

COVER SHEET

**DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE UPPER AMERICAN RIVER AND CHILI BAR
HYDROELECTRIC PROJECTS
Docket Nos. P-2101-084 and P-2155-024**

Section 2
Proposed Action and Alternatives
Pages 2-1 through 2-42

DEIS

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the No-action Alternative, the UARP and Chili Bar Project would continue to operate under the terms and conditions of the existing licenses, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

2.2 UPPER AMERICAN RIVER PROJECT

The UARP was constructed from 1959 to 1985 and placed in service between 1961 and 1985. SMUD owns and operates the project, consisting of 7 developments located in the California counties of El Dorado and Sacramento, within the Rubicon River, Silver Creek, and the SFAR drainages. The project's 11 reservoirs are capable of impounding more than 425,000 acre-feet of water. The eight powerhouses can generate up to 688 MW of power. The project also includes 11 transmission lines that have a combined length of about 180 miles, about 28 miles of power tunnels/penstocks, one canal that is 1.9 miles long, and about 700 developed public-use campsites.

2.2.1 Existing Facilities

The UARP includes seven developments and the components necessary to use the available water resources for hydroelectric generation: Loon Lake, Robbs Peak, Jones Fork, Union Valley, Jaybird, Camino, and Slab Creek/White Rock. Reservoir and powerhouse characteristics are shown in tables 2-1 and 2-2.

Loon Lake

The Loon Lake development is the most upstream project facility and consists of: (1) Rubicon dam—a concrete gravity diversion dam, 36 feet high and 644 feet long, with an auxiliary dam that is 29 feet high and 553 feet long, which together impound the Rubicon reservoir; (2) Rubicon-Rockbound tunnel—a horseshoe tunnel that is 13 feet in diameter and 0.2 mile long that diverts water from the Rubicon reservoir to the Buck Island reservoir via Rockland Lake (a non-project facility) on Highland Creek; (3) Buck Island dam—a concrete gravity diversion dam that is 23 feet high and 293 feet long and a concrete auxiliary dam that is 15 feet high and 244 feet long located on the Little Rubicon River that impounds the Buck Island reservoir; (4) Buck Island-Loon Lake tunnel—an unlined modified horseshoe tunnel that is 1.6 miles long and 13 feet in diameter that diverts water from Buck Island reservoir to Loon Lake reservoir; (5) Loon Lake dam—a rockfill dam that is 108 feet high and 0.4 mile long with a 250-foot-long side channel spillway on the right bank, a rockfill auxiliary dam that is 95 feet high and 910 feet long, and an earth dike that together form Loon Lake reservoir; (6) Loon Lake powerhouse penstock that includes a concrete-lined horseshoe tunnel that is 0.3 mile long and 14 feet in diameter, a concrete lined vertical shaft that is 10 feet in diameter,

and a steel lined tunnel that is 8.5 feet in diameter and extends from Loon Lake reservoir to Loon Lake powerhouse; (7) Loon Lake powerhouse—an underground powerhouse located more than 1,100 feet below the surface of Loon Lake reservoir; (8) Loon Lake powerhouse tailrace tunnel—a unlined horseshoe tunnel that is 18 feet in diameter and extends 3.8 miles from the Loon Lake powerhouse to the Gerle Creek reservoir; and (9) transmission lines—two 69 kilovolt (kV) overhead transmission lines, the Loon Lake-Robbs Peak transmission line extending 7.9 miles to the Robbs Peak and the Loon Lake-Union Valley transmission line extending 12.4 miles to the Union Valley switchyard. Rubicon dam is located inside a designated wilderness area (Desolation Wilderness), within the boundary of the Eldorado National Forest. All other facilities in this development are located outside the wilderness boundary but within the Eldorado National Forest.

Robbs Peak

The Robbs Peak development consists of: (1) Gerle Creek dam—a concrete gravity overflow structure that is 58 feet high and 444 feet long on Gerle Creek, upstream of its confluence with the South Fork of the Rubicon River (SFRR); and that has two low level outlet gates, incorporating the intake of Gerle Creek canal in its left abutment, creating Gerle Creek reservoir; (2) Gerle Creek canal—an above-ground canal, partially lined with gunite, that is 22 feet wide and 19 feet deep, extending 1.9 miles from Gerle Creek reservoir to Robbs Peak reservoir; (3) Robbs Peak dam—a concrete gravity overflow structure that is 44 feet high and 320 feet long, 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, that forms Robbs Peak reservoir; (4) Robbs Peak tunnel—an unlined horseshoe that is 3.2 miles long and 13 feet in diameter and a diversion tunnel that is 10 feet in diameter from Robbs Peak reservoir to Robbs Peak penstock; (5) Robbs Peak penstock—a steel penstock that is from 9.75 to 8.5 feet in diameter extending 0.4 mile from Robbs Peak tunnel to Robbs Peak powerhouse; (6) Robbs Peak powerhouse—located on the northeast shore of Union Valley reservoir; and (7) Robbs Peak-Union Valley transmission line—an overhead 69-kV line that extends 6.8 miles to connect the Robbs Peak switchyard to the Union Valley switchyard. This development is located on both private and public land within the boundary of the Eldorado National Forest.

Jones Fork

The Jones Fork development consists of: (1) Ice House dam—a rockfill dam located on the South Fork of Silver Creek (SFSC) that is 150 feet high and 0.3 mile long incorporating a concrete ogee spillway with radial gates, and two auxiliary earthfill dikes impounding the Ice House reservoir; (2) Jones Fork tunnel—a horseshoe concrete and steel-lined tunnel that is 8 feet in diameter and extends 0.3 mile from Ice House reservoir to the Jones Fork penstock; (3) Jones Fork penstock—a steel and concrete penstock that is 6 feet in diameter and extends 1.6 miles from Jones Fork tunnel to the

Jones Fork powerhouse; (4) Jones Fork powerhouse on the southeast shore of Union Valley reservoir; and (5) Jones Fork-Union Valley transmission line—a 69 kV overhead transmission line that extends 4.0 miles from the Jones Fork switchyard to the Union Valley switchyard. The Jones Fork powerhouse is located on public land within the boundary of the Eldorado National Forest. The Jones Fork tunnel and the Jones Fork penstock are on both private and public land within the Eldorado National Forest.

Union Valley

The Union Valley development consists of: (1) Union Valley dam—an earthfill dam located on Silver Creek that is 453 high and 0.3 mile long, incorporating a concrete ogee spillway with radial gates, creating Union Valley reservoir; (2) Union Valley tunnel—a concrete-lined tunnel that is 11 feet in diameter with a steel penstock approximately 10 feet in diameter in part of the tunnel and extending 268 feet to connect the Union Valley reservoir with Union Valley powerhouse; (3) Union Valley penstock—a steel penstock that is 10 feet in diameter and extends 0.3 mile to convey water from the outlet of the Union Valley tunnel to the Union Valley powerhouse; (4) Union Valley powerhouse, located at the base of Union Valley dam; and (5) transmission lines—two 230-kV overhead transmission lines, one extending 11.8 miles to the Camino switchyard via the Union Valley-Camino transmission line and the other extending 5.9 miles to the Jaybird switchyard via the Union Valley-Jaybird transmission line. This development is located on both public and private land within the boundary of the Eldorado National Forest.

Jaybird

The Jaybird development consists of: (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; (2) Jaybird tunnel—a modified horseshoe tunnel that is 11 to 14 feet in diameter and extends 4.4 miles connecting Junction reservoir and the Jaybird penstock; (3) Jaybird penstock—a steel penstock 6 to 10 feet in diameter that is 0.5 mile long with a surge tank, connecting Jaybird tunnel and Jaybird powerhouse; (4) Jaybird powerhouse; and (5) Jaybird-White Rock transmission line—a 230-kV overhead transmission line that extends 15.9 miles to connect the Jaybird and White Rock switchyards. This development is located on both private and public land within the boundary of the Eldorado National Forest.

Camino

The Camino development consists of: (1) Camino dam—a concrete double curvature arch dam on Silver Creek that is 133 feet high and 470 feet long that has three integral bulkhead gates, creating the Camino reservoir; (2) Camino tunnel—a power tunnel with a diameter ranging from 13 feet to 14 feet, including a surge tank, that extends 5 miles to connect the Camino reservoir with the Camino penstock; (3) Brush Creek dam—a double curvature arch dam located on Brush Creek that is 213 feet high

and 780 feet long, creating Brush Creek reservoir; (4) Brush Creek tunnel—a modified horseshoe tunnel, about 14 feet in diameter extending 0.8 mile from Brush Creek reservoir to the lower end of Camino tunnel; (5) Camino penstock—an above-ground steel penstock that is 5 to 12 feet in diameter extending 0.3 mile to connect the Camino tunnel and Camino powerhouse; (7) Camino powerhouse, located on the SFAR; and (8) transmission lines—two 230-kV overhead transmission lines originating at the Camino switchyard, the Camino-Lake transmission line extends 31.7 miles and connects to SMUD’s Lake substation and the Camino-White Rock transmission line extends 10.0 miles and connects to the White Rock switchyard. All the facilities in this development are located on public land within the Eldorado National Forest.

Slab Creek/White Rock

The Slab Creek/White Rock development consists of: (1) Slab Creek dam—a double curvature variable radius concrete arch dam that stretches across the SFAR that is 250 feet high and 817 feet long, with a central uncontrolled overflow spillway, creating the Slab Creek reservoir; (2) Slab Creek penstock—a steel penstock that is 24 inches in diameter that extend 40 feet and passes through the dam to connect Slab Creek reservoir with Slab Creek powerhouse; (3) Slab Creek powerhouse—located at the base of Slab Creek dam that uses minimum stream flow releases; (4) White Rock tunnel—a modified horseshoe tunnel that is 20 to 24 feet in diameter, with a surge shaft, that extends 4.9 miles to connect Slab Creek reservoir with White Rock penstock; (5) White Rock penstock—an above-ground steel penstock that is 9 to 15 feet in diameter and extends 0.3 mile to connect White Rock tunnel to White Rock powerhouse; (6) White Rock powerhouse; and (7) transmission lines—two 230-kV overhead transmission lines and one 12-kV distribution line both 21.8 miles long. The two transmission lines connect the White Rock switchyard to SMUD’s Folsom Junction. The 600-foot-long 12-kV Slab Creek tap line is 600 feet long and connects the Slab Creek powerhouse to the junction with PG&E's 12-kV distribution line. The Slab Creek/White Rock development is the most downstream Project facility (excluding transmission lines) and discharges into the Chili Bar reservoir, which is part of PG&E’s Chili Bar Project. Slab Creek reservoir is located on public and private (including SMUD) land within the Eldorado National Forest. The remainder of the development is located on private land adjacent to and beyond the western boundary of the Eldorado National Forest.

Table 2-1 summarizes key characteristics of each reservoir associated with the project, and table 2-2 shows the characteristics of each powerhouse. For ease of reference and consistency, we use the terminology presented in these two tables throughout the EIS to discuss various locations relative to the Projects.

