Facilities Management Plan

Sacramento Municipal Utility District

Hydro License Implementation • June 2015

Upper American River Project

FERC Project No. 2101

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1.0 Introduction

As a condition of the new License to operate a hydroelectric project issued by the Federal Energy Regulatory Commission (FERC) for the Upper American River Project (UARP), FERC Project No. 2101, the Sacramento Municipal Utility District (SMUD) has prepared this Facility Management Plan (Plan). The Plan has been prepared in accordance with the terms and conditions of the Relicensing Settlement Agreement for the UARP (2007) and the new FERC License issued on July 23, 2014. See Appendix B for applicable License language.

1.1 Scope and Content of the Plan

The Plan has been prepared in consultation with the United States Forest Service (USFS) and other agencies and interested parties, as required by the FERC License. The Plan must be approved by the USFS and subsequently implemented by SMUD. The sections below describe the consultation process and the content of the Plan.

1.1.1 Consultation

In September 2014 SMUD presented the approach to completing the Plan to the Settlement Agreement Consultation Group, which includes the Eldorado National Forest (ENF). At the meeting SMUD solicited feedback from the group on the approach. Discussion items included the USFS desire to include photos of all facilities; whether recreation-related facilities should be included; whether quarries and stockpile sites should be included; and tying visual resource protection measures to this Plan. Based on the language in Condition 58, the plan is for Project facilities only, not recreation facilities; therefore, the Plan does not cover recreation facilities because they are addressed by other License conditions related to recreation projects (Conditions 41, 42, 44 and 45). In addition, Section 5.3.8 of the License application describes in detail the existing recreation facilities associated with the Project. Also, since SMUD does not directly manage or maintain the recreation facilities associated with the UARP, including them in this Facilities Management Plan is not appropriate. The USFS agreed with this approach. SMUD agreed to provide construction as-built drawings for the recreation facilities it has built over the years if requested by the USFS.

SMUD also met with the USFS on January 20, 2015 to discuss the plan and solicit additional feedback. Notes from this meeting are capture in an email and included in the consultation record.

1.1.2 Content of Plan

Section 1 of the Plan begins with an introduction that describes the purpose and scope of the plan. Important elements of the introduction include the 4(e) Condition language, an overview description of the Project and summary of consultations with USFS. Section 2, Existing Conditions, contains an overview of SMUD's facilities, following the basic outline and structure of Exhibit A of the License Application (SMUD 2005). Pertinent information about SMUD's UARP facilities is summarized in Table 1 in Section 2. Section 3, describes SMUD's commitment to maintenance and repair of facilities and the current condition of facilities. Section 4 summarizes (Table 2) planned maintenance or removal/replacement of existing structures and facilities in the first 5 years from the date of approval of this Plan. Section 5 summarizes the Plan and describes the process of updating the plan every 5 years, as required, including a process to inform the USFS of planned facility maintenance.

Based on consultation with the USFS, a photographic guide to SMUD facilities has been prepared and is contained in Appendix A at the end of this plan. Photographs of most of SMUD's facilities have been captured in this guide; however, in some cases only representative photos are shown for a type of facility. These include facilities like transmission towers and meteorological stations, which are numerous and similar looking. Table 1 includes a column identifying the photo number for each facility.

Condition 58 requires this Plan to include a map of all Project facilities on USFS or Bureau of Land Management (BLM) lands. Figure 1A-1H is a map of all Project facilities on USFS or BLM lands as required by the License condition. The condition also requires the Plan to identify the type and season of use of each facility, as well as the condition of each structure and any planned maintenance or removal of facilities. Tables 1 and 2 summarize all of the required 4(e) information. Quarries and stockpile sites will be shown on maps but management of these sites will be discussed more thoroughly in the Vegetation Management Plan since controlling weeds around these sites is the primary management activity.

1.2 Connection to other FERC License Conditions

It should be noted that USFS 4(e) Condition 58, of the FERC License occurs in the context of multiple other specific and general conditions. Some of these conditions are related to the operation and maintenance of facilities; therefore, the Plan is tied to these conditions. To avoid duplication of effort, elements related to maintenance or management of facilities covered under a separate plan will not be discussed in this Plan.

1.2.1 Condition 53 - Visual Resource Protection

This Condition requires SMUD to file a plan with FERC, approved by the USFS, prior to conducting any maintenance or construction that may affect visual resources. The purpose of any such plan is to provide "…for the protection and rehabilitation of National Forest System visual resources affected by such construction or maintenance." Any project-specific visual resources plan will follow the visual resource standards and guidelines in the Eldorado National Forest Land and Resource Management Plan. In addition, this Condition requires SMUD to meet with the USFS every 5 years to review opportunities to improve how well UARP facilities blend in with the surrounding landscape. SMUD and the USFS agreed that this meeting could be held in the context of the Facility Management Plan, 5-year update, which identifies maintenance reconstruction and removal needs for the UARP, required by Condition 58.

Appendix B of this Plan contains the complete text of Condition 53, which describes the process for visual resource protection and lists mitigation measures for specific facilities that SMUD must implement. Table 2 of the Plan, which lists proposed UARP construction and maintenance projects of potential interest to the USFS for the next 5 years, includes some of the near-term projects identified in Condition 53. Prior to conducting any maintenance activities that may affect visual resources, SMUD will consult the Visual Resource Protection Plan prepared for the UARP and consult with the USFS and/or BLM, as appropriate.

1.2.2 Conditions 39 and 59 - Vegetation Management

These conditions require SMUD to manage vegetation around facilities and prevent the spread of invasive weeds. Keeping facilities clear of nuisance vegetation is a facet of facility management but details regarding the management of vegetation around facilities will be described in a separate plan, prepared according to the above conditions.

1.2.3 Condition 60 - Fire Prevention and Response Plan

The objective of the Fire Prevention and Response Plan (FPRP) is to outline the responsibility of SMUD and its contractor(s) for the prevention of, and response to, fires occurring in the vicinity of the Project and resulting from Project operations. Measures and procedures identified in the FPRP apply to Project operations conducted by SMUD and its contractors within, and in the immediate vicinity of the FERC Project boundary. The FPRP will reference this Plan to provide fire response teams a better understanding of SMUD's facilities. Based on consultation with USFS and CalFire officials in the development of the FPRP, several additions were made to this Plan. Table 1 includes such information as whether the facility is occupied or represents an electrical hazard. Figures 1A-1H and Appendix C indicate where facilities are located graphically and in

tabular form, while Appendix A shows what the facilities look like. Agencies responsible for fighting fires in the region will receive a copy of this Plan along with the FPRP.

1.2.4 Other License Conditions

Other License conditions related to facilities management include Standard Condition No. 1, which requires Forest Service approval of any final designs for Project components; Standard Condition No. 2, which requires Forest Service Approval of any proposed changes to Project features, facilities or uses of Project lands and waters; and Condition No. 23, which requires SMUD to maintain the improvements and premises on National Forest System lands and Licensee adjoining property to standards of repair, orderliness, neatness, sanitation and safety.

2.0 Existing Conditions

2.1 Project Description

The UARP lies almost entirely within El Dorado County and within three watersheds that ultimately drain into the American River. It extends from the Crystal Basin of the west slope of the Sierra Nevada down to the lower foothills near Placerville within the Silver Creek, Rubicon River, and SFAR basins. The major developments of the Project were constructed in the late 1950s and early 1960s, with most major developments online by 1971. The Jones Fork development was completed and operational in 1985. The UARP is composed of seven separate developments, Loon Lake, Robbs Peak, Jones Fork, Union Valley, Jaybird, Camino, and Slab Creek/White Rock; each of which is described in more detail in Section 2.2.

Together, the 7 existing developments include 11 reservoirs that can store up to 425,000 acre-feet (ac-ft) of water, eight powerhouses that have generated an average of 1,730 gigawatt hours (GWh) of power annually since 1990, 11 transmission lines with a combined length of about 177.2 miles, about 28 miles of power tunnels/penstocks, and one canal 1.9-miles long. As a condition of the Project's original License, SMUD has constructed various recreation facilities including campgrounds, day use areas, boat launches, and trails for the USFS, which are not included as "facilities" in this Plan.

As part of its relicensing process, SMUD has proposed modifications to the facilities associated with some of these developments, the most substantial of which is the proposed Iowa Hill Development. The Iowa Hill Development would be a pumped-storage facility that would include a new 6,400 ac-ft reservoir on Iowa Hill and use the Project's existing Slab Creek Reservoir as the lower reservoir. The underground Iowa Hill Powerhouse would be able to generate up to 400 MW, and the development would include a new, approximately 2.0-mile-long transmission line. The Iowa Hill

Development would also require the reconductoring of existing Project transmission lines to ensure sufficient electrical transmission capability to move power from the project to SMUD's load center. Presently, SMUD is studying the feasibility of the Iowa Hill Development and the fate of the development is uncertain. Should the project proceed to construction, SMUD will consult with the USFS and any new facilities will be added to this Plan in an addendum.

2.2 Facilities at each Development

The following section describes the facilities located within each of the seven developments. The descriptions below are taken from Exhibit A, Project Description, of the FERC License application for the UARP (SMUD 2005). The developments are discussed in order from highest elevation (Loon Lake) to lowest (Slab Creek/White Rock). Other minor facilities, such as the various hydrologic and weather monitoring stations, as well as communication facilities are described separately in their respective sections.

Several facilities include underground water and septic systems, which are described under the subheading for each facility below and identified in Table 1. These systems are shown on facility drawings, such as those that are found in Exhibit F of the UARP License. These drawings are considered Critical Energy Infrastructure Information (CEII) by FERC and are not to be released to the general public. According to FERC, CEII is specific engineering, vulnerability, or detailed design information about proposed or existing critical infrastructure (physical or virtual) that:

1. Relates details about the production, generation, transmission, or distribution of energy;

2. Could be useful to a person planning an attack on critical infrastructure;

3. Is exempt from mandatory disclosure under the Freedom of Information Act; and,

4. Gives strategic information beyond the location of the critical infrastructure.

Because of their classification as CEII, SMUD is not including facility drawings in this plan; however, SMUD can provide these drawings to the USFS by request should the need arise to know the location of underground utilities at UARP facilities.

2.2.1 Loon Lake Development

The Loon Lake Development, which began commercial operation on August 27, 1971, includes the highest elevation project facilities and is located approximately 70 miles east of Sacramento. The development utilizes water from the Rubicon River, Highland Creek, Little Rubicon River, and Ellis Creek. One of the Loon Lake Development features, Rubicon Reservoir, is located inside a designated wilderness area (Desolation Wilderness) within the boundary of the ENF. All other Loon Lake Development features are outside the wilderness boundary and are located on public land within the ENF. It should be noted that when Congress approved the designation of Desolation Wilderness, SMUD's facilities were already in place and the act made provisions for the utility operator to have reasonable access to their facilities for O&M purposes.

The development includes:

1. Rubicon Dam - A concrete, gravity, main diversion dam located on the Rubicon River that is 36-feet-high by 644-feet-long, and a concrete, gravity auxiliary dam that is 29-feet-high by 553-feet-long. These structures create the Rubicon Reservoir, which has a storage capacity of 1,450 ac-ft at a maximum water surface elevation of 6,545 feet.

2. Rockbound Tunnel - A 0.2-mile-long, 13-foot-diameter, unlined, horseshoe tunnel that diverts water from Rubicon Reservoir to Buck Island Reservoir via Rockbound Lake (a non-Project facility) located on Highland Creek.

3. Buck Island Dam - A concrete, gravity, diversion dam located on the Rockbound Creek that is 23-feet-high by 293-feet-long, and a 15-foot-high by 244-foot-long concrete gravity auxiliary dam. These structures create Buck Island Reservoir, which has a storage capacity of 1,070 ac-ft at a maximum water surface elevation of 6,436 feet.

4. Buck-Loon Tunnel - A 1.6-mile-long, 13-foot-diameter unlined modified horseshoe tunnel that diverts water from Buck Island Reservoir to Loon Lake Reservoir.

5. Loon Lake Dam - A rockfill dam on Gerle Creek that is 0.4-mile-long by 108-feet-high, with a 250-foot-long side channel spillway on the right bank, and a 910-foot-long by 95foot-high rockfill auxiliary dam, and an earthfill dike. These structures create Loon Lake Reservoir, which has a storage capacity of 76,200 ac-ft at a maximum water surface elevation of 6,410 feet.

6. Loon Lake Penstock - A 0.3-mile-long, 14-foot-diameter concrete-lined horseshoe tunnel; 10-foot-diameter concrete lined vertical shaft; and 8.5-foot-diameter steel lined tunnel extending from Loon Lake Reservoir to Loon Lake Powerhouse.

7. Loon Lake Powerhouse - An underground powerhouse, located over 1,100 feet below the surface of the Loon Lake Reservoir, which consists of one turbine with a rated capacity of 70,479 kW at best gate opening and one generator rated at 85,215

kW, with powerhouse maximum capability of 82,000 kW.

Powerhouse Auxiliary Systems: Sanitation - Wastewater from a bathroom in the machine hall is plumbed to a sewage digester. From the digester, it is transferred to a holding tank in the machine hall. When the holding tank fills, the water is pumped up the inclined access shaft to another holding tank that also services the bathroom in the access building. When this second holding tank fills, a mobile commercial septic service company provides service to the system.

Powerhouse Service Water System - Service water in the powerhouse is supplied by two 25-hp pumps and a carbon steel piping system. This system was modified to allow powerhouse cavern and main step-up transformer cooling using service water. The pumps for this system were overhauled in 1998.

8. Loon Lake Tailrace Tunnel - A 3.8-mile-long, 18-foot-diameter unlined horseshoe tunnel extending from Loon Lake Powerhouse that discharges into Gerle Creek Reservoir.

9. Transmission Lines - Two 69 kV overhead transmission lines: one extending to the Robbs Peak switchyard via the 7.9-mile-long Loon Lake-Robbs Peak Transmission Line, and the other extending to Union Valley switchyard via the 12.4-mile-long Loon Lake-Union Valley Transmission Line.

2.2.2 Robbs Peak Development

The Robbs Peak Development, which began commercial operation on October 25, 1965, is located approximately 70 miles east of Sacramento on both private and public land within the boundary of the ENF. The development primarily utilizes water released from the Loon Lake Development as well as inflow from Gerle Creek (including its tributaries Barts, Deller, and Jerrett Creeks), Angel Creek, and the South Fork Rubicon River (SFRR). The Robbs Peak Development includes:

1. Gerle Creek Dam - A 58-foot-high, 444-foot-long, concrete, gravity overflow structure located on Gerle Creek, upstream of its confluence with SFRR, incorporating the intake of Gerle Creek Canal in its left abutment, creating Gerle Creek Reservoir having 1,260 ac-ft of storage at maximum water surface elevation of 5,231 feet.

2. Gerle Canal - An aboveground canal, 22 feet wide and 19 feet deep that extends 1.9 mile from Gerle Creek Reservoir to Robbs Peak Reservoir. It is partially lined with gunite.

3. Robbs Peak Dam - A 44-foot-high, 320-foot-long, concrete, gravity overflow structure, with 12 steel bulkhead gates, all 6.2 feet high, on the spillway crest, located on the SFRR upstream of its confluence with Gerle Creek, and impounding 30 ac-ft of water at maximum water surface elevation of 5,231 feet.

4. Robbs Peak Tunnel - A 3.2-mile-long, 13-foot-diameter, unlined, horseshoe and 11-foot diameter, lined diversion tunnel from Robbs Peak Reservoir to Robbs Peak Penstock.

5. Robbs Peak Penstock - A 9.75- to 8.5-foot-diameter, 0.4-mile-long steel penstock from Robbs Peak Tunnel to Robbs Peak Powerhouse.

6. Robbs Peak Powerhouse - Located on the northeast shore of Union Valley Reservoir, equipped with one turbine with a rated capacity at best gate opening of 28,125 kW, and one generator rated at 29,700 kW, with maximum capability of 29,000 kW.

   Powerhouse Auxiliary Systems: Septic – The powerhouse bathroom is connected to a septic system. The septic tank and leach field are located behind the powerhouse.

   Service Water System – Service water in the powerhouse is supplied by a 15-hp pump and a carbon steel-piping system. The service air system includes one compressor and a carbon steel-piping network that operates at 105 psi.

7. Robbs Peak-Union Valley Transmission Line - A 6.8-mile-long, 69 kV, overhead line connecting the Robbs Peak Switchyard to the Union Valley Switchyard.

2.2.3 Jones Fork Development

The Jones Fork Development, which began commercial operation on June 10, 1985, is located approximately 70 miles east of Sacramento and is on public land within the boundary of the ENF. The development utilizes water from the South Fork Silver Creek (SFSC). A detailed description of the Jones Fork Development facilities is provided below.

1. Ice House Dam – A rockfill dam located on the SFSC, 0.3 mile long and 150 feet high, incorporating a concrete ogee spillway with radial gates, and two auxiliary earthfill dikes. These structures create the Ice House Reservoir, which has a storage capacity of 45,960 ac-ft at a maximum water surface elevation of 5,450 feet.

2. Jones Fork Tunnel – A 0.3-mile-long, 8-foot-diameter, horseshoe, concrete- and steel-lined tunnel from Ice House Reservoir to the Jones Fork Penstock.

3. Jones Fork Penstock – A 1.6-mile-long, 6-foot-diameter, steel and concrete penstock from Jones Fork Tunnel to the Jones Fork Powerhouse.

4. Jones Fork Powerhouse – Contains a single Francis-type turbine with a rated capacity at best gate opening of 10,400 kW, and one generator rated at 11,495 kW, located on the southeast shore of Union Valley Reservoir; with maximum capability of 11,500 kW.

Powerhouse Auxiliary Systems: Water Waste System – The bathroom at Jones Fork Powerhouse is plumbed to a sewage holding tank serviced by a commercial mobile septic company.

Service Water System – Service water in the powerhouse is supplied by two 15-hp pumps and a galvanized steel piping system. Potable water piping is screwed brass or bronze.

5. Jones Fork-Union Valley Transmission Line – A 69 kV, 4.0-mile-long overhead transmission line from the Jones Fork switchyard to the Union Valley switchyard.

2.2.4 Union Valley Development

The Union Valley Development, which began commercial operation on June 6, 1963, is located approximately 65 miles east of Sacramento and is located on public lands within the ENF. The development primarily utilizes water from Big Silver Creek, Jones Fork Silver Creek, Tells Creek, and Wench Creek and releases from Robbs Peak and Jones Fork Powerhouses. The Union Valley Development includes:

1. Union Valley Dam – An earthfill dam located on Silver Creek, 0.3-mile-long and 453-feet-high, incorporating a concrete ogee spillway with radial gates, creating Union Valley Reservoir with a storage capacity of 277,290 ac-ft at maximum water surface elevation of 4,870 feet.

2. Union Valley Tunnel – A 268-foot-long, 11-foot diameter concrete-lined tunnel with an approximately 10-foot diameter steel penstock in part of the tunnel and connecting Union Valley Reservoir with Union Valley Powerhouse.

3. Union Valley Penstock – A 0.3-mile-long, 10-foot diameter steel penstock that conveys water from the outlet of the Union Valley Tunnel to the Union Valley Powerhouse.

4. Union Valley Powerhouse – The powerhouse is equipped with one turbine with a rated capacity at best gate opening of 40,074 kW, and one generator rated at 44,400 kW, located at the base of Union Valley Dam; with maximum capability of 46,700 kW.

   Powerhouse Auxiliary Systems: Wastewater System – The bathroom at Union Valley Powerhouse is plumbed to a septic tank and leach system. •

   Service Water System – One 10-hp pump and a steel and copper piping system supply service water in the powerhouse. The service air system includes one compressor and a carbon-steel piping network, operating at 105 to 115 psi.

