DRAFT UARP WATER QUALITY CERTIFICATION

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of Water Quality Certification for

SACRAMENTO MUNICIPAL UTILITY DISTRICT

UPPER AMERICAN RIVER HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2101

Sources: Rubicon River, Silver Creek, South Fork American River

Counties: El Dorado and Sacramento

WATER QUALITY CERTIFICATION FOR FEDERAL PERMIT OR LICENSE

Draft released for public comment on **October 7, 2011**

Comments due by 5:00 PM on November 14, 2011 to:

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SACRAMENTO MUNICIPAL UTILITY DISTRICT

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WATER QUALITY CERTIFICATION

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BY THE EXECUTIVE DIRECTOR:

Project Description

1. Sacramento Municipal Utility District (SMUD or Licensee) owns and operates the Upper American River Hydroelectric Project (UARP) located in El Dorado and Sacramento Counties, as shown on Figure 1. SMUD is a publicly-owned municipal utility that generates, transmits and distributes electric power to a 900-square-mile service area that includes Sacramento County and a small portion of Placer and Yolo counties.

2. The UARP was constructed between 1959 and 1985 and was gradually placed in service between 1961 and 1985. The initial Federal Energy Regulatory Commission (FERC or Commission) license issued to SMUD was effective on August 28, 1957, for a term ending July 31, 2007. On August 8, 2007, the Commission issued an order authorizing SMUD to continue to operate the UARP under annual licenses that are automatically renewed until action is taken on SMUD's application for a new license.

3. The Chili Bar Hydroelectric Project (Chili Bar) is directly downstream from the UARP on the South Fork American River (SF American River) and is a Commission-licensed facility (Project No. 2155) owned and operated by Pacific Gas and Electric Company (PG&E). Chili Bar also has a license expiration date of July 31, 2007, and is undergoing relicensing simultaneously with the UARP.

4. The UARP is located on the western slope of the Sierra Nevada mountain range and utilizes water for power generation derived from surface runoff accumulated

from approximately 674 square miles of drainage area in the Rubicon River, Silver Creek and the SF American River watersheds, most of which flows in a generally westward direction.

5. The topography of the UARP watersheds is characterized by mountains in the east, gradually changing to low, rounded hills in the lower elevations towards the west. Average precipitation ranges from 40 to 70 inches, with more than 90 percent of the precipitation occurring from October through April, mainly in the form of snow in the higher elevations. A snow pack of 5 to 10 feet is common in the higher elevations, with little or no snow in the lower elevations (below 2,000 feet).

6. The Commission's UARP boundary encompasses 6,375.2 acres of United States-owned land administered by the U.S. Department of Agriculture Forest Service (USFS) as part of the Eldorado National Forest, and 53.9 acres of United States-owned land administered by the U.S. Bureau of Land Management (BLM).

7. The UARP consists of seven hydroelectric developments with a total of 11 reservoirs and eight powerhouses that together can generate up to 688 megawatts (MW) of electrical power. The UARP also includes 11 transmission lines with a combined length of 180 miles, about 28 miles of power tunnels/penstocks, one 1.9 mile long canal and about 700 developed public-use campsites. General information regarding the reservoirs and powerhouses is provided in Table 1 followed by a description of the facilities included in the seven developments.

Table 1. General Information on Project Reservoirs and Powerhouses

Reservoir Name	Maximum Pool Elevation (feet msl)*	Normal Maximum Capacity (acre-feet)	Useable Storage (acre-feet)	Surface Area at Maximum Pool (acres)	Typical Daily/Annual Elevation Change (feet)	Powerhouse Capacity (MW)
Rubicon	6,545	1,450	1,010	108	<0.5/11.8	--
Buck Island	6,436	1,070	648	78	<0.5/11.5	--
Loon Lake	6,410	76,200	68,988	1,450	<0.5/36	82
Gerle Creek	5,231	1,260	483	60	1.5/9	--
Robbs Peak	5,231	30	30	2	<0.5/5	29
Ice House	5,450	45,960	35,065	678	<0.5/42	11.5
Union Valley	4,870	277,290	266,303	2,860	<0.5/60	46.7
Junction	4,450	3,250	2,140	64	20/32	144
Camino	2,915	825	489	20	20/30	150
Brush Creek	2,915	1,530	374	20	20/<1	--
Slab Creek	1,850	16,600	5,580	280	6/30	224 + 0.4**
Total	--	425,465	381,110	--	--	687.6

* Feet above mean sea level

** Two powerhouses generate power with water from Slab Creek Reservoir: (1) a 0.4 MW facility located at Slab Creek Reservoir Dam utilizes minimum streamflow releases for power generation; and (2) White Rock Powerhouse located about 5 miles downstream utilizes water diverted into the White Rock Tunnel.

8. The Loon Lake development, the most upstream project facility, utilizes water from the Rubicon River, Highland Creek, Little Rubicon River, and Ellis Creek. It consists of:
   - Rubicon Dam and an auxiliary dam that together impound Rubicon Reservoir;
   - 0.2 mile long Rubicon-Rockbound tunnel that diverts water from Rubicon Reservoir to Buck Island Reservoir via Rockbound Lake (a non-UARP facility on Highland Creek);
   - Buck Island Dam and an auxiliary dam on the Little Rubicon River that together impound Buck Island Reservoir;
   - 1.6 mile long Buck Island-Loon Lake tunnel that diverts water from Buck Island Reservoir to Loon Lake;
   - Loon Lake Dam, a side channel spillway, and an auxiliary dam that together impound Loon Lake Reservoir;
   - Loon Lake Powerhouse penstock that extends from Loon Lake Reservoir to Loon Lake Powerhouse;
   - Loon Lake Powerhouse, an underground powerhouse located more than 1,100 feet below Loon Lake Reservoir;
   - Loon Lake Powerhouse tailrace tunnel that extends 3.8 miles from the powerhouse to Gerle Creek Reservoir; and
   - Two 69 kilovolt (kV) transmission lines that consist of the 7.9 mile-long Loon Lake-Robbs Peak line and the 12.4 mile-long Loon Lake-Union Valley line.