Table 2-1. Characteristics of project reservoirs. (Source: SMUD, 2005)

Reservoir Name (Development Name if Different)	Maximum Pool Elevation (feet msl)	Normal Maximum Reservoir Capacity (acre-feet)	Surface Area at Maximum Pool (acres)
Rubicon (Loon Lake)	6,545	1,450	108
Buck Island (Loon Lake)	6,436	1,070	78
Loon Lake	6,410	76,200	1,450
Gerle Creek (Robbs Peak)	5,231	1,260	60
Robbs Peak	5,231	30	2
Ice House (Jones Fork)	5,450	45,960	678
Union Valley	4,870	277,290	2,860
Junction (Jaybird)	4,450	3,250	64
Camino	2,915	825	20
Brush Creek (Camino)	2,915	1,530	20
Slab Creek	1,850	16,600	280

Table 2-2. Characteristics of project powerhouses. (Source: SMUD, 2005)

Reservoir Name (Development Name if Different)	Powerhouse Capacity (MW)	Number of Units	Type of Units
Loon Lake	82	1	Vertical Pelton
Robbs Peak	29	1	Vertical Francis
Jones Fork	11.5	1	Vertical Francis
Union Valley	46.7	1	Vertical Francis
Jaybird	144	2	Vertical Pelton
Camino	150	2	Vertical Francis
Slab Creek	0.4	1	Vertical Francis
White Rock	224	2	Vertical Francis
Total	687.6	11	

2.2.2 Current Operations

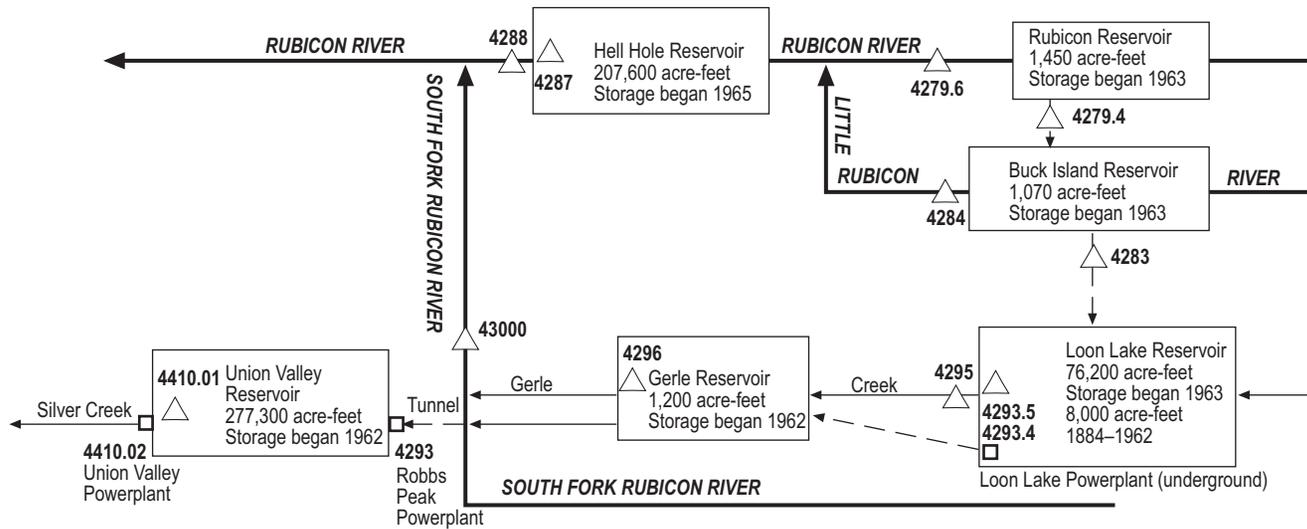
One of the primary aspects of operational flexibility of the UARP lies in the ability of the project to store water seasonally. The combined 400,000 acre-feet gross capacity of the three storage reservoirs (Loon Lake, Ice House, and Union Valley) allows SMUD to manage the water, within physical, safety, and regulatory constraints, to generate electricity when power is most valued throughout the year. The project is operated generally to provide electricity during peak load situations. It is also operated to ensure reliability of the electric transmission system within SMUD's control area.

From a water management perspective, the operation of the project follows an annual cycle of reservoir filling and release that coincides with the natural patterns of rain and snowmelt runoff characteristic of the Sierra Nevada. While the project includes 11 reservoirs, each is used in a different way to manage the water for power production. Loon Lake, Ice House, and Union Valley reservoirs, accounting for 94 percent of total UARP gross storage capacity, operate primarily as long-term storage reservoirs, capturing as much of the winter/spring rain and snowmelt runoff as practicable, consistent with various regulatory constraints.

The two uppermost reservoirs (Rubicon and Buck Island) provide limited storage and are operated primarily run-of-river to capture and divert water from the Rubicon River and the Highland Creek drainages. No power is generated at the uppermost reservoir.

Typically, from about mid-summer to winter, the elevations of the three primary storage reservoirs are gradually lowered to generate electricity and provide adequate storage space to capture winter/spring runoff and minimize the frequency and amount of spillage. During this period, the project is operated in a peaking mode, essentially following the daily demand cycle. Water is released from one or more of the storage reservoirs and is passed through the reservoirs as it makes its way through the series of downstream powerhouses (see figures 2-1 and 2-2). In winter, as rainstorms and snowmelt begin to increase streamflow in the basin, the process is reversed, with more water stored than released through the powerhouses. Thus, from winter to early summer, the water elevations of the storage reservoirs gradually increase.

Five project reservoirs (Gerle Creek, Robbs Peak, Junction, Camino, and Slab Creek) operate primarily as re-regulating forebays and/or afterbays to the various powerhouses. The remaining reservoir (Brush Creek) is operated typically to provide either spinning reserves or maximum peaking power for system reliability purposes. SMUD's water rights do not allow the storage of water in these six reservoirs. Thus, retention time in these reservoirs is short, and water levels are likely to fluctuate daily as they provide the re-regulating functions for which they were designed.



LEGEND

- 4283
△ Gaging station and abbreviated number (complete number as given in the station description of report is 11428300)
- Powerplant
- ← Stream, open flume, or canal showing direction of flow
- ← — Penstock, tunnel, closed flume, or pipe showing direction of flow

Figure 2-1. Diversions and storage in Rubicon River Basin. (Source: USGS, 2005; as modified by staff)

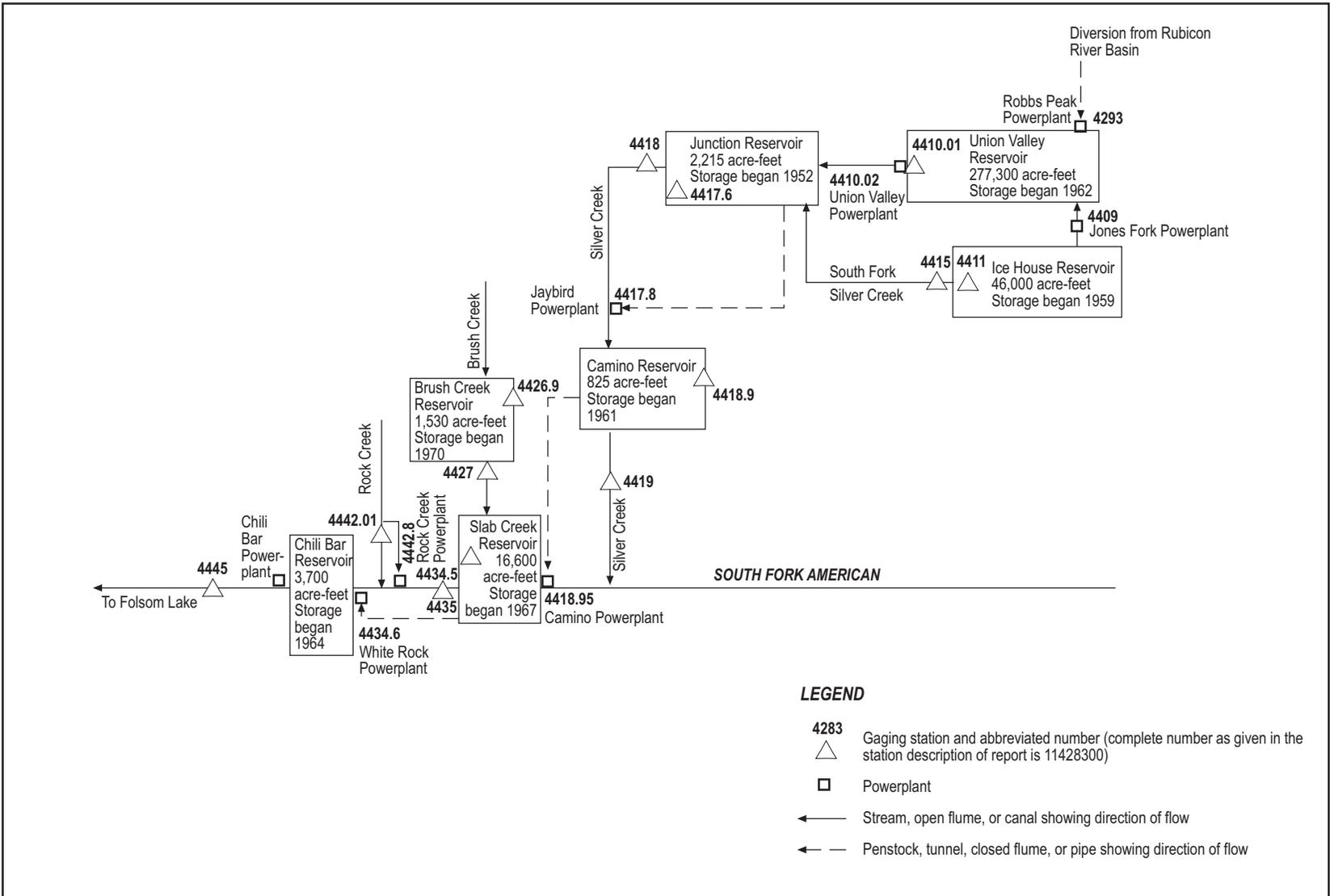


Figure 2-2. Diversions and storage in South Fork of the American River Basin. (Source: USGS, 2005; as modified by staff)

Six powerhouses (Loon Lake, Jones Fork, Union Valley, Jaybird, Camino, and White Rock) account for 95 percent of the total UARP 688-MW maximum capability. These powerhouses can generally be operated flexibly, with limited constraints on flows and sufficient storage to meet daily peaking cycles. Of the two remaining powerhouses, Robbs Peak powerhouse is operated run-of-river due to the lack of storage capacity in the Robbs Peak development. Robbs Peak powerhouse does, however, contribute to peaking power capability, as Robbs Peak's primary inflow during most of the year is the Loon Lake powerhouse discharge. The Slab Creek powerhouse is typically operated to meet baseloads and uses the continuous minimum flow from the Camino tunnel and the SFAR for power generation and releases into the SFAR.

2.2.3 Existing Project Boundary

The current project boundary encompasses all project facilities including linear corridors ranging from 50 to 100 feet for transmission lines and tunnels at each development. The current project boundary follows a contour line generally 3 feet above the maximum normal water surface elevation at each developed reservoir except at the location of project facilities and at most, but not all, project recreational facilities on National Forest System lands. The recreational facilities located within the project boundary at the Loon Lake, Gerle Creek, Union Valley, and Ice House reservoirs are shown on figures 3-33, 3-34, and 3-35 in section 2.2.6, *Recreational Resources*.

Six campgrounds, including Gerle Creek, Pleasant, Deer Crossing, Loon Lake Equestrian, Jones Fork, and Big Silver are only partially within the existing project boundary. Several penstocks and project access roads also are not entirely within the existing boundary. These project facilities include the Jones Fork penstock and access roads at Wolf Creek, Northern Ice House, Jones Fork, and Northern Union Valley.

2.2.4 Project Safety

The UARP has been operating for 28 years under the existing license during which time Commission staff have conducted operational inspections focusing on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the project has been inspected and evaluated every 5 years by an independent consultant, and a consultant's safety report has been filed for Commission review. As part of the relicensing process, the Commission staff would evaluate the adequacy of the proposed project facilities under a new license. Since SMUD proposes to build the Iowa Hill development, Commission staff would inspect the development, if licensed, both during and after construction. Special articles relating to safety issues would be included in any license issued, as appropriate. Commission staff would continue to inspect the project during the new license term to ensure continued adherence to Commission approved-plans and specification, special license articles relating to construction, operation, and maintenance, and accepted engineering practices and procedures.

