFW) is responsible for the protection and conservation of the state’s fish and wildlife resources. CDFW regulates projects that affect the flow, channel, or banks of rivers, streams, and lakes. Sections 1601 and 1603 require public agencies and private individuals respectively to notify and enter into a streambed or lakebed alteration agreement with CDFW before beginning construction of a project that will divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed. Because CDFW includes under its jurisdiction streamside and riparian habitats that may not qualify as wetlands under the federal CWA definition, as well as a broader definition of the lateral jurisdiction, CDFW jurisdiction may be broader than USACE jurisdiction.

Section 1601 contains additional prohibitions against the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. Sections 1601–1607 may apply to any work undertaken within the 100-year floodplain of any body of water or its tributaries, including intermittent stream channels. In general, however, it is construed as applying to work within the active floodplain and/or associated riparian habitat of a wash, stream, or lake that provides benefits to fish and wildlife. Sections 1601–1607 typically do not apply to drainages that lack a defined bed and banks, such as swales, or to very small bodies of water and wetlands such as vernal pools.

### **Central Valley Flood Protection Act**

#### **Central Valley Flood Protection Plan**

The Central Valley Flood Protection Act of 2008 required preparation of the *Central Valley Flood Protection Plan* (CVFPP), as set forth in Water Code, Section 9614. DWR adopted the CVFPP on June 29, 2012. The CVFPP proposes a “systemwide investment approach” for integrated, sustainable flood management in areas currently protected by facilities of the State Plan of Flood Control. The CVFPP includes the following elements.

- A description of the Flood Management System, its performance, and the challenges to modifying it.
- A description of the facilities included in the State Plan of Flood Control.
- A description of probable impacts of projected climate change, land-use patterns, and other potential challenges.
- An evaluation of needed infrastructure improvements and identification of facilities recommended for removal.
- A description of both structural and nonstructural methods for providing an urban level of flood protection to currently urbanized areas in the Central Valley.

## Central Valley Flood Protection Board

The Central Valley Flood Protection Board (CVFPB) (formerly the California Reclamation Board) of the State of California regulates the modification and construction of levees and floodways in the Central Valley defined as part of the Sacramento Valley and San Joaquin Valley flood control projects. Rules promulgated in Title 23 of the California Code of Regulations (CCR) (Title 23, Division 1, Article 8 [Sections 111–137]) regulate the modification and construction of levees to ensure public safety. Title 23, CCR Sections 6 and 7 stipulate permitting authority to the CVFPB. Section 6(a) outlines the need to obtain a permit from the CVFPB for

Every proposal or plan of work, including the placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduct fence, projection, fill, embankment, building.... that involves cutting into the levee wholly or in part within any area for which there is an adopted plan of flood control, must be approved by the board prior to the commencement of work.

Section 7(a) requires that “Prior to submitting an encroachment permit application to the board, the application must be endorsed by the agency responsible for maintenance of levees within the area of the proposed work....”

## Urban Level of Flood Protection Criteria

DWR adopted the Urban Level of Flood Protection Criteria in November 2013 to strengthen the link between land use planning and flood management. Under the Central Valley Flood Protection Act,

‘Urban level of flood protection’ means the level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, the Department of Water Resources. ‘Urban level of flood protection’ shall not mean shallow flooding or flooding from local drainage that meets the criteria of the national Federal Emergency Management Agency standard of flood protection” (Government Code Section 65007[n]).

The criteria apply to land use decisions of cities and counties in the Central Valley and are intended to restrict urban development in areas that lack protection from flooding that have a 1-in-200 chance of occurring in any given year.

## Pesticide Regulation

California Department of Pesticide Regulation (DPR) is the lead agency for regulating the registration, sales, and use of pesticides in California. It is required by law to protect the environment, including surface waters, from environmentally impacts of pesticides by prohibiting, regulating, or controlling the uses of such pesticides. DPR has both a Surface Water and Groundwater Protection Program that addresses sources of pesticide residues in surface waters and have preventive and response components that reduce the presence of pesticides in surface and groundwater. The preventive component includes local outreach to promotion of management practices that reduce pesticide runoff and prevent continued movement to groundwater in contaminated areas. In order to promote cooperation to protect water quality from the adverse effects of pesticides, DPR and the State Water Board signed a Management Agency Agreement. The Management Agency Agreement and its companion document, *The California Pesticide Management Plan for Water Quality*, are intended to coordinate interaction, facilitate communication, promote problem solving, and ultimately assure the protection of water quality.

## Local

### Placer County General Plan

Excerpted below are the goals, policies, and implementation programs from the *Placer County General Plan* that pertain to hydrology and water quality (Placer County 2013).

#### Water Resources

##### Goal

**6.A.** To protect and enhance the natural qualities of Placer County's rivers, streams, creeks and groundwater.

##### Policies

**6.A.2.** The County shall require all development in the 100-year floodplain to comply with the provisions of the Placer County Flood Damage Prevention Ordinance.

**6.A.3.** The County shall require development projects proposing to encroach into a stream zone or stream setback to do one or more of the following, in descending order of desirability:

- a. Avoid the disturbance of riparian vegetation;
- b. Replace all functions of the existing riparian vegetation (on-site, in-kind);
- c. Restore another section of stream (in-kind); and/or
- d. Pay a mitigation fee for in-kind restoration elsewhere (e.g., mitigation banks).

**6.A.4.** Where stream protection is required or proposed, the County should require public and private development to:

- a. Preserve stream zones and stream setback areas through easements or dedications. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a stream is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval;
- b. Designate such easement or dedication areas (as described in a. above) as open space;
- c. Protect stream zones and their habitat value by actions such as: 1) providing an adequate stream setback, 2) maintaining creek corridors in an essentially natural state, 3) employing stream restoration techniques where restoration is needed to achieve a natural stream zone, 4) utilizing riparian vegetation within stream zones, and where possible, within stream setback areas, 5) prohibiting the planting of invasive, non-native plants (such as *Vinca major* and eucalyptus) within stream zones or stream setbacks, and 6) avoiding tree removal within stream zones;
- d. Provide recreation and public access near streams consistent with other General Plan policies;
- e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas; and/or are stabilized with permanent vegetation that will prevent the transport of sediment off site; and 2) temporary vegetation sufficient to stabilize disturbed areas.
- f. Provide for long-term stream zone maintenance by providing a guaranteed financial commitment to the County which accounts for all anticipated maintenance activities.

**6.A.5.** The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and urban runoff and to encourage the use of BMPs for agricultural activities.

**6.A.6.** The County shall require development projects to comply with the municipal and construction stormwater permit requirements of the Federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) Phase I and II programs and the State General Municipal and Construction permits. Municipal requirements affecting project design and construction practices are enacted through the County's Stormwater Quality Ordinance. Separate construction permits may be required by and obtained through the State Water Resources Control Board.

**6.A.7.** All new development and redevelopment projects shall be designed so as to minimize the introduction of pollutants into stormwater runoff, to the maximum extent practicable, as well as minimize the amount of runoff through the incorporation of appropriate Best Management Practices.

**6.A.8.** The County shall support implementation of Low Impact Development site design and Watershed Process Management requirements for new and redevelopment projects in accordance with the NPDES Phase I and II programs, and applicable NPDES permits.

**6.A.9.** The County shall require that natural watercourses be integrated into new development in such a way that they are accessible to the public and provide a positive visual element.

**6.A.10.** The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

**6.A.11.** Where the stream zone has previously been modified by channelization, fill, or other human activity, the County shall require project proponents to restore such areas by means of landscaping, revegetation, or similar stabilization techniques as a part of development activities.

**6.A.12.** The County shall require that newly-created parcels include adequate space outside of watercourses' setback areas to ensure that property owners will not place improvements (e.g., pools, patios, and appurtenant structures), within areas that require protection.

**6.A.13.** The County shall protect groundwater resources from contamination and further overdraft by pursuing the following efforts:

- a. Identifying and controlling sources of potential contamination;
- b. Protecting important groundwater recharge areas;
- c. Encouraging the use of surface water to supply major municipal and industrial consumptive demands;
- d. Encouraging the use of treated wastewater for groundwater recharge; and
- e. Supporting major consumptive use of groundwater aquifer(s) in the western part of the County only where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area.

**6.A.14.** The County shall help ensure that open space located in reservoir is preserved and protected to assure adequate performance of those reservoirs. The watershed is defined as those lands draining into a reservoir and having an immediate effect upon the quality of water within that reservoir. Those lands located within the watershed and within 5,000 feet of the reservoir shall be considered as having an immediate effect. Following are key watersheds labeled "immediate," because of their current domestic usage and proximity to urban areas and "future," because of current non-domestic usage and/or distance from urban areas.

**6.A.15.** The County shall encourage the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.

**6.D.7** The County shall support the management of wetland and riparian plant communities for passive recreation, groundwater recharge, nutrient catchment, and wildlife habitats. Such communities shall be restored or expanded, where possible.

### **Implementation Programs**

**6.1.** In consultation with the Placer County Flood Control District, cities in the County, and downstream counties, the County shall develop guidelines for creek maintenance practices that ensure native vegetation is not removed unnecessarily. These guidelines should also ensure that maintenance is scheduled to minimize disruption of wildlife breeding practices.

**6.2.** The County shall inform the public and prospective developers about those sections of the California Fish and Game Code that apply to diversion or obstruction of stream channels and pollution of waterways with detrimental material. This shall be done through distribution of educational materials with building permits and as a part of project review.

**6.3.** The County shall cooperate with interested state agencies and private conservation organizations to provide public interpretative services at select locations on County- owned or - managed property that contains creek resources to increase public knowledge and appreciation of such resources.

**6.4.** The County shall prepare, adopt, and implement a comprehensive surface and groundwater management program to ensure the long-term protection and maintenance of surface and groundwater resources.

**6.5.** The County shall prepare and implement a stormwater quality program pursuant to the requirements of the National Pollutant Discharge Elimination System and the State Water Resources Control Board phase I and II permits that defines design standards that reduce pollutants in discharges.

The design standards shall, at a minimum, address the following:

- a. Mitigate peak storm water runoff discharge rates to reduce the potential for downstream erosion.
- b. Conserve natural areas in order to minimize the amount of disturbance and maximize natural cover.
- c. Minimize the discharge of storm water pollutants associated with impervious surfaces directly connected to storm water conveyance systems.
- d. Minimize impervious surfaces
- e. Protect slopes and channels from erosion
- f. Public identification of the storm drain system to reduce or eliminate dumping of improper materials into the storm water conveyance system.
- g. Develop design standards for outdoor material storage and transportation storage areas.
- h. Develop mechanisms to insure monitoring and maintenance of BMP areas.

### **Flood Hazards**

#### **Goal**

**8.B.** To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards.

#### **Policies**

**8.B.1.** The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams.

- 8.B.2.** The County shall continue to participate in the Federal Flood Insurance Program.
- 8.B.3.** The County shall require flood proofing of structures in areas subject to flooding.
- 8.B.4.** The County shall require that the design and location of dams and levees be in accordance with all applicable design standards and specifications and accepted state- of-the-art design and construction practices.
- 8.B.5.** The County shall coordinate with neighboring jurisdictions to mitigate the impacts of new development in Placer County that could increase or potentially affect runoff onto parcels downstream in a neighboring jurisdiction.
- 8.B.6.** The County shall prohibit the construction of facilities essential for emergencies and large public assembly in the 100-year floodplain, unless the structure and access to the structure are free from flood inundation.
- 8.B.7.** The County shall require flood control structures, facilities, and improvements to be designed to conserve resources, incorporate and preserve scenic values, and to incorporate opportunities for recreation, where appropriate.
- 8.B.8.** The County shall require that flood management programs avoid alteration of waterways and adjacent areas, whenever possible.

#### **Implementation Programs**

- 8.4.** The County shall continue to maintain flood hazard maps and other relevant floodplain data and shall revise or update this information as new information becomes available.
- 8.5.** The County will continually review and revise its applicable portions of the County Emergency Operations Plan that concern Dam Failure. The Office of Emergency Services will continue to provide public information on dam failure preparedness and response.
- 8.6.** The County shall continue to implement and enforce its Flood Damage Prevention Ordinance.

### **Flood Protection**

#### **Goal**

- 4.F.** To protect the lives and property of the citizens of Placer County from hazards associated with development in floodplains and manage floodplains for their natural resource values.

#### **Policies**

- 4.F.1.** The County shall require that arterial roadways and expressways, residences, commercial and industrial uses and emergency facilities be protected, at a minimum, from a 100- year storm event.
- 4.F.2.** The County shall recognize floodplains as a potential public resource to be managed and maintained for the public's benefit.
- 4.F.3.** The County shall continue to work closely with the U.S. Army Corps of Engineers, the Resource Conservation District, the Federal Emergency Management Agency, the State Department of Water Resources, the Central Valley Flood Protection Board, and the Placer County Flood Control and Water Conservation District, in defining existing and potential flood problem areas.
- 4.F.4.** The County shall require evaluation of potential flood hazards prior to approval of development projects. The County shall require proponents of new development to submit accurate topographic and flow characteristics information and depiction of the 100-year floodplain boundaries under fully developed, unmitigated runoff conditions.
- 4.F.5.** The County shall attempt to maintain natural conditions within the 100-year floodplain of all rivers and streams except under the following circumstances:

- a. Where work is required to manage and maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, California Department of Fish and Wildlife regulations, and Clean Water Act provisions administered by the U.S. Army Corps of Engineers.
- 4.F.6.** The County shall continue to coordinate efforts with local, state, and federal agencies to achieve adequate water quality and flood protection.
- 4.F.7.** The County shall cooperate with the Placer County Flood Control and Water Conservation District, surrounding jurisdictions, the cities in the County, and other public agencies in planning and implementing regional flood control improvements, plans, and programs.
- 4.F.8.** The County shall, where possible, view flood waters as a resource to be used for waterfowl habitat, aquifer recharge, fishery enhancement, agricultural water supply, and other suitable uses.
- 4.F.9.** The County shall continue to implement floodplain zoning and undertake other actions required to comply with state floodplain requirements, and to maintain the County's eligibility under the Federal Flood Insurance Program.
- 4.F.10.** The County shall preserve or enhance the aesthetic qualities of natural drainage courses in their natural or improved state compatible with flood control requirements and economic, environmental, and ecological factors.
- 4.F.11.** To the extent that funding is available, the County shall work to solve flood control problems in areas where existing development has encroached into a floodplain.
- 4.F.12.** The County shall promote the use of natural or non-structural flood control facilities, including off-stream flood control basins, to preserve and enhance creek corridors.
- 4.F.13.** The County shall continue to implement and enforce its Grading, Erosion and Sediment Control Ordinance and Flood Damage Prevention Ordinance.
- 4.F.14.** The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County's Land Development Manual.