   Rubicon Dam and Reservoir are located inside a designated wilderness area (Desolation Wilderness), within Eldorado National Forest. All other facilities in this development are located outside the wilderness boundary but within the boundary of the Eldorado National Forest.

9. The Robbs Peak development consists of:
   - Gerle Creek Dam located on Gerle Creek, upstream of its confluence with the South Fork of the Rubicon River (SF Rubicon River), that incorporates the intake of Gerle Creek canal in its left abutment, creating Gerle Creek Reservoir;
   - Gerle Creek canal, an above-ground, partially-lined 1.9 mile canal from Gerle Creek Reservoir to Robbs Peak Reservoir;
   - Robbs Peak Dam, located on the SF Rubicon River upstream of its confluence with Gerle Creek, that forms Robbs Peak Reservoir;
   - Robbs Peak tunnel that extends 3.2 miles from Robbs Peak Reservoir to Robbs Peak penstock;
   - Robbs Peak penstock that extends 0.4 miles from Robbs Peak tunnel to Robbs Peak Powerhouse;
   - Robbs Peak Powerhouse on the northeast shore of Union Valley Reservoir; and
   - Robbs Peak-Union Valley transmission line, an overhead 69-kV line that extends 6.8 miles.

   This development is located on both private and public land within the boundary of the Eldorado National Forest.

10. The Jones Fork development consists of:
    - Ice House Dam and two auxiliary earthfill dikes that together impound Ice House Reservoir located on the South Fork of Silver Creek (SF Silver Creek);
    - Jones Fork tunnel that extends 0.3 mile from Ice House Reservoir to the Jones Fork penstock;
    - Jones Fork penstock that extends 1.6 miles from Jones Fork tunnel to the Jones Fork Powerhouse;
    - Jones Fork Powerhouse on the southeast shore of Union Valley Reservoir; and
    - Jones Fork-Union Valley transmission line, a 69-kV overhead transmission line that extends 4.0 miles.

    The Jones Fork development is located on both private and public land within the boundary of the Eldorado National Forest.

11. The Union Valley development consists of:
    - Union Valley Dam on Silver Creek that creates Union Valley Reservoir;
    - 268 feet long Union Valley tunnel that connects Union Valley Reservoir with Union Valley Powerhouse;
    - 0.3 mile long Union Valley penstock that conveys water from the outlet of the Union Valley tunnel to the Union Valley Powerhouse;
    - Union Valley Powerhouse, located at the base of Union Valley dam; and
    - Two 230-kV overhead transmission lines, one extending 11.8 miles and the other extending 5.9 miles.

    This development is located on both public and private land within the boundary of the Eldorado National Forest.

12. The Jaybird development consists of:
    - Junction Dam located on Silver Creek that creates Junction Reservoir;
    - 4.4 miles long Jaybird tunnel that connects Junction Reservoir and the Jaybird penstock;
    - 0.5 mile long Jaybird penstock that connects Jaybird tunnel and Jaybird Powerhouse;
    - Jaybird Powerhouse; and
    - 230-kV overhead transmission line that extends 15.9 miles.

    This development is located on both private and public land within the boundary of the Eldorado National Forest.

13. The Camino development consists of:
    - Camino Dam on Silver Creek that creates Camino Reservoir;
    - Camino tunnel that extends 5 miles to connect the Camino Reservoir with the Camino penstock;
    - Brush Creek Dam on Brush Creek that creates Brush Creek Reservoir;
    - Brush Creek tunnel, a modified horseshoe tunnel that extends 0.8 mile from Brush Creek Reservoir to the lower end of Camino tunnel;

- Camino penstock, an above-ground steel penstock that extends 0.3 mile to connect the Camino tunnel and Camino Powerhouse;
- Camino Powerhouse, located on the SF American River; and
- Two 230-kV overhead transmission lines originating at the Camino Switchyard: the Camino-Lake transmission line that extends 31.7 miles; and the Camino-White Rock transmission line that extends 10.0 miles.

All the facilities in this development are located on public land within the boundary of the Eldorado National Forest.

14. The Slab Creek/White Rock development consists of:
    - Slab Creek Dam, a concrete arch dam across the SF American River, with a central uncontrolled overflow spillway, that creates Slab Creek Reservoir;
    - Slab Creek penstock that extends 40 feet and passes through the dam to connect Slab Creek Reservoir with Slab Creek Powerhouse;
    - Slab Creek Powerhouse located at the base of Slab Creek Dam;
    - White Rock tunnel that extends 4.9 miles to connect Slab Creek Reservoir with White Rock penstock;
    - White Rock penstock, a 0.3 mile long penstock that connects White Rock tunnel to White Rock Powerhouse;
    - White Rock Powerhouse located on the SF American River at the upstream end of PG&E's Chili Bar Reservoir (FERC No. 2155); and
    - Two 230-kV overhead transmission lines and one 12-kV distribution line. One 230-kV line is 31.1 miles long and the other is 39.6 miles long. The 12-kV line is 600 feet long.

    The Slab Creek/White Rock development discharges into PG&E's Chili Bar Reservoir. Slab Creek Reservoir is located on public and private land within the Eldorado National Forest. The remainder of the development is located on private land adjacent to the western boundary of the Eldorado National Forest.