2.3 CHILI BAR PROJECT

2.3.1 Existing Project Facilities

The Chili Bar Project is located immediately downstream of SMUD's UARP. The Chili Bar Project facilities consist of a concrete gravity dam that is 126 feet high and 380 feet long with a dam spillway that is 170 feet long with a crest elevation of 997.5 feet (National Geodetic Vertical Datum [NGVD]) located 31 feet below the crest of the dam; (2) a reservoir with a surface area of 110 acres and a useable storage capacity of 1,339 acre-feet at elevation 997.5 feet NGVD; and (3) a powerhouse that is 80 feet square containing a single turbine unit with a normal maximum gross head of 60 feet, a maximum hydraulic capacity of 1,979 cubic feet per second (cfs), and an installed capacity of 7 MW. There is no project transmission line because the 21-kV switchyard connects directly to the local distribution grid.

2.3.2 Current Operations

Because the Chili Bar Project has limited reservoir storage, PG&E can only manage the flow releases from SMUD's upstream White Rock powerhouse on a daily basis. Typically, Chili Bar stores the releases from White Rock during off-peak hours and generates electricity during peak load hours. Therefore, flows downstream of the Chili Bar Project often fluctuate daily. Given that White Rock powerhouse has a flow capacity almost twice as high as Chili Bar, the Chili Bar Project often spills flow in excess of its generating capacity at Chili Bar dam. The Chili Bar powerhouse has semi-automatic operation and is operated from PG&E's Wise Switching Center about 35 miles away in Auburn, California.

2.3.3 Existing Project Boundary

The existing project boundary includes all the land PG&E owns ranging from about 50 to 250 feet from either side of the river and starting about 320 feet downstream of the project dam to about 3.2 miles upstream of the project dam. There are no formal recreational facilities within the Chili Bar Project boundary; however, PG&E manages an informal public boat launch at the Chili Bar dam.

2.3.4 Project Safety

The Chili Bar Project was placed in operation in 1965 and has been operating for 42 years under the existing license. Inspection activity is the same as described for the UARP in section 2.2.4.

2.4 SMUD'S PROPOSAL

2.4.1 Proposed Project Facilities—Iowa Hill Development

As part of the relicensing process, SMUD proposes to increase electrical capacity of the UARP by constructing the Iowa Hill development, which would operate as a pumped storage facility (figures 2-3 and 2-4).

The Iowa Hill development, as proposed, would be an off-stream pumped storage project that makes use of the existing UARP Slab Creek reservoir as a lower reservoir and a new upper reservoir atop Iowa Hill (figure 1-1). The difference in elevation between the two reservoirs would be about 1,200 feet, providing the capability of the development to generate a nominal 400 MW of electricity. Under the proposed layout, the reservoirs would connect through an underground powerhouse and tunnel system.

While SMUD considered alternative reservoir sizes and locations, the upper reservoir as proposed would cover a surface area of about 100 acres atop Iowa Hill and would hold about 6,400 acre-feet. The upper reservoir would be created by the construction of a berm atop Iowa Hill. SMUD proposes to construct the berm for the upper reservoir from crushed rock from the tunneling operation, earth from the upper reservoir basin, a clay or high-density polyethylene liner to prevent leakage, and appropriate revetment/rock where needed to minimize bank erosion. During construction of the upper reservoir, SMUD proposes to balance the excavation and fill requirements of the total development eliminating any need for permanent spoil disposal areas at the upper reservoir. Before construction is completed, all temporary spoil would be eliminated by incorporation into the upper reservoir dikes, and the area would be landscaped.

The proposed underground powerhouse would house three, equally sized, variable-speed pump/turbine units with a rated capacity of 400 MW. Variable speed units possess a number of advantages over conventional synchronous speed units, including: (1) lower system disturbance from pumping starts, (2) the ability to operate at part load during pumping mode, (3) use for regulation while in pumping mode, and (4) flexibility to lower overall system costs.

SMUD proposes to construct a multi-port (i.e., octagonal) intake, at approximately 1,770 feet, 80 feet below the Slab Creek reservoir maximum water level elevation of 1,850 feet. The intake would be 15 feet high. To construct the octagonal intake, a steel cofferdam would be floated-in and sunk in place.

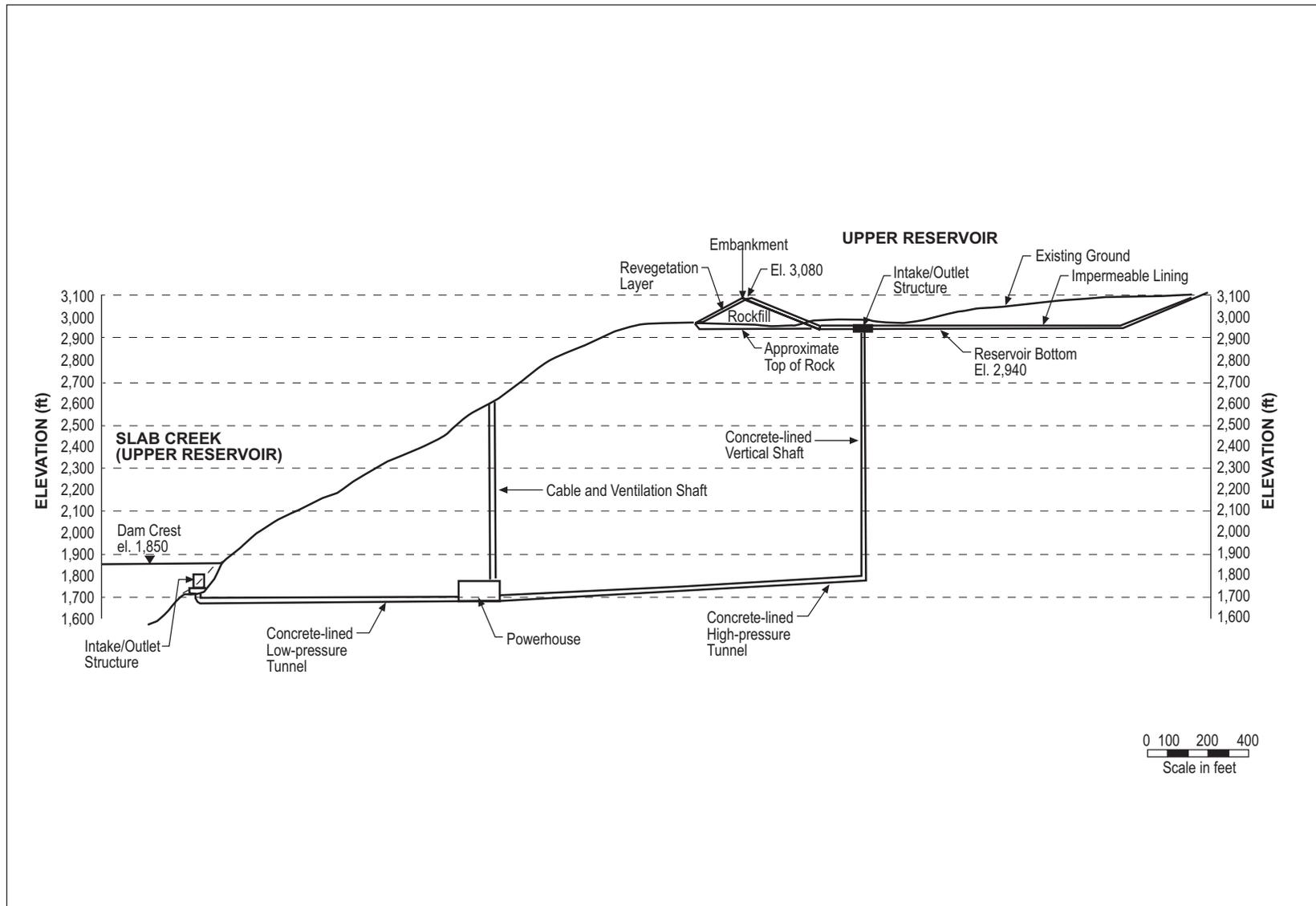


Figure 2-3. Schematic of the proposed Iowa Hill pumped storage operation. (Source: SMUD, 2005, as modified by staff)

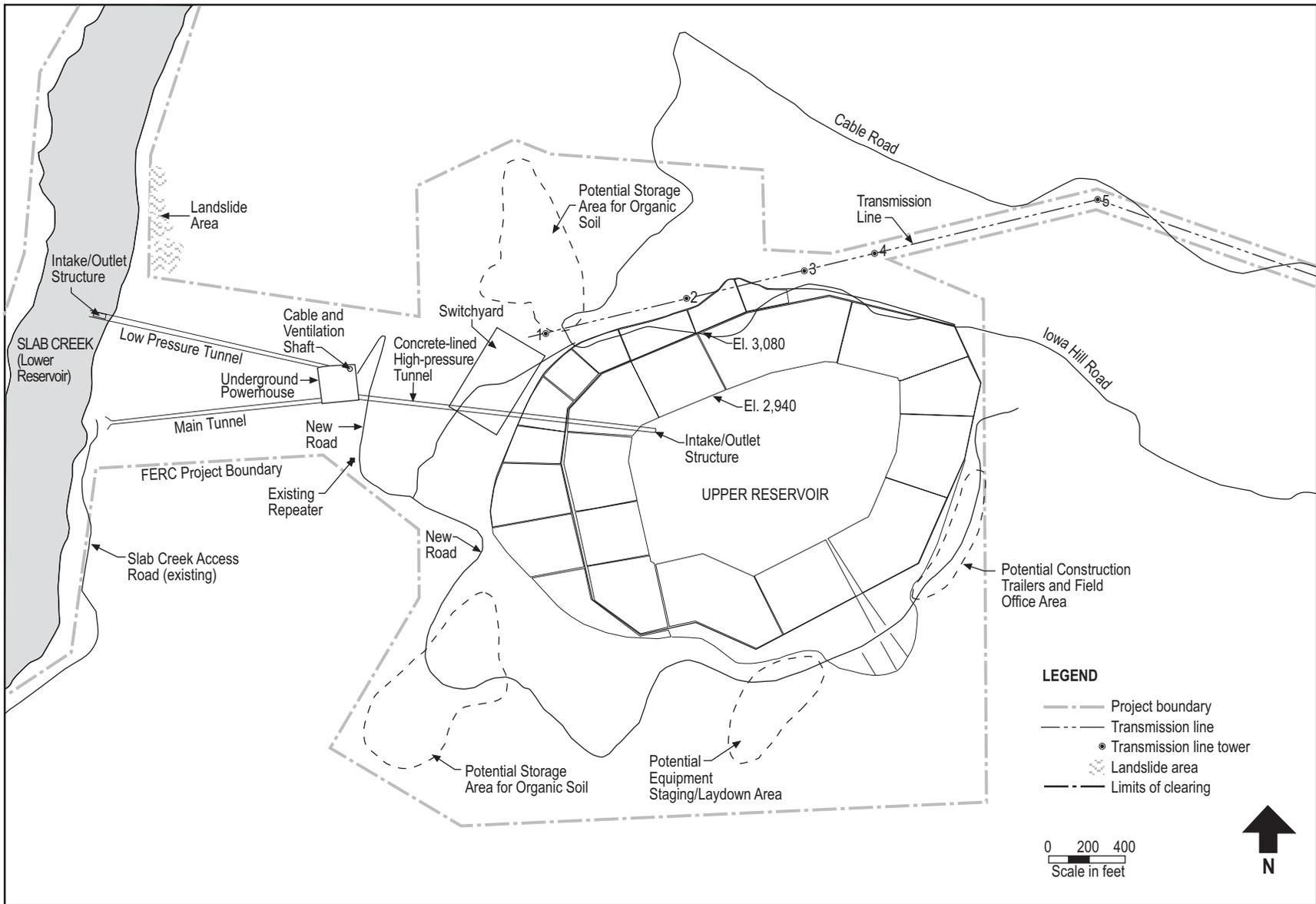


Figure 2-4. Plan view of the Iowa Hill development. (Source: SMUD, 2005, as modified by staff)

Carson Road to Cable Road to Iowa Hill Road would provide the primary access to the upper reservoir site off of U.S. Highway 50. SMUD would improve the serviceability of 4 miles of the existing Cable Road from the end of the paved portion of Cable Road to the upper reservoir site. SMUD would either provide an unimproved gravel road or pave the 4 miles of existing roadway to be improved. The existing road would not be widened. About 1,200 feet of Carson Road would be included in the proposed project boundary for the Iowa Hill development. Wide places in the existing road would be improved along with the rest of the road and would function as passing turnouts. Once constructed, the upper reservoir would be fenced, locked, and unavailable for public recreation.