5. Transmission Lines – Two, 230 kV, overhead transmission lines; one to the Camino switchyard via the 11.8-mile-long Union Valley-Camino Transmission Line and the other to the Jaybird switchyard via the 5.9-mile-long Union Valley-Jaybird Transmission Line.

2.2.5 Jaybird Development

The Jaybird Development began commercial operation on May 1, 1961. The Development is located approximately 55 miles east of Sacramento; it utilizes water released from Junction Reservoir and flows from South Fork Silver Creek and Little Silver Creek. All project facilities in this development are located within the boundary of the ENF. It includes:

1. Junction Dam – A double curvature, concrete overflow arch dam located on Silver Creek that is 525-feet-long and 168-feet-high, creating Junction Reservoir, which has a storage capacity of 3,250 ac-ft at maximum surface water elevation of 4,450 feet.

2. Jaybird Tunnel – An 11- to 14-foot-diameter modified horseshoe tunnel 4.4-mile-long, connecting Junction Reservoir and the Jaybird Penstock.

3. Jaybird Penstock – A 6- to 10-foot-diameter steel penstock with a surge tank that is 0.5mile-long, connecting Jaybird Tunnel and Jaybird Powerhouse.

4. Jaybird Powerhouse – The powerhouse is equipped with two Pelton turbines, one with a rated capacity of 61,607 kW and the other 61,574 kW at best gate opening, and two generators, each rated at 84,450 kW; with total powerhouse maximum capability of 144,000 kW.

   Powerhouse Auxiliary Systems: Water Waste System – The bathroom in the powerhouse is plumbed to a septic tank and leach system.

5. Jaybird-White Rock Transmission Line – A 15.9-mile-long, 230 kV overhead transmission line.

2.2.6 Camino Development

The Camino Development is located approximately 55 miles east of Sacramento, and utilizes water released from Camino Reservoir and Brush Creek Reservoir. The Camino Powerhouse began commercial operation on November 1, 1963. The major facilities in this development are located within the boundary of the ENF. The development includes:

1. Camino Dam – A concrete, double curvature, arch dam located on Silver Creek that is 470-feet long and 133-feet high, and has three integral bulkhead gates. These structures create Camino Reservoir, which has a capacity of 825 ac-ft at maximum water surface elevation of 2,915 feet.

2. Camino Tunnel – A power tunnel 5 miles long with a diameter ranging from 13 feet to 14 feet, including a surge tank that connects Camino Reservoir with the Camino Penstock.

3. Brush Creek Dam—A double curvature arch dam located on Brush Creek, 213 feet high and 780feet long, creating Brush Creek Reservoir with storage capacity of

1,530 ac-ft at maximum water surface elevation of 2,915 feet.

4. Brush Creek Tunnel – An approximately 14-foot-diameter modified horseshoe tunnel extending 0.8 mile from Brush Creek Reservoir to the lower end of Camino Tunnel.

5. Camino Penstock – A 5-foot to 12-foot-diameter, 0.3-mile-long aboveground steel penstock connecting Camino Tunnel and Camino Powerhouse.

6. Camino Powerhouse – The powerhouse is located on the SFAR and is equipped with two turbines: one with a rated capacity of 73,760 kW and the other with a rated capacity at best gate opening of 70,769 kW with total powerhouse maximum capability of 150,000 kW. The powerhouse is also equipped with two generators rated at 90,820 kW each. Both generators are installed with secondary oil containment.

   Powerhouse Auxiliary Systems: Water System – The powerhouse bathrooms are plumbed to a septic tank and leach system.

   Service Water System – One pump supplies service water for the powerhouse with strainers and a mixed galvanized steel and carbon steel piping system. Two 5-hp drainage pumps with black steel piping are provided for normal station drainage.

7. Transmission Lines – Two 230 kV overhead transmission lines originate at the Camino switchyard, one (Camino-Lake) is 31.7-miles-long and connects to SMUD's Lake Substation and the other (Camino-White Rock) is 10.0-miles-long and connects to the White Rock switchyard. Under the SMUD's proposal to reduce the length of the UARP transmission line system, a 1.9-miles-long section of the Camino-Lake 230 kV transmission line from the Lake Substation to the Folsom Junction will no longer be associated with the Project. This will create a 29.8-miles-long transmission line between the Camino switchyard and Folsom Junction.

2.2.7 Slab Creek/White Rock Development

The Slab Creek/White Rock Development is located approximately 50 miles east of Sacramento. The White Rock Powerhouse is the most downstream Project facility (excluding transmission lines) and discharges into the Chili Bar Reservoir, which is part of Pacific Gas and Electric Company's Chili Bar Project (FERC No. 2155). The Slab Creek/White Rock Development utilizes water released from Camino Powerhouse and inflow from the SFAR and Slab Creek. The Slab Creek and White Rock Powerhouses began commercial operation in 1983 and 1968, respectively. The facilities associated with this development are on ENF, BLM and private lands. The development includes:

1. Slab Creek Dam - A double curvature, variable radius, concrete arch dam that stretches across the SFAR is 250-feet-high and 817-feet-long, with a central uncontrolled overflow spillway. The structures create Slab Creek Reservoir, which has a capacity of 16,600 ac-ft at normal maximum water surface elevation of 1,850

feet.

2. Slab Creek Penstock - A 40-foot-long, 36-inch-diameter steel penstock that passes through the dam and connects Slab Creek Reservoir with Slab Creek Powerhouse.

3. Slab Creek Powerhouse - The powerhouse is located at the base of Slab Creek Dam and utilizes minimum stream flow releases, with one turbine with a rated capacity at best gate opening of 450 kW, and one generator rated at 485 kW. The powerhouse has a maximum capability of 400 kW.

4. White Rock Tunnel - An approximately 20- to 24-foot-diameter modified horseshoe tunnel 4.9 miles long with a surge shaft that connects Slab Creek Reservoir with White Rock Penstock.

5. White Rock Penstock - A 9- to 15-foot-diameter, 0.3-mile-long aboveground steel penstock that connects White Rock Tunnel to White Rock Powerhouse.

6. White Rock Powerhouse - The powerhouse is equipped with two turbines, one rated at 112,976 kW and the other at 120,000 kW at best gate opening, and two generators, rated at 109,250 kW and 133,000 kW; with total powerhouse maximum capability of 224,000 kW.

   Powerhouse Auxiliary Systems: Water Waste System – The powerhouse bathroom is plumbed into a septic tank and leach system.

   Service Water System – Service water in the powerhouse is supplied by two 15-hp pumps, strainers and a carbon steel piping system.

7. Transmission Lines - There are two transmission lines and one 12-kV distribution line to PG&E: the 31.1-mile-long 230 kV White Rock-Orangevale overhead transmission line connects the White Rock switchyard to SMUD's Orangevale Substation. The 39.6-milelong 230 kV White Rock-Hedge overhead transmission line connects the White Rock switchyard to SMUD's Hedge Substation. For the purposes of this plan, the transmission lines within the FERC boundary end at the Folsom Substation and are primarily located on privately-owned land with some sections on BLM-owned land. The 600-foot-long 12 kV Slab Creek tap line connects the Slab Creek Powerhouse to the junction with PG&E's 12-kV distribution line.

2.2.8 Hydrologic and Meteorlogic Monitoring Stations

In addition to the facilities described above, SMUD operates 32 hydrologic/meteorlogic monitoring (hydro-met) stations in the watershed. Figure 2 shows the locations of these stations. All of the hydro-met stations are authorized under an existing Special-Use Permit (PAC-52), which describes specific operating conditions required by the USFS. The Special-Use Permit includes location data and a table describing the sensors at each station (Appendix A). These remote stations are used for measuring and recording meteorological and hydrological observations. Sixteen of these are in the FERC boundary and the rest are outside of it, mostly on USFS land. Meteorological

monitoring stations consist of a series of sensors attached to a scaffold structure(s) to raise them well above ground level. The station components are often painted a neutral color (the USFS 4(e) Condition 53 requires repainting all of the stations within 4 years of License issuance).

Stream gages typically consist of a pressure transducer tacked to the streambed and connected to electronic recording equipment with conduit tacked to the bank or bare cable. Some gage stations include a 3 to 4-foot diameter corrugated steel cylindrical stilling basin, from 12 to 25 feet tall with a conical roof. These structures may or may not be painted.

2.2.9 Communication Facilities

SMUD operates and maintains several facilities that are used to transmit radio and microwave signals between UARP facilities and to Power System Operators in Sacramento. The facilities that are located on USFS lands are under Special Use Permit. The primary communication facilities are at Big Hill, Slate Mountain and Sourdough Hill. Each of these sites is shared in some way with other users, either the USFS or other agencies. These sites contain sensitive electronic equipment, weather stations and antennas of various designs. Several smaller structures include signal repeaters and signal reflectors. There are five of these on National Forest lands: Loon Lake, Peavine, Independence, Iowa Hill and Moon Lane.

Table 1. UARP Facilities Data

Facility Name	Type of Facility	Septic & Water System	Land Owner	Year Built	Square Feet or Length	FERC Boundary	Map	Photo ID	Visibility to Public	Building materials	Color	Condition	Staff Presence	Electrical Hazard
Loon Lake Development														
Rubicon Dam (main and aux.)	Concrete Gravity Dam	No	USFS	1963	1,197 ft.	Yes	1H	LL-1	Moderate	Concrete	Grey	Minor spalling	Incidental	No
Buck Island Dam (main and aux.)	Concrete Gravity Dam	No	USFS	1963	537 ft.	Yes	1H	LL-2	Moderate	Concrete	Grey	Minor spalling	Incidental	No
Loon Lake Main Dam and Spillway	Rockfill dam with core; 250 ft. side channel concrete weir	No	USFS	1963	2,130 ft.	Yes	1H	LL-6	High	Rock	Grey	Good	Incidental	No
Loon Lake Auxiliary Dam	Rockfill Dam with core	No	USFS	1963	910	Yes	1H	LL-10	High	Rock	Grey	Good	Incidental	No
Loon Lake Outlet Valve House	Outlet Valve	No	USFS	1963		Yes	1H	N/A	Moderate	Concrete	Grey	Good	Occasional	No
Loon Lake Powerhouse Access Building/ Switchyard	Building and Switchyard	Yes	USFS	1963	34,000 ft.	Yes	1H	LL-8	High	Concrete	Grey	Good	Frequent	Yes
Loon Lake-Robbs Peak 69 kV T-Line	69 kV Transmission Line	No	USFS	1963	7.9 mi	Yes	1H, 1G	TL-2	Moderate	Concrete	Grey	Good	Incidental	Yes
Loon Lake - Union Valley Switchyard 69 kV T-Line	69 kV Transmission line	No	USFS	1963	12.4 mi	Yes	1H, 1G, 1E	TL-1	Moderate	Concrete	Grey	Good	Incidental	Yes
Loon Lake Gatehouse	Gate House	No	USFS	1963	1100 ft.	Yes	1H	LL-7	High	Concrete	Grey	Good	Occasional	No
Rockbound Tunnel	Non-pressurized Tunnel	No	USFS	1963	1170 ft.	Yes	1H	N/A	Low	Concrete/Rock	Grey	Good	Incidental	No
Buck - Loon Tunnel	Non-pressurized Tunnel	No	USFS	1963	8,225 ft.	Yes	1H	LL-5	Low	Concrete/Rock	Grey	Good	Incidental	No
Loon Lake Penstock	Penstock	No	USFS	1963	1,454 ft.	Yes	1H	N/A	Low	Concrete/Steel	Grey	Good	Incidental	No
Loon Lake Tailrace Tunnel	Non-pressurized Tunnel	No	USFS	1963	3.8 mi.	Yes	1H	RP1	Low	Concrete/Rock	Grey	Good	Incidental	No
Robbs Peak Development														
Gerle Creek Dam	Concrete Gravity Dam	No	USFS	1962	444 ft.	Yes	1G	RP-1	Moderate	Concrete	Grey	Good	Occasional	No
Robbs Peak Dam	Concrete Gravity Dam	No	USFS	1961	320 ft.	Yes	1G	RP-3	High	Concrete	Grey	Good	Incidental	No
Robbs Peak Penstock	Steel Penstock	No	USFS	1961	2,235 ft.	Yes	1G	RP-5	High	Steel/Concrete	Tan	Good	Incidental	No
Robbs Peak Powerhouse and Switchyard	Powerhouse/Switchyard	Yes	USFS	1961	24,000 ft.	Yes	1G	RP-6	High	Concrete	Green/Grey	Good	Frequent	Yes
Robbs Peak Intake Gatehouse	Gate House	No	USFS	1961	1,200 ft.	Yes	1G	RP-4	High	Concrete	Green	Good	Occasional	No
Robbs Peak Penstock Valve House	Valve House	No	USFS	1961	7,700 ft.	Yes	1G	RP-7	Low	Concrete	Grey	Good	Occasional	No
Robbs Peak -Union Valley 69 kV T-Line	69 kV Transmission Line	No	USFS	1961	6.8 mi.	Yes	1G	N/A	Moderate	Steel	Grey	Good	Incidental	Yes
Gerle Creek Canal	Canal	No	USFS	1961	9,950 ft.	Yes	1F, 1G	RP-2	Low	Concrete	N/A	Good	Incidental	No
Robbs Peak Tunnel	Tunnel	No	USFS	1961	16,917 ft.	Yes	1G	N/A	Low	Rock/Concrete	N/A	Good	Incidental	No
Robbs Peak Surge Chamber	Surge Chamber	No	USFS	1961	5,000 ft.	Yes	1G	RP-8	Low	Concrete	N/A	Good	Incidental	No
Jones Fork /Ice House Development														
Ice House Dam and Spillway	Rockfill Dam with core	No	USFS	1960	1,600 ft.	Yes	1D	JF-1	High	Rock	Grey	Good	Incidental	No
Ice House Dike 1	Zoned Earthfill Dam	No	USFS	1960	975 ft.	Yes	1D	JF-4	High	Rock	Grey	Good	Incidental	No
Ice House Dike 2	Earthfill Dam	No	USFS	1960	248 ft.	Yes	1D	JF-5	High	Rock	Grey	Good	Incidental	No
Jones Fork Penstock	Steel Penstock	No	SMUD/USFS	1983	8,509 ft.	Yes	1D	JF-2	High	Steel /concrete	Tan	Good	Incidental	No
Jones Fork Powerhouse and Switchyard	Powerhouse/Switchyard	Yes	USFS	1983	5,400 ft.	Yes	1D, 1E	JF-3	Moderate	Concrete	Grey	Good	Frequent	Yes
Jones Fork- 69kV Union Valley T-line	69 kV transmission line	No	USFS	1983	4 mi.	Yes	1D, 1E	TL-3, TL-4	Moderate	Steel /concrete	Grey	Good	Incidental	Yes
Ice House Gate House	Gate House	No	USFS	1983	764 ft.	Yes	1D	JF-6	High	Brick	Tan	Good	Incidental	No
Ice House Outlet Structure	Outlet Valve House	No	USFS	1960		Yes	1D	N/A	Low	Concrete	Grey	Good	Occasional	No
Jones Fork Tunnel	Tunnel	No	USFS	1983	1,631 ft.	Yes	1D	JF-8	Low	Rock/Concrete	N/A	Good	Incidental	No
Jones Fork Penstock Valve House	Valve House	No	USFS	1983	1,400	Yes	1D	JF-7	Low	Concrete	Green	Good	Incidental	No
Union Valley Development														
Union Valley Dam and Spillway	Zoned Earthfill Dam	No	USFS	1962	1,835 ft.	Yes	1E	UV-1, UV-6	High	Rock/Concrete	Grey	Good	Incidental	No
Union Valley Powerhouse	Powerhouse	Yes	USFS	1962	11,000 ft.	Yes	1E	UV-2, UV-3	Moderate	Concrete	Grey	Good	Frequent	Yes
Union Valley Switchyard	Switchyard	No	USFS	1962	48,400 ft.	Yes	1E	UV-4, UV-5	Moderate	Steel/Concrete	Grey	Good	Occasional	Yes
Union Valley-Camino 230 kV T-line	230 kV Transmission Line	No	USFS/SPI	1962	11.8 mi.	Yes	1E, 1C, 1B	N/A	Moderate	Concrete	Grey	Good	Incidental	Yes
Union Valley-Jaybird 230 kV T-line	230 kV Transmission Line	No	USFS/SPI	1962	5.9 mi.	Yes	1E, 1C	TL-5	Moderate	Concrete	Grey	Good	Incidental	Yes
Union Valley Gate House	Gate House	No	USFS	1962	2,224 ft.	Yes	1E	UV-5	Moderate	Concrete	Grey	Good	Occasional	No
Union Valley Tunnel	Tunnel	No	USFS	1962	268 ft.	Yes	1E	N/A	Low	Concrete	N/A	Good	Maintenance	No