Proposed Iowa Hill Development

15. SMUD's application for a new Commission license for the UARP also includes a proposed new development, the Iowa Hill Pumped-Storage Development (Iowa Hill). The location proposed for Iowa Hill is approximately one mile upstream of the existing Slab Creek Dam on the south side of the SF American River above Slab Creek Reservoir (Figure 2). Iowa Hill would be an off-stream pumped-storage hydroelectric development that will generate approximately 400 MW and would include the following components:
    - 109-acre Iowa Hill Reservoir with a capacity of approximately 6,400 acre-feet;
    - Underground facilities including: a concrete-lined vertical shaft; a concrete-lined high pressure tunnel; a steel-lined high pressure tunnel; three steel manifolds; three steel penstocks; three draft tube extensions; and a concrete-lined low pressure tunnel;

- An underground powerhouse consisting of two main caverns: one that contains three variable speed motor/generators and the control equipment; and one that contains the transformers;
- An octagonal, multi-port intake/outlet structure to be located approximately 80 feet below the Slab Creek Reservoir normal maximum water surface elevation; and trash bar racks to prevent debris from entering the intake;
- Project access road improvements to the existing Slab Creek Reservoir Access Road;
- Approximately 2-mile-long new double circuit 230-kV generation tie line interconnection to the existing Camino-White Rock transmission line; and
- A 230-kV switchyard approximately two acres in size.

16. The Iowa Hill development would generate power by utilizing water that is pumped from Slab Creek Reservoir to the Iowa Hill Reservoir during periods of low power demand for subsequent release during periods of peak demand. Water levels in Slab Creek Reservoir would fluctuate as water is withdrawn during the night and released back into the reservoir during the day.

17. SMUD estimates that after issuance of the new UARP license, six to eight years will be required to obtain SMUD Board of Directors (SMUD Board) approval and to complete the engineering, planning, procurement and construction of Iowa Hill. A complete project description and construction plan is not available at this time. Upon receiving a complete project description and construction plan, the State Water Resources Control Board (State Water Board) Deputy Director of the Division of Water Rights (Deputy Director), will determine whether to amend this certification to add conditions necessary to protect water quality during the construction and subsequent operation of Iowa Hill. Additional environmental review pursuant to the California Environmental Quality Act (CEQA) will be required prior to construction.

SMUD's State-issued Water Rights

18. SMUD holds Water Right Licenses 11073 (Application 12323), 11074 (Application 12624), 10495 (Application 14963), 10496 (Application 20522), and 10513 (Application 22110), and Water Right Permit 19025 (Application 26768). In 2005, SMUD submitted two additional applications (Applications 31595 and 31596) to appropriate water for non-consumptive power generation within the Rubicon River, Silver Creek and SF American River watersheds. These applications were filed to ensure that SMUD has adequate water rights to cover operation of the UARP and to address the potential for changes in the timing of peak flows. Water stored under these permits will not exceed the quantity that SMUD was licensed to store under Licenses 11073 and 11074. Acquisition of these water rights does not change UARP operations as defined by the conditions of this certification. The State Water Board issued Permits 21261 and 21262 in February 2011 to SMUD and PG&E for these applications. PG&E's interest in the new permits applies only to use of the water at Chili Bar. Table 2 provides information regarding SMUD's water rights.

Table 2. Summary of SMUD's Water Rights						
Application No./ Permit No./ License No.	Priority Date & Face Amount acre-feet (ac-ft)	Source	Purpose of Use	Diversion & Storage in cubic feet per second (cfs) and acre-feet (ac-ft)	Points of Rediversion	Places of Use (Powerhouses)
A12323/10703/ 11073	2/13/1948 459,300 ac-ft/yr	Silver Creek and SF Silver Creek	Power Recreation	400 cfs @ Union Valley, Junction and Camino Reservoirs 238,900 ac-ft @ Union Valley and Ice House Reservoirs Combined	Brush Creek Dam Slab Creek Dam Chili Bar Dam	Union Valley Jaybird Camino Slab Creek White Rock Jones Fork Chili Bar
A12624/10704/ 11074	7/29/1948 281,100 ac-ft/yr	Rubicon River Rockbound Creek Gerle Creek SF Rubicon River	Power Recreation Fish and Wildlife Protection and Enhancement	500 cfs @ Rubicon Dam 200 cfs @ Buck Island Dam 325 cfs @ Loon Lake and Gerle Creek Dams combined 175 cfs @ Robbs Peak Dam 226,900 ac-ft @ Loon Lake and Union Valley Reservoirs 440 ac-ft @ Buck Island Reservoir 450 ac-ft @ Rubicon Reservoir	Union Valley Dam Junction Dam Camino Dam Brush Creek Dam Slab Creek Dam Chili Bar Dam	Loon Lake Robbs Peak Union Valley Jaybird Camino White Rock Slab Creek Chili Bar
A14963/10705/ 10495	8/12/1952 868,773 ac-ft/yr	Silver Creek SF American River	Power	400 cfs @ Union Valley, Junction and Camino Dams 800 cfs @ Slab Creek and Chili Bar Dams	Junction Dam Camino Dam Brush Creek Dam Slab Creek Dam Chili Bar Dam	Union Valley Jaybird Camino Slab Creek White Rock Chili Bar
A20522/13746/ 10496	12/12/1961 1,375,557 ac-ft/yr	Brush Creek SF American River	Power	1,900 cfs @ Brush Creek Dam, Slab Creek Dam and Chili Bar Dams combined	Slab Creek Dam Chili Bar Dam	Camino Slab Creek White Rock Chili Bar
A22110/15088/ 10513	4/23/1965 579,182 ac-ft/yr	SF American River	Power	800 cfs @ Slab Creek Dam	Chili Bar Dam	White Rock Slab Creek Chili Bar
A26768/19025/ Not Applicable	3/30/1981 255,473.9 ac-ft/yr	SF Silver Creek	Power	270 cfs @ Ice House Dam 60,000 ac-ft @ Ice House and Union Valley Reservoirs	Union Valley Dam	Jones Fork Union Valley