Carson Road to Larsen Drive would provide the primary access to the lower reservoir site off U.S. Highway 50 to the Slab Creek reservoir access road. The location of the project facilities to be constructed at the lower reservoir is at the end of the existing 2-mile-long Slab Creek reservoir access road. SMUD constructed the first 1.1 miles of the existing road, starting from North Canyon Road going to a point near the dam, as a gravel road to provide access for dam construction and operation and maintenance access to the existing Slab Creek reservoir. The remaining 0.9 mile of the existing access road, starting from near the dam and heading east, was originally constructed as a 10-foot-wide road and currently provides access to the existing, semi-developed boat launch site. This segment of road, which would be included in the project boundary, would be widened by 2 feet and paved. During construction, the excavated rock and soil from the powerhouse, tunnel, and shaft would be transported to the upper reservoir site to be used for berm construction of the upper reservoir. Large dump trucks would be used to transport the excavated rock from the main access tunnel for the powerhouse to the upper reservoir site. The transportation route would likely be along the following route starting from the main access tunnel site: Slab Creek reservoir access road, North Canyon Road, Larson Drive, Carson Road, Cable Road, and concluding at the upper reservoir site at Iowa Hill.

The electrical power output would be carried by the existing three, 230-kV transmission lines that move power from the UARP to SMUD's load center. The only new transmission line would be a generation tie-line about 2 miles long that would tie the Iowa Hill development into the UARP system by looping the Camino/White Rock circuit through the development switchyard. This same tie-line would also be used for the development when it is operated in the pumping mode. The tie-line would start at the proposed switchyard, to be located on the bank of Slab Creek reservoir in the area near the intake, and then come up out the SFAR canyon. Then from there, the tie-line would head toward the existing UARP transmission corridor, which passes by the development to the south and southeast. The total distance of the tie-line would be between about 1.25 to 2.5 miles, depending on which route is ultimately selected.

Five preliminary transmission tie-line alternative routes are under consideration. There are two options for getting power from the Iowa Hill development switchyard, which is in the Slab Creek reservoir canyon, up and over Iowa Hill, which is 1,000-

1,200 feet higher in elevation: (1) spanning across the reservoir from the switchyard to a mid-point on the west bank of the canyon, and then back across the canyon in an east, southeast, south, or southwest direction to get up and over Iowa Hill; or (2) a transmission right-of-way up the south bank of the canyon, up the side of Iowa Hill, to the top. Once out of the canyon, various options exist to connect with the existing UARP transmission line.

Figure 2-4 shows a plan view of the proposed Iowa Hill development.

2.4.2 Proposed Operations

Slab Creek reservoir, the lower reservoir of the Iowa Hill development, is currently operated as a re-regulating afterbay/forebay. The reservoir serves as an afterbay to the Camino powerhouse and a forebay for the White Rock powerhouse. The reservoir currently receives water from Camino powerhouse and inflow from the SFAR. Because of this re-regulating mode of operation, water levels in the reservoir may fluctuate daily with changing volumes of inflow and powerhouse flow. Typical weekly fluctuation is no more than 30 feet, ranging between the operation pool levels of 1,820 feet and 1,850 feet.

In the pumping mode for a 400-MW powerhouse, the estimated discharge capacity of the tunnels (i.e., rate of withdrawal from Slab Creek Reservoir) would range between 3,600 and 4,200 cfs and in the generating mode the discharge capacity of the tunnel (i.e., rate of release to Slab Creek Reservoir) would range between 4,800 and 5,200 cfs. The “rated” condition is based on the need to be capable of delivering 400 MW in the generating mode under adverse conditions (i.e., when the upper reservoir is nearly empty and the lower reservoir is near its normal maximum elevation of 1,850 feet).

Early evaluations of the Iowa Hill development indicated small changes to the current levels of fluctuation of Slab Creek reservoir. For example, if the Slab Creek reservoir is at elevation 1,830 feet, a release of 5,200 cfs would increase the reservoir elevation by about 2 feet per hour. Thus, with minimal change in the pattern of reservoir elevation, there should be no increased incidence of spill at the dam, no effect on the ability to release minimum flows into the Slab Creek dam bypassed reach, and no change in the volume of water released through the White Rock powerhouse.

2.4.3 Proposed Environmental Measures under the Settlement Agreement

SMUD proposes a comprehensive set of measures covering the full range of resources in the Upper American River Basin. Table 2-3 summarizes those proposed measures under the Settlement Agreement.¹⁸

Table 2-3. Proposed environmental measures for the UARP under the Settlement Agreement. (Source: SMUD and PG&E, 2007)

Article	Measure	Elements
Measures Specific to the Upper American River Project		
1-1	Minimum Streamflows	<p>Maintain minimum streamflows in Rubicon River below Rubicon dam, Little Rubicon River below the Buck Island dam, Gerle Creek Below Loon Lake dam, Gerle Creek below Gerle dam, SFSC below Ice House dam, Silver Creek below Junction dam, Silver Creek below Camino dam, Brush Creek below Brush Creek dam, SFAR below Slab Creek dam, and SFAR within 3 days of determining base water year types and operations consistent with California Department of Water Resources (DWR) Bulletin 120 forecast each February through May until 2 days after issuance of a subsequent monthly forecast.</p> <p>Specific minimum flow schedules for each river reach, the specific factors to be applied to each river reach, and the compliance points for measuring minimum streamflows are provided in section 3.3.3.2, <i>Aquatic Resources</i>.¹⁹</p>

¹⁸The precise wording of the measure summaries in this table differs from the specific language of the Settlement Agreement. Individual measures (Proposed Articles in the Settlement Agreement) include programmatic elements for scheduling and developing plans, monitoring, evaluation, and reporting that are not listed in this table. Characterizations of these measures are primarily the result of our attempt to provide a concise summary of the measures for this draft EIS and are not intended to modify any of the terms of the Settlement Agreement.

¹⁹Definitions of Critical Dry (CD), Dry, Below Normal (BN), Above Normal (AN), and Wet water year types are also provided in section 3.3.3.2, *Aquatic Resources*.

Article	Measure	Elements
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1-2 Pulse Flows

Provide annual pulse flow events beginning as early as reasonably practicable within 3 months after license issuance, but not prior to the implementation of the new minimum streamflows, in Rubicon River below Rubicon River dam, Gerle Creek below Loon Lake dam, and SFSC below Ice House dam.

Specified pulse flows do not need to be implemented in water years where natural spill provides flows of equivalent magnitude and duration during spring snowmelt runoff or a natural storm event that occurs in the months of January through May in each of the specified watersheds.

Rubicon River Below Rubicon Dam

Provide a pulse flow of 600 cfs for 3 days that coincides with winter storm events or spring snowmelt runoff in the Rubicon River watershed during below normal (BN), above normal (AN), and Wet water years if a natural spill of 3,600 acre-feet or more within 3 consecutive days does not occur. Implement the specified pulse flow using the existing flashboards at the Rubicon tunnel headworks and either meet annually or develop a tunnel gate operation plan for future pulse flows.

Gerle Creek Below Loon Lake Dam

Schedule pulse flows to coincide with spring snowmelt runoff as specified based on month and water year type as follows:

	BN	AN	Wet
Day 1	125	200	600
Day 2	125	200	600
Day 3	180	250	740*
Day 4	125	200	600
Day 5	125	200	600

*or maximum capacity of outlet works, whichever is less.

Article	Measure	Elements																								
		<p data-bbox="639 279 1390 506">Complete a sensitive site investigation that includes additional permanent cross-sections that characterize the upper and middle Rosgen²⁰ Level 3 analysis reaches, and mapping unstable banks and downed logs that are obstructing streamflow and test pulse flows at levels up to 740 cfs, or the maximum capacity of the outlet works, to determine the appropriate pulse flows to meet desired channel conditions.</p> <p data-bbox="639 541 992 569">SFSC Below Ice House Dam</p> <p data-bbox="639 590 1398 653">Schedule pulse flows to coincide with spring snowmelt runoff as specified based on month and water year type, below.</p> <table border="1" data-bbox="639 667 1076 1041"> <thead> <tr> <th></th> <th>BN</th> <th>AN</th> <th>Wet</th> </tr> </thead> <tbody> <tr> <td>Day 1</td> <td>450</td> <td>550</td> <td>600</td> </tr> <tr> <td>Day 2</td> <td>450</td> <td>550</td> <td>600</td> </tr> <tr> <td>Day 3</td> <td>550</td> <td>650</td> <td>780*</td> </tr> <tr> <td>Day 4</td> <td>450</td> <td>550</td> <td>600</td> </tr> <tr> <td>Day 5</td> <td>450</td> <td>550</td> <td>600</td> </tr> </tbody> </table> <p data-bbox="639 1062 1101 1125">*or maximum capacity of outlet works, whichever is less.</p> <p data-bbox="639 1157 1398 1287">Pulse flows may be timed to coincide with winter storm events between December 15 and April 10. Base pulse flows implemented during this period on the prior water year type, and regardless of water year type revisions after the event.</p>		BN	AN	Wet	Day 1	450	550	600	Day 2	450	550	600	Day 3	550	650	780*	Day 4	450	550	600	Day 5	450	550	600
	BN	AN	Wet																							
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Day 3	550	650	780*																							
Day 4	450	550	600																							
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1-3	Ramping Rates	Use a ramping rate of 1 foot per hour for pulse flow releases in Gerle Creek below Loon Lake dam and SFSC below Ice House dam; minimum streamflow releases in Silver Creek below Junction dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam; and recreational streamflow releases in SFSC below Ice House dam and SFAR below Slab Creek dam.																								
1-4	Coordinated Operations	Develop and implement a plan to coordinate operations with the licensee of the Chili Bar Project to comply with the minimum streamflows, pulse flows, ramping rates, and recreational streamflows for both Projects.																								

²⁰This is a classification system developed by Dave Rosgen and described in *Applied River Morphology* (Rosgen, 1996).