Table 1. UARP Facilities Data

Facility Name	Type of Facility	Septic & Water System	Land Owner	Year Built	Square Feet or Length	FERC Boundary	Map	Photo ID	Visibility to Public	Building materials	Color	Condition	Staff Presence	Electrical Hazard
Union Valley Penstock	Penstock	No	USFS	1962	1,435 ft.	Yes	1E	N/A	Low	Concrete	N/A	Good	Incidental	No
Jaybird Development														
Junction Dam	Double Curvature Concrete Overflow Arch Dam	No	USFS	1962	525 ft.	Yes	1C	JB-1, JB-3	Low	Concrete	Grey	Good	Occasional	No
Jaybird Penstock	Steel Penstock	No	USFS	1961	2,620 ft.	Yes	1C	JB-5	Moderate	Concrete	Silver	Good	Incidental	No
Jaybird Penstock Valve House	Valve house	No	USFS	1961	1,400 ft.	Yes	1C	JB-5	Low	Concrete	Grey	Good	Occasional	No
Jaybird Powerhouse and Switchyard	Powerhouse and Switchyard	Yes	USFS	1961	24,500 ft.	Yes	1C	JB-4, JB-6	Low	Concrete	Tan	Good	Frequent	No
Jaybird-Whiterock 230 kV T-line	230 kV transmission line	No	USFS	1961	15.9 mi.	Yes	1C	TL-6	Moderate	Steel	Grey	Good	Incidental	No
Junction Gatehouse	Gate House	No	USFS	1962	2,000 ft.	Yes	1C	JB-2	Low	Concrete	Grey	Good	Occasional	No
Jaybird Tunnel	Tunnel	No	USFS/SPI	1961	4.4 mi.	Yes	1C	N/A	Low	Concrete	N/A	Good	Maintenance	No
Camino Development														
Camino Dam	Dam	No	USFS	1961	470	Yes	1C	CM-1	Low	Concrete	Grey	Good	Incidental	No
Brush Creek Dam	Dam	No	USFS	1970	780 ft.	Yes	1B	CM-2	Moderate	Concrete	Grey	Good	Incidental	No
Camino Penstock	Penstock	No	USFS	1961	1,560 ft.	Yes	1B	CM-3	Moderate	Concrete	Green	Good	Incidental	No
Camino Powerhouse and Switchyard	Powerhouse and Switchyard	Yes	USFS	1961	25,000 ft.	Yes	1B	CM-4	Moderate	Concrete	Tan/Grey	Good	Frequent	No
Camino-Whiterock 230 kV T-line	230 kV Transmission Line	No	USFS	1961	10.0 ft.	Yes	1B	TL-7	Moderate	Steel	Grey	Good	Incidental	No
Camino-Lake 230 kV T-line	230 kV Transmission Line	No	USFS	1961	31.7 ft.	Yes	1B	N/A	Moderate	Steel	Grey	Good	Incidental	No
Camino Gate House	Gate House	No	USFS	1961	900 ft.	Yes	1C	CM-6	Moderate	Concrete	Grey	Good	Incidental	No
Brush Creek Gate House	Gate House	No	USFS	1970	1,750 ft.	Yes	1B	CM-7	Moderate	Concrete	Grey	Good	Incidental	No
Camino Surge Tank	Surge chamber	No	USFS	1961	6,650 ft.	Yes	1B	CM-8	Moderate	Concrete	Grey	Good	Incidental	No
Camino Tunnel	Tunnel	No	USFS	1961	5 mi.	Yes	1B	N/A	Low	Concrete	N/A	Good	Incidental	No
Brush Creek Tunnel	Tunnel	No	USFS	1970	1,900 ft.	Yes	1B	N/A	Low	Concrete	N/A	Good	Incidental	No
Camino Valve House	Valve House	No	USFS	1961	1,400 ft.	Yes	1B	CM-5	Moderate	Concrete	Grey	Good	Incidental	No
Slab Creek / White Rock Development														
Slab Creek Dam and Powerhouse	Dam / Powerhouse	No	USFS	1967/1983	817 ft.	Yes	1A	WR-1, WR-2	Moderate	Concrete	Grey	Good	Frequent	No
White Rock Penstock	Penstock	No	SMUD	1967	1,675 ft.	Yes	1A	WR-4, WR-8	Moderate	Concrete	Green	Good	Incidental	No
White Rock Powerhouse and Switchyard	Powerhouse/Switchyard	Yes	SMUD	1967	80,400 ft.	Yes	1A	WR-6,7,8	Moderate	Concrete	Tan, Grey	Good	Frequent	No
12 kV T-line to PG&E	12kV Transmission Line	No	USFS	1983	600 ft.	Yes	1A	N/A	Moderate			Good	Incidental	No
White Rock - Folsom 230 kV T-line	230 kV Transmission Line	No	Multiple/No USFS	1967	21.8 mi.	Yes	1A	N/A	Moderate	Steel	Grey	Good	Incidental	No
White Rock - Folsom 230 kV T-line	230 kV Transmission Line	No	Multiple/No USFS	1967	21.8 mi.	Yes	1A	N/A	High	Steel	Grey	Good	Incidental	No
Slab Creek Gate House	Gate House	No	USFS	1967	2,500 ft.	Yes	1A	WR-3	Low	Concrete	Grey	Good	Incidental	No
White Rock Tunnel Valve House	Valve House	No	SMUD	1967	3,000 ft.	Yes	1A	WR-10	Low	Concrete	Grey	Good	Incidental	No
White Rock Surge Chamber	Surge Chamber	No	SMUD	1967	14,000 ft.	Yes	1A	WR-9	Low	Concrete	Grey	Good	Incidental	No
White Rock Tunnel	Tunnel	No	USFS/Other	1967	4.9 mi.	Yes	1A	N/A	Low	Concrete	Grey	Good	Incidental	No
Hydromet Stations														
Sourdough Hill	Communication	No	USFS	N/A	200 ft.	No	2	MC-2	Low	Concrete Block	Grey/Green	Good	Occasional	No
Slate Mountain	Communication	No	USFS	N/A				N/A	Low			Good	Occasional	Yes
Lost Corner Mountain	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel		Needs paint	Incidental	No
Buck Island Reservoir (Buck-Loon Tunnel)	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel		Good	Incidental	No
Little Rubicon River below Buck Island Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Moderate	Steel		Good	Incidental	No
Gerle Creek below Loon Lake Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	High	Steel			Incidental	No
Rockbound Tunnel Outlet	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Rubicon Reservoir (Rockbound Tunnel)	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Rubicon River below Rubicon Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Moderate	Steel			Incidental	No
Loon Lake Auxiliary Dam Leakage	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Loon Lake Chalet	Meteorological	No	USFS	N/A	N/A	No	2	N/A	High	Steel			Incidental	No
Upper Van Vleck	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Moderate	Steel		Needs paint	Incidental	No
Moratinni Flat	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel		Needs paint	Incidental	No
Gerle Creek Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No

Table 1. UARP Facilities Data

Facility Name	Type of Facility	Septic & Water System	Land Owner	Year Built	Square Feet or Length	FERC Boundary	Map	Photo ID	Visibility to Public	Building materials	Color	Condition	Staff Presence	Electrical Hazard
South Fork Rubicon River below Gerle Creek	Hydrological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel			Incidental	No
South Fork Rubicon above Robbs Peak Reservoir	Hydrological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel			Incidental	No
Robbs Saddle	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Moderate	Steel		Needs paint	Incidental	No
Little Silver Creek above Junction Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Union Valley Powerhouse	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Moderate	Steel			Incidental	No
Silver Creek below Junction Dam	Hydrological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel			Incidental	No
South Fork Silver Creek above Junction Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Moderate	Steel			Incidental	No
Big Hill	Com /Meteorological	No	USFS	N/A	N/A	No	2	MC-1	High	Concrete Block	Tan		Occasional	Yes
Wrights Lake	Meteorological	No	USFS	N/A	N/A	No	2	MC-6	High	Steel		Needs paint	Incidental	No
Alpha	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel		Needs paint	Incidental	No
Ice House Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Jaybird Springs	Meteorological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel		Needs paint	Incidental	No
Silver Creek below Camino Dam	Hydrological	No	USFS	N/A	N/A	No	2	N/A	Low	Steel			Incidental	No
Brush Creek below Brush Creek Dam	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
South Fork American River at Forebay Road	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Moderate	Steel			Incidental	No
Silver Creek above Camino Reservoir	Hydrological	No	USFS	N/A	N/A	Yes	2	N/A	Low	Steel			Incidental	No
Silver Creek above SF American River	Hydrological	No	USFS	2013	N/A	No	2	MC-3	Low	Steel			Incidental	No
Schneiders	Meteorological	No	USFS		N/A	No	2	N/A	Low	Steel		Needs paint	Incidental	No
Refletors/Repeaters														
Repeater Site at EID Penstock - Moon Ln.	Communication	No	USFS	2013		No	2	N/A	Low	Steel	grey		Incidental	No
Loon Lake Reflector	Communication	No	USFS	2014	N/A	Yes	2	MC-4	High	Steel	grey	New	Incidental	No
Peavine Reflector	Communication	No	USFS		N/A	Yes	2	N/A	Low	Steel	green		Incidental	No
Independence Reflector	Communication	No	USFS		N/A	Yes	2	N/A	Low	Steel	green		Incidental	No
Iowa Hill Reflector	Communication	No	USFS		N/A	No	2	MC-7	Moderate	Steel	green		Incidental	No

Description of Values in Table 1

Facility Name: This is the most commonly used name of the facility, sometimes there are multiple names for sites but for simplicity, one name is shown.

Type of Facility: General category of facility. Types include Gate Houses, Dams, Penstocks, Tunnels, etc.

Septic & Water Systems: If the facility has a septic and/or water system a "Yes" value is entered.

Land Owner: USFS = United States Forest Service; BLM = Bureau of Land Management; SPI = Sierra Pacific Industries (private); Other = other private.

Year Built: This is the approximate date that the facility was put into operation; some facilities, such as Hydro-met stations do not have a year built due to difficulty of tracking down this data.

Square feet or length: Values are lengths in feet (ft.) or miles (mi.) for linear facilities like tunnels, dams and penstocks; for buildings and other structures, values are square feet (ft.) of the footprint.

FERC Boundary: If the facility is in the FERC Project Boundary the value is "Yes" (drawings available upon request).

Figure ID: The primary map in Figure 1A-1H that the facility can be found on; some facilities span multiple maps and some can be found on areas of overlap between figures.

Photo ID: This is the photo ID of the facility in *Appendixt 1. Photographic Guide to SMUD's UARP Facilities*. Photographs are not available for all facilities.

Visibility to Public: This value was determined by SMUD using several criteria and is for informational purposes for the USFS or BLM when making determination about visual resource protection. This information is not to be confused with the Forest Service Visual Management System (VMS) Visual Quality Objectives (VQOs) or the Forest Service Scenery Management System (SMS) Scenic Integrity Objectives, which will be addressed in the Visual Resources Management Plan for the Project. There are 3 categories: High, Moderate, and Low.

> High = Site is very visible from a well-traveled public road or recreation facility.
>
> Moderate = Site is visible from a less well-traveled road or partially visible form a recreation site.
>
> Low = Site is only visible when very near the structure or from only obscure vantage points along forest roads or behind locked gates.

Building Materials: This is the primary building material used in the construction of the facility. Typically these values are steel, concrete, concrete block or rock.

Color: This is the primary color of the facility and is not a comprehensive list of colors used on the structure. This field will be updated as information is collected.

Staff Presence: There are three categories to define staffing levels at facilities:

> Frequent = During normal SMUD business hours (M-F 6 am-5 pm) there is usually some level of staffing at the site.
>
> Occasional = Staff visits the site somewhat routinely.
>
> Incidental = Staff typically only at the site for specific maintenance activity.

Electrical Hazard: If the site is involved in the transmission of high voltage electrical current the value is "Yes". Other sites with "No" may typical, high voltage electrical service to power the facility.

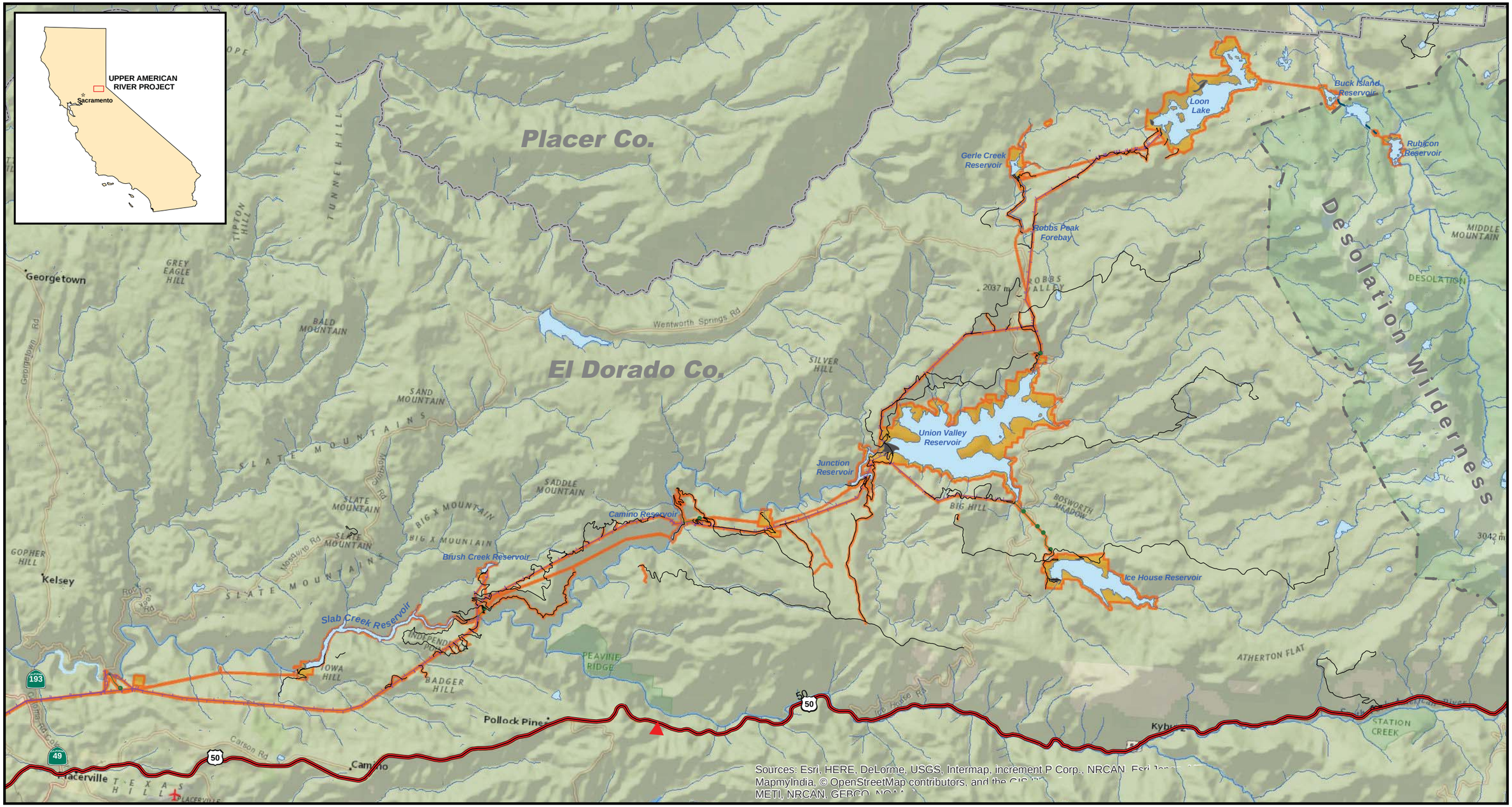


Figure 1. SMUD UARP Overview

Upper American River Project - FERC No. 2101

SMUD™

Map Features

- UARP FERC Boundary
- SMUD Facilites
- Transmission Line

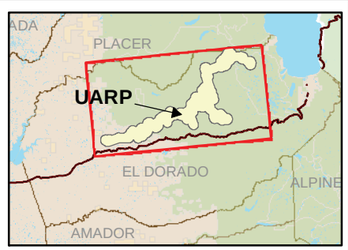
Transportation

- US Highway 50
- Select_FS_roads

Water Conveyance

- Canal
- Channel
- Penstock

Notes:



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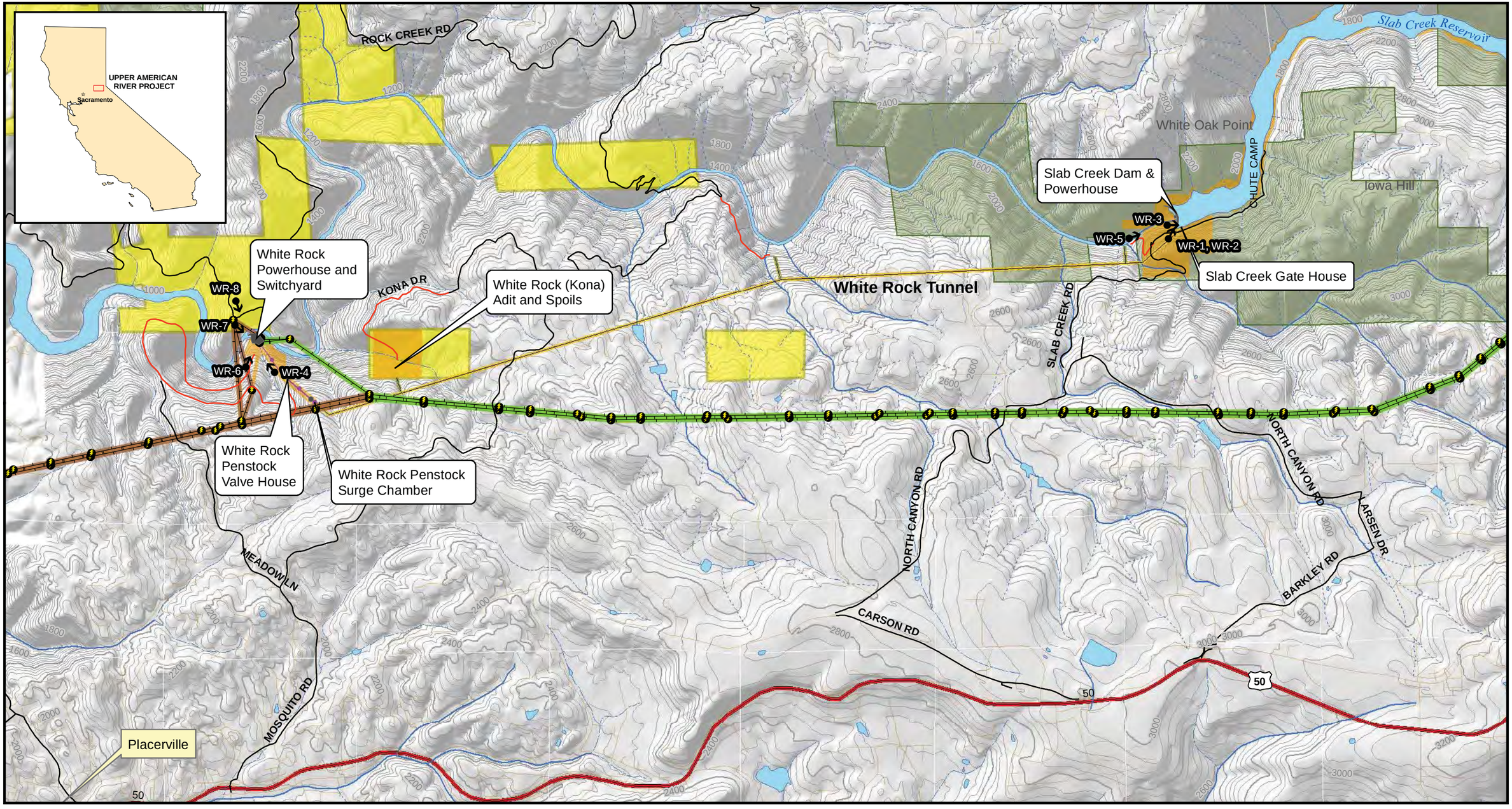

Figure 1A. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land
- Bureau of Land Management

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads
- Other Roads

Water Conveyance

Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom

N

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1 in = 0.5 miles

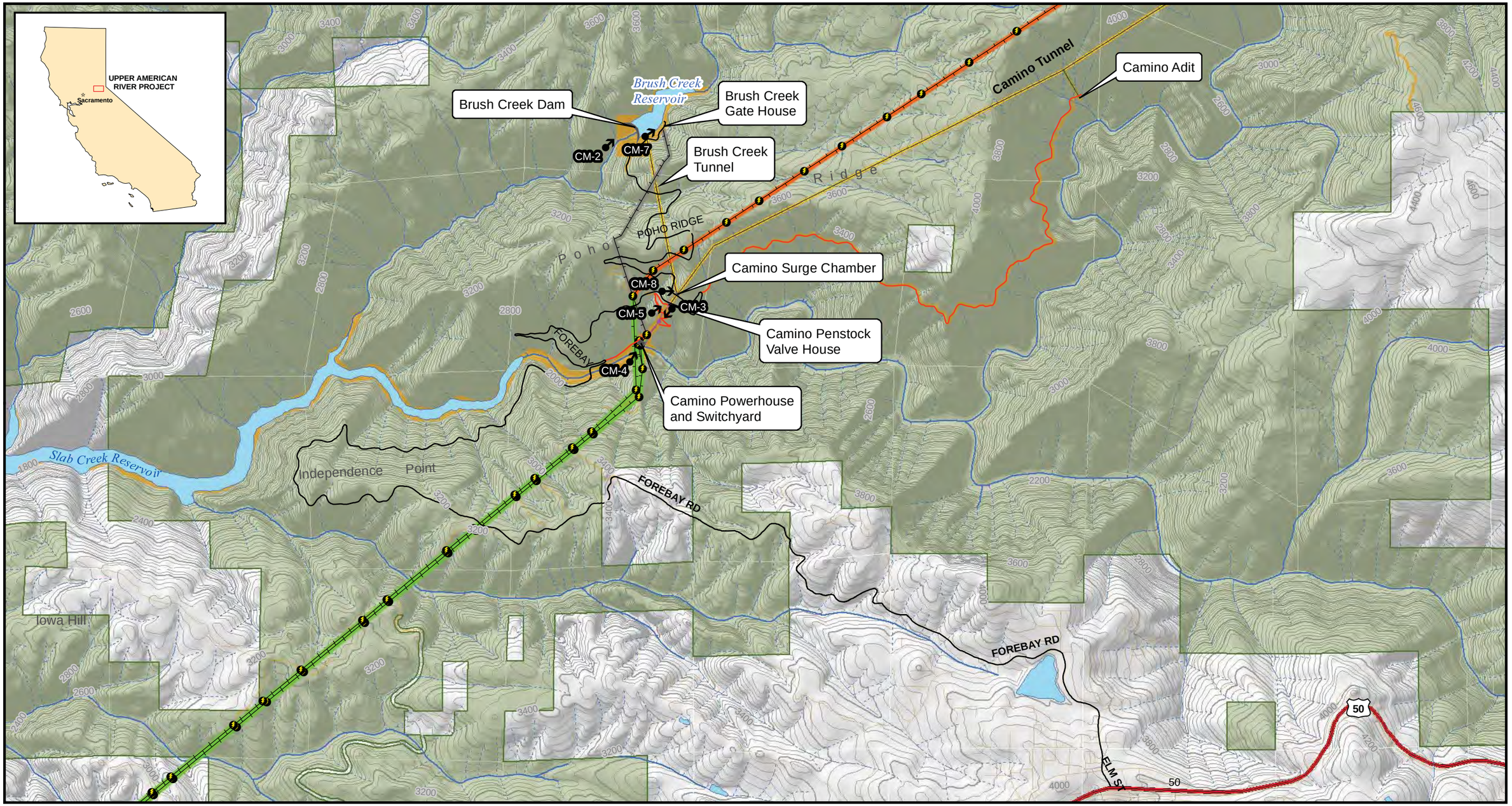


Figure 1B. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads
- Other Roads

Water Conveyance

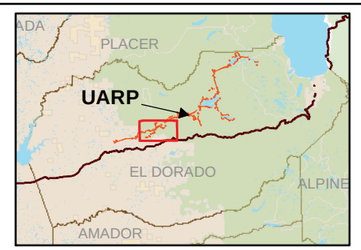
Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom



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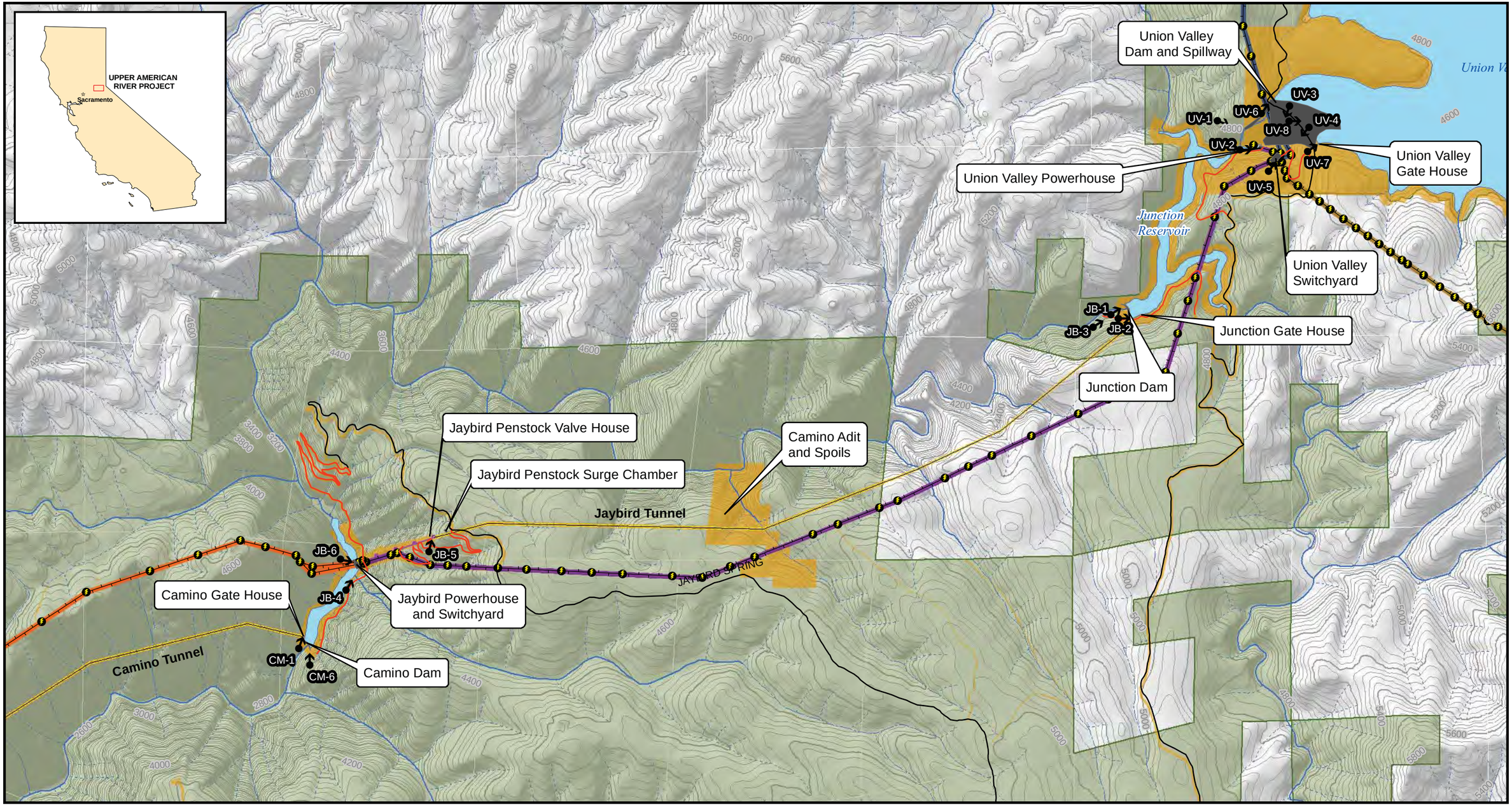

Figure 1C. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line

T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom

N

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1 in = 0.5 miles

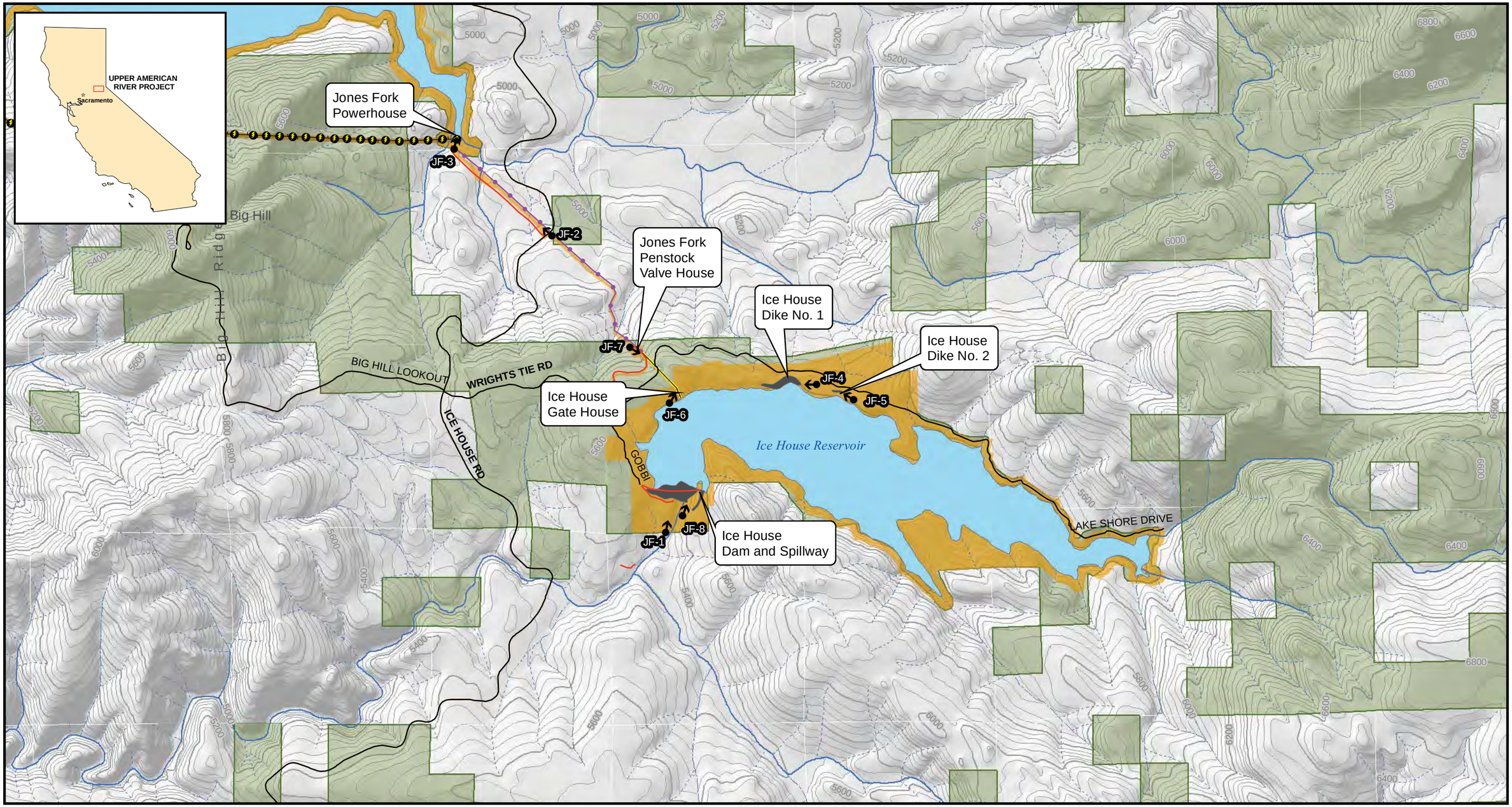

Figure 1D. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom

N

0 0.25 0.5 Miles

1 in = 0.5 miles

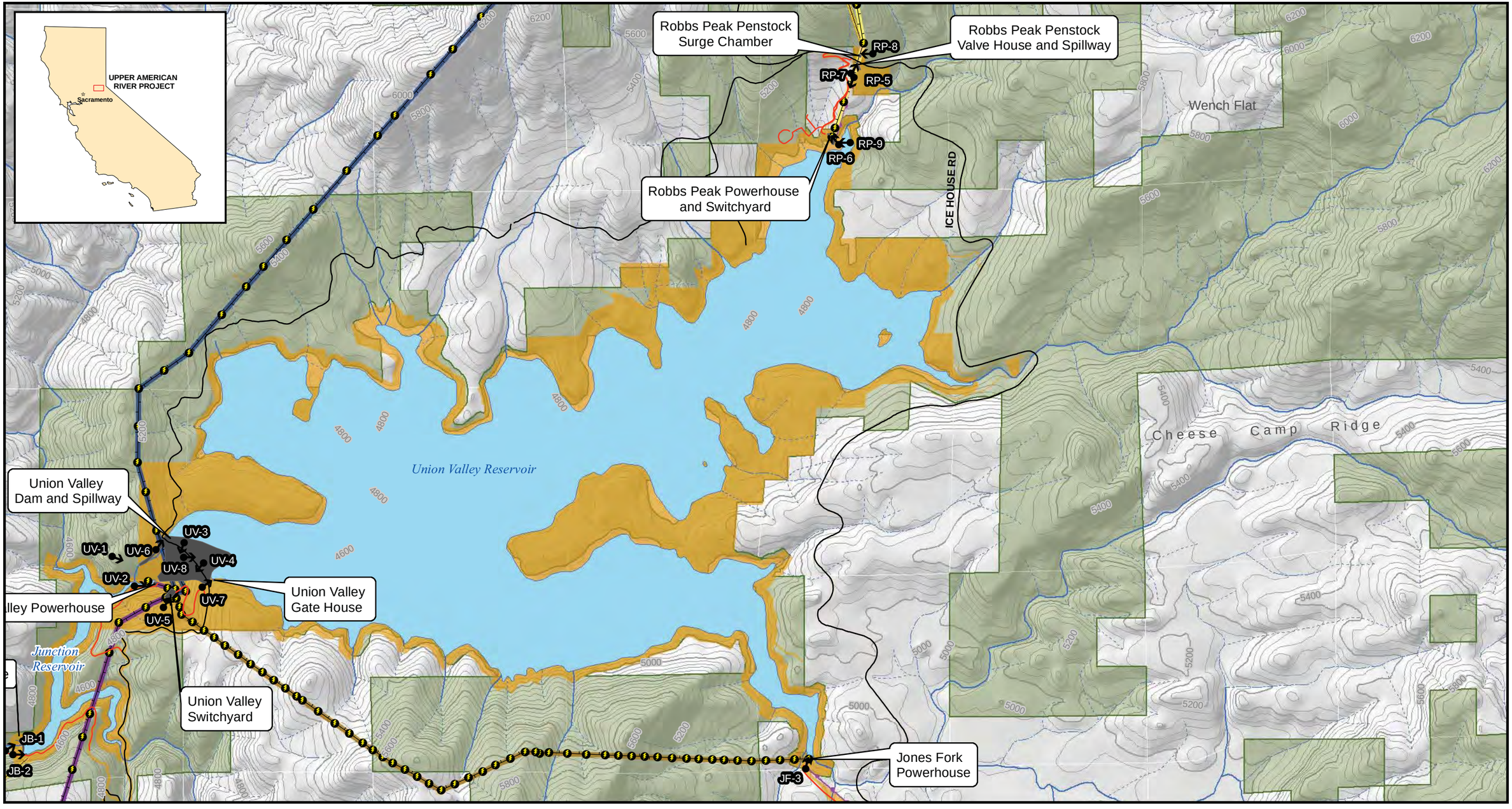

Figure 1E. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom

N

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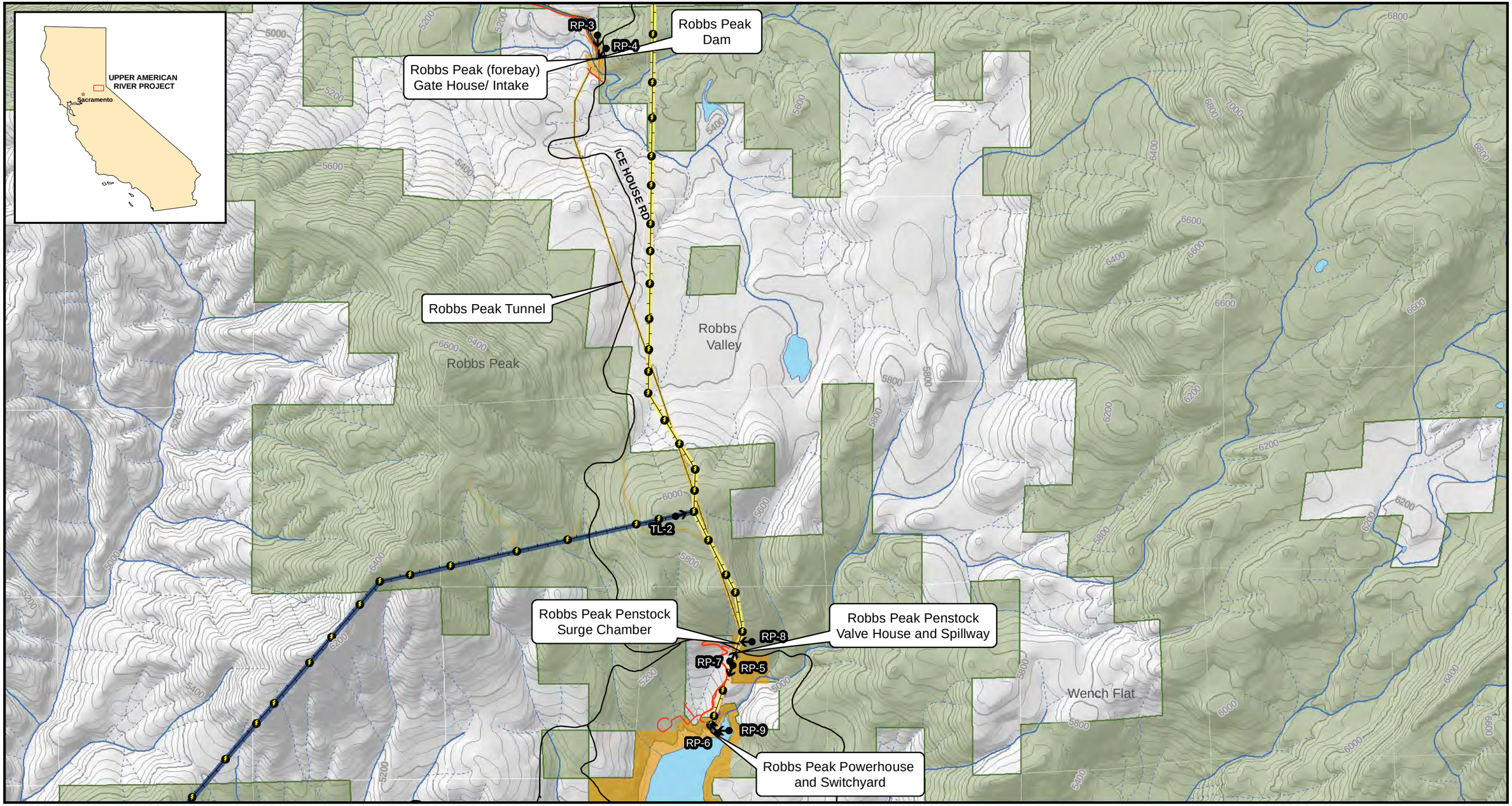


Figure 1F. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

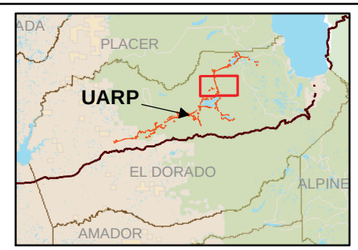
Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom



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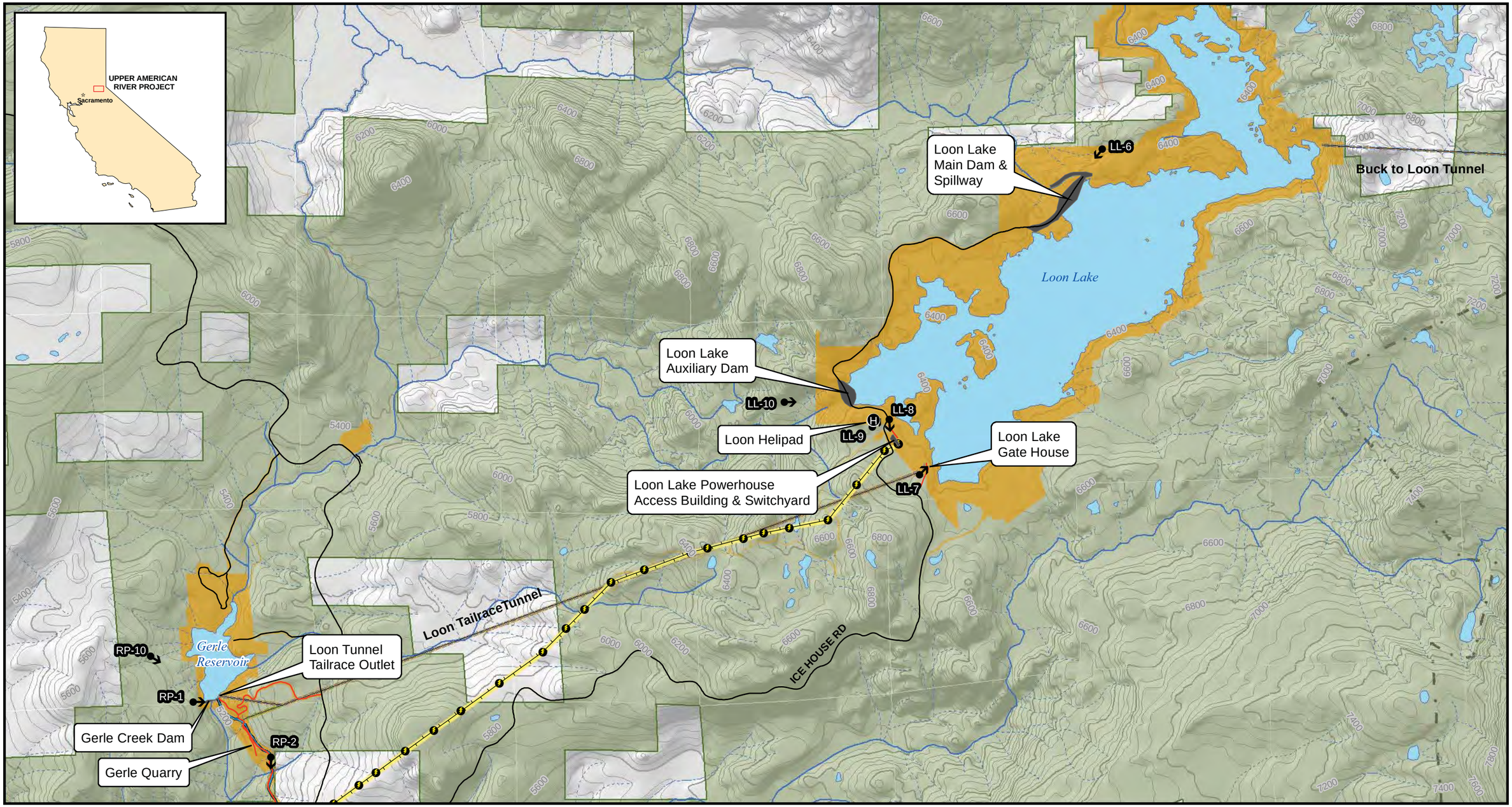