Table 2. Summary of SMUD's Water Rights						
Application No./ Permit No./ License No.	Priority Date & Face Amount acre-feet (ac-ft)	Source	Purpose of Use	Diversion & Storage in cubic feet per second (cfs) and acre-feet (ac-ft)	Points of Rediversion	Places of Use (Powerhouses)
A31595/21261/ Not Applicable	5/24/2005 413,610 ac-ft/yr	Gerle Creek Little Rubicon River (Rockbound/ Highland Creek) Rubicon River, SF Rubicon River	Power Recreation Fish and Wildlife Protection and Enhancement	800 cfs @ Rubicon Dam 1550 ac-ft @ Rubicon Reservoir 160 cfs @ Buck Island Dam 760 ac-ft @ Buck Island Reservoir 950 cfs @ Loon Lake Dam, Gerle Creek Dam and Robbs Peak Dam 1200 ac-ft at Gerle Creek Reservoir 100 ac-ft @ Robbs Peak Reservoir The total amount to be directly diverted under this application and under License 11074 will not exceed 410,000 ac-ft per year. The total amount to be directly diverted to beneficial use (flow through Robbs Peak Powerhouse) under this application and under License 11074 will not exceed 405,000 ac-ft per year. The total amount of water collected to storage from all sources under this application and existing License 11074 will not exceed 226,900 ac-ft per year, the storage limitation of License 11074.	Buck Island Dam Loon Lake Dam Gerle Creek Dam Robbs Peak Dam Union Valley Dam Junction Dam Camino Dam Brush Creek Dam Slab Creek Dam Chili Bar Dam	Loon Lake Robbs Peak Union Valley Jaybird Camino White Rock Slab Creek Chili Bar
A31596/21262/ Not Applicable	5/24/2005 27,200 ac-ft/yr	Brush Creek Gerle Creek Little Rubicon River (Rockbound/ Highland Creek) Rubicon River, SF Rubicon River Silver Creek SF Silver Creek SF American River	Power Recreation	1400 ac-ft @ Camino Reservoir 6300 ac-ft @ Junction Reservoir 2500 ac-ft @ Brush Creek Reservoir 17000 ac-ft @ Slab Creek Reservoir The total amount of water collected to storage from all sources under Application 31596 and SMUD's existing Licenses 11073 and 11074 shall not exceed 465,800 ac-ft per year, which is the combined existing storage limitation in Licenses 11073 and 11074.	Buck Island Dam Loon Lake Dam Gerle Creek Dam Robbs Peak Dam Union Valley Dam Junction Dam Camino Dam Brush Creek Dam Slab Creek Dam Chili Bar Dam	Jaybird Camino White Rock Slab Creek Chili Bar

Project Operations

19. SMUD operates the UARP to generate power when it is most valued during the year by storing water seasonally and providing electricity during peak load situations. The UARP is also operated to ensure reliability of the electrical transmission system within SMUD's Balancing Authority, which is the region within which SMUD maintains and balances its power load and power interchanges with other control areas.

20. Loon Lake, Union Valley and Ice House Reservoirs account for 94 percent of total UARP storage capacity and operate primarily as long-term storage reservoirs for the winter/spring rain and snowmelt runoff. Starting in mid-summer, the elevations of these storage reservoirs are gradually lowered as water is released to generate power. Rubicon and Buck Island Reservoirs, located in the upper part of the Middle Fork American River Watershed, provide limited storage and are operated primarily to capture and divert water from the Rubicon River and Highland Creek drainages into Loon Lake.

21. Five UARP reservoirs (Gerle Creek, Robbs Peak, Junction, Camino, and Slab Creek) operate primarily as re-regulating forebays and/or afterbays to various powerhouses. Brush Creek Reservoir is typically operated to provide either spinning reserves or maximum peaking power for system reliability purposes. SMUD's pre-2005 water rights do not allow long-term water storage in these six reservoirs. SMUD's newly approved 2005 water right applications do include water storage in these reservoirs; however, the total amount of water stored in UARP reservoirs under the recently approved applications, together with SMUD's pre-2005 water rights, will not exceed the combined maximum storage limitations contained in SMUD's existing water right licenses (465,800 ac-ft per year).

22. Water levels in Slab Creek Reservoir fluctuate seasonally as well as daily for power peaking, and generally range between the maximum normal water surface elevation of 1,850 feet and the normal drawdown water surface elevation of 1,820 feet. Operation of the proposed Iowa Hill development would be expected to increase short-term water surface fluctuation in Slab Creek Reservoir, but water surface elevations would be expected to stay within the currently observed range (i.e., between 1,820 and 1,850 feet).

23. SMUD entered into a cooperation agreement with PG&E, the Licensee of Chili Bar, to coordinate UARP and Chili Bar operations to enable PG&E to comply with the minimum streamflows, ramping rates and recreational streamflows applied for in the new Commission license and water quality certification for Chili Bar. SMUD and PG&E will be required to prepare and implement a plan to coordinate UARP and Chili Bar operations as a condition of this water quality certification.

Commission Proceeding and Settlement Agreement

24. SMUD filed a formal request with the Commission to use the Alternative Licensing Procedure for the UARP, which was approved on August 29, 2001. SMUD filed a

Notice of Intent to file an application for new license for the UARP on July 18, 2002, and filed its Application for New License (License Application) with the Commission on July 15, 2005, which included a Preliminary Draft Environmental Assessment that analyzed SMUD's proposed alternative.