## **Stormwater Drainage**

### **Goal**

**4.E.** To manage rainwater and stormwater at the source in a sustainable manner that least inconveniences the public, reduces potential water-related damage, augments water supply, mitigates storm water pollution, and enhances the environment.

### **Policies**

- 4.E.1.** The County shall encourage the use of natural stormwater drainage systems to preserve and enhance natural features.
- 4.E.2.** The County shall support efforts to acquire land or obtain easements for drainage and other public uses of floodplains where it is desirable to maintain drainage channels in a natural state.
- 4.E.3.** The County shall consider using stormwater of adequate quality to replenish local groundwater basins, restore wetlands and riparian habitat, and irrigate agricultural lands.
- 4.E.4.** The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County Land Development Manual.
- 4.E.5.** The County shall continue to implement and enforce its Grading, Erosion and Sediment Control Ordinance and Flood Damage Prevention Ordinance.

- 4.E.6.** The County shall continue to support the programs and policies of the watershed flood control plans developed by the Flood Control and Water Conservation District.
- 4.E.7.** The County shall prohibit the use of underground storm drain systems in rural and agricultural areas, unless no other feasible alternatives are available for conveyance of stormwater from new development or when necessary to mitigate flood hazards.
- 4.E.8.** The County shall consider recreational opportunities and aesthetics in the design of stormwater ponds and conveyance facilities.
- 4.E.9.** The County shall encourage good soil conservation practices in agricultural and urban areas and carefully examine the impact of proposed urban developments with regard to drainage courses.
- 4.E.10.** The County shall strive to improve the quality of runoff from urban and suburban development through use of appropriate site design measures including, but not limited to vegetated swales, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, rooftop and impervious area disconnection, porous pavement, and other best management practices (BMPs).
- 4.E.11.** The County shall require new development to adequately mitigate increases in stormwater peak flows and/or volume. Mitigation measures should take into consideration impacts on adjoining lands in the unincorporated area and on properties in jurisdictions within and immediately adjacent to Placer County.
- 4.E.12.** The County shall encourage project designs that minimize drainage concentrations and impervious coverage and maintain, to the extent feasible, natural site drainage conditions.
- 4.E.13.** The County shall require that new development conforms with the applicable programs, policies, recommendations, and plans of the Placer County Flood Control and Water Conservation District.
- 4.E.14.** The County shall require projects that have significant impacts on the quantity and quality of surface water runoff to allocate land as necessary for the purpose of detaining post-project flows, evapotranspiring, infiltrating, harvesting/using, and biotreating stormwater, and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.
- 4.E.15.** The County shall require that new development in primarily urban development areas incorporate low impact development measures to reduce the amount of runoff, to the maximum extent practicable, for which retention and treatment is required.
- 4.E.16.** The County shall identify and coordinate mitigation measures with responsible agencies for the control of storm drainage systems, monitoring of discharges, and implementation of measures to control pollutant loads in urban storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Environmental Health Division, Placer County Department of Public Works, CDRA Engineering and Surveying Division, Placer County Flood Control and Water Conservation District).
- 4.E.17.** The County shall strive to protect domestic water supply canal systems from contamination resulting from spillage or runoff.
- 4.E.18.** The County shall, wherever feasible, require that proponents of new projects encase, or otherwise protect from contamination, domestic water supply canals where they pass through developments with lot sizes of 2.3 acres or less; where subdivision roads are constructed within 100 feet upslope or upstream from canals; and within all commercial, industrial, institutional, and multi-family developments.
- 4.E.19.** The County shall require that proponents of new projects fence domestic water supply canals where they pass through development with lot sizes between 2.3 and 4.6 acres; and on a case-by-case basis as determined by the entity responsible for the canal. This fencing shall be installed inside the project property line, and the proponent or subsequent landowner shall be responsible for fence maintenance. Said fencing shall be designed to impede pedestrian trespass of the canal area and to impede any dumping of materials into the canal.

**4.E.20.** The County shall continue to implement and enforce its Stormwater Quality Ordinance.

### **Implementation Programs**

**4.12.** The County shall prepare and adopt ordinances and programs as necessary and appropriate to implement and fund current and future watershed management, flood control, water quality protection, and water conservation plans of the Placer County Flood Control and Water Conservation District.

**4.13.** The County shall prepare and adopt ordinances and programs as necessary and appropriate to implement required actions under state and federal stormwater quality programs.

**4.14.** The County shall develop brochures and other methods to educate the public and developers regarding the potential impacts of development on drainage, flooding, and water quality.

## **Sunset Industrial Area Plan**

Excerpted below are the goal and policy from the *Sunset Industrial Area Plan* that pertain to hydrology and water quality (Placer County 1997). Placer County is moving forward with the *Sunset Area Plan*. This area plan would replace the 1997 *Sunset Industrial Area Plan*.

### **Public Facilities and Services**

#### **Goal**

**3.E.** To collect and dispose of stormwater in a manner that least inconveniences the public, reduces potential water-related damage, and enhances the environment.

#### **Policy**

**3.E.7.** The County shall require that new development adequately mitigate increases in stormwater peak flow and/or volumes to 90% of pre-project levels. Detention facilities should be constructed at the project site or within a larger project's development area where joint facilities are warranted. Mitigation measures should take into consideration impacts on adjoining lands in the unincorporated area and on properties in jurisdictions within and immediately adjacent to Placer County. At such time that a regional stormwater detention program is developed, new projects shall participate in the implementation of the regional program, as deemed necessary.

## **Placer County Grading, Erosion, and Sediment Control Ordinance**

Placer County requires a grading permit prior to any land disturbance or other construction activity that would cause a ground disturbance for the following common activities (Placer County 2016).

- Fill or excavation greater than 250 cubic yards.
- Cuts or fills exceeding 4 feet in depth.
- Structural retaining walls exceeding 4 feet in total height, as measured from bottom of footing to the top of the wall and/or supporting a surcharge.
- Soil or vegetation disturbances exceeding 10,000 square feet.
- Grading within or adjacent to a drainage course or wetland.
- Grading within a floodplain.

## Placer County Flood Control and Stormwater Policies

The Placer County Flood Control and Water Conservation District (PCFCWCD) was created in 1984 by the State Legislature as a Special District separate from County government to address flood control issues arising with growth. PCFCWCD is supported through a cooperative effort by the County and the Cities of Auburn, Lincoln, Rocklin, and Roseville, and the Town of Loomis. District policies and activities are largely guided by the consensus of participating members. PCFCWCD is empowered to control flood and storm waters throughout the county. PCFCWCD has no direct influence over the County or the cities regarding land use and planning matters; however, PCFCWCD does develop drainage plans for entire watersheds that cross jurisdictional boundaries. These drainage plans specify the flood control improvements needed to serve planned development in the area and are used to set drainage fees assessed against new development.

The primary responsibilities of PCFCWCD that relate to water quality and hydrology are as follows.

- Implementing regional flood control projects.
- Developing and implementing master plans for selected watersheds in the county.
- Providing technical support and information on flood control for the cities, the county, and the development community.
- Operating and maintaining an ALERT flood warning system.
- Reviewing proposed development projects to ensure they meet District standards.
- Developing hydrologic and hydraulic models for county watersheds.
- Providing technical support for Office of Emergency Services activities.
- Managing on behalf of Placer County the annual stream channel maintenance program within the Dry Creek and Cross Canal Watersheds.
- The *West Placer Storm Water Quality Design Manual* was prepared by Placer County, the Cities of Lincoln, Auburn, and Roseville, and the Town of Loomis to address increases in frequency and intensity of stormwater runoff (Placer County et al. 2016). The manual emphasizes the use of low impact development (LID) techniques that preserve elements of a project site's pre-development hydrologic function. The manual promotes the following low impact development goals.
  - Minimize adverse impacts of storm water runoff on water quality, biological integrity of receiving waters, and beneficial uses of water bodies.
  - Minimize the percentage of impervious surfaces on land development projects and implement mitigation measures to approximately preserve the overall pre-development water balance through infiltration, evapotranspiration, and capture and use of storm water.
  - Minimize pollutant loadings from impervious surfaces such as roof tops, parking lots, and roadways through the use of properly designed, technically appropriate storm water controls, including source control measures or good housekeeping practices, LID planning and design strategies, and treatment control BMPs.
  - Guide proper selection, design and maintenance of storm water BMPs to address pollutants generated by land development, minimize post-development surface flows and velocities, assure long-term functionality of BMPs, and avoid vector breeding.

In addition, projects in unincorporated Placer County are reviewed for compliance with Section 5 of the *Placer County Land Development Manual*, which regulates the design of storm drainage to ensure that drainage from a project site does not damage existing drainage systems or property or cause a hazard.

## Sutter County General Plan

Excerpted below are the relevant goals and policies from the *Sutter County General Plan* that pertain to hydrology and water quality (Sutter County 2011).

### Water Resources

#### Goal

**Ag 3.** Protect the natural resources needed to ensure that agriculture remains an essential and sustainable part of Sutter County's future

#### Policies

**AG 3.1 Efficient Water Management.** Support the efficient management and use of agricultural water resources where economically feasible to support agriculture.

**AG 3.3 Water Quality and Quantity.** Support efforts to maintain water resource quality and quantity for the irrigation of productive farmland.

**AG 3.6 Groundwater Resources.** Support the efforts of the local water agencies to promote groundwater recharge, conjunctive use, conservation of significant recharge areas, and other activities to protect and manage Sutter County's groundwater resources.

#### Goal

**ER 6.** Preserve and protect the County's surface water and groundwater resources.

#### Policies

**ER 6.1 Integrated Water Management Programs.** Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

**ER 6.2 Surface Water Resources.** Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

**ER 6.3 Groundwater Sustainability.** Protect the sustainability of groundwater resources.

**ER 6.4 Groundwater Recharge Areas.** Require new development to preserve and enhance areas that provide important groundwater recharge, stormwater management, and water quality benefits, such as undeveloped open spaces, natural habitat, river and riparian corridors, wetlands, and natural drainage areas.

**ER 6.5 Regional Coordination on Groundwater Use.** Coordinate with local and regional jurisdictions and water agencies on groundwater use to minimize overdraft conditions of aquifers.

**ER 6.6 Groundwater Protection.** Regulate stormwater collection and conveyance, as necessary, to protect groundwater supplies from contamination.

**ER 6.10 Stormwater Quality.** Control pollutant sources from construction and operational activities, and improve stormwater runoff quality, through the use of stormwater protection measures in accordance with County, state, and federal regulations.

**ER 6.11 New Development.** Require new development to protect the quality of water resources and natural drainage systems through site design, and use of source controls, stormwater treatment, runoff reduction measures, best management practices, and Low Impact Development.

**ER 6.12 Natural Watercourses.** Require new development to integrate natural watercourses and provide buffers between waterways and urban development to minimize disturbance of watercourses and to protect water quality.

### Implementation Programs

**ER 6-A.** Develop a Countywide Groundwater Sustainability Plan consistent with state regulations in order to protect groundwater quality and supply and participate in the development and implementation of an Integrated Regional Water Management Plan.

**ER 6-D.** Require new development that incorporates or is adjacent to natural watercourses to consult with the U.S. Army Corps of Engineers, California Department of Fish and Game, and/or the Regional Quality Control Board to determine the appropriate buffer width between waterways and urban development.

## Stormwater Drainage

### Goal

**I 3.** Ensure stormwater runoff is collected and conveyed safely and efficiently.

### Policies

**I 3.1 Availability.** Require new development to study, coordinate, and plan the provision of stormwater services to support the new development and demonstrate the availability of longterm, safe, and reliable stormwater collection, and conveyance.

**I 3.2 Infrastructure Planning.** Establish stormwater collection master plans for areas served, or to be served, by County-owned or County-operated stormwater systems. Ensure that the required infrastructure is successfully planned and designed.

**I 3.4 Efficient Infrastructure.** Require stormwater infrastructure that is to be owned or operated by the County to be designed and constructed to minimize the long-term life cycle costs of the infrastructure. Require the plans and design of stormwater infrastructure to be owned and/or operated by another public agency or private utility be approved by the servicing agency/utility.

**I 3.8 New Development.** Require new development to provide stormwater systems supporting the development based on the following guidelines for stormwater collection and conveyance:

- a. Urban development shall utilize underground storm drain systems sized to collect and convey peak flows from the 10-year storm; and may utilize overland flow systems and open channels sized to convey peak flows from the 100-year storm. Detention facilities shall be consolidated at publicly owned points in the system.
- b. Rural development and suburban development shall utilize underground storm drain systems where feasible and cost effective as determined by the County, sized to collect and convey peak flows from the 10-year storm; and may utilize overland flow systems and open channels sized to convey peak flows from the 100-year storm. If utilizing an underground system is not feasible, detention facilities and open channels for stormwater collection and conveyance may be utilized, provided these systems prevent property damage from a 100-year storm event.
- c. Agricultural areas may utilize detention facilities and open channels for stormwater collection and conveyance, provided these systems prevent property damage from a 100-year storm event.