Figure 1G. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

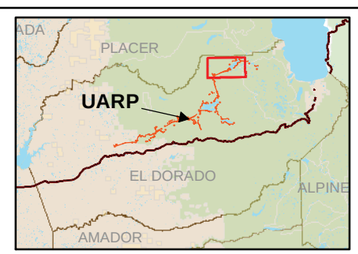
Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line
T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom



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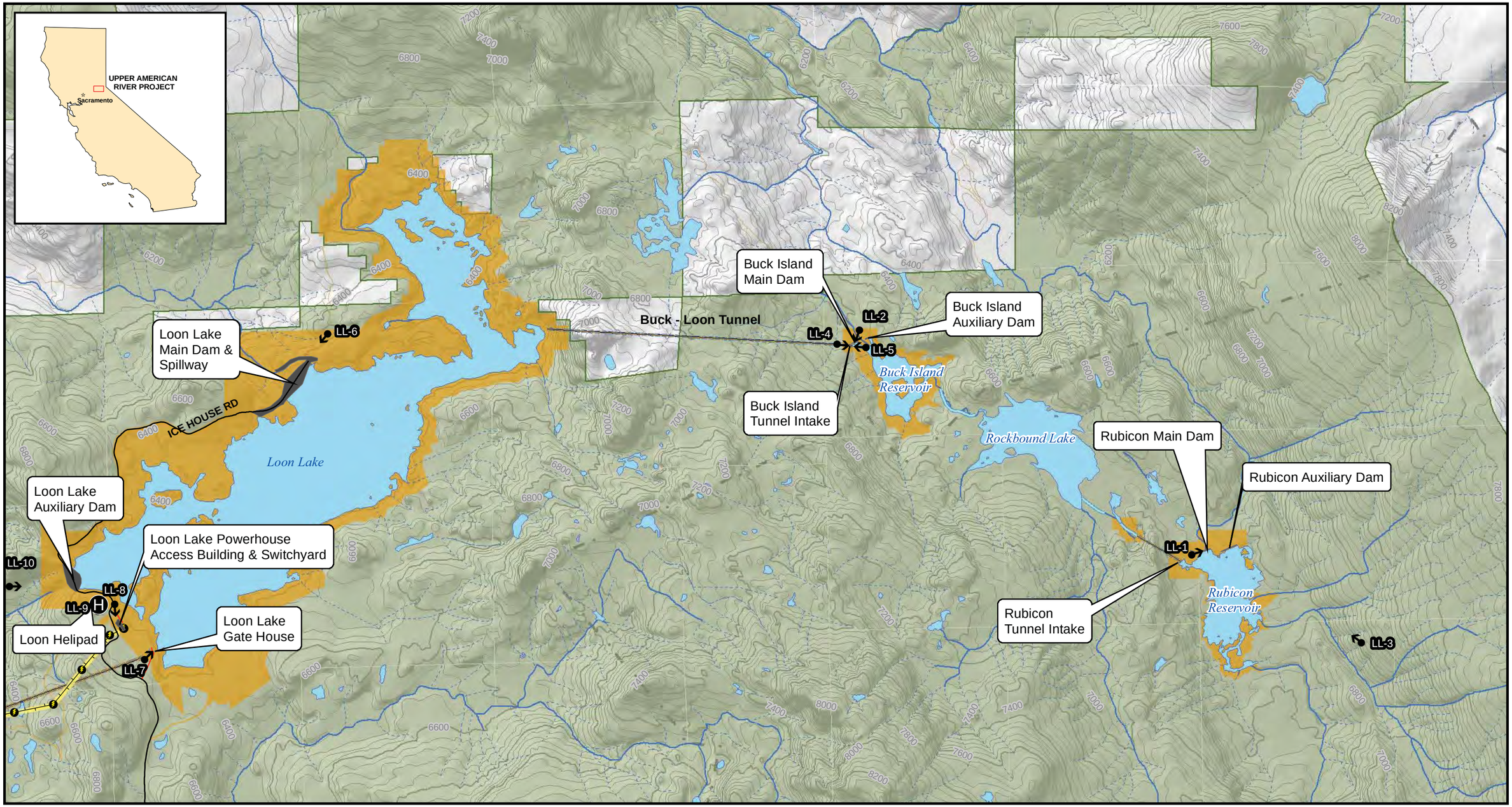


Figure 1H. SMUD UARP Facilities

Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD®

Map Features

- UARP FERC Boundary
- SMUD Facilites

Land Ownership
- National Forest Land

Transportation
- US Highway 50
- Primary Access Roads
- Gated Access Roads

Water Conveyance

Tunnel
- Non-pressurized Tunnel
- Pressurized Tunnel
- Adit / Spur

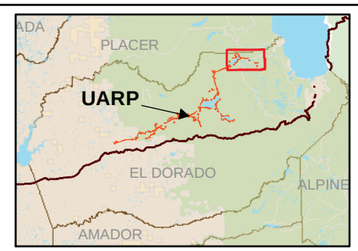
Penstock
- Penstock
- Penstock Subsurface

Other
- Channel
- Canal

Transmission
- Transmission Structures
- Transmission Lines
- Photo Point

Transmission Line

T-line Segment
- Loon Lake to Robbs
- Robbs to Union Valley
- Jones Fork to Union Valley
- Union Valley to Jaybird
- Jaybird to Camino
- Camino to White Rock
- Brush Creek
- White Rock to Folsom
- Folsom



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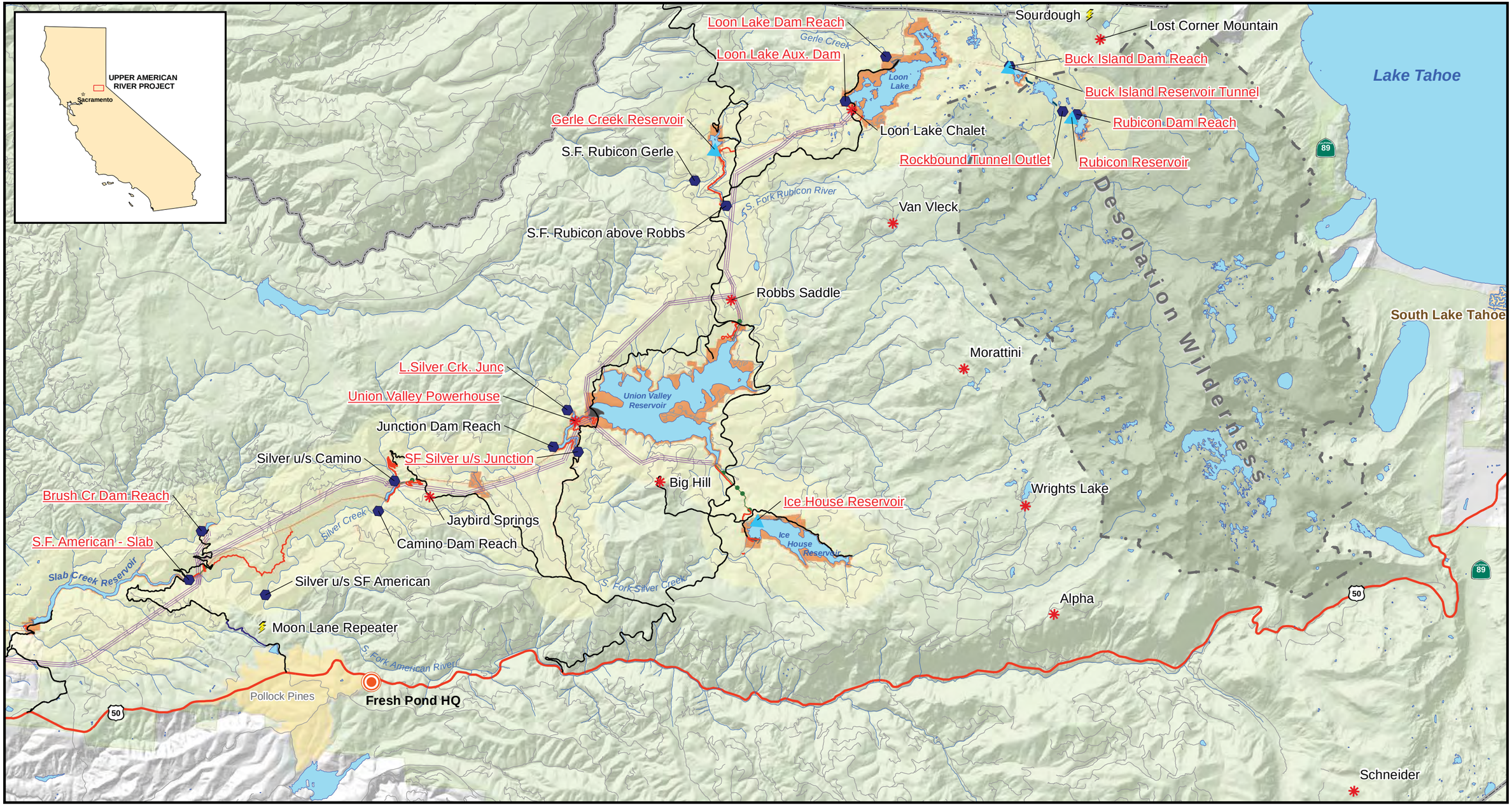

Figure 2. UARP Hydro-met and Communication Facilities

SMUD - Upper American River Project - FERC No. 2101
Facility Management Plan

SMUD™

Map Features

- UARP FERC Boundary
- SMUD Facilites
- Transmission Line
- Primary Access Roads
- Gated Access Roads
- Other Roads

Water Conveyance

- Canal
- Channel
- Penstock

Hydromet Stations

- Reservoir
- Streamflow
- Met
- Telecom

Notes:

Hydromet Station Labels:
Red Underline = Inside FERC Boundary
No Underline = Outside FERC Boundary

February, 2015

N

1 in = 2.5 miles

1:156,000

3.0 UARP Maintenance Program

3.1 Regular, Preventative and Scheduled Maintenance

In order to keep the UARP operating efficiently and reliably, SMUD has a team of more than 120 people dedicated to operating, maintaining, monitoring, and repairing the multiple facilities of the UARP. The fact that the UARP has been continuously providing reliable electrical service for 50 years since 1963, is testament to SMUD's thorough operations and maintenance program. During planned annual outages, SMUD repairs and maintains powerhouses and water conveyance facilities on a scheduled basis. This includes both minor and major repairs. All of the facilities associated with the UARP are instrumental in the successful operation of the project. As such, there are no derelict buildings, abandoned facilities or other structures in disrepair. All of the facilities are regularly visited and maintained. In the event that SMUD would need to remove a facility from the Project, the USFS would be notified and a plan would be prepared to ensure that the facility is properly decommissioned and the site restored.

3.1.1 Dams, Penstocks, Gate Houses, Valve Houses – All of these structures are regularly inspected and monitored by both SMUD and regulatory agencies, including the California Division of Safety of Dams (DSOD). There is a considerable public safety element associated with operating these structures, which requires strict attention to maintenance. All painting or other maintenance activity that may affect visual resources is done in consultation with the USFS. Many structures, such as the gatehouses, are left unpainted, which provides a neutral gray concrete color.

*3.1.2 Powerhouse*s – Powerhouses are overhauled each year. This includes performing all regular maintenance as well as specific repair needs and equipment upgrades. Paintable surfaces (metal) are painted as needed and concrete surfaces are patched when deterioration is extensive enough to warrant maintenance. Building maintenance staff performs monthly inspections of all buildings, including powerhouses, which is used to identify any maintenance needs of a building. If major maintenance is needed, asset managers plan and budget for these repairs several years in advance unless it requires immediate action. All painting or other maintenance activity that may affect visual resources is done in consultation with the USFS.

3.1.3 Tunnels – Tunnels are inspected and maintained on as-needed basis. Most tunnels don't require the frequent attention that other facilities do. They are generally very stable and require inspection only if there is reason to believe

that the tunnel structure is compromised. In fact, draining the tunnels can lead to destabilization of the tunnel due to changes in hydrostatic pressure and is only done if there is an emergency need or a known problem with the tunnel.

3.1.4 *Transmission Lines and Towers* – Operation and maintenance of transmission lines is carried out by SMUD's Grid Assets Department. This department has an annual Capital Improvement Project list and a maintenance budget to keep towers and lines well maintained. Maintenance includes annual inspections and both preventative and corrective actions to lines and towers, as well as vegetation management. Inspections include regular helicopter flights to view the condition of lines, insulators and towers. Keeping vegetation clear in the Right-of-Way (ROW) beneath transmissions lines is a significant maintenance activity. Details of vegetation management along transmission ROWs will be discussed in the UARP Vegetation and Invasive Weed Management Plan. The effective operation of the electric transmission lines and towers is regulated by FERC and NERC and heavy fines and penalties can be levied on SMUD for non-compliance. SMUD does not plan on removing any transmission lines from the Project at this time.

3.1.5 *Hydro-met Stations* – All of SMUD's Project-related hydro-met stations are visited regularly throughout the year. The proper functioning of these facilities is absolutely critical for day-to-day operations. Current maintenance for these structures is focused on keeping them operable so that they continue to provide the valuable weather and hydrologic data for regular operations and planning. Periodic maintenance includes replacing older measuring devices, solar panels etc. Repainting is done infrequently and as noted in the USFS 4(e) Condition 53, many stations need repainting and SMUD is required to paint them within 4 years of License issuance.

3.1.6 *Other Sites* – Other structures include appurtenant buildings near existing facilities, such as the storage shed at Robbs Powerhouse. These buildings are regularly visited and inspected by building maintenance staff, as described above. Any maintenance issues or needed repairs are documented and the asset supervisors schedule needed repairs. SMUD also utilizes rock from several quarry/spoils sites in the UARP. These include sites near Gerle Canal, Union Valley Reservoir and near some of the tunnel adits. Vegetation management at these sites is the primary

maintenance activity and will be described in detail in the Vegetation Management Plan.

3.2 Agency Consultation and Environmental Review

SMUD currently meets with the ENF quarterly to discuss upcoming maintenance, operations and capital projects. At these meetings, the five year maintenance schedule will be reviewed and for near term projects, the project scope and extent to which any further environmental review or permits are needed will be discussed (e.g. field surveys, Biological Evaluations, cultural resource evaluations, etc.). This review would cover any changed circumstances, required measures to protect specific resources, or site - specific concerns to consider in the design or operation of the Project. The USFS will have the opportunity to express concerns about any number of issues associated with upcoming activities. SMUD plans to continue to have regular quarterly Operation and Maintenance meetings with the ENF.

During maintenance planning, SMUD reviews maintenance projects to determine if any environmental permitting will be required. This includes, but is not limited to: CDFW Section 1602 Streambed Alteration Agreements, Clean Water Act (CWA) Section 404 permits from the Army Corps of Engineers (ACOE), CWA Section 401 Water Quality Certificate (WQC) from the Regional Water Quality Control Board. SMUD is currently seeking a Section 1602 Routine Maintenance Agreement from CDFW that will cover a variety of projects for a term of up to 12 years. In addition, SMUD is seeking a CWA, Section 404 Regional General Permit from the ACOE and accompanying WQC from the RWQCB for a variety of maintenance and small capital projects in the UARP. These programmatic permits will allow SMUD to more efficiently manage environmental compliance.

As part of the environmental review process for maintenance projects in the UARP, SMUD consults the Historic Properties Management Plan (HPMP) prepared for the UARP. The HPMP contains all of the known cultural resource sites in the UARP and provides a process for managing these sites and reviewing projects to ensure compliance with Section 106 of the National Historic Preservation Act. The HPMP was reviewed and approved by the State Historic Preservation Officer (SHPO) and the USFS. Future National Register of Historic Properties eligibility evaluations of the facilities discussed in this Plan may be necessary.

3.3 Unscheduled Emergency Repairs

In the event of an emergency SMUD reserves the right to expeditiously repair a facility or otherwise remedy the situation without formally consulting the USFS. SMUD will

notify the USFS and FERC of any emergency situation that could impact the public and/or USFS lands or resources. Following the resolution of the emergency situation, SMUD will work with the USFS to mitigate any potential impacts to USFS lands or resources as a result of the emergency situation.

4.0 Five-year Planned Maintenance Schedule

According to License Condition 58, SMUD is required to provide a plan that identifies projected 5-year maintenance, reconstruction and removal needs for Project facilities. SMUD will consult with the USFS on the proposed maintenance activities listed below and file a new plan, approved by the USFS, with FERC every 5 years. For the purpose of this Plan, covered maintenance activities include only significant, visible activities that could affect USFS or BLM lands or forest users. It does not include much of the routine operational maintenance or power generation equipment upgrades. Table 2 identifies maintenance activities that would occur in the first 5 years following License implementation. Some of these include projects that were identified in Condition 53, to reduce impacts to visual resources. For any planned maintenance projects that could affect visual resources on USFS or BLM lands, SMUD will consult with the USFS or BLM to determine if there are any visual resource mitigation measures that need to be implemented. At this time, SMUD does not plan on removing or rebuilding any UARP facilities in the next 5 years.