25. Settlement negotiations between SMUD and federal and resources agencies and other interested stakeholders (Settlement Negotiation Group) began prior to submittal of SMUD's License Application. The Settlement Negotiation Group did not reach settlement prior to the statutory deadline for SMUD to file its License Application with the Commission.

26. On November 1, 2005, the USFS filed the Comprehensive Resource Agency/Non-Governmental Organization Alternative (Agency Alternative) with the Commission, which set forth proposed terms and conditions for the new license. On August 18, 2006, SMUD filed a Supplemental Preliminary Draft Environmental Assessment with the Commission that analyzed the measures set forth in the Agency Alternative.

27. The Settlement Negotiation Group reconvened to continue negotiating a comprehensive settlement in the relicensing of the UARP and Chili Bar, which led to an Agreement in Principle that was filed with the Commission on November 16, 2006. A final Settlement Agreement (SA) was signed by the Settling Parties and filed with the Commission on January 31, 2007. The Settling Parties consist of SMUD, PG&E, USFS, BLM, U.S. Fish and Wildlife Service (USFWS), National Park Service, California Department of Fish and Game (CDFG), California Department of Parks and Recreation (CDPR), American River Recreation Association and Camp Lotus, California Outdoors, California Sportfishing Protection Alliance, Friends of the River, American Whitewater, Foothill Conservancy, Theresa Simsiman, Hilde Schweitzer, and Rich Platt. Although not a signatory to the SA, State Water Board staff participated in the settlement discussions for the purposes of providing information and guidance. A document entitled "Rationale Report for Relicensing Settlement Agreement" (Rationale Report), that provides CDFG's supporting documentation and the rationale used in developing the recommendations in the Settlement Agreement, was filed with the Commission by CDFG.

28. The State Water Board supports the negotiation of agreements regarding complex resources allocation issues among a broad base of stakeholders. The endorsement of a broad range of experts signing the SA provides a strong recommendation for action on which the State Water Board exercises its independent water quality certification authority.

29. Many of the SA measures require consultation with the Consultation Group[1]. The State Water Board supports consultation with a broad range of regulatory agencies and stakeholders when developing plans or making decisions affecting resources in which a number of agencies and stakeholders have an interest and expertise. The State Water Board recognizes and appreciates the expertise and dedication that the

[1] The SA defines the Consultation Group as including all parties to the SA with the addition of the State Water Board, the Central Valley Water Board and El Dorado County.

settlement parties can bring to decisions and planning for beneficial use and resource protection. However, only certain governmental entities are formally vested with the authority and responsibility to protect such uses and resources, and are publicly accountable for these duties. The centrality of these responsibilities to those government agencies ensures that they, or successor agencies, will be responsible for consultation throughout the term of a 30-to-50-year license. Each of the conditions in this water quality certification that includes consultation with agencies lists the specific agencies that must be contacted; however this does not preclude consultation with the Consultation Group as well. The State Water Board hopes and expects that the parties will fulfill their contractual obligations and use the Consultation Group process described in the SA, as this process includes a broad range of parties that can bring valuable expertise to the various planning processes.

30. The SA also includes approval by multiple agencies for many of its provisions, including many of those that affect water quality. However, except for provisions for which the water quality component is a small part of what is essentially a land management plan, this water quality certification does not require approvals by agencies outside of the State Water Board. The settlement process and water quality certification are distinct processes, and the State Water Board has an independent responsibility to ultimately ensure that the Licensee implements the certification conditions necessary to protect water quality. The State Water Board requires consultation with the agencies with approval authority under the SA, and expects that the parties will fulfill their contractual obligations and go through the approval process when there are multiple agencies with jurisdiction over various measures.

Additional Water Quality Concerns

31. A debris pile lies on the steep slope above Slab Creek Reservoir, composed of large woody debris that accumulated at Slab Creek Dam after the January 1997 flood on the SF American River. The State Water Board received comments from community members in the vicinity of Camino, CA that the debris pile might constitute a threat to water quality. State Water Board staff visited the site in August 2010 and no immediate threat to water quality was evident. The pile was entirely composed of wood debris with no evidence of household garbage or toxic materials contained in the pile. The decision was made after discussion among USFS, California Department of Forestry and Fire Protection (CAL FIRE) and SMUD staff during the site visit that the best course of action is to let the wood pile remain in place to decompose naturally. Burning or physical removal of the pile was deemed not feasible due to fire danger and likely water quality impacts associated with, among other things, bringing heavy equipment to the site.

Rationale for Minimum Streamflows, Pulse Flows and Recreational Streamflows

32. The Rationale Report describes how the construction and operation of the UARP, which includes several large reservoirs and numerous dams and diversion structures, have had serious impacts on water quality, habitat conditions and on native species indigenous to the SF American River, Rubicon and Silver Creek watersheds. The

Rationale Report also provides a review of the current conditions in UARP-affected stream reaches under the current Commission license and describes impacts associated with hydropower project operations. For example, the existence of Rubicon Reservoir Dam and Buck Island Reservoir, which capture a majority of the peak runoff flow in the upper portion of the UARP, significantly alters the historical hydrologic regime which has led to an over-abundance of sediment within the stream channel, a reduction in the mobility of large woody debris, and an increases in water temperature during the late summer/early fall time period. The conditions included in this water quality certification are needed to improve conditions in the UARP watersheds and to protect the beneficial uses described in the Basin Plan, which are described in more detail below.