Article	Measure	Elements
1-5	Monitoring Program	<p data-bbox="639 279 1192 304">General Monitoring Program Requirements</p> <p data-bbox="639 327 1390 489">Monitoring plans for items (11) recreation survey, (14) heritage resources, (15) review of recreational developments, and (16) reservoir level evaluation are described in Proposed Articles 1-16, <i>Recreation Survey</i>, 1-29, <i>Heritage Resource Discover</i>, 1-18, <i>Review of Recreation Developments</i>, and 1-26, <i>Fish Stocking</i>.</p> <p data-bbox="305 522 1390 747">1. Fish Population Develop a plan to (a) monitor rainbow trout fish populations by electrofishing and/or snorkeling during late summer/fall in 10 river reaches; (b) monitor hardhead by snorkel surveys in SFAR below Slab Creek dam reach, only, from immediately downstream of Mosquito Road Bridge to, and including site SCD-F2; and (c) monitor brown trout in the Gerle Creek below Loon Lake dam reach.</p> <p data-bbox="305 781 1390 978">2. Aquatic Benthic Macroinvertebrate Monitoring Develop a plan to conduct aquatic benthic macroinvertebrate monitoring at: Rubicon river below Rubicon dam, Gerle Creek below Loon Lake dam, Gerle Creek below Gerle dam, SFRR below Robbs Peak dam, SFSC below Ice House dam, Silver Creek below Junction dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam.</p> <p data-bbox="305 1012 1390 1209">3. Amphibian and Reptile Monitoring Develop a plan to (a) monitor the foothill yellow-legged frog in Silver Creek below Junction dam, Silver Creek below Camino dam, SFAR below Slab Creek dam, and Rock Creek (tributary upstream of White Rock powerhouse), and (b) monitor the mountain yellow-legged frog in Rubicon reservoir, Rockland lake, and Buck Island reservoir.</p> <p data-bbox="305 1243 1390 1377">4. Foothill Yellow-legged Frog Flow Fluctuation Monitoring Develop a plan to conduct visual surveys for the foothill yellow-legged frog in Silver Creek below Camino dam in June through September when streamflows are 100 cfs or less and flows fluctuate more than 40 cfs or more over 1 week's time.</p> <p data-bbox="305 1411 1390 1545">5. Riparian Vegetation Monitoring Develop a plan to conduct aerial photo flights and Greenline method at the 15 intensive field study sites, and collect data to document species composition, percent cover, and length and width of riparian community.</p> <p data-bbox="305 1579 1390 1776">6. Algal Species Identification and Monitoring Develop a plan to collect, identify, and archive samples of the species of algae in Silver Creek below Junction dam and additional baseline samples in SFRR below Robbs Peak dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam, and add additional sites or reaches if it is determined that the algal species have negative effects on the aquatic ecosystem.</p>

Article	Measure	Elements
	7. Geomorphology, Sensitive Site Investigation and Mitigation	Complete a detailed field investigation of Gerle Creek fluvial, geomorphic properties below Loon Lake dam at LL-DG1 and LL-G2 in years 1 and 2 and develop a Gerle Creek Geomorphology Mitigation Plan that includes channel stabilization recommendations.
	8. Geomorphology, Continuing Evaluation	Develop a geomorphology continuing evaluation of representative channel areas monitoring plan providing for establishing permanent transects and monitoring channel cross-sections, longitudinal profiles, substrate composition, and other geomorphic properties (Rosgen Level 3) in representative areas, including in the Rubicon River below Rubicon dam, Gerle Creek below Loon Lake dam, SFRR below Robbs Peak dam, SFSC below Ice House dam, Silver Creek below Camino dam, and SFAR below Slab Creek dam.
	9. Water Temperature	Develop a water temperature monitoring plan to install and maintain continuous recording devices as soon as weather and flow conditions allow at 17 locations immediately above and below project dams and at the confluence with tributaries and monitor stream temperatures from March 15 to September 30 in all years or until it can demonstrated that operation of the project reasonably protects the "cold freshwater" beneficial use as determined by the Agencies. ²¹
	10. Water Quality	<p>Develop a water quality monitoring plan addressing the water quality monitoring elements listed below, field sampling locations, sampling frequency, handling methods, quality assurance/quality control methods, and define the laboratory analyses and associated method detection limits for all constituents and parameters to be monitored in the monitoring program.</p> <p>Water Chemistry Monitoring—Conduct a water chemistry sampling program using U.S. Environmental Protection Agency (EPA) standard methods of analysis for parameters (pH, water temperature, dissolved oxygen (DO), specific conductance and turbidity) designed to demonstrate seasonal conditions at all reservoir and stream locations described in the UARP relicensing <i>Water Quality Study Plan</i> (Plenary approval, January 8, 2003).</p>

²¹The Agencies include CDFG, the Forest Service, FWS, and the Water Board.

Article	Measure	Elements
		<p>Bacterial Monitoring—Conduct bacterial monitoring consistent with <i>Basin Plan</i> objectives for protection of the REC-1 beneficial uses annually, at a minimum of 15 shoreline recreational locations within the project boundary that have swimming and other water contact recreational activities in the area and sources for potential introduction of pathogens to the water column in the immediate vicinity for the first 5 years after license issuance.</p> <p>Metals Bioaccumulation Monitoring—Collect resident fish tissue samples from Loon Lake, Gerle, Ice House, Union Valley, Camino, and Slab Creek reservoirs to analyze for rates of bioaccumulation and tissue residue levels of mercury, copper, lead, and silver using target fish species, numbers of individuals, sampling strategy, and analytical methods that are consistent with current <i>Surface Water Ambient Monitoring</i>.</p>
	12. Robbs Peak Powerhouse Entrainment	Develop a monitoring plan to determine when and at what flows flow fish migration is occurring, and if fish are being entrained.
	13. Terrestrial Wildlife Monitoring	Develop a bear management monitoring plan and a bald eagle monitoring plan.
1-6	Adaptive Management Program	<p>General Adaptive Management Program Requirements—Implement an <i>Ecological Resources Adaptive Management Program</i> as early as reasonably practicable within 3 months after license issuance generally consisting of implementation of a monitoring program (Proposed Article 1-5, <i>Monitoring Program</i>), and specific adaptive management measures.</p> <p>Conduct monitoring to determine if the applicable ecological resource objectives are achievable and being met. Implement adaptive management if the monitoring program and other scientific information indicate that it is likely the applicable ecological resource objectives identified in the Rationale Report (CDFG, 2007) will not be met without adaptive management changes. Adaptive measures include (1) cancellation of pulse and recreational streamflows in SFSC if water temperatures at SFSC rise above 12 degrees Celsius (°C) mean daily temperature for a 7-day running average, (2) cancellation of recreational streamflows in SFAR due to water temperatures, (3) control of untimely spill events below Slab Creek and Camino dams, (4) cancellation of October recreational streamflows below Slab Creek dam if amphibian monitoring show unacceptable impacts; (5) measures to address fish entrainment in the SFRR if monitoring indicates fish are being entrained during fish migration, (6) placement of sediment downstream or dredging based on geomorphology monitoring, (7) management of algae growth in Silver Creek below Junction dam if the new</p>

Article	Measure	Elements
		streamflow regime does not reduce algae growth, (8) performance of additional studies if results of monitoring metals bioaccumulation suggest that metals are adversely affecting aquatic species; (9) adjustment of water temperature indicator for the foothill yellow-legged frog, (10) additional measures to reduce bear/human interactions if monitoring indicates that such interactions have not declined, and (11) investigation of other measures if annual review of coordinated operations shows they are not effective.
1-7	Gerle Creek Channel Stabilization	Develop and implement a stabilization plan for the Gerle Creek channel below Loon Lake dam.
1-8	Gerle Creek Fish Passage	Maintain Gerle Creek reservoir at an elevation that provides fish passage into Gerle Creek from August through October 31.
1-9	Large Woody Debris	Ensure that mobile, instream large woody debris greater than 20 centimeters wide and 12 meters long continues to move downstream beyond Robbs, Junction, Camino, and Slab Creek dams.
1-10	Streamflow and Reservoir Elevation Gaging	Develop and file a Streamflow and Reservoir Elevation Gaging Plan that meets U.S. Geological Survey (USGS) standards and includes a minimum of 10 streamflow gage locations, 9 reservoir elevation compliance gaging locations, and provides for simple staff gages at the Slab Creek and Ice House recreational boating put-ins and the installation of telemetry equipment if such equipment is economically and technologically feasible, and can be installed in a manner consistent with the laws, regulations, and policies applicable to the Congressionally designated Desolation Wilderness.
1-11	Canal and Penstock Emergency and Maintenance Release Points	Develop and implement a plan to evaluate canal and penstock emergency and maintenance release points to determine if improvements can be made to minimize potential adverse water quality impacts when the release points are used.
1-12	Wildlife and Plant Protection Measures	(1) Project Canals and Wildlife —Maintain and operate in working condition all devices and measures for wildlife protection along project canals; provide an annual report of deer or other wildlife found in project canals; and, should wildlife mortality exceed three individuals, develop and implement a wildlife exclusion plan.

Article	Measure	Elements
1-13	Vegetation and Invasive Weed Management	<p>(2) Future Need for Biological Evaluation/Assessment—Before commencing any new construction or maintenance (including but not limited to proposed recreational developments), on National Forest System lands that may affect state or federally listed sensitive plant or wildlife species or its habitat, ensure that a biological evaluation (including necessary surveys) for Forest Service approval, and for any activity that might affect a species proposed or listed under the Endangered Species Act (ESA), or its critical habitat, is prepared for the relevant federal agency (U.S. Fish and Wildlife Service [FWS] or National Marine Fisheries Service [NMFS]).</p> <p>(3) Sensitive Plants—Immediately notify agencies if occurrences of sensitive plants or wildlife species are detected prior to or during ongoing construction, operation, or maintenance of the project. If Forest Service, California Department of Fish and Game (CDFG), or FWS determines that the project-related activities are adversely affecting the sensitive species, then develop and implement appropriate protection measures.</p> <p>(4) TES and Special Status Species Review—Annually review the current list of special status plant and wildlife species (federal ESA or Eldorado National Forest Watch List) and if species are added, determine if the species or unsurveyed habitat for the species might occur on National Forest Systems lands and if so, develop and implement a study plan to assess the effects of the project on the species.</p> <p>(5) Pine Hill Rare Plant Preserve—Consult with BLM, FWS, and CDFG prior to undertaking maintenance under transmission lines within the Pine Hill Rare Plant Preserve.</p> <p>(6) Avian Protection—Develop and implement an avian protection plan that addresses retrofitting transmission lines as described in the Bird-Powerline Associations Technical Report to meet the Avian Power Line Interaction Committee (APLIC) design and siting standards</p> <p>Invasive Weed Management—Develop and file an invasive weed management plan that provides for inventory and mapping of new populations and actions and/or strategies to prevent and control known populations or introductions of new populations.</p>

Article	Measure	Elements
		<p>Vegetation Management—Develop and implement a vegetation management plan that addresses hazard tree removal and trimming; transmission line clearing; habitat improvement; revegetation of disturbed sites; soil protection and erosion control; revegetation with culturally important plant populations; and use of clean, weed free, and preferably locally collected seed.</p>
1-14	<p>Annual Review of Ecological Conditions</p>	<p>Annually schedule and facilitate a meeting with the Agencies to review and discuss the results of implementing license conditions and other issues related to preserving and protecting the ecological values affected by the project and provide, 2 weeks prior to the meeting, an operations and maintenance plan for the year.</p>
1-15	<p>Recreation Implementation Plan</p>	<p>Develop and implement a recreation implementation plan including a construction schedule for the recreational facilities specified in Proposed Article 1-19, <i>Specific Recreation Measures</i>, and other issues including but not limited to signing and sign placement, dissemination of public information, and a schedule for the design of facilities to be reconstructed.</p>
1-16	<p>Recreation Survey</p>	<p>Conduct a recreational survey and prepare a report on recreational resources every 6 years from the date of license issuance, including, but not limited to, changes in use and use patterns, levels of use, user preferences, kinds and sizes of recreational vehicles, carrying capacity information sufficient to indicate change in capacity, and recreational user trends in the project area.</p>
1-17	<p>Forest Service Liaison</p>	<p>Provide an individual for liaison with the Forest Service whenever planning or construction of recreational facilities or other project improvements and maintenance activities are taking place within the Eldorado National Forest.</p>
1-18	<p>Review of Recreation Developments and Facilities within the Project Boundary</p>	<p>Schedule a meeting with the Forest Service every 6 years to review all project recreational facilities described in Proposed Articles 1-18, <i>Review of Recreation Developments</i>, and 1-19, <i>Specific Recreation Measures</i>, and to agree upon the need and timing for maintenance, rehabilitation, construction, and reconstruction work. Keep or include project recreational facilities within the project boundary as shown in Attachment 1, and include the listed 34 recreational facilities constructed or reconstructed by SMUD in the future within the project boundary.</p>