**I 3.10 Mitigation of Stormwater Flows.** Require new development to adequately mitigate increases in stormwater flow rates and volume.

**3.11 Stormwater Quality.** Ensure that new development protects water quality in runoff, streams, and rivers.

#### **Implementation Programs**

**I 3-A.** Review new development applications in unincorporated areas to ensure that adequate stormwater service will be available through the County, or other service providers (including the State for any State-owned pump stations), to serve the new development. Require evidence of service availability. If the use of State-owned pump stations is proposed, sufficient capacity shall be demonstrated through completion of a drainage study that is incorporated into any countywide or master drainage study.

**I 3-C.** Develop a Countywide stormwater master plan consistent with this General Plan; require design of stormwater systems to be consistent with the approved master plan; and ensure stormwater systems are constructed consistent with the approved designs.

**I 3-H.** Review new development to ensure that proposed stormwater systems are adequate and appropriate for the type of development and are consistent with federal, state, and local codes and standards, and master plans.

**I 3-J.** Condition new development to adequately study and plan local drainage for the development. Require that new development conform to the relevant County, State, and Federal requirements and standards governing stormwater drainage and water quality.

### **Flood Protection**

#### **Goal**

**PHS 1.** Minimize the potential for loss of life, personal injury, and property damage associated with floods.

#### **Policies**

**PHS 1.1 Flood Data and Information.** Use the best available flood hazard information from local, regional, state and federal agencies when updating floodplain mapping, land use plans, and emergency response plans to inform land use and public facilities investment decisions.

**PHS 1.3 Minimum Standard of Flood Protection.** Require a minimum of 100-year flood protection for development, in accordance with local, state, and federal requirements to avoid or minimize the risk of flood damage.

**PHS 1.4 Urban Level of Flood Protection.** Require development in urban and urbanizing areas to provide 200-year flood protection in accordance with State requirements to avoid or minimize the risk of flood damage.

**PHS 1.6 Floodwater Diversion Prevention.** Require new flood management projects or developments within areas subject to 100- or 200-year floods to be done in a manner that will not cause floodwaters to be diverted onto adjacent property or increase flood hazards to properties located elsewhere unless secured through a flood easement or fee title buyout.

**PHS 1.9 Inter-Agency Coordination.** Coordinate efforts with local, regional, state, and federal agencies to maintain and improve the existing levee system to protect life and property. Ensure that dams, levees, and supporting facilities are properly operated and maintained to incorporate recreational opportunities, conserve natural habitat, and preserve scenic values, and provide adequate long-term flood protection.

**PHS 1.10 Integrated Water Management.** Continue involvement with implementation of regional flood management facility improvements and an integrated water management approach to provide regional self-reliance and sustainability, contributing to the development and implementation of an integrated water management plan, in collaboration with the neighboring counties.

**PHS 1.11 Central Valley Flood Protection Board Collaboration.** Require projects that are located within the jurisdictional area regulated by the Central Valley Flood Protection Board to consult with, and obtain applicable permits from, the Board.

### **Implementation Programs**

**PHS 1-A.** Work with local, regional, state, and federal agencies to maintain an adequate flood management information base, identify strategies to mitigate flooding impacts, develop funding mechanisms to finance the local share of flood management responsibilities, and pursue funding to improve flood protection in Sutter County.

**PHS 1-B.** Evaluate whether new development should be located within flood hazard areas. If new development is located within a flood hazard area, the County's Floodplain Management Ordinance will dictate specific construction methods required, such as elevation and floodproofing, to minimize flood damage.

**PHS 1-F.** Require new development to be consistent with regional flood improvement efforts, and contribute its fair-share basis to regional solutions to improve flood protection to meet state and federal standards. Require projects that are located within the jurisdictional area regulated by the Central Valley Flood Protection Board to consult with and obtain applicable permits from the Board.

## **Sutter County Floodplain Management Ordinance**

Sutter County's floodplain ordinance (Sutter County Code Section 1780) is intended to protect public health and safety and to minimize damage to property and infrastructure from flooding. The ordinance applies to lands that have at least a 1% chance of flooding in any given year. Among other things, the ordinance restricts alteration of natural floodplains, stream channels, and natural protective barriers. The ordinance restricts filling, dredging, or development that might increase flood damage, and it regulates the construction of flood barriers.

## **City of Lincoln General Plan**

Excerpted below are the relevant goals and policies from the *City of Lincoln General Plan* that pertain to hydrology and water quality (City of Lincoln 2008).

### **Public Facilities and Services Element**

#### **Goal**

**PFS-1.** To ensure that adequate public services and facilities are provided to meet the needs of residents of the city.

#### **Policy**

**PFS-1.4 Compliance with Federal and State Standards for Surface Water Protection.** The City shall comply with the requirements of the CWA and other regulations with the intent of minimizing the discharge of pollutants to surface waters.

#### **Goal**

**PFS-2.** Ensure provision of a water system with adequate supply transmission, distribution and storage facilities to meet the needs of existing and future development.

## Policies

**PFS-2.5.** The City shall not allow development within newly annexed areas until a potable water supply is obtained through Placer County Water Agency (PCWA) or Nevada Irrigation District (NID) or, where appropriate, other water districts.

**PFS-2.7 Groundwater Supplies.** The City shall consider development of groundwater supplies in the western portions of the City's sphere of influence to provide emergency back up and to supplement the domestic supply provided by the PCWA and NID.

**PFS-2.11 Groundwater Recharge.** The City shall evaluate groundwater recharge capabilities as necessary, but at least every five years and ensure adequate long-term protection of groundwater resources.

**PFS-2.19 Regional Sustainability of Groundwater Supplies.** The City shall work in concert with the County of Placer, other cities and local water purveyors to share groundwater data, develop a mutually beneficial Integrated Regional Water Resources Management Program, define the long-term sustainability of the groundwater basin, and work to manage groundwater uses in ways that facilitate the basin's sustainability.

## Goal

**PFS-4.** To ensure provision and sizing of adequate storm drainage facilities to accommodate existing and planned development.

## Policies

**PFS-4.1 Adequate Storm Drainage Facilities.** The City shall provide storm drainage facilities with sufficient capacity to protect the public and private property from storm water damage. The facilities will also be implemented in a manner that reduces all public safety and/or environmental impacts associated with the construction, operation, or maintenance of any required drainage improvements (i.e., drainage basins, etc.).

**PFS-4.2 Development Requirements.** The City shall encourage project designs that minimize drainage concentrations and impervious coverage and avoid floodplain areas and, where feasible, be designed to provide a natural water course appearance.

**PFS-4.3 Facilities Management.** The City shall manage drainage facilities in accordance with local, state, and federal guidelines.

**PFS-4.4 Stormwater Detention Basins.** The City shall design stormwater detention basins to ensure public safety, to be visually unobtrusive and to provide temporary or permanent wildlife habitat values and where feasible, recreational uses.

**PFS-4.5 Regional Drainage and Flood Control Efforts.** For purposes of coordination, the City shall consider other regional drainage and flood control efforts that are underway in preparing a Drainage Management Plan.

**PFS-4.6 Preproject Conditions.** The City will require new development to provide storm-water detention sufficient to limit outflow per Figure 7-1 of the City's Stormwater Management Manual (February 1994), or as revised.

Master Drainage Plans shall be designed to require new development to provide, or contribute towards, stormwater detention to reduce post- development peak flow from a 100 year event to pre-development flow rate less 10 percent of the difference between the estimated pre-development and the post-development unmitigated peak flow rates. The Master Drainage Plan shall identify appropriate locations to achieve such post- development flows. This criterion is principally designed to address the 100- year event with appropriate consideration given for the feasibility of mitigating 2-year and 10-year events.

**PFS-4.7 Stormwater Runoff.** The City shall require new development to provide stormwater-retention sufficient for the incremental runoff from an eight-day 100 year storm.

**PFS-4.8 Discharge of Urban Pollutants.** The City shall require appropriate runoff control measures as part of future development proposals to minimize discharge of urban pollutants (such as oil and grease) into area drainages.

**PFS-4.9 100-year Floodplain.** The City will discourage development or major fill or structural improvements (except for flood control purposes) within the 100-year floodplain as regulated by FEMA. Requests for fill and improvements within the floodplain may be approved by the City based upon a detailed hydraulic volumetric analysis prepared to evaluate impacts and provide for any mitigation measures to be provided as a part of the development to the satisfaction of the City Engineer / Public Works Director. Recreational activities that do not conflict with habitat uses may be permitted within the floodplain.

**PFS-4.10 Erosion Control Measures.** The City shall require adequate provision of erosion control measures as part of new development to minimize sedimentation of streams and drainage channels.

**PFS-4.11 Stormwater Management Manual.** The City shall require drainage designs and practices to be in accordance with the Stormwater Management manual of the Placer County Flood Control District unless alternative methods are approved by the City Engineer.

**PFS-4.12 Drainage Management Plan Costs.** The City shall require that the cost to develop new or modify existing Drainage Management Plans be allocated to applicants proposing development within the City's Sphere of Influence.

**PFS-4.13 Maintenance of Detention Basins.** The City shall require City maintenance of detention basins with financing by a separate drainage or special assessment district. When private facilities are used for detention, maintenance will be privately financed.

## Open Space and Conservation Element

### Goal

**OSC-1.** To designate, protect, and encourage natural resources, open space, and recreation lands in the city, protect and enhance a significant system of interconnected natural habitat areas, and provide opportunities for recreation activities to meet citizen needs.

### Policies

**OSC-1.4 100-year Floodplains.** The city will apply open space designations to all lands located within the 100 year floodway as shown on the FIRM panel or as determined by a project drainage plan and approved by the City Engineer/Director of Public Works; The City will also apply open space designations to all 100-year floodplain fringe areas, and/or remaining floodplain fringe areas as determined by a project drainage plan identifying floodplain fringe encroachment areas, and quantifying their impact along with other improvements to show a zero (0) net impact to the upstream, downstream and adjacent properties. Open space designations will apply to all land located within a minimum of 50 feet from the center channel of all perennial and intermittent streams and creeks providing natural drainage, and to areas consisting of riparian habitat. In designating these areas as open space, the city is preserving natural resources and protecting these areas from development.

**OSC-1.6 Soil Erosion.** The City shall require new development to implement measures that minimize soil erosion from wind and water related to construction. Measures may include, but not be limited to the following:

- Grading requirements that limit grading to the amount necessary to provide stable areas for structural foundations, street rights-of-way, parking facilities, or other intended uses; and/or

- Construction techniques that utilize site preparation, grading, and best management practices that provide erosion and sediment control to prevent construction-related contaminants from leaving development sites and polluting local waterways.

### Goal

**OSC-4.** To preserve and enhance local streams, creeks, and aquifers.

### Policies

**OSC-4.1 Identify and Protect Aquifers.** The City will protect local aquifers and water recharge areas.

**OSC-4.2 Develop Groundwater Management Plan.** The City shall develop and periodically update a groundwater management plan to protect local aquifers.

**OSC-4.3 Protect Surface Water and Groundwater.** The City shall ensure that new development projects do not degrade surface water and groundwater.

**OSC-4.4 Protection and Management of Flood Plains.** The City shall encourage the protection of 100 year floodplains and where appropriate, obtain public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.

**OSC-4.6 Best Management Practices.** The City shall continue to require the use of feasible and practical best management practices (BMPs) to protect surface water and groundwater from the adverse effects of construction activities and urban runoff. Additionally, The City shall require, as part of its Storm Water NPDES Permit and ordinances, to implement the Pollution Prevention Plan (SWPPP) during construction activities for any improvement projects, new development and redevelopment projects for reducing pollutants to the maximum extent practicable.

## Health and Safety Element

### Goal

**HS-6.** To minimize the risk of life and property of the City's residents from flood hazards.

### Policies

**HS-6.1 Flood Protection.** The City shall ensure that adequate flood protection is provided throughout the community.

**HS-6.2 Drainage and Flood Control Facilities.** The City will continue to cooperate and coordinate efforts with the Placer County Flood Control and Water Conservation District for the construction, operation, and maintenance of drainage and flood control facilities and where feasible provide for their joint use. This includes cooperation with Placer County, cities within Placer County, and Sutter County and special districts to provide regional flood control protection.

**HS-6.3 Master Drainage Plans.** The City shall require master drainage plans as a condition of approval for large development projects.

**HS-6.4 New Residential Construction.** The City shall require new residential construction to have its lowest habitable floor elevated above the base flood level elevation, determined by FEMA standards.

**HS-6.5 Stream Channels.** The City shall prohibit development along stream channels that would reduce the stream capacity, increase erosion, or cause deterioration of the channel.

**HS-6.6 Flood Insurance Program.** The City shall continue to participate in the National Flood Insurance Program.

### **City of Lincoln Construction Stormwater Runoff Control Ordinance**

The City of Lincoln Ordinance No. 876B describes the provisions, procedures, requirements, and enforcement actions related to managing stormwater and erosion to protect and enhance water quality of watercourses and water bodies in a manner pursuant to and consistent with the federal CWA by reducing pollutants in stormwater discharges associated with construction activity to the maximum extent practical and by prohibiting non-authorized non-stormwater discharges to the stormwater conveyance system.

### **City of Lincoln Post-Construction Stormwater Runoff Control Ordinance**

The City of Lincoln Ordinance No. 826B describes the provisions, procedures, requirements, maintenance, inspection, and enforcement actions related to post-construction stormwater monitoring. The purpose of the ordinance is to protect and enhance the water quality of watercourses and water bodies in a manner pursuant to and consistent with the federal CWA by reducing pollutants in stormwater discharges to the maximum extent practical and by prohibiting non-stormwater discharges to the stormwater system.