33. Information used to establish streamflow criteria includes resource objectives for specific reaches within the UARP based on state and federal agency management goals, available information on existing and desired conditions, and matrices created by the resource agencies that relate ecosystem attributes with streamflow throughout the year and water year type. In general, minimum streamflows for specific stream reaches, which are defined for six water year types,[2] were established after evaluating ecosystem conditions under regulated and unimpaired streamflows. Important ecosystem attributes for a given reach and potential limiting factors, such as the appropriate water temperature for a particular aquatic species life stage, were also evaluated. Additional considerations include: an emphasis on native species (particularly rainbow trout, mountain yellow-legged frogs, foothill yellow-legged frogs (FYL frog), western pond turtles, and hardhead); specific non-native species (brown trout in Gerle Creek below Loon Lake Reservoir Dam); the importance of mimicking the natural hydrograph to maintain overall ecosystem function; maintenance of cold water and transitional habitats; maintenance of beneficial water quality conditions; hydraulic connectivity above and below UARP features; recreational opportunities; hydroelectric operations; and other resource objectives identified for a given reach. Streamflow recommendations were developed from the Weighted-Usable-Area results of the Physical Habitat Simulation (PHABSIM) modeling of the affected stream reaches, which relates trout habitat with instream flow, water temperature modeling results, and the results from a reservoir simulation model (Res-Sim) developed by CDFG to evaluate various streamflow and reservoir elevation alternatives.

34. Minimum streamflows in the Rubicon River below Rubicon Reservoir Dam were designed to benefit rainbow trout habitat and de-emphasize California roach and speckled dace that are currently more common than trout in this reach and are typically associated with warm water and found at lower elevation foothill locations. In contrast to the current conditions characterized by constant, year-round minimum streamflows, increased streamflows from March to June will enhance trout spawning. Pulse flows below Rubicon Reservoir Dam occurring in Wet, Above Normal (AN), and Below Normal (BN) water years during either a winter storm event or the spring snowmelt period are designed to provide bankfull streamflow at the same time of year

[2] Water year types (i.e. Wet, Above Normal, Below Normal, Dry, Critically Dry, and Super Dry) are defined based on the water year forecast of unimpaired runoff in the American River below Folsom Lake as indicated in Condition 1 of this certification.

that sediment is flushed into the river below the reservoir. Pulse flows will also redistribute large woody debris and transport tributary bedload at the appropriate time of year. CDFG, USFS, USFWS and the State Water Board will be consulted regarding the logistics of how to provide the pulse flows. These agencies will also evaluate whether the flows are satisfying the resource objectives. Adjustments may be made to the quantity and/or duration of pulse flows in future years based on this evaluation.

35. Minimum streamflows in the Little Rubicon River below Buck Island Dam were developed by adjusting the flows recommended for the Rubicon River in proportion to the Little Rubicon River Watershed area. These flows are meant to improve trout habitat and to reduce the current dominance of exotic species (golden shiners) in this stream reach.

36. Minimum streamflows in Gerle Creek below Loon Lake Dam will improve habitat for rainbow trout and non-native brown trout (a desired species in this reach). Higher fall streamflows are designed to provide spawning habitat for brown trout in October and November, while higher spring flows emulate the natural snowmelt hydrograph and are expected to enhance riparian vegetation during the spring growth period and provide improved spawning habitat for rainbow trout. Pulse flows below Loon Lake Dam that occur in Wet, AN, and BN water years during the spring snowmelt period will mobilize the bedload, transport fines and sort spawning gravels, all of which are needed to improve habitat quality for rainbow trout. The upper magnitude of the pulse flow was designed to correspond with the capacity of the Loon Lake Dam outlet works, while the 5-day duration of the pulse flow was based on a review of the unimpaired hydrology and information from the Instream Flow Council, an organization devoted to improving the effectiveness of instream flow programs, and other relicensing proceedings.

37. Minimum streamflows in Gerle Creek below Gerle Reservoir Dam were developed to increase trout biomass by increasing habitat for both rainbow trout and brown trout. Higher streamflows in the spring will increase spawning habitat for rainbow trout and improve riparian vegetation by increasing the duration of inundation of the riparian zone.

38. Minimum streamflows in the SF Rubicon River below Robbs Peak Reservoir Dam were designed to improve habitat for rainbow trout and to inundate the primary flood terrace during the spring snowmelt period, which is expected to benefit riparian vegetation. An important goal in this reach is to maximize rainbow trout recruitment by increasing spawning habitat to offset the potential for fish entrainment into the Robbs Peak powerhouse tunnel.

39. Minimum streamflows in SF Silver Creek below Ice House Reservoir Dam were designed to address the habitat needs of both rainbow trout and FYL frog, for which suitable habitat exists in the lower half of the reach. Minimum streamflows peak in May to coincide with the spring snowmelt period, then decrease in June and July to mimic the natural hydrograph and to allow for gradual warming in water temperature

to greater than 12ºC, which is an important cue for FYL frog breeding activity. Modeling results indicate that water temperatures supportive of the cold freshwater habitat beneficial use (i.e., mean daily water temperatures at or below 20ºC) are expected to occur at the lower end of the reach during the summer and early fall, which would provide adequate water temperature conditions for rainbow trout.

40. Peak flows in the reach below Ice House Reservoir Dam have been greatly reduced since the construction of the Jones Fork Powerhouse in 1985, which lead to excess bedload in the stream channel as a result of tributary and hillslope inputs. Pulse flows below Ice House Reservoir Dam that occur in Wet, AN and BN water years are expected to improve geomorphological conditions by redistributing sediment, cleaning and sorting trout spawning gravel, increasing pool depths and redistributing large woody debris.