Article	Measure	Elements
1-19	Specific Recreation Measures	<p>Complete the construction, reconstruction, and restoration to meet current Forest Service design standards and the requirements of the American with Disabilities Act (ADA) including all the pre-construction survey, design, permitting, analysis, and specifications for the initial recreational projects identified at the time of license issuance, including Buck Island development; High Country are trails; formal recreational facilities in Crystal Basin at Loon Lake, Gerle Creek, Union Valley, and Ice House reservoirs; recreational facilities in the Canyonlands at Junction, Brush Creek, and Slab Creek reservoirs; and developing and implementing a plan to install bear-proof food storage lockers and bear-proof trash receptacles at all recreational facilities identified as lacking such facilities</p> <p>The specific sites and elements at each site are described in detail in table 3-65 in section 3.3.6, <i>Recreational Resources</i>.</p>
1-20	Heavy Maintenance	<p>Maintain, rehabilitate, and reconstruct, including the costs of design and administration, project recreational facilities as determined through the Review of Recreation Developments.</p>
1-21	Recreation, Operation, Maintenance, and Administration	<p>Beginning in the first full year after license issuance, pay the Forest Service \$1,000,000 (year 2007 cost basis and escalated based on the GDP-IDP²²) annually for the Forest Service to provide for operation, maintenance, and administration of those developed recreational sites adjacent to or in the vicinity of project reservoirs and facilities listed in Proposed Article 1-18, <i>Review of Recreation Developments</i>, and 1-19, <i>Specific Recreation Measures</i> (either developed as part of the original/amended license or affected by operations).</p>
1-22	Carrying Capacity on Lands Affected by the Project	<p>Provide data to support the Forest Service determination of carrying capacity on lands affected by the project, including, but not limited to: visitor perceptions of crowding, user perceptions of “desired conditions,” user preferences for amenities, capacity conditions at developed facilities within or affected by the project, and resource impacts and social experience.</p>

²²GDP-IDP is the U.S. Gross Domestic Product—Implicit Price Deflator.

Article	Measure	Elements
1-23	Reservoir Levels	<p>Beginning as early as reasonably practicable within 6 months after license issuance: (1) meet or exceed the end-of-month reservoir elevations for Loon Lake, Union Valley, and Ice House reservoirs; (2) maintain water surface at as high elevations as possible in Gerle Creek reservoir from May 1 to September 10 and in Slab Creek reservoir from July 1 through September 30, and limit daytime fluctuations to less than 6 feet (3) maintain seasonal reservoir levels at Junction and Brush Creek reservoirs within the range of levels measured between 1975 and 2000; (4) make every reasonable effort to maintain the water surface in Rubicon and Buck Island reservoir at as high as possible with minimum fluctuation between May 1 and September 10; (5) maintain an overwintering minimum pool elevation of 6,527 feet msl in Rubicon reservoir; (6) follow procedures and protocols for Super Dry (SD) water years, interim modification, conferences on abnormal water years, and reservoir level monitoring and adjustments; and (7) measure compliance at the reservoir elevation gages as published by the USGS. The specific elevations are detailed in section 3.3.2.1, <i>Water Quantity, Reservoir Levels</i></p>
1-24	Recreation Streamflows	<p>Based on the determination of water year type, provide recreational streamflows (1) in the SFAR below Slab Creek in BN, AN, and wet water years by spilling water between 850 and 1,500 cfs between 10:00 a.m. and 4:00 p.m. for 6 days in not less than 3 events from March 1 through May 31 and, if conditions permit, one of the events will be replaced with a 3-day event on the Memorial Day weekend in which case the total number of days would be increased to 7, until the Iowa Hill development is constructed or 15 years and longer if specific triggers are met, and prepare and implement a recreation management plan to address the whitewater recreational needs in reach from the Slab Creek dam to White Rock powerhouse; and (2) in Silver Creek below Ice House dam from 10:00 a.m. and 1:00 p.m. from 300 cfs to 500 cfs for 1 to 4 weekend days as determined by water year type and prepare and implement a recreation plan to determine triggers for establishing when the number of days of recreational streamflows could be increased. The specific recreation streamflow schedules are described in detail in section 3.3.6.2, <i>Recreational Resources, Whitewater Boating</i>.</p>

Article	Measure	Elements
1-25	Public Information Services	Provide (1) real-time streamflow information for 10 reaches via a toll-free telephone number and website and real-time reservoir level information for 10 reservoirs including two simple staff gages for use by the public at each reservoir; (2) a project recreation brochure/map that describes the recreational opportunities, facilities, rules, and responsibilities for the project area; and (3) an interpretive, education, and public information plan within 2 years.
1-26	Fish Stocking	Provide up to a total of 50,000 pounds of fish per year but not less than 25,000 pounds of fish per year to be distributed among Loon Lake, Union Valley, and Ice House reservoirs as determined by CDFG.
1-27	Visual Resource Protection	Meet every 5 years with the Forest Service to review opportunities to improve how well project facilities blend in with the surrounding landscape, 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), prepare and implement a plan for the protection and rehabilitation of National Forest System visual resources affected by the project, and perform 10 specific mitigation measures to existing facilities to improve visual quality within 2 to 8 years of license issuance.
1-28	Heritage Resources	Develop and implement a Historic Properties Management Plan (HPMP) that would be incorporated into the programmatic agreement (PA) by reference.
1-29	Heritage Resource Discovery	Immediately cease work and notify the Forest Service and do not resume work until the Forest Service provides written approval if, prior to or during ground disturbance or as a result of project operations, items of potential cultural, historical, archeological, or paleontological value are reported or discovered, or a known deposit of such items is disturbed on National Forest System lands and adjoining property, and perform recovery, excavation, and preservation of the site and its artifacts at the licensee's expense through provisions of an Archaeological Resources Protection Act permit issued by the Forest Service.
1-30	Transportation System Management	Develop and implement a transportation system management plan for roads on or affecting National Forest System lands addressing SMUD's primary responsibility for non-system roads and for maintenance level 1 and 2 roads and the shared levels of responsibility for maintenance level 3, 4, and 5 roads.

Article	Measure	Elements
1-31	Trails System Management	Develop and implement a trails system management plan for the trails that are needed for project operations and are located on or affect National Forest System lands, including a map developed based on GIS locations, showing the location of all trails associated with the project; the seasons and amount of use of the trails by SMUD, the conditions of the trails indicating construction or maintenance needs, and a provision for identifying maintenance and reconstruction needs for trails required for project operations every 5 years.
1-32	Facility Management	Develop and implement a facility management plan including (1) 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.; (2) the type and season of use of each structure; (3) the condition of each structure and planned maintenance or removal; and (4) provision for a plan every 5 years identifying the maintenance, reconstruction, and removal needs of project facilities.
1-33	Vegetation Management Plan	Prior to any ground-disturbing activities, provide to Forest Service, a vegetative management plan that (1) identifies and prioritizes all inadequately vegetated areas to be revegetated or rehabilitated along with an implementation schedule, (2) lists the plants to be used along with planting locations, methods, and densities, giving an emphasis to native plant species, especially those of cultural importance and to using seed from certified weed-free sources and local sources.
1-34	Fire Management and Response Plan	Develop and implement a fire prevention and response plan that is developed in consultation with appropriate state and local fire agencies and that sets forth in detail SMUD's responsibility for the prevention, reporting, control, and extinguishing of fires in the vicinity of the project resulting from project operations.
1-35	Reservation of Authority under Section 18	SMUD recognizes the NMFS and U.S. Department of the Interior (Interior) right to reserve authority to prescribe the construction, operation, and maintenance of fishways at the project, including measures to determine, ensure, or improve the effectiveness of such fishways.
1-36	BLM Reservation of Authority under Section 4(e)	Under the separate off-license Recreation Payment Agreement filed as appendix 6 to the Settlement Agreement for information purposes only, make a one-time payment to BLM of \$270,000 and annual payments of \$270,000, as annually adjusted based on the GDP-IDP with 2007 as the base year, on or before October 1 of each year during the term of the license and all annual renewals thereof.

Article	Measure	Elements
1-37	Implementation Schedule	Develop and implement an implementation plan that includes (1) a schedule for implementing the articles in any license issued for the project; (2) a schedule for filing the plans and related documents in Proposed Articles 1-1 through 1-50; and (3) documentation of consultation with the Consultation Group.
Measures Specific to the Iowa Hill Development		
1-38	Special Use Authorization	Obtain a special-use authorization from the Forest Service for the occupancy and use of National Forest System lands.
1-40	Aquatic Resources (hardhead)	To protect hardhead in the Slab Creek reservoir (1) monitor hardhead during all four seasons of the year to establish the locations of all life stages in Slab Creek reservoir (including edgewater locations) and in the water fluctuation zone upstream on SFAR above and below the Iowa Hill development for 2 years prior to and 2 years after commencement of operations; (2) monitor edgewater temperatures of Slab Creek reservoir between May and September to demonstrate that temperatures in shallow water areas of the Slab Creek reservoir are not affecting hardhead distribution by pump discharge; (3) maintain at least 12°C during the months of June (after the descending limb of the hydrograph), July, and August in the SFAR Slab Creek dam reach below Mosquito Bridge; (4) ensure that flow fluctuations in the SFAR below Slab Creek dam do not occur as a result of the Iowa Hill development; and (5) monitor hardhead to determine whether entrainment is occurring as a result of the Iowa Hill development.
1-41	Terrestrial Resources	Prior to initiating construction of the development, purchase an equivalent acreage of land (or a conservation easement for an equivalent acreage of land) to be managed as wildlife habitat over the term of the license to mitigate the loss of wildlife habitat associated with the Iowa Hill development. The Forest Service and CDFG would determine the in-kind value of lands proposed for this purpose.
1-42	Water Quality and Water Pollution	No later than 90 days before initiating ground-disturbing activities for construction of the Iowa Hill development, file with the Commission a storm water pollution prevention plan to describe the measures SMUD would implement to protect water quality and manage hazardous substances during construction of the Iowa Hill development, and obtain all necessary permits.