### **Lincoln Groundwater Master Plan**

Prior to being a joint partner in the development of the *Western Placer County Groundwater Management Plan (WPCGMP)*, the City of Lincoln completed and adopted a SB 1938-compliant groundwater management plan (GMP) in 2003 to better manage and protect its groundwater. The GMP mission statement is to “ensure a viable resource for use by the City [Lincoln] to meet backup, emergency and peak demands without adversely affecting adjacent areas.” In 2005, the City of Lincoln installed five new multi-completion monitoring wells to better manage groundwater activities (City of Lincoln 2003).

The following BMOs are included in the GMP.

- Maintain groundwater elevations at a level that will ensure an adequate groundwater supply for backup, emergency and peak demands, without causing significant adverse impacts to adjacent areas.
- Preserve overall groundwater quality by stabilizing existing groundwater contaminant migration, avoiding known contaminated areas, and protecting recharge areas.
- Ensure that the direction of groundwater flow continues its southwesterly flow pattern despite additional groundwater extraction or other potential influences.

The City of Lincoln has identified and begun implementing a series of management actions to achieve the BMOs, including implementing a groundwater monitoring program, better understanding of the groundwater aquifer, operation requirements for City wells, and implementing a groundwater protection program.

### **Placer County Water Agency’s Natural Resources Management Plan**

Published in 2009 and developed by the Placer County Water Agency (PCWA) and USACE, the *Natural Resources Management Plan for Raw Water Distribution System Operations and Maintenance Activities* documents the condition of natural resources along PCWA’s raw water distribution system and in the region, describes regulatory requirements for operation and maintenance (O&M) of the system, identifies potential effects of O&M activities on natural resources, and identifies BMPs for

PCWA's O&M activities. This plan is intended to "help PCWA staff identify BMPs that may assist in minimizing the effects of O&M activities on natural resources conditions" (Placer County Water Agency 2009).

### **Placer County Water Agency's Western Placer County Groundwater Storage Study**

PCWA prepared the *Western Placer County Groundwater Storage Study* in 2005 to create alternatives for increased groundwater storage and conjunctive use in western Placer County with the goals of providing enhanced reliability of water supply for agriculture and improved water management flexibility for PCWA.

### **Western Placer County Groundwater Management Plan**

In 2007, the City of Lincoln, City of Roseville, PCWA, and the California American Water Company prepared the joint WPCGMP as a planning tool with the objectives of maintaining a safe, sustainable, and high-quality groundwater resource. The WPCGMP is intended to be a living document that will be updated in the future to account for progress and changing conditions (City of Roseville et al. 2007).

The WPCGMP contains the following technical requirements and provisions.

- An inventory of water supplies and description of water uses within western Placer County.
- Establishment of groundwater Basin Management Objectives (BMOs) designed to protect and enhance the groundwater basin.
- Identification of monitoring and management programs that ensure the BMOs are being met.
- Development of a stakeholder involvement and public information plan for the groundwater basin.

Since its formation the WPCGMP in 2007, the participating agencies have:

- Constructed 22 new monitoring wells (MWH 2011 and GEI 2015).
- An inventory of groundwater supplies and users in the basin (City of Roseville et al. 2013a).
- Monthly to quarterly monitoring of groundwater levels (agency personnel).
- Assessment of the state of groundwater conditions in the subbasin (City of Roseville et al. 2013b, GEI 2017).
- Performed outreach to stakeholders to understand their concerns about groundwater (MWH 2017).
- Much of the information on groundwater resources comes from these WPCGMP studies and investigations and includes most of western Placer County within the Plan Area.
- More recently, the Sustainable Groundwater Management Act of 2014 required local public agencies to achieve "sustainable groundwater management" by implementing various elements of the Act, including formation of a Groundwater Sustainability Agency. On May 9, 2017, Placer County entered into a Memorandum of Agreement with the City of Lincoln, City of Roseville, Nevada Irrigation District (NID), PCWA, and the California American Water Company (as of July 25, 2017) forming the West Placer Groundwater Sustainability Agency. Further information about groundwater in West Placer County can be obtained at

<http://westplacergroundwater.com/>. Four other GSAs have been formed to cooperatively manage groundwater beneath the entire North American Subbasin. The South Sutter Water District GSA will manage groundwater beneath portions of west Placer County and in eastern Sutter County.

## 3.5.2 Environmental Setting

### Surface Water

#### Precipitation

Western Placer County is located within the Sacramento Valley Air Basin, which is relatively flat and bordered by mountains to the east, west, and north. The climate is characterized by hot, dry summers and cool, rainy winters, sometimes with periods of dense and persistent low-level fog that are most prevalent between winter storms. The extreme summer aridity of the Mediterranean climate is caused by sinking air of subtropical high-pressure regions. In the case of the Sacramento Valley, the ocean has less influence than in the coastal areas, giving the interior Mediterranean climate more seasonal temperature variation.

Because the Plan Area covers the transition from the low elevations of the Sacramento Valley to the Sierra Nevada foothills, there is a corresponding transition in climate. Most precipitation here results from air masses that move in from the Pacific Ocean during the winter months, from west or northwest. Rainfall increases as the air mass is pushed upward and cools; therefore, the lower western edge of the Plan Area is drier than the higher eastern edge. The normal annual precipitation, which occurs primarily from November through April, ranges across the Plan Area from 18 inches on the west to 36 inches on the east.

The Plan Area has nearly 250 sunny days per year. The heat and summer sun, and typically less than an inch of rainfall from May to August, cause rapid drying of open water. The climate, coupled with the extensive hardpan underlying Valley soils, creates the vernal pool condition. When rain fills the pools in the winter and spring, the water collects and remains in the depressions. In the springtime, the water gradually evaporates until the pools become completely dry in the summer and fall. Monthly rainfall typically begins to exceed potential for water loss through evapotranspiration beginning in November and falls below evapotranspiration at the end of March.

#### Drainage Network Overview

The Plan Area is located on the west slope of the Sierra Nevada in the Lower Sacramento River Basin. The Sacramento and American River tributaries define a series of subbasins. Western Placer County falls within five subbasins at U.S. Geological Survey Hydrologic Unit Code Level 8 (HUC-8): 1) Upper Bear (18020126); 2) Upper Coon-Auburn (18020161); 3) North Fork American River (18020128); 4) Lower American River (18020111); and 5) Lower Sacramento River (18020163). To provide better resolution of planning issues, the PCCP further divides the Coon Creek/Auburn Ravine watershed into four watersheds: Coon Creek, Markham Ravine, Auburn Ravine, and Pleasant Grove Creek. This results in seven PCCP planning watersheds. Streams drain from northeast to the southwest, eventually reaching the Sacramento River, or in the case of Dry Creek, drain first to the American River before reaching the Sacramento River. Watersheds are mapped in Figure 3.5-1, and drainage areas are listed in Table 3.5-2. The northern watersheds are mainly in the Valley and the Foothills, while the watersheds from Pleasant Grove south are mainly in the non-participating cities.

Major streams in the Plan Area have extensive natural floodplains in the valley floor (see Figure 3.5-2).

**Table 3.5-2. Western Placer Watersheds—Land Area (acres)**

Watershed	Plan Area Valley	Plan Area Foothills	Non-Participating Cities	All Western Placer
Bear River	18,625	15,020	–	33,645
Coon Creek	14,143	37,967	284	52,394
Markham Ravine	16,127	1,050	–	17,177
Auburn Ravine	25,133	17,223	3,703	46,059
Pleasant Grove	15,341	–	24,378	39,719
Dry Creek	11,552	28,047	20,920	60,519
American	–	9,869	1,351	11,220
All Watersheds	100,921	109,177	50,636	260,734

Source: Appendix A.

**Table 3.5-3. Western Placer Watersheds—Stream Length (stream miles)**

Watershed	Plan Area Valley	Plan Area Foothills	Non-Participating Cities	All Western Placer
Bear River	50	52	–	102
Coon Creek	47	90	–	137
Markham Ravine	43	4	–	47
Auburn Ravine	79	30	8	117
Pleasant Grove	40	–	95	135
Dry Creek	34	91	57	182
American	–	16	2	18
All Watersheds	294	282	162	738
<i>Major Streams</i>	<i>31%</i>	<i>21%</i>	<i>31%</i>	<i>27%</i>
<i>Perennial Streams</i>	<i>16%</i>	<i>34%</i>	<i>23%</i>	<i>25%</i>

Source: Appendix A.

Note: Major streams are mapped as Strahler stream order 3 or greater.

Western Placer County is covered by a network of streams and artificial canals, as shown in Figure 3.5-2. Altogether, 738 miles of streams are mapped in western Placer County. Table 3.5-3 shows the length of stream miles in the planning watersheds, respectively.

A total of 34% of streams in the Foothills are mapped as perennial while only 16% of streams in the Valley are mapped as perennial, though as described below in *Hydrologic Modifications*, the distinction between perennial and intermittent is often not meaningful because of the non-seasonal presence of irrigation water.

**Table 3.5-4. Western Placer Streams, Canals, and Reservoirs (miles)**

Hydrologic Feature	Valley	Foothills	Non-Participating Cities	All Western Placer
Streams	294	282	162	738
<i>Major Streams</i>	90	58	50	198
<i>Minor Streams</i>	204	224	112	540
Canals	87	194	22	303
Reservoir Streamline	-	25	-	25
Reservoir Shoreline	-	35	-	35

Source: Appendix A.

Notes: Major streams are mapped as Strahler stream order 3 or greater.

Canals are artificial features and include both supply and drainage channels.

*Reservoir streamline* is where a stream passes through a reservoir maximum pool extent.

*Reservoir shoreline* is the shoreline of a reservoir at maximum pool extent.

Western Placer County has many artificial canals. Some 303 miles of irrigation supply and drainage canals are mapped. The supply canals take advantage of the abundant Sierra Nevada runoff in the Bear, Yuba, and American Rivers and connect to a series of small reservoirs in the Foothills. The drainage canals are found in the Valley and Foothills. In the Valley the drainage canals drain rainfall and irrigation runoff that would otherwise accumulate in the flat alluvial plain. For the Foothills, they provide irrigation water for ponds, irrigated pasture, landscaping, and crop production. Although the canals are not natural hydrologic features, they are occasionally the source of perennial seeps that may create small pockets of wetland habitat or other wet areas that are not wetlands or habitat in the Foothills and may serve some aquatic habitat functions in the Valley.

The Plan Area includes two major reservoirs: Camp Far West Reservoir (104,000 acre-feet storage capacity) on the Bear River to the north and Folsom Reservoir (975,000 acre-feet storage capacity) on the American River to the southeast. Table 3.5-4 lists the length of the shoreline and the length of the streams that flow through the reservoir at maximum pool size.

Rainfall, and the subsequent groundwater release, is the primary water source for surface flows in the winter and spring. Agricultural and urban runoff, water deliveries for irrigation, and wastewater treatment plant (WWTP) effluent can constitute significant portions of total streamflow in the spring, summer, and fall. Some watersheds that were once seasonally intermittent are now perennial. Irrigation also transfers water between watersheds. For example, Auburn Ravine receives water imports from the Bear, Yuba, and American Rivers and is used by Pacific Gas and Electric Company (PG&E), NID, and PCWA as a conveyance feature.

Unless noted otherwise, the watershed descriptions below have been excerpted from the Plan, which based its descriptions on the Jones & Stokes Associates' *Assessment of Habitat Conditions for Chinook Salmon and Steelhead in Western Placer County, CA*.

## Watershed Descriptions

### Bear River Watershed

Headwaters for the Bear River are in the vicinity of Emigrant Gap and Lake Spaulding in Nevada County. The Bear River forms the northern Placer County boundary as it flows southwesterly to a

point approximately 8 miles north of Auburn where it turns west and flows to its confluence with the Feather River in the vicinity of Nicolaus in Sutter County. The Bear River is the second-largest tributary to the Feather River.

The Bear River planning watershed comprises the Placer County side of the Lower Bear and Middle Bear HUC-10 watersheds. Most of those watersheds are in Yuba and Nevada Counties such that the Plan Area portion makes up only 29% of the whole Bear River watershed.

Bear River historically experienced high winter flows and low summer flows, but today the timing of flow and volume is highly regulated by releases from reservoir storage and diversions. Camp Far West is the largest storage reservoir on the Bear River. The exportation of water diverted from the Bear River watershed is made through NID and PG&E conveyance facilities. These diversions supply nearly all of the water imported to the Coon Creek watershed and a substantial percentage of the flows imported to the Auburn Ravine watershed. The flow is diverted for irrigation, power generation, and domestic supply in the Auburn and Mount Pleasant area. The upstream diversions from the Bear River basins have depleted the streamflow downstream from the Sutter Irrigation District Diversion Dam, which is 1 mile downstream of Camp Far West Reservoir. Minimum flow releases are 25 cubic feet per second (cfs) in the spring and 10 cfs during the rest of the year. Below the dam, Bear River flows range between 0 and 40 cfs from June to December.

NID has proposed construction of the Centennial Dam on the Bear River just upstream from Combie Reservoir, which is located approximately 5 miles north of Auburn. The dam would create a 6-mile-long reservoir, called Centennial Reservoir, holding up to 110,000 acre-feet of water. The reservoir would supply drinking water and agricultural irrigation water (Nevada Irrigation District 2016). NID issued a Notice of Preparation of an EIR for the dam in February 2016.