41. In addition to or possibly coincident with the pulse flows required to achieve geomorphological objectives, recreational boating flow requirements are also established for the Ice House Reach to provide high elevation, intermediate to advanced boating opportunities. Based on the recreational boating studies, the recommended flow magnitude and number of boating days vary depending on the water year type. Flows will be reexamined periodically throughout the license term to determine whether adjustments are required based on the recreational boating use. During Wet, AN, and BN water years, when geomorphology pulse flows are required, the boating flows may be nested within the pulse flows such that they occur simultaneously.

42. Minimum streamflows in Silver Creek below Junction Reservoir Dam were designed to provide habitat conditions that benefit FYL frogs, which have a high potential for colonizing this reach since they were found in the downstream reach of Silver Creek below Camino Dam. Additional considerations for establishing flows in this reach are to maintain streamflows of similar magnitude to those released upstream at Ice House Reservoir Dam and to reduce the presence of an unidentified algal species whose proliferation may indicate poor water quality conditions. Peak streamflows that occur in May and gradually decrease during June, July and August mimic the natural hydrograph and are expected to improve rainbow trout spawning habitat by flushing fine sediments and revitalizing gravel beds. The spring flows should also eliminate stagnant conditions that allow nuisance algae to become established. The summer flows are expected to provide suitable water temperatures to support cold-water fisheries while also allowing for warmer water temperatures in edgewater habitat to benefit FYL frog. The required flow regime is expected to appropriately balance the beneficial uses designated for Silver Creek below Junction Reservoir Dam.

43. Minimum streamflows in Silver Creek below Camino Reservoir Dam were developed to provide suitable habitat conditions for FYL frog, which are present in this reach, and to provide water temperatures that support both native fish and amphibians. Streamflow magnitude and timing below the dam are identical to the reach above Camino Reservoir to maintain the continuity of flows in Silver Creek. An assessment of the relationship between streamflow and FYL frog breeding confirmed that the flow

transitions are not likely to result in stranding of FYL frog eggs and larvae. Under the recommended flow regime, mean daily water temperatures will be reduced. However, water temperature modeling results indicate that mean daily water temperatures may still exceed 20ºC at times, especially during Critically Dry (CD) and Dry water years, and in years of hot ambient air temperatures.

44. Due to the potential for water temperature in Silver Creek to exceed target values for cold freshwater habitat, a specific quantity of water will be made available in Wet water years for release below Junction and Camino Reservoirs when mean daily water temperatures exceed 20ºC in Silver Creek immediately upstream of Camino Reservoir and/or below Camino Reservoir immediately upstream of the confluence with the SF American River. The installation of a telemetry system to transmit hourly data will allow SMUD to promptly notify resource agencies when water temperatures exceed the 20ºC criteria at either location, which will trigger implementation of an approved plan for release of the additional water during the months of July, August and September. The plan will also address monitoring requirements in response to concerns related to possible adverse impacts to FYL frogs due to the flow fluctuations in Silver Creek.

45. Minimum instream flows in Brush Creek below Brush Creek Reservoir Dam were developed to increase trout biomass by increasing habitat for rainbow trout. However, when natural inflow to Brush Creek Reservoir is below the specified flow requirement, the minimum instream flow below Brush Creek Reservoir is set equal to the inflow to the reservoir. This prevents the reservoir from being emptied, which might otherwise occur due to its limited capacity.

46. Minimum instream flows in the SF American River below Slab Creek Reservoir Dam were developed to provide habitat for FYL frogs, western pond turtles and native fish (rainbow trout and hardhead). Additional management objectives include: reducing the prevalence of non-native species, such as bullfrogs and bass; and implementing flows that mimic the natural hydrograph and provide water temperatures that support a transition zone fish community, while also reducing water temperature fluctuation.

47. In addition to increased base flows during summer and winter, the recommended flow regime includes a simulation of natural spring hydrology with weekly adjustments to flows that gradually increase starting in either March or April, then decline in either May or June, depending on water year type. Simulation of the natural hydrograph provides important cues for amphibian reproduction, especially during the descending limb of the hydrograph, the timing of which was determined based on an examination of unimpaired hydrology. Water temperature modeling results indicate that the recommended streamflows for July, August and September will improve habitat conditions for rainbow trout by reducing water temperatures (especially in the upper portion of the reach), while also providing habitat in the lower portion of the reach for hardhead, which prefer warmer temperatures.

48. Recreational streamflows were established for the SF American River below Slab Creek Reservoir Dam based on positive boater evaluations elicited during the

whitewater boating study that emphasized the high aesthetic value of the scenery, ease of use and access. Experienced boaters that participated in the whitewater boating study or otherwise had knowledge of the reach provided input to establish the appropriate magnitude for the recreational flows, which are designed to provide opportunities for both kayakers and rafters. Recreational flows will be limited to the months of March, April, May and October to avoid adverse impacts to FYL frogs, which are present in this reach. The number of days that recreational flows will be provided will be determined based on thresholds of observed boater use defined in a Whitewater Boating Recreation Plan. The boater use thresholds will also be used to determine whether facility modifications to allow the delivery of recreational flows (such as the installation of a new valve) will be required for Slab Creek Reservoir. Initially, the recreational streamflows will be limited to BN, AN and Wet water years and will be implemented by controlled spills at Slab Creek Reservoir Dam, since the required flows are greater than the capacity of the outlet works at the dam.