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Table 2. SMUD UARP 5-year Maintenance Plan*

Project Title	Description	2015	2016	2017	2018	2019	Comments
General UARP							
Security Upgrades-All UARP Powerhouses/Dams/etc.	Annual budget to enhance fencing, add monitoring (video) and card readers, etc.	X	X	X	X	X	Annual
Penstock Platforms and Ladders	Replace and install where needed, penstock ladders and platforms at multiple locations in UARP	X		X			
UARP Log Boom Replacement	Purchases log booms to replace ageing/damaged booms on UARP reservoirs.	x					
Paint Weather Stations	Paint all reflective surfaces except instruments	X	X	X	X		required by 4(e) condition (within 4 years)
Vegetation Removal	A program to remove vegetation on the slope side of Gerle Canal to reduce deterioration of shotcrete liner, under and around penstocks, switchyards, etc.	X	X	X	X	X	Other facilities, roads, etc.
Wrights Lake Snow Pillow	Install a new snow pillow with pressure transducer at existing net site			X			
UARP Communication Cable	Replace/upgrade cables from valve house/intake to powerhouses at all plants			X	X	X	Safety and loss of control between powerhouse and intake
Loon Lake Development							
Rubicon Reservoir Painting etc.	Paint all metal components; replace chain link fence with black chain link		X				required by 4(e) condition (within 2 years)
Loon Lake Sub-station Painting	paint doors		X				required by 4(e) condition (within 2 years)
Loon Lake Gatehouse	Paint and re-roof building		X				required by 4(e) condition (within 2 years)
Security Upgrade - Fencing at Loon Dam	Replace fencing at Loon Dam to address Security Plan recommendations (FERC)			X	X		
Loon Lake PH sewage system	Rebuild the sewage system at LL PH				X	X	
Loon Lake Access Building Roof	Replace or up-grade with a coating to protect roof.		X				
Robbs Peak Development							
Seal Robbs Peak Powerhouse	Seal exterior concrete walls of Robbs Peak PH to control water intrusion	X	X				
Robbs Peak Forebay Painting etc.	Paint railing and replace fencing with black chain link		X				required by 4(e) condition (within 2 years)
Construct New Weir on South Fork Rubicon River	New concrete weir downstream of Robbs Peak to measure new required fish flows	X					required by 4(e) condition (within 2 years)
Robbs Valve House	Paint paintable surfaces, replace roof		X				
Gerle Gate House	Paint paintable surfaces, replace roof		X				
Robbs Forebay Gate House	Paint paintable surfaces, replace roof, paint railings, repair concrete		X				
Gerle Reservoir Dam Painting	Paint handrail and guardrail	X	X				required by 4(e) condition (within 2 years)
Union Valley Development							
Rebuild Union Valley Duct Bank					X	X	

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Table 2. SMUD UARP 5-year Maintenance Plan*

Project Title	Description	2015	2016	2017	2018	2019	Comments
Security Upgrade - Fencing UV PH	Replace fencing at Union Valley PH to address Security Plan recommendations (FERC)		X				
Road Improvements near Union Valley	Improve roads on N. Side of UV reservoir			X			Required by 4(e) condition
Jones Fork Development							
Telemetered Stream Gage South Fork Silver Creek	Install new gaging station with access from Wrights Lake Road for inflows to Ice House reservoir	X					Not on NFS land
Road Improvements near Ice House	Improve intersection with Wrights Lake Tie road			X			Required by 4(e) condition
Ice House Outlet Valve House	Paint paintable surfaces, replace roof			X			
Penstock Painting - Jones Fork	Paint the Jones Fork penstock		X	X			Jones fork painting required by 4(e) condition (within 3 years)
Jones Fork Intake Building	Paint paintable surfaces, replace roof		X	X			
Jones Fork PH - EG building	Enclose the emergency generator building at JF	X					
Security Upgrade - Fencing at Jones Fork PH	Replace fencing at Jones Fork Powerhouse to address Security Plan recommendations (FERC)	X					
Jaybird Development							
Penstock Painting - Jaybird	Paint the Jones Fork and Jaybird penstocks.		X	X			
Jaybird Roof Replacement	Replace leaking roof		X				
Recording Stream Gage @ Round Tent Creek	Install new gaging station at Round Tent Creek			X			
Fiber optics Jaybird PH to Camino Dam	Install Fiber Optic Cable from Jaybird Powerhouse to Camino Dam for Hydromet station and gate controls			X			Above ground?
Security Upgrade - Fencing at Jaybird PH and Switchyard	Replace fencing at Jaybird to address Security Plan recommendations (FERC)		X				
Jaybird Valve House	replace roof, touch-up paint		X				
Camino Development							
Construct new Weir on Silver Creek below Camino Reservoir	New weir needed to measure increased flows required by new license		X				
Paint Outlet Valves on Camino Dam	Paint fish water release valves and pipes on Camino Dam	X					
Camino Trash Rack Cleaning	Clean intake trash rack	X					
Camino PH Roof Replacement	Replace leaky roof	X					
Security Upgrade - Fencing at Camino PH and Switchyard	Replace fencing at Camino & RP Switchyard to address Security Plan recommendations (FERC)	X					
Boat Ramp Repair at Brush Creek	Repair erosion damage at brush creek ramp	X					
Tower 109 Rock Fall Mitigation	Install Rockfall mitigation structure above Tower 109, situated on the steep canyon just west of Jaybird PH	X	X				

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Table 2. SMUD UARP 5-year Maintenance Plan*

Project Title	Description	2015	2016	2017	2018	2019	Comments
Camino Dam	Paint Gate lifting equipment		X	X			
Camino Valve House	Paint door, re-roof		X	X			
Brush Creek Gate House	Clean building, repaint doors, replace windows, re-roof		X	X			
Security Upgrade - Fencing at Brush Creek Dam and Intake	Replace fencing at Brush Cr Dam & Intake to address Security Plan recommendations (FERC)	X					
Slab Creek / White Rock Development							
New Powerhouse @ Slab Creek Dam Area	Permit & build a new powerhouse at Slab Creek Dam. Part of the Green Energy plan and to use the higher flows as a result of the new Hydro license. Also transmission line and substation to support new small Hydro.		X	X	X		
Slab Creek Gate House	Paint doors, paint entry gates		X				
Install Fire barriers at White Rock PH	Install fire barriers between transformers at WR PH and switchyard				X		

*** Schedule subject to change**

5.0 Summary

This Plan has been prepared in consultation with the USFS, BLM and other agencies and fulfills Condition 58 of Appendix B of the new License for the UARP, FERC No. 2101. The Plan is tied to Condition 53 (visual resources) of the Final 4(e) conditions and includes information relevant to SMUD's compliance with that condition too. The Plan provides a set of maps showing the locations of all Project facilities, including structures on or affecting USFS or BLM lands. Table 1 summarizes relevant information about each facility, including the type, season of use and condition of each facility. Table 2 lists all proposed/planned maintenance and construction activities for the next 5 years, including required modifications to facilities as described in Condition 53 for the enhancement of visual quality. Table 2, which describes SMUD's planned maintenance projects, will be updated every 5 years and filed with FERC after receiving approval by the USFS.

6.0 Plan Revisions

If SMUD, USFS, CDFW, or SWRCB collaboratively determine that revisions should be made to the plan, SMUD will make any revisions to the Plan in coordination and consultation with the listed resource agencies. Any revisions to the plan must be approved by USFS, CDFW, and SWRCB. Any revisions shall be filed with FERC for approval prior to implementing.

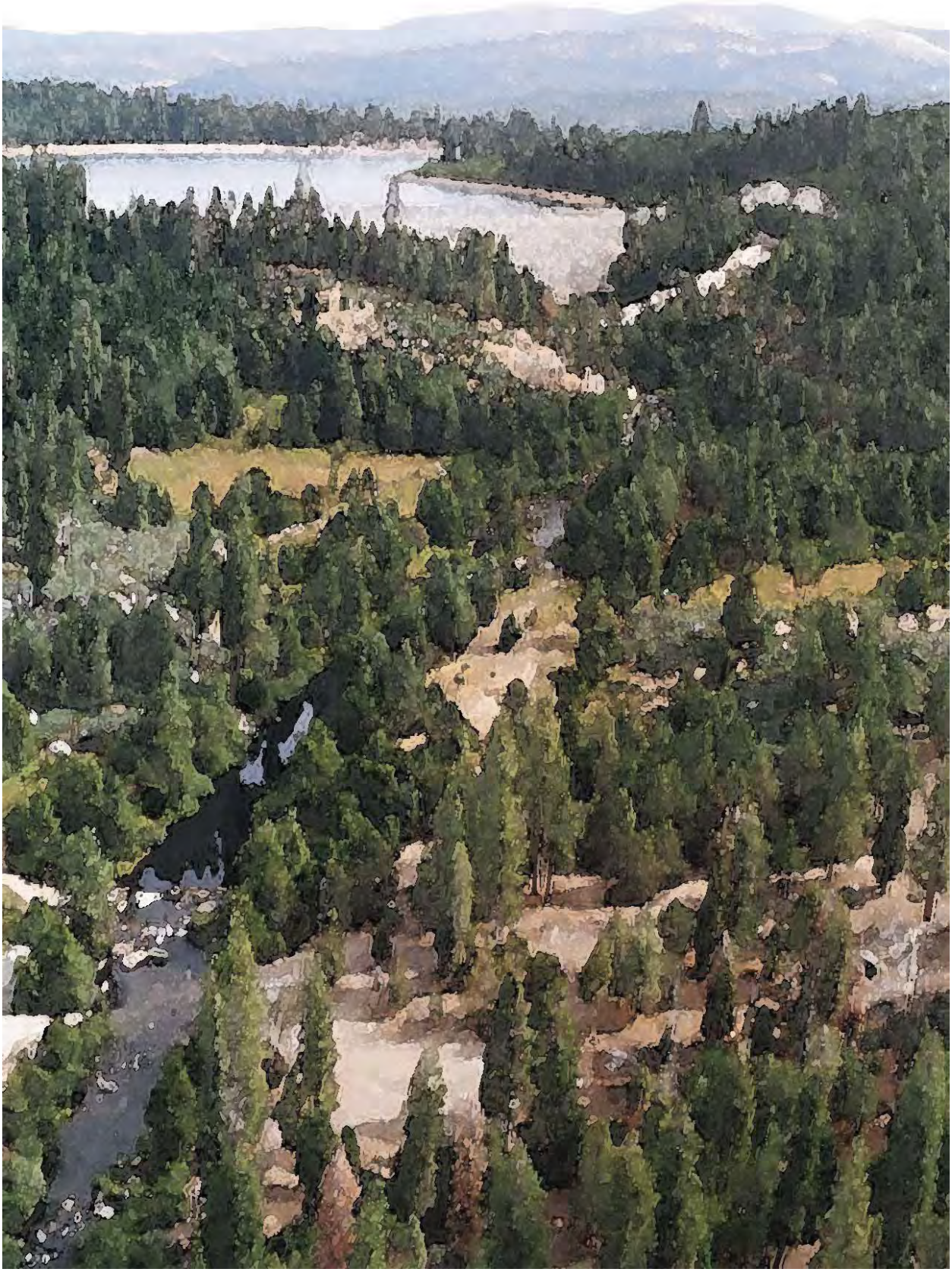
6.0 References

FERC 2014. Order Issuing New License for the Upper American River Project, FERC Project 2101. Federal Energy Regulatory Commission, Washington, D.C. July 23, 2014.

SMUD 2005. Upper American River Project, FERC Project No. 2101, Application for New License. Sacramento Municipal Utility District. July 2005.

SMUD et al. 2007. Relicensing Settlement Agreement for the Upper American River Project and Chili Bar Hydroelectric Project. Sacramento Municipal Utility District, Sacramento, CA

Appendix A. Photographic Guide to SMUD's UARP Facilities



Loon Lake Development

LL-1. Rubicon Dam (Main)