U.S. Geological Survey gage #11424000 Bear River near Wheatland is located in the northeast corner of the Plan Area. Streamflow records at the gage show that the mean annual flow for water years (WYs) 1996–2015 was 384 cfs, with a minimum annual flow of 25 cfs (WY 2001) and maximum annual flow of 990 cfs (WY 2011). Mean monthly flows over the same 1996–2015 period show streamflows in the range of 28–53 cfs during the months of July through November with flows steadily increasing up to 988 cfs in March, the month with the highest monthly streamflow. A log Pearson Type III analysis of peak annual flows at the same gage shows the 1.5-year recurrence interval event is 7,360 cfs and the 100-year event is 48,300 cfs.

Yankee Slough is a part of the Bear River watershed and flows into the Bear River drainage downstream of State Route 65 and outside of the Plan Area in Sutter County. Yankee Slough originates north and east of the unincorporated township of Sheridan in the lower Sierra foothills. Yankee Slough flows perennially due to irrigation runoff. Yankee Slough historically flowed into the American River basin, once a massive marsh complex that is now principally rice fields and urban neighborhoods. Little or no riparian vegetation is present on much of Yankee Slough in Placer County. Outside the Plan Area in Sutter County, Yankee Slough is mostly channelized and serves as drainage facility for agricultural runoff. Some of the largest perennial freshwater marshes in western Placer County are along Yankee Slough east of State Route 65, where the Yankee Slough Conservation Bank is located.

### **Coon Creek Watershed**

Coon Creek originates east of Auburn near Meadow Vista and flows westward. It is intercepted by the East Side Canal in Sutter County just west of the county line. The East Side Canal then flows into

the Cross Canal where it is joined by flows from Markham Ravine and Auburn Ravine. Pleasant Grove Creek enters the Pleasant Grove Creek Canal, which joins the East Side Canal, at a confluence in Sutter County where it then becomes the Cross Canal. The Cross Canal joins the Sacramento River immediately downstream of the confluence of the Feather and Sacramento Rivers near Verona. Coon Creek historically flowed into the American River basin.

The Coon Creek planning watershed corresponds to 58% of the Coon Creek HUC-10 watershed, with a portion extending east of Plan Area A in Placer County and a portion extending west in the Sutter County where it meets the Pleasant Grove Creek–Cross Canal watershed.

In Coon Creek, most of the streamflow present during the late spring through early fall consists of imported water en route to downstream agricultural diversions (Appendix A). Coon Creek historically had little or no summer flow in the lower reaches. The creek previously received a daily discharge of around 2 cfs from the Placer County Sewer Maintenance District #1 (SMD-1) WWTP. The SMD-1 effluent flows into Coon Creek ceased following the construction of a sewer pipeline that now conveys flows from the SMD-1 service area for treatment at the Lincoln WWTP on Auburn Ravine. NID discharges 7.5 cfs during the summer and fall (i.e., about April 15 through October 15). Flow in Coon Creek is controlled by releases from Orr Creek Reservoir, operated by NID. The last downstream diversion receiving NID deliveries of water is near Gladding Road. Streamflow is managed to have no excess flow (i.e., essentially dry at Lincoln Boulevard at the old alignment for State Route 65) (Appendix A).

The natural flow pattern for small foothill streams is a gradual decline in flow during the spring, summer, and early fall, until the first rainstorms begin in late fall. Flow is an essential component of fish habitat. Low-flow conditions can result in lack of depth for adult fish passage, minimal flow over redds,<sup>1</sup> increased siltation of redds and reduced levels of oxygen to the eggs, and reduced space for juvenile rearing.

In the lower reaches of Coon Creek, runs are the most dominant channel structure element, followed by low-gradient riffles, glides, dammed pools, mid-channel pools, lateral scour pools, and channel confluence pools (Appendix A). There are minimal amounts of in-stream cover (i.e., woody debris and undercut banks) and overhead cover (i.e., riparian vegetation). Streamside vegetation is sparse in many places due to grazing by livestock. Channel instability and resultant bank cutting may also prevent the establishment of vegetation. Stream channel substrates consist predominantly of cobble, gravel, sand, and silt- and clay-sized particles.

Doty Ravine originating west of Auburn is the main tributary to Coon Creek. The streambed in the headwaters consists primarily of gravel and cobbles with some larger granitic boulders. Doty Ravine upstream of Gladding Road flows through oak woodland and is bordered by rural-residential and ranch lands. Downstream of Gladding Road, the bordering lands experience higher livestock use, and the ravine is considered highly disturbed (Appendix A).

Doty Ravine receives water from deliveries by NID as well as natural runoff. Import of NID deliveries and conveyance down Doty Ravine is generally completed by October. Winter flows can exceed several thousand cfs, but during the irrigation season the flows generally average less than 20 cfs and are usually substantially less (Appendix A). All irrigation water is diverted at the Doty South Diversion Dam (DSDD) west of Crosby Herold Road. Downstream of the DSDD, flow in the stream

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<sup>1</sup> A redd is a depression in the gravel of the river, scooped out by the salmonid fish males for females to lay their eggs in. After fertilization, the females cover the eggs with gravel.

accretes from leakage at the DSDD, groundwater, and agricultural runoff. During the non-irrigation season, the flows are around 5–6 cfs.

### **Markham Ravine Watershed**

The Markham Ravine watershed is almost entirely on the Valley floor, originating in the low elevation hills northeast of the city of Lincoln and emptying into the East Side Canal approximately 1 mile north of Auburn Ravine in Sutter County. Because of the nearly flat terrain and the extensive history of drainage and irrigation modifications, watershed boundaries here are indistinct in the lower reaches. The Markham Ravine planning watershed comprises the northern portion of the Pleasant Grove Creek–Cross Canal HUC-10 watershed (Appendix A).

In its headwaters, the channel of Markham Ravine is poorly defined. Near Lincoln Boulevard, the channel becomes more distinct and passes through industrial, light industrial, and rapidly urbanizing areas located in the northern portion of Lincoln. West of Lincoln, the channel passes through a mixture of farms and ranches, including pastures for grazing as well as rice and other grain farming. In this reach of Markham Ravine, streamflow is artificially augmented by irrigation return flows and urban runoff. There are no effluent discharges into the ravine. The presence of relatively permanent flows allows the establishment of riparian and wetland vegetation. Beavers are very active west of Lincoln, resulting in small impoundments forming seasonal and perennial marshes (Appendix A).

### **Auburn Ravine Watershed**

Auburn Ravine originates on the north side of the city of Auburn and flows west to its confluence with East Side Canal in Sutter County and then into the Cross Canal and the Sacramento River. The elevation of the basin ranges from 30 to 1,600 feet above sea level. The Auburn Ravine planning watershed includes the entire HUC-10 Auburn Ravine watershed and a portion of the Pleasant Grove Creek–Cross Canal HUC-10 watershed (Appendix A).

In its headwaters, Auburn Ravine is characterized by a high-gradient, incised channel with steep-sided banks. Large boulders and cobbles dominate the substrate. The channel includes scour pools, waterfalls, and high-velocity chutes. Riparian vegetation is abundant. In its middle reaches downstream to Lincoln, the stream's gradient decreases substantially, and the substrate is characterized by sand, gravel, and cobbles. Pools and riffles are common, and trees and shrubs dominate the riparian zone. The channel contains large woody debris and bank erosion increases relative to the upper reach (Appendix A).

Within the city limits of Lincoln, Auburn Ravine has a very a low gradient and sandy substrate. Riparian vegetation is characterized by a relatively open tree canopy with an understory dominated by blackberries and shrubs.

Downstream from the city of Lincoln, rice farms and livestock ranches border the stream. In some places, Auburn Ravine is contained within levees and riparian vegetation may be absent. Stream channel substrate is mostly clay and fine sediments, with occasional pieces of large woody debris. Grazing and channel maintenance activities restrict the development of riparian vegetation. The lower 2.5 miles of Auburn Ravine was rerouted and leveed to flow into the East Side Canal (Appendix A).

Winter flow in Auburn Ravine is dominated by runoff from rainfall events and effluent from the City of Auburn and City of Lincoln WWTPs, both of which contribute discharge year-round. Winter flows range from less than 3 cfs to an estimated 100-year flow event that exceeds 14,000 cfs (Appendix A).

Summer flows are high relative to natural conditions because of the effects of water imports. Auburn Ravine receives water imports from the Bear, Yuba, and American Rivers by NID, PCWA, and PG&E, creating above-normal spring and summer flow conditions. NID, PG&E, and PCWA use Auburn Ravine as a water conveyance feature. In addition to water imports, NID and PCWA customers indirectly affect Auburn Ravine hydrology through customer return flows (remaining portions of customer water deliveries that return to drainages). In September or October, flow is substantially decreased as irrigation demands diminish or cease. Flow during the fall may often be less than 3 cfs. Auburn Ravine's artificially high flow in the summer months provides more—and substantially different—aquatic habitat compared with what would exist under natural flow conditions. Reduced flow in September and October substantially reduces the area of aquatic habitat relative to habitat available in the summer (Appendix A). Flow in the Auburn Ravine is also affected by PG&E system maintenance. The following description is from Section 2.3.2 of the PCWA natural resources management plan (Placer County Water Agency 2009):

PG&E implements an annual water delivery outage to PCWA while PG&E conducts maintenance on its system. The outage typically takes place from mid-October to mid-November, reducing water available to PCWA's Zone 1 customers from PG&E's Wise, Bear, and South canals. The amount of water available for raw water delivery depends on customer demands for treated water from PCWA's WTPs. Generally, treated water needs are met before raw water needs. During the PG&E outage, PCWA relies on stored water in surface reservoirs, water bypassed through Zone 3, and water delivered through the ARPS to supplement flow to the WTPs and to canal customers. Water pumped from the North Fork American River through the AROs is pumped again to PCWA's Auburn Ravine Tunnel Pump into PG&E's South Canal, and PCWA's raw water distribution system requiring alternative delivery schedules, such as rotating outages among canals.

### **Pleasant Grove Creek Watershed**

The Pleasant Grove Creek watershed and its constituent Curry Creek are located in western Placer County, including the western portions of the cities of Roseville and Rocklin and eastern Sutter County. Both of these creeks empty into the Pleasant Grove Creek Canal, which drains to the Sacramento River via the Cross Canal.

The Pleasant Grove planning watershed comprises the southern portion of the Pleasant Grove Creek-Cross Canal HUC-10 watershed and the Placer County portion of the Curry Creek HUC-10 watershed. Altogether, the Markham Ravine, Auburn Ravine, Coon Creek, and the Pleasant Grove planning watersheds cover more than 90% of the total watershed area that feeds into the Cross Canal.

The watershed is composed of five major drainages: Curry Creek, Lower Pleasant Grove Creek, Kaseberg Creek, South Branch Pleasant Grove Creek, and Upper Pleasant Grove Creek. In general, slopes are very flat, less than 5%, particularly in the lower watershed. These creeks were historically dry or very nearly dry in the summer months but are now mostly perennial because of urban runoff and agricultural irrigation return flows. The Pleasant Grove WWTP, operated by the City of Roseville, also augments natural streamflow, on average, by 11 cfs per day.

The dominant land cover types within the watershed are annual grassland, urban and suburban, and agriculture. Urban and suburban land uses within the watershed are currently confined to unincorporated Placer County, the cities of Roseville and Rocklin, and the town of Loomis, but

significant growth in urban and suburban land uses is expected in the next 10–20 years, including nonresidential development in the unincorporated Sunset Industrial Area. Current development in the watershed is resulting in the conversion of agricultural and grasslands to suburban land uses, predominantly low- to medium-density residential communities with associated neighborhood or community commercial.

The Pleasant Grove Creek watershed was historically dominated by agriculture, and that is still the dominant land use in the lower portions. Rice farming in the lower watershed is very active, with farmers growing white, wild, and organic rice. Agriculture in the middle portion of the watershed involves primarily rice farming and cattle ranching on unirrigated grasslands (Appendix A).

### **Dry Creek Watershed**

The following section is excerpted from the Plan (Appendix A), which summarizes ECORP Consulting's *Dry Creek Watershed Coordinated Resource Management Plan* and Jones & Stokes Associates' *Assessment of Habitat Conditions for Chinook Salmon and Steelhead in Western Placer County, CA*.

The Dry Creek planning watershed includes the northeastern corner of the much larger Lower American HUC-8 watershed, comprising portions of the Dry Creek and Steelhead Creek HUC-10 watersheds. The Dry Creek planning watershed ranges from the unincorporated community of Newcastle (near Auburn) to Sacramento County.

Major tributaries to Dry Creek include Antelope Creek, Secret Ravine, Miners Ravine, Strap Ravine Creek, Linda Creek, Clover Valley Creek, and Cirby Creek. The gradient of the main stem of Dry Creek is low, generally less than 1%. The channel is well defined with sandy substrate and bordering riparian vegetation.

The middle portion of the Dry Creek watershed has been subject to extreme development pressure by relatively recent growth, primarily within the cities of Roseville and Rocklin. The lower portions of the watershed are experiencing similar growth at this time. The upper watershed is largely composed of rural-residential property in the unincorporated area of the Loomis Basin and Penryn and some suburban growth in unincorporated Granite Bay. Urbanization has exacerbated flooding in the lower watershed, particularly in Sacramento County.

Water quality concerns have arisen because of the perceived increase in sedimentation and potential contamination from non-point sources.<sup>2</sup> Given these concerns, the Dry Creek Conservancy has collected a large amount of physical and biological data on the watershed. The Office of Environmental Health Hazard Assessment is currently analyzing the data, including data on water quality indicators, to gain a better understanding of the stressors in the watershed (Appendix A).

As with most of the streams in the Plan Area, late summer flows in Dry Creek are largely urban runoff and releases from the existing WWTP. The City of Roseville's Dry Creek WWTP drains into Dry Creek west of Interstate 80.