Article	Measure	Elements
1-43	Groundwater	Develop and implement a plan for managing groundwater inflows during construction and for groundwater monitoring and management once construction is completed including provisions for (1) a completed survey of the project area that would be affected by the proposed tunnel; (2) monitoring springs and creeks for 5 years after the tunneling operation is completed; (3) a method for quantifying groundwater encountered during tunneling boring operations; (4) a method for verifying is not occurring or has been minimized after tunnel construction; (5) identification of corrective measures if tunnel boring operations encounter more groundwater than predicted; and (6) mitigation of any and all identified impacts.
1-44	Visual Resources	Develop a design for the Iowa Hill development that meets the visual quality objectives (VQOs) of the Eldorado National Forest Land and Resource Management Plan.
1-45	Heritage Resource Protection	Comply with section 106 requirements of the National Historic Preservation Act (NHPA) and its implementing regulations, found at 36 Code of Federal Regulations (CFR) 800, prior to the licensee undertaking activities on National Forest System lands.
1-46	Road Use	File a road use permit for all National Forest System roads that would be used for construction activities for the Iowa Hill development.
1-47	Spoils Disposal	Obtain permitting approvals, as necessary, for discharge of spoils to land and avoid depositing spoils on National Forest System lands without prior review and approval by the Forest Service.
1-48	Construction Noise	Prior to undertaking construction activities affecting National Forest System lands, develop and implement a plan to address construction noise, including measures to address (1) vehicle idling, (2) advance notification of any material transport and construction activities with 0.5 mile of the tract; (3) notices for residents indicating the nature, timing, and duration of all materials transport and construction occurring with 0.5 mile for their residences; (4) a noise hot line telephone system for reporting construction noise disturbances; (5) monitoring to address compliance with items (1) through (4), and (6) actions to mitigate violations of the above measures.
1-49	Recreation Access Plan for Slab Creek Reservoir	Develop and implement a recreation access plan that addresses recreational access to the reservoir (1) during the time of construction of Iowa Hill reservoir and the tunnel connecting to Slab Creek reservoir, and (2) when Iowa Hill reservoir and associated powerhouse are operational.

Article	Measure	Elements
1-50	Future Revisions to the Iowa Hill Development	The Agencies and BLM reserve the right to seek modification of Proposed Articles 1-38 through 1-49 (related to the Iowa Hill development) if SMUD seeks a revision or amendment to the description and/or proposed operation of the Iowa Hill development as approved in any license for the project and such revision would affect resources under their jurisdiction.

2.4.4 Project Boundary

As part of the Proposed Action, SMUD proposes to exclude from the project description and Commission project boundary certain transmission line sections included in the current license and Commission project boundary. The excluded sections are (1) a 9.3-mile-long section of 230-kV line from Folsom Junction to Orangevale Substation; (2) a 17.8-mile-long section of 230-kV line from Folsom Junction to Hedge Substation; and (3) a 1.9-mile-long section of 230-kV line from Folsom Junction to Lake Substation.

SMUD states that these three line sections (lines) would still exist even if the UARP were retired, since they are needed for system reliability. If the project were retired, the lines would require minor reconfiguration to provide power flow between the three substations as part of SMUD’s interconnected system. Therefore, we recommend that these three line sections be excluded in any license issued for the UARP.

The Settlement Agreement includes a provision to include all of the 34 recreational facilities that would be upgraded or otherwise improved within the project boundary, if they are not already included.

2.5 PG&E'S PROPOSAL

2.5.1 Proposed Project Facilities

PG&E does not plan any changes to the project facilities. The project would continue to be operated as it has been in the past with only modifications as needed to complete maintenance activities.

2.5.2 Proposed Operations

PG&E does not plan any changes to the operation of the Chili Bar Project. The project would continue to be operated as it has been in the past, with only modifications as needed to implement any resource management measures that are adopted as conditions of the new license.

2.5.3 Proposed Environmental Measures

PG&E proposes a comprehensive set of measures covering the full range of resources in the SFAR Basin. Table 2-4 summarizes those proposed measures under the Settlement Agreement.²³

Table 2-4. Proposed environmental measures for the Chili Bar Project under the Settlement Agreement. (Source: SMUD and PG&E, 2007)

Article	Measure	Elements
2-1	Minimum Streamflows	Maintain minimum streamflows in the SFAR below Chili Bar dam provided inflow to the project is sufficient within 3 days of determining base water year types and operations consistent with the DWR Bulletin 120 forecast each February through May until 2 days after issuance of a subsequent monthly forecast. The minimum streamflow schedule, the specific factors to be applied, and the compliance point for measuring minimum streamflows are provided in section 3.3.3.2, <i>Aquatic Resources</i> .
2-2	Ramping Rates	Implement upramping rates for licensee-controlled streamflow releases of 500 cfs per hour for flows between 150 and 1,000 cfs and 1 foot per hour for flows between 1,000 cfs and 1,950 cfs. Implement downramping rates of 1 foot per hour for flows between 1,950 and 1,000 cfs, 500 cfs per hour for flows between 1,000 cfs and 600 cfs and 250 cfs for flows between 600 cfs and 150 cfs provided that inflow to the project is sufficient.
2-3	Coordination with UARP License	Develop and implement a plan to coordinate operations with the licensee of the UARP to enable PG&E to comply with the minimum streamflows, pulse flows, ramping rates, and recreational streamflows for both Projects.

²³The precise wording of the measure summaries in this table differs from the specific language of the Settlement Agreement. Individual measures (Proposed Articles in the Settlement Agreement) include programmatic elements for scheduling and developing plans, monitoring, evaluation, and reporting that are not listed in this table. Characterizations of these measures are primarily the result of our attempt to provide a concise summary of the measures for this draft EIS and are not intended to modify any of the terms of the Settlement Agreement.

Article	Measure	Elements
2-4	Monitoring Program	<p data-bbox="634 279 1187 306">General Monitoring Program Requirements</p> <p data-bbox="634 327 1411 558">Implement the monitoring program in coordination with SMUD after license issuance and through the term of the new license and any annual licenses, in coordination with the Agencies. Monitoring may be reduced or terminated at any time if the relevant ecological resource objective(s) have been met or no changes in resource response(s) are expected. Monitoring plans for heritage resources would be described in the HPMP.</p> <p data-bbox="634 579 1411 747">File with the Commission by June 30 of each year an annual monitoring report fully describing the monitoring efforts and results of the previous calendar year. The Agencies have at least 30 days to review and comment on the draft monitoring report prior to filing with the Commission.</p> <ol data-bbox="323 768 1411 1648" style="list-style-type: none"> <li data-bbox="323 768 1411 873">1. Fish Population Develop a plan to (a) monitor rainbow and brown trout fish populations by electrofishing and/or snorkeling at SFAR below Chili Bar dam and note any hardhead detected. <li data-bbox="323 894 1411 999">2. Aquatic Benthic Macroinvertebrate Monitoring Develop a plan to conduct aquatic benthic macroinvertebrate monitoring at SFAR below Chili Bar dam <li data-bbox="323 1020 1411 1167">3. Amphibian and Reptile Monitoring Develop a plan to monitor the foothill yellow-legged frog, western pond turtle, and California red-legged frog in the SFAR below Chili Bar dam (entire reach from CB-A15 to Ponderosa Campground on right and left banks). <li data-bbox="323 1188 1411 1335">4. Riparian Vegetation Monitoring Develop a plan to conduct aerial photo flights and Greenline method at the 5 intensive field study sites and collect data to document species composition, percent cover, and length and width of riparian community. <li data-bbox="323 1356 1411 1648">5. Water Temperature Develop a water temperature monitoring plan to install and maintain continuous recording devices as soon as weather and flow conditions allow at 4 locations in the SFAR immediately below Chili Bar dam, upstream of Dutch Creek confluence, upstream of Camp Lotus, and upstream of Greenwood Creek and monitor stream temperatures from March 15 to October 15 in all years or until it can demonstrated that operation of the project reasonably protects the "cold freshwater" beneficial use as determined by the Agencies.

Article	Measure	Elements
6.	Water Quality	<p data-bbox="634 279 1360 506">Develop a water quality monitoring plan addressing the water quality monitoring elements listed below, field sampling locations, sampling frequency, handling methods, quality assurance/quality control methods, and define the laboratory analyses and associated method detection limits for all constituents and parameters to be monitored in the monitoring program.</p> <p data-bbox="634 541 1386 768">Water Chemistry Monitoring—Conduct a water chemistry sampling program using EPA standard methods of analysis for parameters (pH, water temperature, DO, specific conductance and turbidity) designed to demonstrate seasonal conditions at all reservoir and stream locations described in the Project No. 2101/2155 relicensing <i>Water Quality Study Plan</i> (Plenary approval, January 8, 2003).</p> <p data-bbox="634 804 1401 1131">Bacterial Monitoring—Conduct bacterial monitoring consistent with <i>Basin Plan</i> objectives for protection of the REC-1 beneficial uses annually, at a minimum of 8 shoreline recreational locations within the project boundary that have swimming and other water contact recreational activities in the area and sources for potential introduction of pathogens to the water column in the immediate vicinity for the first 5 years after license issuance. Continue annual monitoring if data demonstrates bacterial concentrations present risks to human health at specific reservoir(s) or riverine sites, through the life of the license.</p> <p data-bbox="634 1167 1390 1360">Metals Bioaccumulation Monitoring—Collect resident fish tissue samples from Chili Bar reservoirs to analyze for rates of bioaccumulation and tissue residue levels of mercury, copper, lead, and silver using target fish species, numbers of individuals, sampling strategy, and analytical methods that are consistent with current <i>Surface Water Ambient Monitoring Program</i>.</p> <p data-bbox="634 1396 1352 1486">Algae Monitoring—Monitor for <i>didymosphenia genimata</i> in conjunction with the annual water quality monitoring in the SFAR downstream of Chili Bar dam.</p>

Article	Measure	Elements
2-5	Adaptive Management Program	Implement in coordination with SMUD an adaptive management program as early as reasonably practicable within 3 months after license issuance generally consisting of implementation of a monitoring program (Proposed Article 2-5, <i>Adaptive Management Program</i>), and specific adaptive management measures. Conduct monitoring to determine if the applicable ecological resource objectives are achievable and being met. Implement adaptive management if the monitoring program and other scientific information indicate that it is likely the applicable ecological resource objectives identified in the Rationale Report (CDFG, 2007), will not be met without adaptive management changes. Annually review the coordinated operations and determine the need for placement of sediment downstream or dredging based on geomorphology monitoring (Proposed Article 2-6, <i>Sediment Management Plan</i>)
2-6	Sediment Management Plan	Develop a geomorphology monitoring plan in coordination with SMUD include be profile measurements at three cross-sectional transects, longitudinal profiles, substrate composition, and other geomorphic properties three sampling sites (CB-G1, CB-G2 and CB-G3) to be performed every 5 years.
2-7	Large Woody Debris	Ensure, provided conditions permit safe and reasonable access and working conditions, that mobile instream large woody debris in Chili Bar reservoir, including at a minimum, all sizes greater than 20 centimeters wide and 12 meters in length, continues downstream beyond Chili Bar dam using reasonable means that include short-term spill flows at the dam and shall be allowed to continue downstream beyond the dam.
2-8	Streamflow and Reservoir Elevation Gaging	Develop and implement a streamflow and reservoir elevation gaging plan that meets USGS standards and approved by the Water Board at a minimum addressing compliance gaging at SFAR below Chili Bar dam (existing USGS gage no. 11444500 or its successor) and in the Chili Bar reservoir
2-9	Wildlife and Plant Protection Measures	TES and Special Status Species Review —Annually review the current list of special status plant and wildlife species (Federal ESA or Eldorado National Forest Watch List) and if species are added, determine if the species or un-surveyed habitat for the species might occur on National Forest Systems lands and if so, develop and implement a study plan to assess the effects of the project on the species.
2-10	Invasive Weed and Vegetation Management Plan	Invasive Weed Management —Develop and file an invasive weed management plan that provides for inventory and mapping of new populations and actions and/or strategies to prevent and control known populations or introductions of new populations.