LL-2. Buck Island Dam and Stream Gaging Weir

Loon Lake Development

LL-3. Rubicon Reservoir

LL-4. Buck Island Dam Reservoir and Helipad

Loon Lake Development

LL-5. Buck-Loon Tunnel Intake

LL-6. Loon Lake Main Dam

Loon Lake Development

LL-7. Loon Lake gate house

LL-8. Loon Lake Switchyard and Powerhouse Access Building

Loon Lake Development

LL-9. Loon Lake Helipad

LL-10. Loon Lake and the Loon Auxiliary Dam

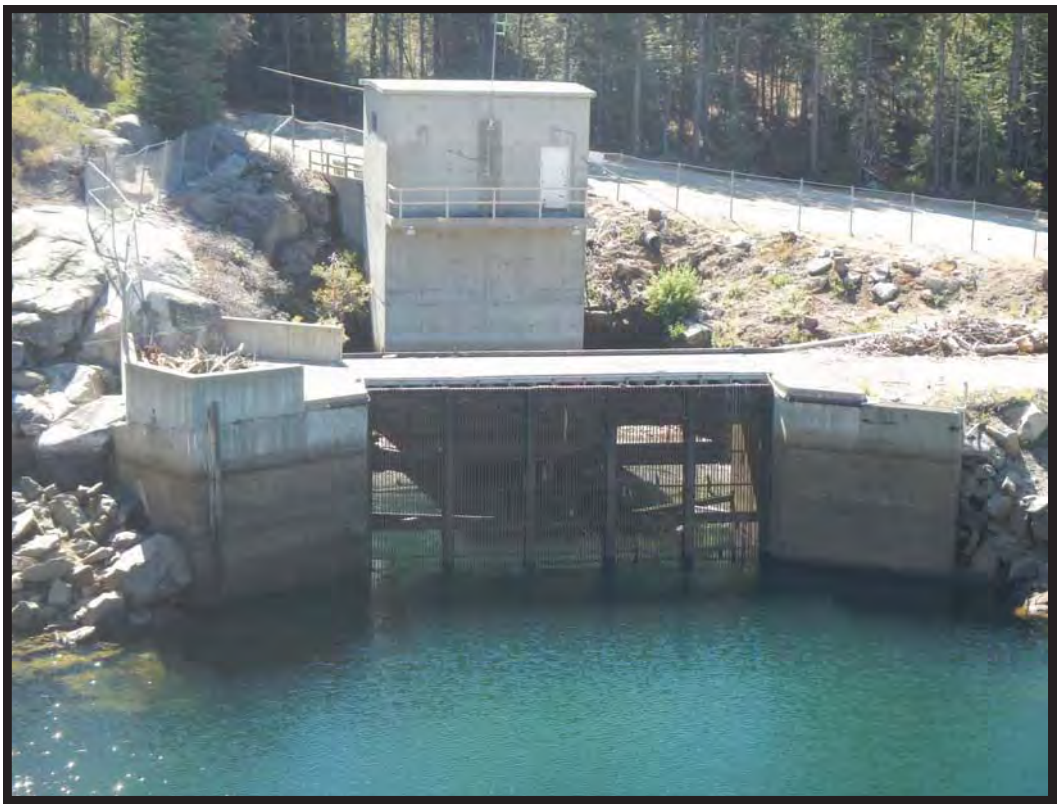
Robbs Peak Development

RP-1. Gerle Creek Dam and Loon Tailrace Tunnel Outlet Structure

RP-2. Gerle Canal

Robbs Peak Development

RP-3. Robbs Peak Dam and Gerle Canal



RP-4. Robbs Peak Tunnel Intake/ Gate House

Robbs Peak Development

RP-5. Robbs Peak Penstock

RP-6. Robbs Peak Powerhouse

Robbs Peak Development

RP-7. Robbs Peak Penstock Valve House

RP-8. Robbs Peak Surge Chamber

Robbs Peak Development

RP-9. Robbs Peak Switchyard

RP-10. Gerle Creek Reservoir

Jones Fork Development

JF-1. Ice House Dam

JF-2. Jones Fork Penstock

Jones Fork Development

JF-3. Jones Fork Powerhouse and Switchyard

JF-4. Ice House Dike 1

Jones Fork Development

JF-5. Ice House Dike 2

JF-6. Jones Fork Gate House

Jones Fork Development

JF-7. Jones Fork Valve House

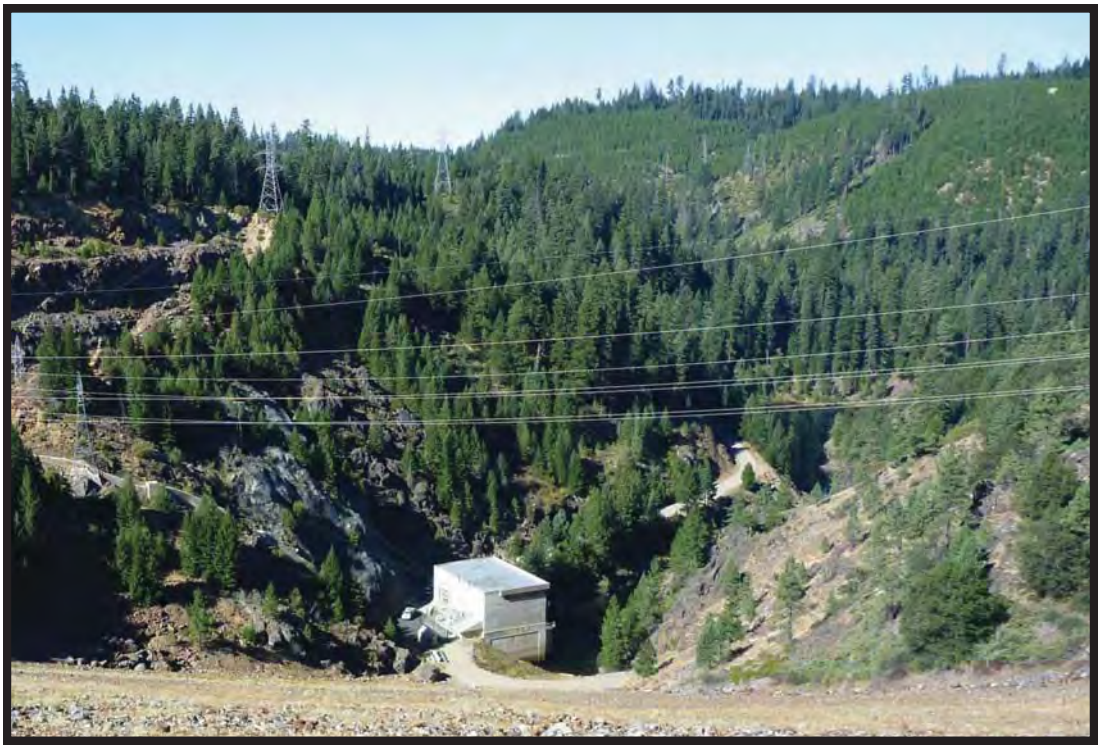
JF-8. Ice House Outlet Structure

Union Valley Development

UV-1. Union Valley Dam

UV-2. Union Valley Powerhouse

Union Valley Development



UV-3. Union Valley Powerhouse

UV-4. Union Valley Switchyard

Union Valley Development

UV-5. Union Valley Switchyard

UV-6. Union Valley Spillway

Union Valley Development

UV-7. Union Valley Gatehouse

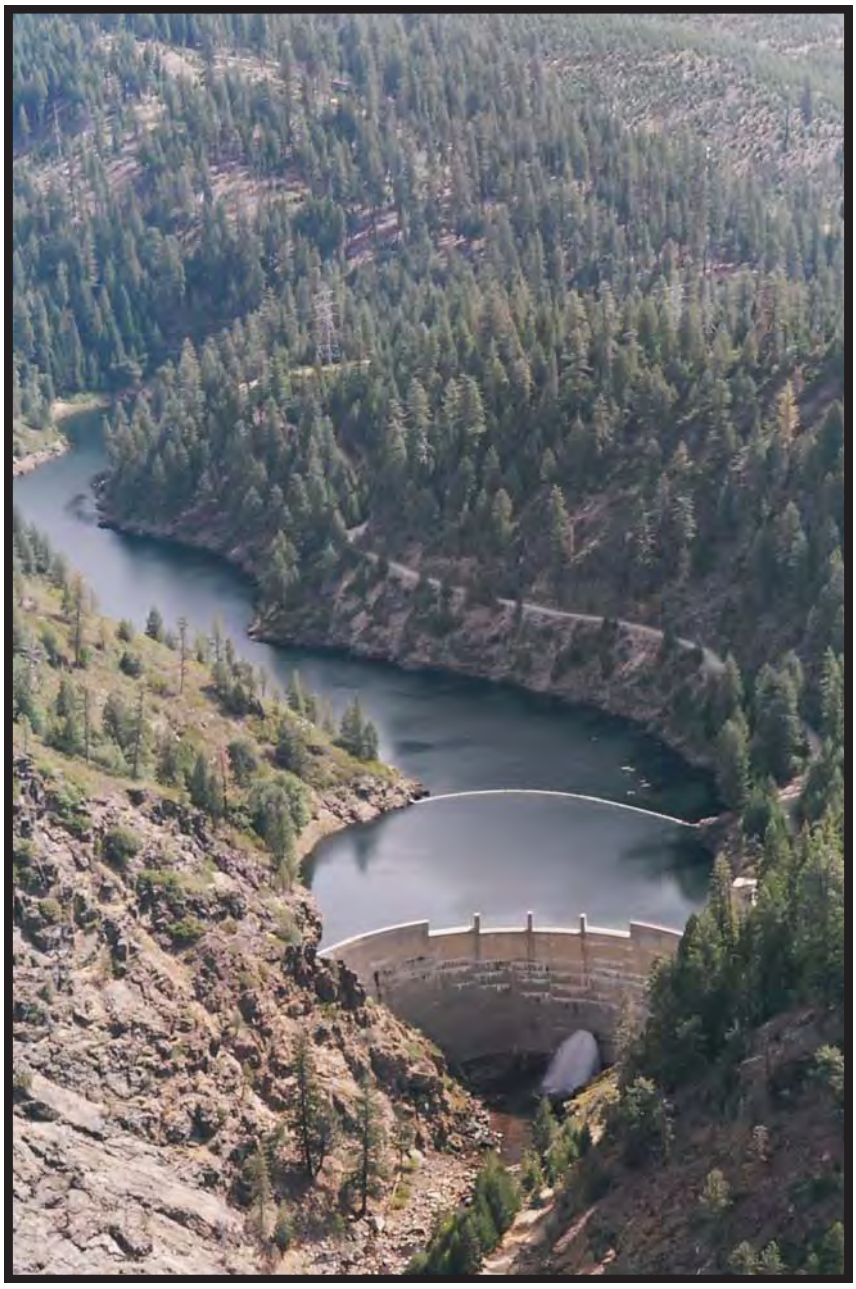
UV-8. Union Valley Reservoir

Jaybird Development

JB-1. Junction Reservoir Dam

JB-2. Junction Gate House

Jaybird Development



JB-3. Junction Reservoir

Jaybird Development

JB-4. Jaybird Powerhouse

JB-5. Jaybird Valve House

Jaybird Development

JB-6. Jaybird Powerhouse Switchyard

Camino Development

CM-1. Camino Dam

CM-2. Brush Creek Dam and Reservoir

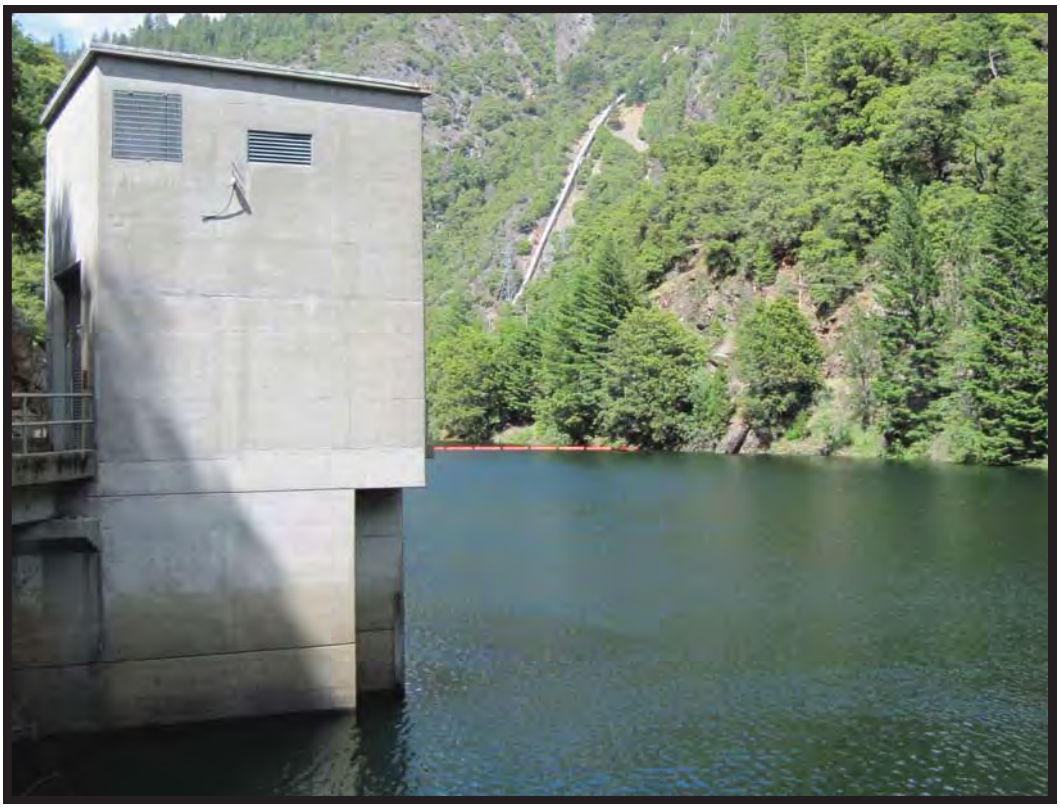
Jaybird Development

CM-3. Camino Penstock

CM-4. Camino Powerhouse

Jaybird Development

CM-5. Camino Valvehouse



CM-6. Camino Gate House

Jaybird Development

CM-7. Brush Creek Gate House

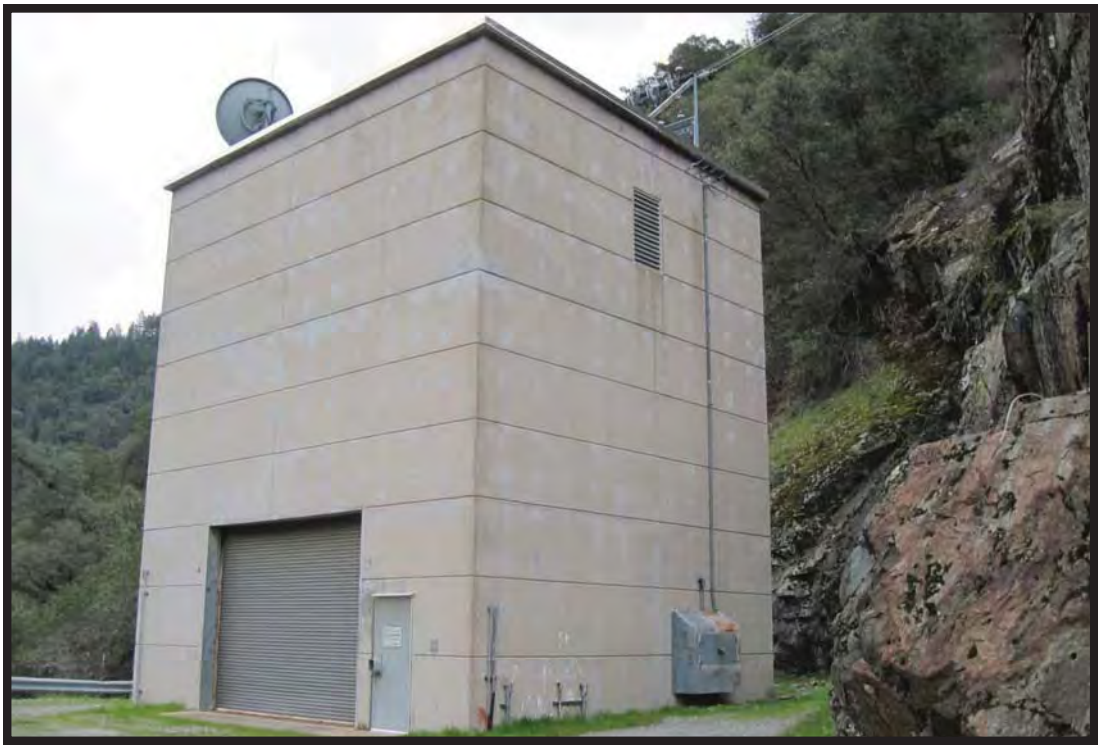
CM-8. Camino Surge Tank

White Rock Development

WR-1. Slab Creek Dam

WR-2. Slab Creek Powerhouse and Outlet

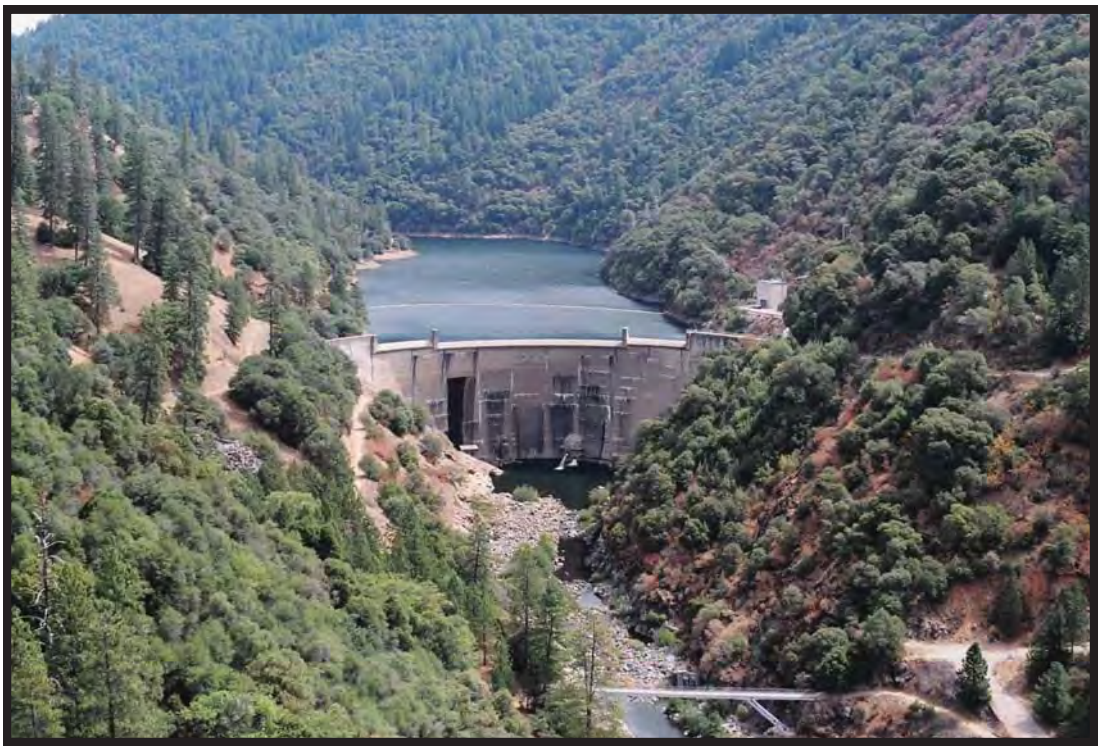
White Rock Development



WR-3. Slab Creek Gate House

WR-4. White Rock Penstock

White Rock Development



WR-5. Slab Creek Reservoir

WR-4. White Rock Penstock

White Rock Development

WR-6. White Rock Powerhouse

WR-7. White Rock Powerhouse 2

White Rock Development

WR-8. White Rock Powerhouse, Penstock and Valve House

White Rock Development

WR-9. White Rock Surge Chamber

WR-10. White Rock Valve House

Transmission Towers & Lines

TL-1. Loon Lake to Union Valley 69 kV

Transmission Towers & Lines

TL-2. Loon Lake to Robbs 69 kV

Transmission Towers & Lines

TL-3. Jones Fork to Union Valley 5-pole Tower 69 kV

Transmission Towers & Lines

TL-4. Jones Fork to Union Valley 2-pole Tower 69 kV

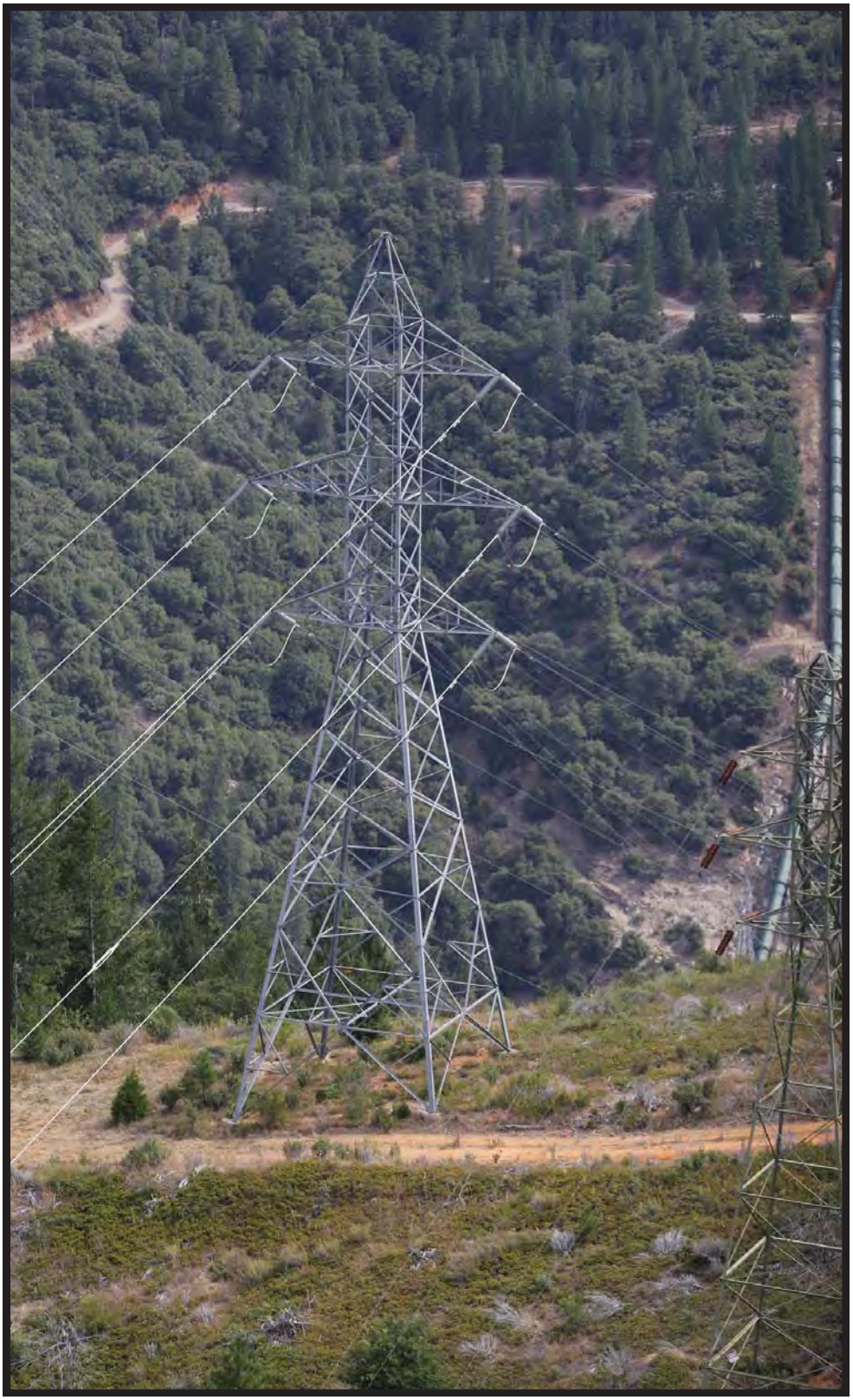
Transmission Towers & Lines

TL-5. Jaybird to Union Valley Tower 230 kV

Transmission Towers & Lines

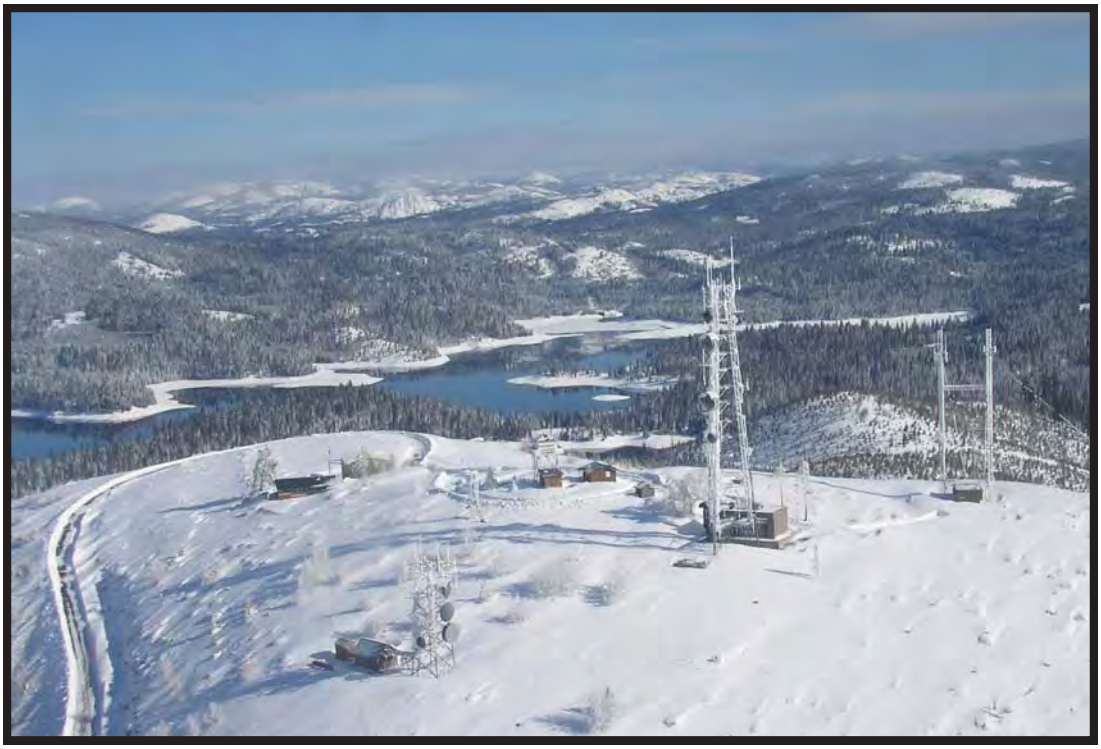
TL-6. Jaybird to White Rock Tower 230 kV

Transmission Towers & Lines



TL-7. Camino to White Rock 230 kV

Miscellaneous



MC-1. Big Hill Telecom Site

MC-2. Sourdough Hill Telecom Site

Miscellaneous

MC-3. Stream Gaging Station South Fork Silver Creek near South Fork American River

MC-4. Loon Lake Microwave Reflector

Miscellaneous

MC-5. Loon Lake Meteorological Station

MC-6. Wrights Lake Meteorological Station

Miscellaneous

MC-7. Microwave Signal Reflector

Appendix B

Appendix B

Condition No. 1 - Forest Service Approval of Final Design

Before any new construction of the Project occurs on National Forest System lands, the licensee shall obtain prior written approval of FS for all final design plans for Project components, which FS deems as affecting or potentially affecting National Forest System resources. The licensee shall follow the schedules and procedures for design review and approval specified in the conditions herein and in the Special Use Permit. As part of such written approval, FS may require adjustments to the final plans and facility locations to preclude or mitigate impacts and to insure that the Project is either compatible with on-the-ground conditions or approved by FS based on agreed upon compensation or mitigation measures to address compatibility issues. Should such necessary adjustments be deemed by FS, FERC, or the licensee to be a substantial change, the licensee shall follow the procedures of FERC Standard Article 2 of the license. Any changes to the license made for any reason pursuant to FERC Standard Article 2 or Article 3 shall be made subject to any new terms and conditions of the Secretary of Agriculture made pursuant to Section 4(e) of the Federal Power Act.

Condition No. 2 - Approval of Changes

Notwithstanding any license authorization to make changes to the project, when such changes directly affect National Forest System lands the licensee shall obtain written approval from FS prior to making any changes in any constructed Project features or facilities, or in the uses of Project lands and waters or any departure from the requirements of any approved exhibits filed with FERC. Following receipt of such approval from FS, and a minimum of 60-days prior to initiating any such changes, the licensee shall file a report with FERC describing the changes, the reasons for the changes, and showing the approval of FS for such changes. The licensee shall file an exact copy of this report with FS at the same time it is filed with FERC. This article does not relieve the licensee from the amendment or other requirements of FERC Standard Article 2 or Article 3 of this license.