U.S. Geological Survey gage #11447293 Dry Creek at Vernon St Bridge at Roseville is located in the southern portion of the Plan Area. Streamflow records at the gage show the mean annual flow for

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<sup>2</sup> Non-point source is a source of water pollution that comes from many diffuse sources (e.g., land runoff, precipitation, drainage, etc.), as opposed to a point source, which comes from a discernible, confined, and discrete conveyance such as a pipe, ditch, channel, etc.

WY 2000–2011 (the period of record for analysis) was 77 cfs, with a minimum annual flow of 49 cfs (WY 2007) and maximum annual flow of 131 cfs (WY 2006). Mean monthly flows over the same 2000–2011 period show streamflows in the range of 15–39 cfs during the months of June through November with flows steadily increasing up to 177 cfs in February, the month with the highest monthly streamflow. Peak annual flows are highly influenced watershed urbanization. The maximum peak annual flow over the 1997–2012 period of 7,950 cfs occurred January 22, 1997, and the minimum of 983 cfs occurred February 11, 2001.

### **American River Watershed**

The North Fork American River defines the southeast border of the county and, with the South Fork in El Dorado County, forms Folsom Lake. No part of North Fork American stream habitat would be managed as part of the PCCP because most of this land is managed by the California Department of Parks and Recreation. The Middle Fork of the American River is outside the Plan Area; however, a portion of the Middle Fork's watershed includes Plan Area B5, the Big Gun Conservation Bank for California red-legged frog near the unincorporated town site of Michigan Bluff, 21 miles east of Auburn.

### **Hydrologic Modifications**

Urbanization, water supply and power generation projects throughout the county and elsewhere in the Sierra Nevada have altered the natural hydrology of many streams and watersheds. Hydrologic effects vary and range from increased peak flows to reduced or augmented summertime flows. As a watershed urbanizes, the amount of impervious surface increases and the proportion of precipitation that is surface runoff also increases. This changes the timing and magnitude of peak flows in receiving channels. In addition to increasing the potential for downstream flooding, increased peak flows also have the capacity to erode channels.

Although some of the stream channels in the upland areas of western Placer County are still natural, most of the tributaries within the Valley floor area of the watershed have been significantly modified to quickly route flood flows off the landscape, deliver irrigation water, to reduce natural channel bank erosion in support of agricultural production by laterally confining streams through levees and bank armoring. Many types of control structures have been installed, including earthen levees, floodwalls, culverts, and, to a limited extent, engineered channels. These structures were historically focused on conveying 100-year stormflows and preventing flooding in new development adjacent to these stream corridors. Concrete dams, seasonal flashboard dams, and diversions are present throughout the Plan Area. To facilitate water deliveries to users, seasonal flashboard dams are installed in the Plan Area, particularly in Auburn Ravine, from mid-April to October. Channelization has complex effects that vary from stream to stream. Generally, current flood control methods emphasize methods other than structural approaches to reducing hydrologic impacts of development. These include the use of retention basins, bypass channels, and other means of minimizing impacts of urbanization on peak flows.

### **Water Deliveries and Diversions**

Western Placer County has an extensive network of some 300 miles of canals, as shown in Figure 3.5-2. Inter-basin transfers artificially augment streamflow in most western Placer County watersheds. Water is delivered to the various watersheds for agriculture, domestic, and commercial use. The main entities involved in the delivery of water in western Placer County include the SSWD, NID, PG&E, and the PCWA. Auburn Ravine receives a large amount of water from the Bear, Yuba, and

North Fork American River through PG&E, NID, and PCWA. PG&E delivers Bear, Yuba, and North Fork American River water to Auburn Ravine just upstream of the City of Auburn WWTP at the Wise Powerhouse and at Lozanos Road Bridge. NID delivers Yuba and Bear River water to Auburn Ravine for downstream diversions at the Auburn Ravine One Canal and the Hemphill Canal. PCWA diverts Middle Fork American River water to Auburn Ravine through the Auburn Tunnel (Appendix A).

The upper half of the Coon Creek basin has a complex network of irrigation canals, which are managed by NID, that carry water imported from the Bear River. NID uses Orr Creek, or sometimes Rock Creek in dry years, to transport imported water from Bear River downstream to agricultural users. During the irrigation season, flows in Orr Creek average about 40 cfs above natural flows. The primary NID diversion on Coon Creek takes place at the Camp Far West Canal. Doty Ravine, the main tributary of Coon Creek, receives NID deliveries through the Auburn Ravine I and Gold Hill II/Sailor's Ravine canal system. The management objective on Doty Ravine is to divert all irrigation water at the DSDD, located just west of Crosby Herold Road (Appendix A).

For the Dry Creek watershed, PCWA, San Juan Suburban Water District, and the City of Roseville are the major water resource management agencies. Water supplies from outside of the Dry Creek watershed are augmenting Dry Creek flows and may dominate them during the dry season (Appendix A).

## Wastewater Treatment Plants

Some of the water imported into Auburn Ravine is the discharge from WWTPs operated by the Cities of Auburn and Lincoln. Lincoln's current permit allows a dry-weather flow discharge of 4.2 million gallons per day (mgd), with current dry-weather flows averaging 2.8 mgd. The City's permit allows for expansion up to 8.4 mgd. The actual level of discharge will vary and may be less than the permit limits, depending upon the City's level of beneficial use of reclaimed water during the course of the year (Appendix A).

The Placer County WWTP SMD-1, located off State Route 49 near Joeger Road in Auburn, was decommissioned, and all effluent is now conveyed to the City of Lincoln for treatment at the regional WWTP on Auburn Ravine. A portion of the site is being reclaimed, a new export pump station is being constructed, and a new emergency containment basin is also being constructed. The overall project is known as the Mid-Western Placer Regional Sewer Project. Prior to its decommissioning, the WWTP discharged treated effluent into Rock Creek, a tributary of Orr Creek, which is a tributary to Coon Creek. The effluent discharged from SMD-1 was approximately 1.3 mgd, or about 2 cfs, which was a significant portion of total flow only in the fall when NID imports to Coon Creek stop (Appendix A).

Dry Creek receives treated effluent from the Roseville Dry Creek WWTP. The design capacity is 18 mgd. Treated effluent contributes relatively little to flows during wet-weather months; however, they can represent a high proportion of dry-weather flows (more than 50% of total flow at Vernon Street Bridge) (Appendix A).

The Placer County Sewer Maintenance District #3 (SMD-3) facility was a minor discharger of municipal wastewater for the Loomis Basin/Granite Bay area. This facility was decommissioned in November 2014, and all effluent is being transferred to the existing Placer County Sewer Maintenance District #2 collection system in Granite Bay for treatment at the Dry Creek WWTP in Roseville. The site is being reclaimed.

## Surface Water Quality

The following sections discuss specific water quality parameters and contaminants of concern in creeks and rivers in the Plan Area.

### Total Suspended Solids and Turbidity

*Total suspended solids* (TSS) are suspended or colloidal particles in water which do not readily settle out by gravity. Streams carry much more suspended sediment during high flow periods. In surface water, TSS is indicative of upstream scouring, bank erosion, and agricultural return flow transporting and depositing sediment. Suspended sediment is considered a pollutant by the Central Valley Water Board and can transport other contaminants (e.g., phosphorus) and hydrophobic contaminants (e.g., organochlorine pesticides).

*Turbidity* is the reduction of water clarity due to the presence of suspended or colloidal particles and is commonly used as an indicator for the general condition of water clarity. Turbidity in surface water comprises naturally occurring and/or introduced organic matter and inorganic minerals, such as silt, clay, industrial waste, sewage, and algae. It is quantified according to the amount of light which is reflected by the suspended particles and is measured in nephelometric turbidity units (NTUs). Turbidity is closely related to TSS, but also includes plankton and other organisms (Murphy 2009). The Basin Plan specifies waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Turbidity increases for water bodies depend on the water body's natural turbidity levels. For Folsom Lake specifically, the Basin Plan states the turbidity shall be less than or equal to 10 NTUs.

### Water Temperature, Salinity (Electrical Conductivity), and pH

Water temperature affects the concentration of dissolved oxygen and is an important water quality variable for aquatic life. The Basin Plan water temperature objective requires that the temperature not be increased more than more than 5°F above natural receiving water temperature (California Regional Water Quality Control Board 2011).

Electrical conductivity (EC) of water is directly related to the concentration of TDS. TDS and EC are general indicators of salinity and are regulated under the Basin Plan. The Basin Plan does not specify EC targets for water bodies in the Plan Area. The Basin Plan does specify that TDS of the North Fork of the American River from the source to Folsom Lake shall not exceed 125 milligrams per liter (mg/L) and in Folsom Lake shall not exceed 100 mg/L (California Regional Water Quality Control Board 2011).

The Basin Plan objective for pH is between 6.5 and 8.5; pH represents the effective concentration (activity) of hydrogen ions in water is reported on a scale from 0 (acidic) to 14 (alkaline).

### Water Quality of Major Surface Water Features

Surface water quality in the Plan Area is variable depending on the water body. Several of the larger water bodies in the Plan Area are listed as impaired according to Section 303(d) of the CWA (Section 3.5.1, *Regulatory Setting*, above). The following list of 303(d) listed impaired water bodies is based on the 2010 303(d) list. Table 3.5-5 summarizes water quality impairments in major surface waters in the Plan Area and the sources of these impairments.

**Table 3.5-5. CWA Section 303(d)-Listed Impaired Water Bodies and Associated Potential Sources for Major Water Bodies within the Plan Area**

Water Body	Listed Pollutants	Associated Potential Sources
Bear River	Mercury	Resource extraction
	Chlorpyrifos	Agriculture
	Copper	Source unknown
	Diazinon	Agriculture
North Fork American River	Mercury	Resource extraction
Curry Creek	Pyrethroids	Urban runoff/storm sewers
	Sediment toxicity	Source unknown
Miners Ravine	Dissolved oxygen	Source unknown
Natomas East-Main Drainage Canal	PCBs (Polychlorinated biphenyls)	Agriculture; industrial point sources; urban runoff/storm sewers
Pleasant Grove Creek	Dissolved oxygen	Source unknown
	Pyrethroids	Urban runoff/storm sewers
	Sediment toxicity	Source unknown
Yankee Slough	Chlorpyrifos	Agriculture
	Unknown toxicity	Agriculture; source unknown

Source: State Water Resources Control Board 2010.

PCBs = Polychlorinated biphenyls.

The following are descriptions of surface water quality for select tributaries in addition to those stated in Table 3.5-5.

#### ***North Fork American River***

Despite mercury accumulations in riverbed sediment, overall water quality in the North Fork of the American River is good to excellent. The water is low in alkalinity, disinfection by-product precursor materials, mineral content, and organic contamination (City of Roseville et al. 2007).

#### ***Bear River***

Water quality is affected by previous mining activities (mercury accumulation in riverbed sediment) and in the lower portion of the watershed is affected by agricultural runoff. Flow regulation and diversions can also affect water temperature (City of Roseville et al. 2007).

#### ***Dry Creek***

The runoff in Dry Creek and its tributaries is heavily affected by urban land use. In the summer the water quality resembles treated wastewater effluent since it is the source of most of the streamflow in the dry months. With the onset of the first rainfall in the fall the water contains trace metals, organic chemicals and other contaminants typical of urban runoff (City of Roseville et al. 2007).

***Auburn Ravine***

Several factors affect the water quality of Auburn Ravine, including treated effluent, failing septic systems, agricultural return flows, and urban. High concentrations of heavy metals, including copper, lead and mercury have been measured. The pesticide diazinon has also been detected in water quality samples (City of Roseville et al. 2007).

***Coon Creek***

Despite the historic and ongoing disturbances to the Coon Creek watershed, several factors affect the water quality of Coon Creek, including urban stormwater, effluent, and agricultural return flows. Excess nutrients levels from wastewater treatment and cattle grazing along the creek have depleted oxygen levels. The pesticide heptachlor was detected in water quality samples during the Coon Creek watershed assessment (Placer County 2017:49)

**Groundwater****Groundwater Hydrology**

Groundwater in the Plan Area occurs in alluvial sediments and fractured bedrock aquifers. The major alluvial aquifers are located in the western portion of the Plan Area in the Sacramento Valley Groundwater Basin–NASb as defined by DWR in its Bulletin 118 (California Department of Water Resources 2016a). The NASb is bounded by the central Sierra Nevada to the east, and the American, Sacramento, and Bear Rivers to the south, west, and north, respectively. About 40% of the northeastern portion of the NASb lies in Placer County. The groundwater supplied in the subbasin is variable in terms of water quantity and quality due to the variety of fine and coarse-grained sediment types that make up the groundwater aquifers. The western portion of the Plan Area contains more fine-grained sediments (silt and clay) but has significant water-bearing formations up to a depth of 2,000 feet below ground. The base of fresh water is about 1,000–1,500 feet deep. Below this boundary, water quality is too poor to be used as a reliable municipal or agricultural water source (City of Roseville et al. 2007). To the east along the border of the Sierra Nevada foothills, NASb deposits are of similar origin but are coarser, more permeable, and thinner. Aquifers that are exposed at ground surface along the eastern edge of the NASb are tilted to the west and interconnected to deeper, confined aquifers in the rest of the NASb.

Groundwater recharge occurs primarily along active river and creek channels where abundant sand and gravel deposits occur, particularly in the eastern portion of the NASb at the transition from the fractured bedrock of the Sierra Nevada foothills into the coarse sediments of the NASb. The major recharge sources include all the small creeks and streams such as Coon Creek, Dry Creek, and Auburn Ravine along with the larger Bear River. Significant recharge also occurs from deep percolation of irrigation water and precipitation.