Article	Measure	Elements
2-11	Annual Review of Ecological Conditions	<p>Vegetation Management—Develop and implement a vegetation management plan that addresses hazard tree removal and trimming, transmission line clearing, habitat improvement, revegetation of disturbed sites, soil protection and erosion control, revegetation with culturally important plant populations, and use of clean, weed free, and preferably locally collected seed.</p> <p>Annually schedule and facilitate a meeting with the Agencies and BLM to review and discuss the results of implementing license conditions and other issues related to preserving and protecting the ecological values affected by the project and provide, 2 weeks prior to the meeting, an operations and maintenance plan for the year.</p>
2-12	BLM Liaison	<p>Provide an individual for liaison with the BLM whenever planning or construction of recreational facilities or other project improvements and maintenance activities are taking place on BLM lands with the Chili Bar Project boundary.</p>
2-13	BLM Recreation Improvements	<p>Construct (1) a gravel parking area for three to four vehicles off Rock Creek Road, (2) a 36-inch-wide trail that meets a grade of 5 percent or less from the parking area to Chili Bar reservoir, (3) a kiosk sign along the trail near the beginning, explaining the rules of the area, and (4) one picnic table of coated wire mesh material will be provided in a leveled out area that is outside of the floodplain.</p>
2-14	Public Information Services	<p>Provide in coordination with the UARP licensee (1) real-time streamflow information for 10 reaches via a toll-free telephone number and website and real-time reservoir level information 10 reservoirs including two simple staff gages for use by the public at each reservoir; and (2) in coordination with the UARP licensee pay BLM \$15,000 annually for BLM to provide a project recreation brochure/map that describes the recreational opportunities, facilities, rule, and responsibilities for the project area; and an interpretive, education, and public information plan.</p>
2-15	Recreational Streamflows	<p>Based on the determination of water year type, provide recreational streamflows (1) in the SFAR below Chili Bar dam provided that inflows to the project are sufficient. The specific recreation streamflow schedule is described in detail in section 3.3.6.2, <i>Recreational Resources, Whitewater Boating</i>.</p>

Article	Measure	Elements
2-16	Visual Resource Protection	Meet every 5 years with BLM to review opportunities to improve how well Project facilities blend in with the surrounding landscape, during planning and prior to any new construction or maintenance of facilities that have the potential to affect visual resources on BLM lands (including but not limited to the recreation-related construction), the licensee prepare and implement a plan for the protection and rehabilitation of BLM visual resources affected by the Project.
2-17	Heritage Resources	Develop and implement an HPMP that would be incorporated into the PA by reference.
2-18	Heritage Resource Discovery	Immediately cease work and notify BLM and not resume work until BLM provides written approval if, prior to or during ground disturbance or as a result of Project operations, items of potential cultural, historical, archeological, or paleontological value are reported or discovered, or a known deposit of such items is disturbed on BLM lands and licensee adjoining property, and perform recovery, excavation, and preservation of the site and its artifacts at the licensee's expense through provisions of an Archaeological Resources Protection Act permit issued by BLM.
2-19	Reservation of Authority under Section 18	PG&E recognizes the NMFS and Interior right to reserve authority to prescribe the construction, operation, and maintenance of fishways at the project, including measures to determine, ensure, or improve the effectiveness of such fishways.
2-21	Implementation Schedule	Develop and implement an implementation plan that includes (1) a schedule for implementing the articles in any license issued for the project; (2) a schedule for filing the plans and related documents in Proposed Articles 2-1 through 2-21; and (3) documentation of consultation with the Consultation Group.

2.5.4 Project Boundary

PG&E proposes to revise the project boundary. The existing project boundary includes all the land PG&E owns ranging from about 50 to 250 feet from either side of the river and starting about 320 feet downstream of the project dam to about 3.2 miles upstream of the project dam. The proposed project boundary would be at the normal maximum water surface elevation at 997.5 feet mean sea level. The proposed project boundary would enclose all project works including the Chili Bar dam and downstream tailrace, intake structure, powerhouse, switchyard, access roads, stream gage, and reservoir. In addition, the proposed project boundary would include a 12-foot-wide corridor for a new proposed hiking trail (Sand Bar Trail) to provide public access to the reservoir shoreline.

2.6 UPPER AMERICAN RIVER PROJECT-ONLY ALTERNATIVE

Under the UARP-only Alternative, all components of SMUD's Proposed Action would be in place except those dealing with the addition of the 400-MW Iowa Hill development. SMUD would operate the existing UARP facilities in a manner identical to SMUD's Proposed Action, except that the increased frequency of water level fluctuation at Slab Creek reservoir described under the Proposed Action would not occur. Slab Creek reservoir water level fluctuations under this alternative would be the same as the Proposed Action. The release schedule for the project dams would be the same as SMUD's Proposed Action. Thus, the quantity of water stored in project reservoirs (with seasonal and daily changes) and the volume of water passing through project reaches would be the same as the Proposed Action. All environmental measures contained in the Proposed Action would occur except for those pertaining to the Iowa Hill development, and the potential impacts associated with construction and operation of the Iowa Hill development would not occur. If the Iowa Hill development were not constructed and the recreational triggers are met in year 15, SMUD proposes to make physical modifications to the White Rock tunnel to provide enhanced recreational boating flows downstream of Slab Creek reservoir.

2.7 MODIFICATIONS TO APPLICANTS' PROPOSALS

2.7.1 Water Quality Certification

SMUD and PG&E applied for section 401 Water Quality Certification for their Projects on September 22 and 18, 2006, respectively, following the Commission's issuance of the Ready for Environmental Analysis notice on July 28, 2006. In its letters filed with the Commission on March 30 and April 10, 2007, the Water Board requested that SMUD and PG&E, respectively, amend their applications for water quality certification to bring the requests into consistency with the provisions of the Settlement Agreement. In response to the Water Board's request, PG&E simultaneously withdrew its application for water quality certification and submitted a new application for water quality certification in a letter dated May 1, 2007, that was acknowledged as received by the Water Board on May 22, 2007. SMUD withdrew its application for water quality certification on September 6, 2007, and indicated that it would resubmit its application shortly. Therefore, state action on the Water Quality Certifications will be required within a year of the date of receipt of the SMUD re-filed application for the UARP and before May 1, 2008, for the Chili Bar Project.

2.7.2 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as the Secretaries of the U.S. Departments of Commerce (NMFS) and Interior (through FWS) may prescribe. NMFS, by letter filed on October 18, 2006, and Interior, by letters filed on October 17, 2006, and January 31, 2007, reserved this authority.

2.7.3 Section 4(e) Federal Land Management Conditions

Section 4(e) of the FPA states that the Commission may issue a license for a project on a federal reservation only if it finds that the license will not interfere or be inconsistent with the purpose for which the reservation was created or acquired. Such a reservation includes, without limitation, the Forest Service- and BLM-administered land. Section 4(e) of the FPA requires that a Commission license for a project located on a reservation include the conditions that the Secretary of the department under whose supervision the reservation falls deems necessary for the adequate protection and utilization of such reservation.

The Forest Service filed preliminary 4(e) conditions on October 18, 2006, and revised preliminary conditions on January 30, 2007, for the UARP. Interior, on behalf of FWS and BLM, filed preliminary 4(e) conditions on October 17, 2006, and revised preliminary 4(e) conditions on January 31, 2007, for both the UARP and the Chili Bar Project. Both agencies state that their revised preliminary 4(e) conditions are intended to be consistent with the Settlement Agreement. Interior, on behalf of BLM, filed only standard general conditions and its filing did not include any project-specific conditions for either project.

In its revised preliminary conditions for the UARP, Forest Service put into italics the portions of its conditions that Forest Service determined to be outside its jurisdiction, but indicated that Forest Service fully supports the italicized wording and recommends it be included in any licenses issued for the Projects. The italicized wording is found in the project-specific conditions and pertains generally to all references to consultation with other agencies and specifically to: (1) locations that are not within or adjacent to the Eldorado National Forest, including monitoring the foothill yellow-legged frog in Rock Creek (condition no. 31, item 3), and maintenance under transmission lines in the Pine Hill Rare Plant Preserve (condition no. 38); or (2) issues that are under the purview of other agencies, including water temperature monitoring (condition no. 31, item 9), water quality (condition no. 31, item 10), adjustments to the project boundary to include all project recreational facilities (condition no. 44), fish stocking in Loon Lake, Union Valley, and Ice House reservoirs (condition no. 52), reservation of authority under section 18 of the FPA (condition no. 61), and BLM reservation of section 4(e) authority (condition no. 62).

Because the revised preliminary conditions filed by the Forest Service and Interior are consistent with the provisions of the Settlement Agreement, we discuss these terms and conditions in the context of our discussions of the Settlement Agreement measures throughout this EIS

2.7.4 Section 10(j) Recommendations

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided

by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) also states that, whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purpose and the requirements of the FPA or other applicable laws, the Commission and agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibility of the agency.

In response to the Commission's Ready for Environmental Analysis notice issued on July 28, 2006, Interior (on behalf of FWS), CDFG, and NMFS filed comment letters that included section 10(j) recommendations.²⁴ Interior and CDFG, parties to the Settlement Agreement, filed revised 10(j) recommendations, on January 31, 2007, that are consistent with the Settlement Agreement. NMFS did not file revised 10(j) recommendations. We discuss the 10(j) recommendations in the context of our discussion of the Settlement Agreement measures throughout the EIS.

2.7.5 Proposed Action with Staff Modifications (Staff Alternative)

After evaluating the Proposed Actions, including the terms and conditions filed pursuant to section 4(e) of the FPA, and other recommendations from resource agencies and interested entities under section 10(a) and 10(j) of the FPA, we considered what, if any, additional measures may be necessary or appropriate for the continued operation of the UARP and Chili Bar Project.

UARP

In addition to the applicant's proposed project-related environmental measures for UARP, the Staff Alternative includes provisions to:

- File a report with the Commission by July 31 of each year stating the dates when the pulse flows were provided or an explanation of why they were not provided.
- Expand the geographic scope of the invasive weed and vegetation management plans to cover all land within the project boundary affected by project activities.
- Include an annual employee environmental awareness program to educate employees and key personnel about the known locations of special status species and habitats in the vegetation management plan
- Prepare a wildlife lands mitigation plan for the construction of the Iowa Hill development.

²⁴NMFS letter filed October 18, 2006, Interior (FWS) letter dated October 17, 2006, and CDFG letters dated October 16, 2006.

Chili Bar Project

In addition to the applicant's proposed project-related environmental measures for the Chili Bar Project, the Staff Alternative includes provisions to:

- Expand the geographic scope of the invasive weed and vegetation management plans to cover all land within the project boundary affected by project activities.
- Include an annual employee environmental awareness program to educate employees and key personnel about the known locations of special status species and habitats in the vegetation management plan
- Develop and implement a recreation plan.

2.8 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

We propose eliminating the following alternatives from detailed study in the EIS.

2.8.1 Federal Government Takeover

We do not consider federal takeover to be a reasonable alternative. Federal takeover of the Projects would require Congressional approval. Although that fact alone would not preclude further consideration of this alternative, there is currently no evidence showing that a federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed an interest in operating the UARP or Chili Bar Project.

2.8.2 Nonpower License

A nonpower license is a temporary license the Commission would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the nonpower license. At this time, no governmental agency has suggested a willingness or ability to takeover the Projects. No party has sought a nonpower license, and we have no basis for concluding that the UARP and Chili Bar Project should no longer be used to produce power. Thus, we do not consider a nonpower license a reasonable alternative.

2.8.3 Project Retirement

Retiring the Projects would require denying SMUD and PG&E's license applications and require the surrender and termination of the existing licenses with any necessary conditions. The Projects would no longer be authorized to generate power. Retiring the Projects would involve significant cost and would foreclose any opportunity to add environmental enhancements to the existing UARP or Chili Bar Project. For these reasons, we do not consider project retirement to be a reasonable alternative.