Condition No. 23 - Maintenance of Improvements

The licensee shall maintain the improvements and premises on National Forest System lands and licensee adjoining property to standards of repair, orderliness, neatness, sanitation, and safety. For example, trash, debris, and unusable machinery will be

disposed of separately; other materials will be stacked, stored neatly, or placed within buildings. Disposal will be at an approved existing location, except as otherwise agreed to by FS.

Condition No. 39 – Vegetation and Invasive Weed Management Plan

Within 2 years of license issuance, the licensee shall file with FERC an Invasive Weed Management Plan developed in consultation with FS, *FWS, the appropriate County Agricultural Commissioner,* and California Department of Food and Agriculture. Invasive weeds will be those weeds defined in the California Food and Agriculture code, and other species identified by FS. The plan will address both aquatic and terrestriali weeds within the project boundary and adjacent to project features directly affecting National Forest System lands including, roads, and distribution and transmission lines.

1. The Invasive Weed Plan will include and address the following elements:

    a. Inventory and mapping of new populations of invasive weeds using a FS compatible database and GIS software. The invasive weed GIS data layer will be updated periodically and shared with resource agencies.

    b. Action and/or strategies to prevent and control spread of known populations or introductions of new populations, such as vehicle/equipment wash stations. Noxious weeds presently identified include**:** *Aegilops triuncialis, Carduus pycnocephalus, Centaurea solstitialis, Chondrilla juncea, Cytisus scoparius, Genistia monspessulana, Lythrum salicaria, Bromus tectorum, Bromus diandrus, and Taeniatherum caput-medusae*. Where these populations are: (1) contiguous and extend outside the Project boundary or (2) downstream of populations inside the project boundary and have a reasonable nexus to the project, the licensee shall make reasonable efforts to control the entire population unit.

    c. Development of a schedule for control of all known A, B, Q and selected other rated invasive weed species, designated by resource agencies.

    d. On-going annual monitoring of known populations of invasive weeds for the life of the license in locations tied to project actions or effects, such as road maintenance, at project facilities, O&M activities, , new construction sites, etc. to evaluate the effectiveness of re-vegetation and invasive weed control measures.

e. The plan will include an adaptive management element to implement methods for prevention of aquatic invasive weeds, as necessary. These actions may include, but may not be limited to: (1) public education and signing of public boat access, (2) preparation of an Aquatic Plant Management Plan approved by FS, and in consultation with other agencies, and (3) boat cleaning stations at boat ramps for the removal of aquatic Invasive weeds.

New infestations of A& B rated weeds shall be controlled within 12 months of detection or as soon as is practical and feasible (A, B, C, & Q ratings refer to the California Department of Food & Agriculture Action Oriented Pest Rating System). At specific sites where other objectives need to be met all classes of invasive weeds may be required to be treated.

Monitoring will be done in conjunction with other project maintenance and resource surveys, so as not to require separate travel and personnel. Monitoring information, in database and GIS formats, will be provided to FS as part of the annual consultation on affected FS resources (Condition No. 40). To assist with this monitoring requirement, training in invasive plant identification will be provided to project employees and contractors by FS.

Licensee shall restore/revegetate areas where treatment has eliminated invasive weeds in an effort to eliminate the reintroduction of invasive weed species. Project-induced ground disturbing activities shall be monitored annually for the first 3 years after disturbance to detect and map new populations of invasive weeds.

2. The Vegetation Management plan shall include and/or address the following elements:

a. Hazard tree removal and trimming.

b. Powerline/transmission line clearing.

c. Vegetation management for habitat improvement.

d. Revegetation of disturbed sites.

e. Soil protection and erosion control, including use of certified weed free straw.

f. Establishment of and/or revegetation with culturally important plant populations.

g. Use of clean, weed free seed with a preference for locally collected seed.

The licensee shall comply with the Eldorado National Forest prescriptions for seed, mulch, and fertilizer for restoration or erosion control purposes. Upon FERC approval, the licensee shall implement the plan.

Condition No. 58 - Facility Management

Within 1 year of license issuance, the licensee shall file with FERC a Facility Management Plan for lands within the FERC Project boundary that is approved by FS. The licensee shall implement the plan upon approval. At a minimum, the Plan shall:

Include a map showing all Project facilities, including structures on or affecting National Forest System or BLM lands (and associated water and septic systems, and other utilities); above- and below-ground storage tanks; etc.

Identify the type and season of use of each structure.

Identify the condition of each structure, and planned maintenance or removal.

Every 5 years, the licensee shall prepare a 5-year plan that will identify the maintenance, reconstruction, and removal needs for Project facilities, including transmission lines. The licensee shall file the plan with FERC after approval by FS. Transmission lines shall not be removed from the FERC license until the licensee has obtained the appropriate rights of way or permits for transmission lines that affect National Forest System or BLM lands.

Condition No. 59 - Vegetation Management Plan

The licensee shall file with FERC, within 2 years of license issuance or prior to any ground-disturbing activities, a Vegetation Management Plan that is approved by FS, *FWS, and CDFG*. At a minimum the plan shall:

1. Identify and prioritize (into high, moderate, and low priority sites) all inadequately vegetated areas to be re-vegetated or rehabilitated along with an implementation schedule.

2. List the plant species to be used along with planting locations, methods, and densities (emphasis shall be given to use of native plant species, especially those with cultural importance). Emphasis shall also be given to using seed from certified weed-free sources and using seed from local sources.

3. Address vegetation management under existing project-associated distribution and transmission lines on National Forest System lands.

Condition No. 60 - Fire Prevention, Response, and Investigation Plan

Within one year of license issuance, the licensee shall file with FERC a Fire Prevention and Response Plan that is approved by FS *and developed in consultation with appropriate State and local fire agencies*. The plan shall set forth in detail the licensee's responsibility for the prevention (excluding vegetation treatment as described in Condition No. 59), cost sharing, coordination with other agencies, reporting, control, and extinguishing of fires in the vicinity of the Project resulting from Project operations. At a minimum the plan shall address the following categories:

1. Fuels Treatment/Vegetation Management

   Identification of fire hazard reduction measures to prevent the escape of Project-induced fires.

2. Prevention

a. Availability of fire access roads, community road escape routes, helispots to allow aerial firefighting assistance in the steep canyon, water drafting sites and other fire suppression strategies.

b. Address fire danger and public safety associated with project induced recreation, including fire danger associated with dispersed camping, existing and proposed developed recreation sites, trails, and vehicle access.

3. Emergency Response Preparedness

Analyze fire prevention needs including equipment and personnel availability.

4. Reporting

Licensee shall report any project related fires to FS within 24 hours.

5. Fire Control/Extinguishing

a. Provide FS a list of the locations of available fire suppression equipment and the location and availability of fire suppression personnel.

b. Assure fire prevention measures will conform to water quality protection practices as enumerated in USDA, Forest Service, Pacific Southwest Region, Water Quality Management for National Forest System Lands in California-Best Management Practices.

6. Investigation of Project-Related Fires

The licensee agrees to fully cooperate with FS on all fire Investigations. The licensee shall produce upon request all materials and witnesses not subject to the attorney-client or attorney work product privileges, over which the licensee has control, related to the fire and its investigation including:

a. All investigation reports.

b. All witness statements.

c. All photographs.

d. All drawings.

e. All analysis of cause and origin.

f. All other, similar materials and documents regardless of how collected or maintained.

The licensee shall preserve all physical evidence, and give custody to FS of all physical evidence requested. FS shall provide the licensee with reasonable access to the physical evidence and documents the licensee requires in order to defend any and all claims, which may arise from a fire resulting from Project operations, to the extent such access is not precluded by ongoing criminal or civil litigation.

Condition No. 53 - Visual Resource Protection

FS and licensee shall meet every 5 years to review opportunities to improve how well Project facilities blend in with the surrounding landscape. The type of rehabilitation/reconstruction work needed will be dependent on current policies, technologies, condition of facilities, impacts to surrounding areas, and other factors.

2. During planning and prior to any new construction or maintenance of facilities that have the potential to affect visual resources of National Forest System lands (including but not limited to the recreation related construction), the licensee shall file with FERC, a plan approved by FS for the protection and rehabilitation of National Forest System visual resources affected by such construction or maintenance. At a minimum, the plan shall address clearings, spoil piles, and Project facilities involved in such construction or maintenance, like diversion structures, penstocks, pipes, ditches, powerhouses, other buildings, transmission lines, corridors, and access roads. The plan shall address facility configurations, alignments, building materials, colors, landscaping, and screening. The plan shall provide a proposed mitigation and implementation schedule to bring the

Project facilities involved in such construction and maintenance affecting visual resources on National Forest System lands into compliance with visual resource standards and guidelines in the Eldorado National Forest Land and Resource Management Plan. Mitigation measures identified for either the visual resource plan for new construction or maintenance or the measures identified for existing facilities shall include, but are not limited to: (1) surface reatments with FS approved colors and natural appearing materials that will be in harmony with the surrounding landscape, (2) use of non-specular conductors for the transmission lines, (3) use of native plant species to screen facilities from view, (4) reshaping and revegetating disturbed areas to blend with surrounding visual characteristics, and, (5) locating transmission facilities to minimize visual impacts.

3. The following mitigation measures to existing facilities will be performed to improve visual quality reductions as follows for improvements that have not already been completed:

a. Rubicon Reservoir. Within 2 years of license issuance paint the metal components of the gaging station, intake booms, telemetry facilities and cable crossing and bucket a nonreflective black color. Perform a visual inspection every 2 years and touch-up or re-paint as necessary to maintain the facility in good condition. Replace galvanized chain link fence at tunnel outlet with black fencing.

b. Robbs Peak Forebay. Within 2 years of license issuance paint galvanized railings with non-reflective black paint. Perform a visual inspection every 2 years and touch-up or re-paint as necessary to maintain the facility in good condition. Replace galvanized chain link fence with black vinyl fencing with black posts. Powder coating is preferred over painted metal. Paint or stain building roof a dark gray color to be approved by FS.

c. Robbs Powerhouse Facilities. Within 8 years of license issuance paint all paintable surfaces the same color as the Robbs Penstock.

d. Union Valley Dam and Sub-station. Within 13 years of license issuance sandblast white paint from guardrail. Paint non-reflective black or replace with coreten guardrail. Replace all chain link fence with black vinyl fencing with black posts. Powder coated posts are preferred over painted metal.

e. Loon Lake Sub-station. Within 2 years of license issuance paint doors on building dark gray.

f. Loon Lake Passive Reflector (Wentworth Peak). Within 2 years of license issuance move the reflector from the skyline to a location with a back-drop. Paint a camouflage design on reflector in colors that allow it to blend in with the natural surroundings. If re-location is not possible because of site-line, investigate

alternative technology to replace the facility with a structure with less visual impact.

g. Loon Lake Gate Shaft. Within 2 years of license issuance paint roof and building colors approved by FS.

h. Gerle Reservoir Dam. Within 2 years of license issuance paint handrail and guardrail non-reflective black.

i. Licensee-owned Weather Stations. Within 4 years of license issuance paint all reflective components with non-reflective black paint, except for meteorological sensors. Jones Fork Penstock. Within 3 years of license issuance paint the same color as the Robbs Penstock.

Appendix C

Geographic Locations of Facilities

	State Plane Zone 2-ft		WGS 84 - Decimal deg.	
Name	**X_coord_**	**Y_coord**	**Lat**	**Long_**
Whiterock Powerhouse and Switchyard	6907490	2042770	-120.78709	38.7651215
Whiterock Penstock Valvehouse	6908340	2041650	-120.78413	38.7620163
Slab Creek Valvehouse	6932810	2045820	-120.69813	38.7725372
Slab Creek Dam	6932630	2046170	-120.69874	38.77351
Slab Creek Powerhouse	6932640	2046110	-120.69871	38.7733307
Brush Creek Dam	6954240	2060400	-120.62221	38.8116989
Brush Creek Gatehouse	6954540	2060270	-120.62114	38.8113098
Camino Surge Chamber	6955400	2055900	-120.61837	38.7992935
Camino Penstock Valvehouse	6955160	2055630	-120.61922	38.7985458
Camino Powerhouse and Switchyard	6954400	2054570	-120.62193	38.7956696
Camino Gatehouse	6978400	2067010	-120.53703	38.8287964
Camino Dam	6978490	2066810	-120.53674	38.8282394
Jaybird Powerhouse and Switchyard	6979860	2068960	-120.5318	38.8341064
Jaybird Penstock Valvehouse	6981860	2069740	-120.52473	38.8361549
Junction Dam	7000960	2075900	-120.45731	38.8521767
Junction Gatehouse	7001070	2075710	-120.45695	38.8516617
Union Valley Dam and Spillway	7005580	2081030	-120.44081	38.8660698
Union Valley Gatehouse	7006220	2080480	-120.43858	38.8645172
Union Valley Switchyard	7005020	2080090	-120.44281	38.8635063
Union Valley Powerhouse	7004610	2080370	-120.44424	38.864296
Robbs Peak Shed	7023050	2092700	-120.37874	38.8972473
Robbs Peak Powerhouse and Switchya	7023180	2092550	-120.37829	38.8968391
Robbs Peak Dam	7019980	2110880	-120.38836	38.9473114
Robbs Peak (forebay) Gatehouse	7019960	2110670	-120.38845	38.9467278
Gerle Creek Gatehouse	7018490	2117820	-120.39318	38.9664497
Gerle Creek Dam	7018180	2117670	-120.39427	38.9660378
Loon Lake Powerhouse Access Buildin	7036960	2124810	-120.32776	38.9847221
Loon Lake Gatehouse	7037920	2124090	-120.32443	38.9826851
Loon Lake Auxiliary Dam	7035660	2126090	-120.33226	38.988308
	7041490	2131510	-120.31142	39.0028801
Loon Lake Main Dam	7041610	2131420	-120.311	39.0026321
	7037880	2124030	-120.32458	38.9825325
Buck Island Auxiliary Dam	7057440	2132660	-120.2552	39.0052223
Buck Island Main Dam	7057090	2132540	-120.25645	39.0049019
Buck Island Gate Structure	7056950	2132440	-120.25696	39.0046387
Rubicon Gate Structure	7065920	2126510	-120.22578	38.9878769
Rubicon Main Dam	7066600	2126840	-120.22339	38.9887428
Rubicon Auxiliary Dam	7067340	2126910	-120.22079	38.9889107
Whiterock Penstock Surge Chamber	6908980	2041120	-120.78194	38.7605286
Jaybird Penstock Surge Chamber	6982310	2069880	-120.52317	38.8365135
Robbs Peak Penstock Surge Chamber	7023900	2094840	-120.37561	38.9030991
Robbs Peak Penstock Valvehouse and	7023850	2094580	-120.37578	38.9023781
Jones Fork Penstock Valvehouse	7027440	2069830	-120.36475	38.8342438

Ice House Dam and Spillway	7028540	2065910	-120.36114	38.8234291
Jones Fork Powerhouse	7022450	2075570	-120.38189	38.8502655
Ice House Gatehouse	7028570	2068640	-120.36086	38.8309288
Ice House Dike No. 1	7031430	2068920	-120.35078	38.831543
Ice House Dike No. 2	7032920	2068680	-120.34558	38.8308067

FEDERAL ENERGY REGULATORY COMMISSION
Washington, D. C. 20426

OFFICE OF ENERGY PROJECTS

Project No. 2101-111 – California
Upper American River Project
Sacramento Municipal Utility District

September 9, 2015

Mr. Jon Bertolino, Manager
Hydro Generation Assets, Power Generation
Sacramento Municipal Utility District
P.O. Box 1500
Pollock Pines, CA 95726

Subject: Facilities Management Plan – U.S. Forest Service 4(e) Condition No. 58

Dear Mr. Bertolino:

Thank you for your Facility Management Plan filed on June 24, 2015, for the Upper American River Project No. 2101. You made the filing in compliance with U.S. Forest Service 4(e) condition no. 58.

Background

The Commission issued a new license for your Upper American River Project on July 23, 2014.[1] U.S. Forest Service 4(e) condition no. 58, incorporated into the license by ordering paragraph (E), requires you to prepare a Facility Management Plan that includes a map showing all project facilities and related utilities, identifies the types of structures and in which seasons they are used, and characterizes the condition of the structures and identifies whether you intend to maintain or remove them. You are required to file the plan with the Commission within 1 year of license issuance, following approval of the plan by the U.S. Forest Service. Condition no. 58 also requires you to prepare a Project Facility Maintenance Plan every 5 years for U.S. Forest Service approval. You are required to file this plan with the Commission after the U.S. Forest Service approves it.

[1] *Sacramento Municipal Utility District*, 148 FERC ¶ 62,070 (2014).

Facility Management Plan

In your Facility Management Plan, filed on June 24, 2015, you included a description of all project facilities including dams, power tunnels, canals, penstocks, telecommunications equipment, and hydrological/metrological gages. You also included a map and table which located and identified characteristics of each facility including type, size, age, visibility to the public, color, condition, and ownership of land on which the structure is located. In the plan, you state that all project facilities are necessary for project operation; therefore, you do not intend to remove any facility from the project. You also state that, if necessary, you would update your plan in consultation with federal and state agencies and file the revised plan with Commission for approval. Furthermore, your Facility Management Plan includes a description of your five year planned maintenance schedule and you state that you will prepare a Project Facility Maintenance Plan in consultation with the U.S. Forest Service and file it with the Commission every five years.

Your filing indicates that you sent a draft copy of the Facility Management Plan to the Consultation Group, as well as the California State Water Resources Control Board, the California Central Valley Regional Water Quality Control Board, and El Dorado County for review on February 13, 2015. [2] You show that, based on the comments received from the consulted parties, you prepared and submitted a revised plan to the U.S. Forest Service on April 7, 2015 and June 2, 2015. In an email dated June 18, 2015, the U.S. Forest Service approved the plan.

Discussion

We have reviewed your Facility Management Plan and determine that it adequately identifies and describes all project facilities. You also provide evidence that you prepared the plan in consultation with interested parties and that the U.S. Forest Service approved the plan. Therefore, the Facility Management Plan filed on June 24, 2015 fulfills the requirements of U.S. Forest Service 4(e) condition no. 58.

In your plan, you state that you intend to file any subsequent revisions with the Commission for its approval. However, in the license, the Commission did not require

[2] The consultation group is comprised of signatories to the settlement agreement and includes; the U.S. Department of the Interior, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the U.S. Bureau of Land Management, the U.S. National Park Service, the California Department of Fish and Wildlife, California Parks and Recreation, Pacific Gas & Electric Company, the American River Recreation Association, American Whitewater, California Outdoors, the California Sportfishing Protection Alliance, Camp Lotus, the Foothill Conservancy, the Friends of the River, Rich Platt, Hilde Schweitzer, and Theresa Simsiman.

you to file the original Facility Management Plan for approval, and subsequently, any revisions to the plan would also not require Commission approval. Although, we do request that if any revisions or updates are made to the plan sufficient enough to require U.S. Forest Service approval, whether they be part of the 5-year Project Facility Maintenance Plan or are initiated by you and the agencies, that you file the revised Facility Management Plan with the Commission. We also request that your filing include evidence of consultation with appropriate agencies and approval by the U.S. Forest Service.

Thank you for your cooperation in this matter. If you have any questions, please contact Mr. Steven Sachs at (202) 502-8666 or Steven.Sachs@ferc.gov.

Sincerely,

Kelly Houff
Chief, Engineering Resources Branch
Division of Hydropower Administration
and Compliance

Document Content(s)