Groundwater resources in the eastern portion of the Plan Area, outside of the NASb, are supplied from the fractured rock sources of the Sierra Nevada and are extremely variable in terms of water quantity and quality (California Department of Water Resources 2006).

**Groundwater Elevations**

A map of groundwater elevations in the Placer County portion of the NASb for spring 2017 is shown in Figure 3.5-3. The elevations are shown relative to mean sea level (msl). Spring groundwater elevations are typically 10–20 feet higher than fall elevations (City of Roseville et al. 2007). A

regional depression of groundwater levels exists in southwestern portion of the Plan Area, near the junction of Placer, Sutter, and Sacramento Counties. Groundwater elevations within the Plan Area typically range from -25 feet msl in the southwest corner (within the cone of depression) and 80 feet msl. Groundwater generally flows toward the east and south into the regional depression. Depth to groundwater below the ground surface is about 100 feet in this area, and typically less than 30 feet below ground at the eastern NASb edge.

Graphs of historic water levels (hydrographs) are shown in Figure 3.5-4 and indicate that the depression in the southwestern area started developing in the 1950s but has been relatively stable since the 1980s. Water levels along the eastern portion of the Plan Area near Sutter County have been highly variable over time, likely due to agricultural demand. Other areas have been relatively stable over time.

### **Groundwater Quality**

The quality of shallow groundwater is largely dependent on the quantity and quality of surface water that percolates into the ground and the subsequent chemical interactions that take place with the soil's bedrock within the saturated aquifer layers. Factors that affect the susceptibility of shallow groundwater to contamination include the type of soil and water-bearing materials, permeability of the soil to surface water infiltration, location of pollutant sources, and depth to the aquifer. Potential sources of shallow groundwater contamination include agricultural application of fertilizers and pesticides, hazardous material spills from industrial and commercial processes, septic tank leachate, infiltration of contaminated urban stormwater runoff, and disposal of municipal wastewater (City of Roseville et al. 2007). Most major contamination sites appear to be well monitored and have remedial actions in progress to contain the contaminants from either reaching the groundwater or migrating offsite. The Central Valley Water Board is aware and assessing groundwater contamination beneath one former dry cleaner, in old town Roseville, which is not being remediated (GEI 2018).

The quality of groundwater in the aquifer system within the Plan Area has been assessed through samples obtained from monitoring wells (GEI 2018). Groundwater in the NASb is generally of good quality and does not require treatment beyond disinfection. Shallow groundwater is preferable to groundwater in the lower aquifer (below about 500 feet) system because the lower aquifer contains higher concentrations of total dissolved solids, chloride, sulfate, iron, and manganese, and possibly arsenic (City of Roseville et al. 2007). Municipal water supply systems groundwater sources meet all water quality standards.

### **Known Flooding**

Many of the creeks and rivers within the lower lying western portion of the Plan Area in the Central Valley have 100-year floodplains as designated by FEMA. A small portion of land within the far northwestern corner of Placer County within the Plan Area along the Bear River is mapped as being within the 200-year floodplain. This area near the Bear River is also the only location in the Plan Area with a federal levee. These 100-year and 200-year floodplains and levee areas are illustrated on the DWR's Best Available Maps website (California Department of Water Resources 2016b) as well as Figure 3.5-5, which is a map of flood-prone properties in Placer County available on the PCFWCD website (Placer County Flood Control and Water Conservation District 2016).

Increased development in the Plan Area has led to more infrastructure being built within or adjacent to natural floodplains and thus susceptible to flooding. Urbanization has also led to increased runoff and higher peak flows that exacerbates flooding in developed areas. PCFCWCD undertakes projects to address flooding that is problematic to the existing and planned growth in the Plan Area. Typical flood control and stormwater management activities include channelization, maintenance activities, water retention/detention facilities construction, streambed and channel debris and vegetative control and removal, channel lining, culvert replacement, stormwater conveyance facilities and outfall structures, erosion/sediment control, bank stabilization, and floodplain enhancement. Operation and maintenance of flood protection and stormwater facilities such as drainage improvements, dams, armored creeks, bypass channels, and detention ponds.

### **Dry Creek Watershed Flood Control Plan**

The *Update to the Dry Creek Watershed Flood Control Plan* (Placer County Flood Control and Water Conservation District 2011) recommended structural and non-structural measures to correct existing deficiencies and mitigate for impacts of future development that will create even more impervious surface in the already heavily urbanized Dry Creek watershed. Some of the recommendations have been implemented, while many have not due to environmental and/or economic constraints. The flood control plan provides a hydrological analysis of the watershed, provides recommendations for feasible regional flood control projects, means to mitigate development projects, and recommends an updated facility plan and fee program. Capital project elements within this plan include on- and off-channel stormwater detention projects located throughout the watershed, floodplain restoration and re-connections, bridge and culvert improvement projects, improvements to underground conduits, artificial and natural channels.

### **Cross Canal Watershed Flood Control Plan**

The purpose of the *Cross Canal Watershed Flood Control Plan* is to provide PCFCWCD and other governmental agencies in both Placer and Sacramento Counties with the information and policies necessary to manage flood waters within the Cross Canal Watershed, which includes Pleasant Grove, Auburn Ravine, Markham Ravine, and Coon Creek. The plan evaluates existing flooding problems and identifies flood management options as well as a funding mechanism to achieve plan's recommendations. There are numerous stormwater retention projects combined with wetland and agricultural conservation easements within the floodplain areas (Appendix A:Chapter 2).

### **Lakeview Farms Volumetric Mitigation Facility**

One of the bigger capital flood control projects within the unincorporated portion of Placer County is the Lakeview Farms volumetric mitigation facility constructed by the City of Lincoln.

The City of Lincoln purchased 456 acres of north of Waltz Road in the unincorporated portion of Placer County to construct an off channel (off of Coon Creek) retention facility for flood control purposes. The project is being constructed in phases to passively capture flood water during range of storm event intervals. Phase one of the project would be developed on 160 acres of rice fields to impound 1,030 acre feet of stormwater, with phase two being developed on 160 acres retaining an additional 1,570 acre feet of water. The site would function as a retention basin only in large storm events during the rainy season of December through April and would remain in rice production from approximately March through September.

### Scilacci Farms Retention Basin

Placer County is in the planning stage of a stormwater retention basin at Scilacci Farms, also off Coon Creek. The facility would provide volumetric mitigation of stormwater drainage from developed area during a range of storm events. Once complete, the facility would capture stormwater only when the Sacramento River gauge at Verona exceeds 37 feet, which is 4.3 feet below flood stage (Appendix A:Chapter 2).

### Reason Farms Retention Basin

The City of Roseville has developed the Reason Farms Retention Basin, a regional stormwater retention facility in the Reason Farms Environmental Preserve along Pleasant Grove Creek. The basin has approximately 2,500 acre-feet of storage. The basin captures stormwater runoff from urban developments in Roseville and unincorporated Placer County (City of Roseville 2011)

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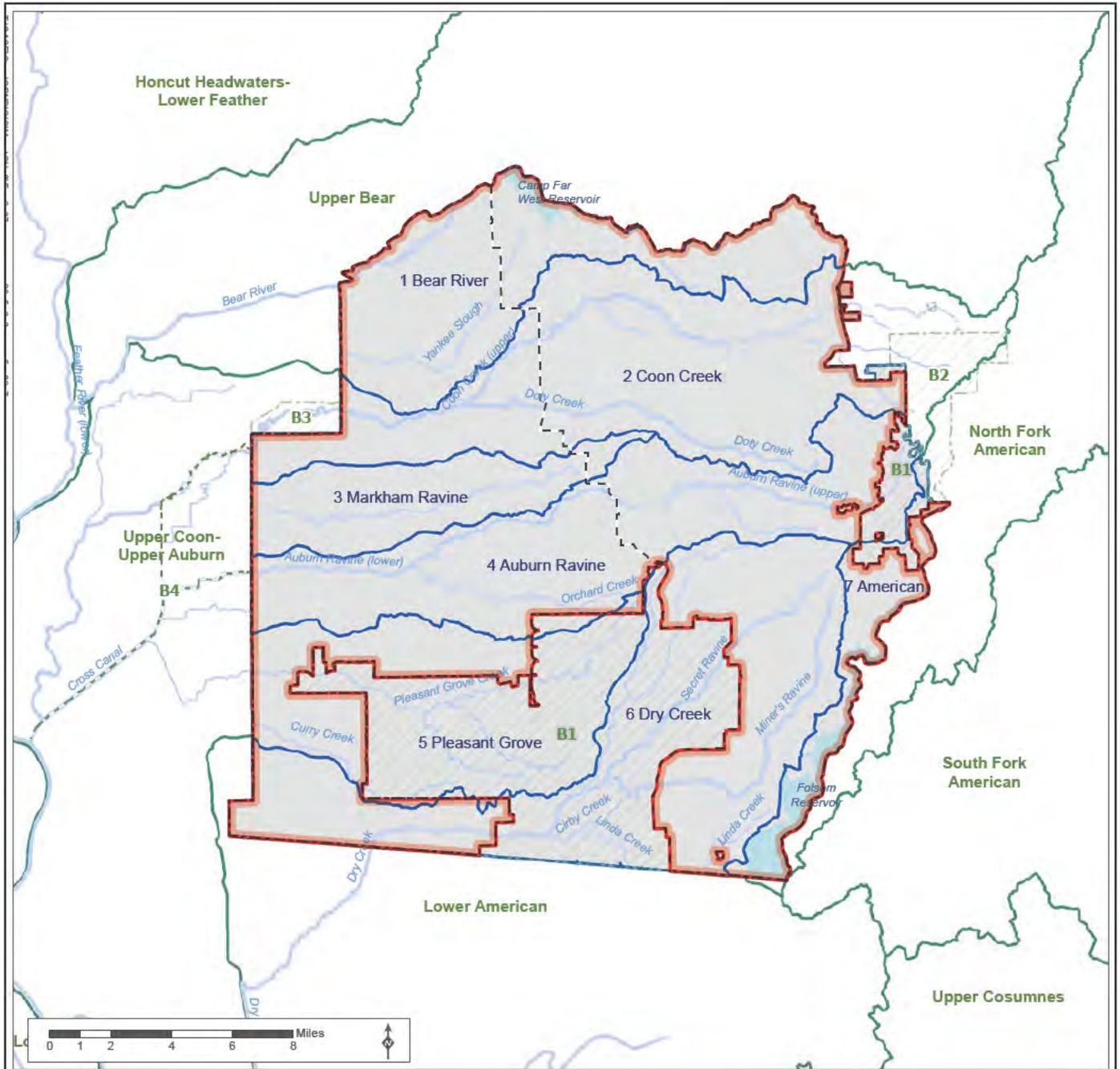
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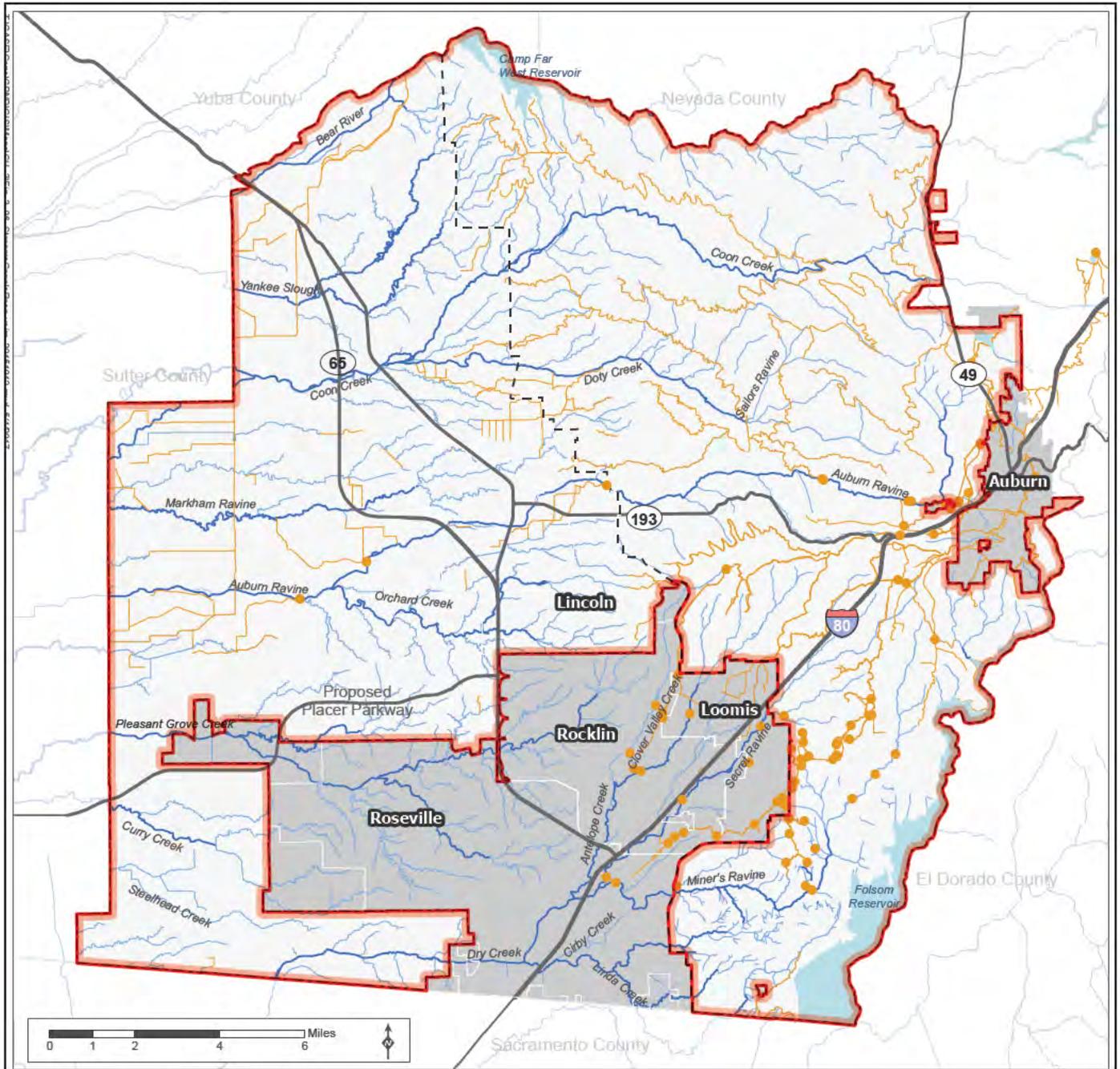
- ▭ HUC 8 Watersheds
- ▭ Placer County Planning Watersheds
- Stream
- River
- - Valley/Foothill Divide
- Plan Area A**
- Plan Area A Boundary
- Plan Area B**
- B1 Non-Participating Cities
- B2 PCWA O&M
- B3 Coon Creek Floodplain
- B4 Fish Passage Improvement
- B5 Big Gun Conservation Bank (not shown)

Source: Appendix A.

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**Figure 3.5-1**  
**Watersheds in Plan Area**  
 Placer County Conservation Program – EIS/EIR



Source: Placer County, 2014; MIG | TRA, 2015; PCWA, 2013; USGS

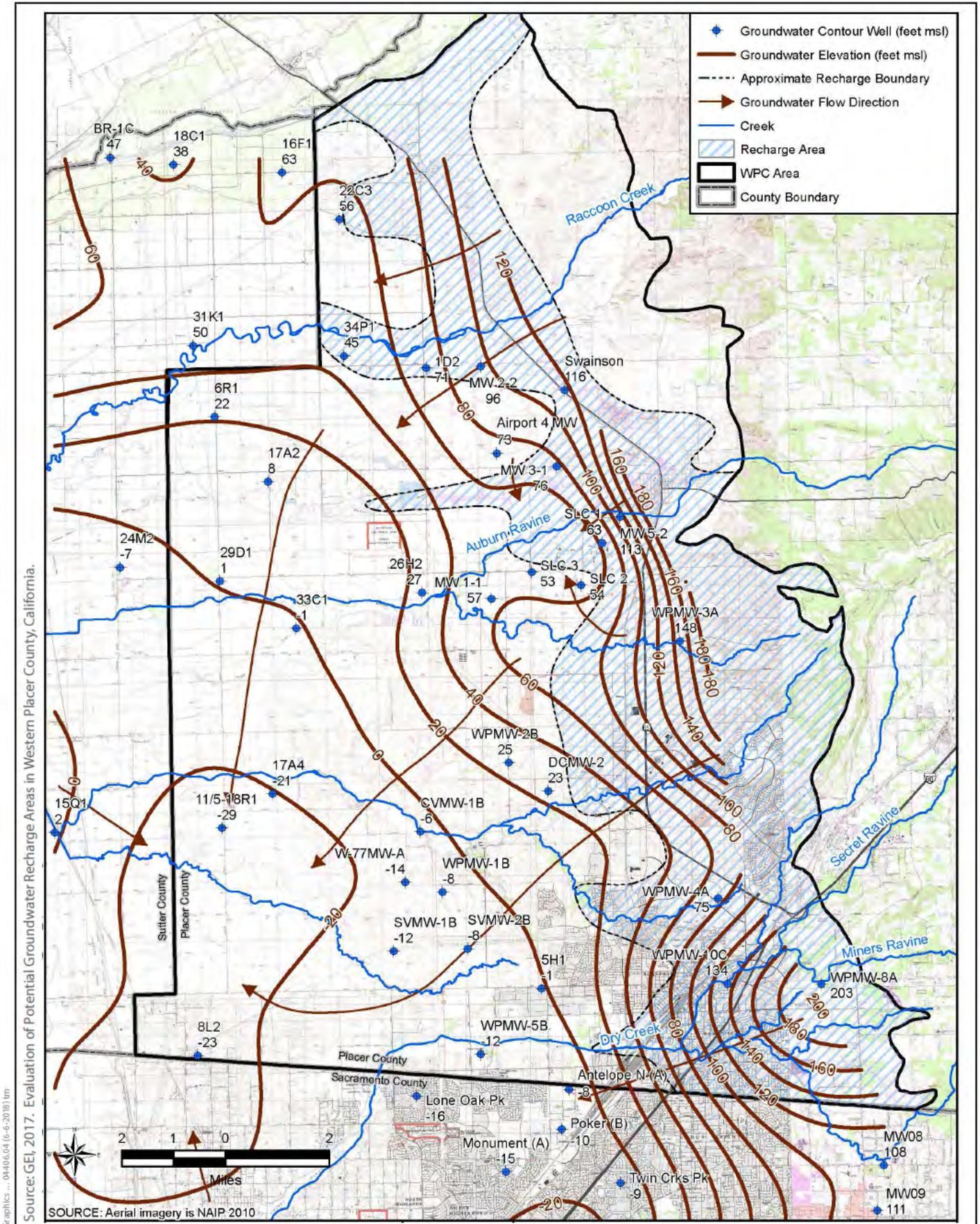
- Major Stream
- Minor Stream
- Canal
- PCWA Canal/Stream Turnout or Diversion
- Reservoir
- Non-Participating City
- - Valley/Foothill Divide
- Plan Area A Boundary

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Source: Appendix A.



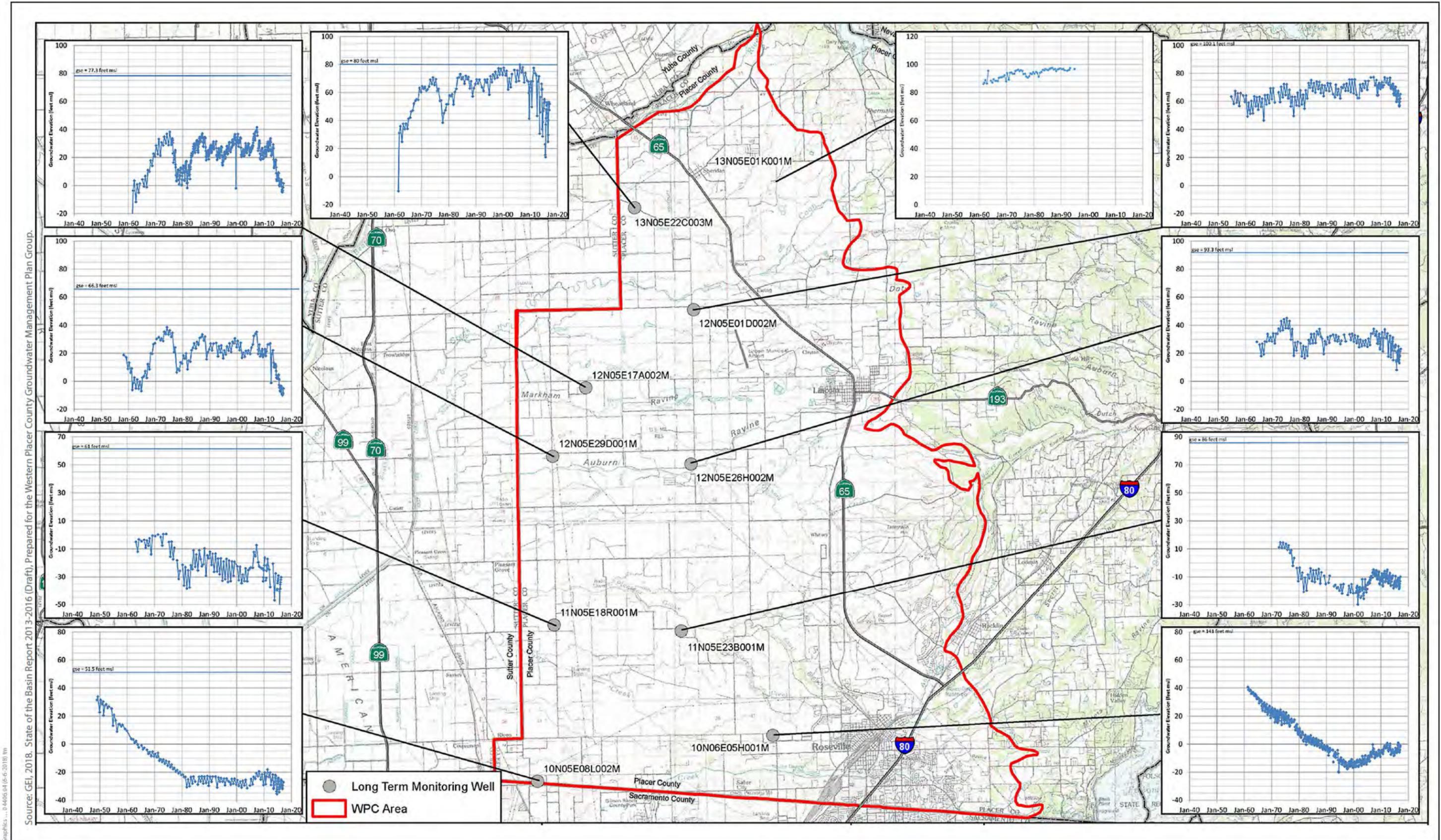
**Figure 3.5-2**  
**Streams, Canals, and Reservoirs in Plan Area**  
 Placer County Conservation Program – EIS/EIR



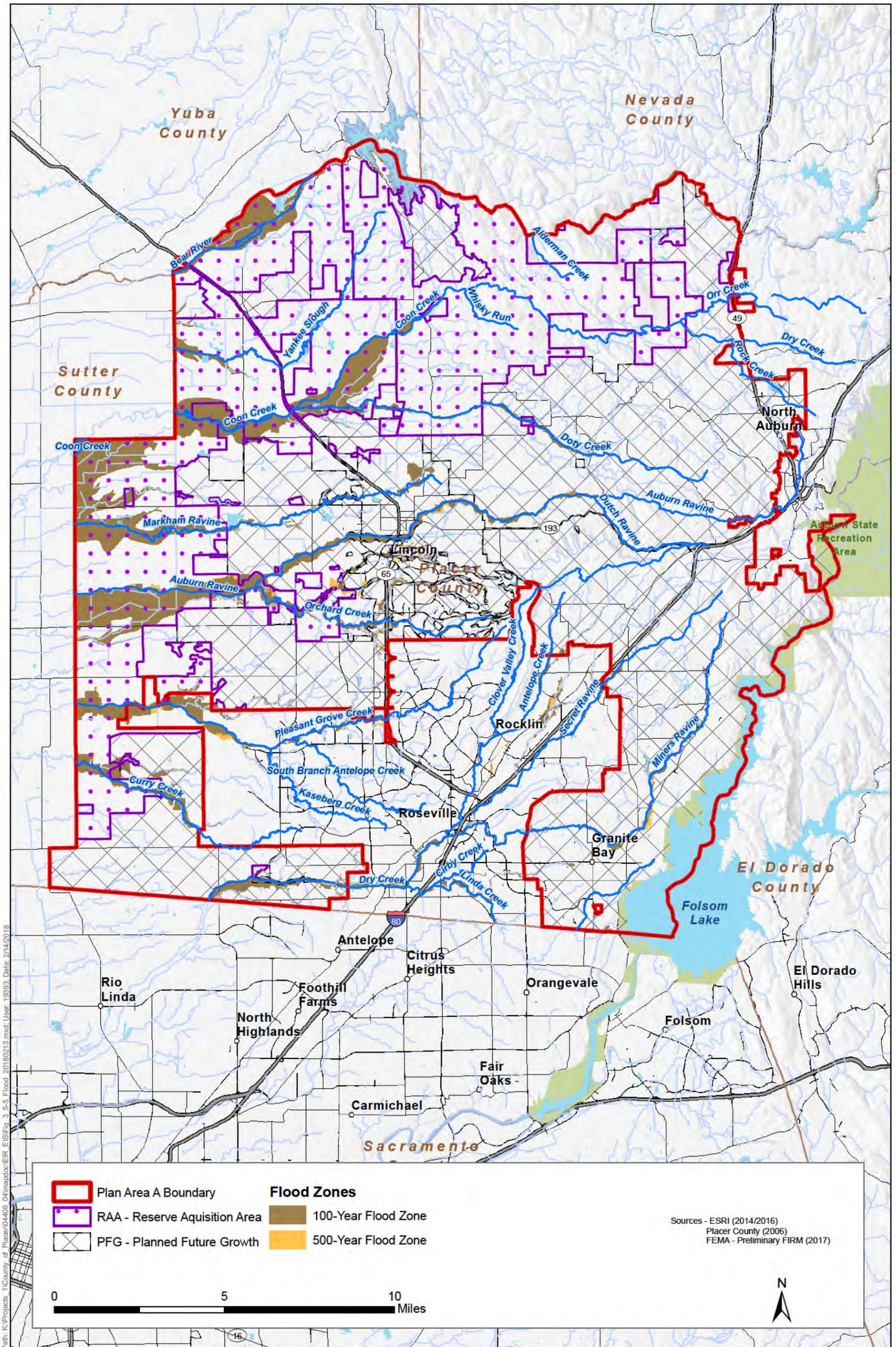
**Figure 3.5-3**  
**Groundwater Contours and Flow Directions, Spring 2017**  
 Placer County Conservation Program – EIS/EIR



Source: GEI, 2017. Evaluation of Potential Groundwater Recharge Areas in Western Placer County, California.



**Figure 3.5-4**  
**Representative Water Level Hydrographs**  
 Placer County Conservation Program – EIS/EIR



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**Figure 3.5-5**  
**Flood-Prone Properties in Placer County**  
Placer County Conservation Program—EIS/EIR