Rationale for Reservoir Elevation and Stream Gaging

49. The current Commission license does not include requirements for the maintenance of specific reservoir levels, but rather instructs the Licensee to make every reasonable effort to maintain water surface elevations as high as practicable, with minimum fluctuations between May 1 and September 10. For the new UARP license, minimum monthly reservoir levels were developed for three of the major storage reservoirs which are important recreation destinations (Loon Lake, Union Valley Reservoir and Ice House Reservoir). These minimum levels assure that recreational facilities, such as boat launches, are usable during the recreation season. Operational targets that shall be met year-round are provided for the other reservoirs The required reservoir elevations may only be modified due to certain events such as state or federal electrical emergencies, system events that cause the Licensee's Operating Reserves to drop below the Western Energy Coordinating Council Minimum Operating Reliability Criteria, equipment malfunction, public safety emergency, or law enforcement activity. Minimum reservoir levels are based on multiple factors that include: the need to generate hydroelectric power; recreation objectives for individual reservoirs; aesthetic qualities and public perceptions; the functionality of recreation facilities, such as boat ramps and picnic areas; current and anticipated future recreational uses and trends; and observations by Eldorado National Forest recreation managers. Reservoir level requirements will be expressed as end-of-month minimum elevations instead of reservoir level drawdown curves to provide operational flexibility to the Licensee. A Res-Sim model depicting the proposed UARP operations was used to verify that the reservoir levels are attainable while also providing the water needed for power generation, minimum streamflows and recreational streamflows.

50. Low reservoir elevations in Gerle Creek Reservoir between August and October may prevent the movement of brown trout upstream to spawning grounds in Gerle Creek. Due to potential operational constraints and the bathymetric characteristics of the reservoir/stream interface, a minimum reservoir elevation is not specified for Gerle

Creek Reservoir. Instead, the reservoir elevation is required to be sufficient to provide fish passage into Gerle Creek between August and October.

51. Minimum reservoir levels may be modified in response to electrical emergency situations or system events that require power generation outside of normal planned operations, equipment malfunction, public safety emergencies or law enforcement activities and abnormally low precipitation patterns. The Licensee will consult with USFS, CDFG, USFWS and the State Water Board, and receive approval from the Deputy Director and the Commission for a required plan that describes how reservoir levels will be managed when reservoir levels are so modified.

52. Real-time streamflow and reservoir level information will be made available to the public via the Internet. Toll-free telephone numbers will increase opportunities for recreational boating use of both natural spill events and managed flows in UARP stream reaches and within the UARP reservoirs. The current schedule for recreational and minimum streamflows will also be provided via the Internet to allow the public to plan their recreational activities in advance.

Rationale for Resource Monitoring Program

53. The resource monitoring program is designed to determine whether new streamflows achieve applicable resource objectives. The monitoring program includes periodic monitoring for fish populations, aquatic macroinvertebrates, special status amphibians and reptiles, riparian vegetation, algal species composition, geomorphology, water temperature, water quality, and metal bioaccumulation in resident fish. The methods and frequency of monitoring are designed to measure the response of resources to adjustments in streamflow and other conditions during the term of the license and to determine whether resource objectives are being met.

54. The Deputy Director, based on consultation with or recommendations by the Licensee, USFS, CDFG, and USFWS, has the flexibility to alter the monitoring program methodologies and frequencies of data collection if: (a) there is a more appropriate or preferable methodology or site to use than that described in the individual elements of the monitoring program; or (b) monitoring may be reduced or terminated because the relevant ecological resource objective has been met or no change in resource response is expected. In addition, the Deputy Director may approve alternate years within the scope of the specified monitoring program to ensure that monitoring occurs during a range of water year types. The Licensee shall submit a revised monitoring plan based on its own, the Deputy Director's or another agency's recommendations, and the Deputy Director must approve the revised monitoring plan before the Licensee implements it or submits it to the Commission for approval, if needed.

55. Monitoring for FYL frogs will document the population response to the new license conditions and identify long-term population trends. More intensive monitoring in the first year after licensing and after certain spill events will focus on evaluating potential impacts to FYL frogs in relation to short-term streamflow fluctuations or recreation

flows. Periodic monitoring for Mountain Yellow-legged Frogs, which were not found within the UARP during the relicensing studies, will be required in the Rubicon River watershed to provide information on long-term population trends.

56. Monitoring riparian vegetation will provide information on whether riparian areas are in proper functioning condition or whether they require restoration in response to the new streamflow conditions. A onetime baseline documentation of algal species present in the UARP is required, which will allow concerns related to the presence of nuisance algae in Silver Creek to be addressed once the baseline documentation has been completed and locations of concern are identified. Additional measures to address nuisance algae are included in the condition that describes the required adaptive management measures.

57. A detailed geomorphic investigation of the Gerle Creek channel below Loon Lake is needed to determine appropriate stabilization measures to address the poor channel conditions identified during the relicensing studies. An on-going evaluation of geomorphic conditions using permanent cross-section transects will be conducted. Geomorphic information will be collected at regular intervals during the license term and will be compared to the baseline information collected during the relicensing studies to provide an evaluation of changes in channel conditions in response to the new streamflow conditions.

58. Annual water temperature monitoring at specified stream sites will provide information needed to determine whether cold freshwater resource objectives are being met and will provide an evaluation of breeding conditions for sensitive amphibian species. Stream temperature monitoring results will also be used to determine whether water temperature profiles within the reservoirs are needed to better understand cold water availability. An adaptive approach to water temperature monitoring will allow the monitoring sites to be reduced if results indicate water temperatures are adequate for specific locations.

59. Water quality monitoring is important for determining compliance with state and federal water quality standards and examining long-term trends in water quality. The frequency of monitoring for any compound can be reduced if shown to be at background or non-detect levels for a statistically significant period of time. Fish sampling for the analysis of metal bioaccumulation allows for an evaluation of health risks to humans and wildlife and creates a long-term data set to detect trends in bioaccumulation through the license term.

60. Monitoring to determine when and at what streamflow fish migration occurs in the SF Rubicon River and Robbs Peak Reservoir is required due to concerns that entrainment into Robbs Peak Powerhouse may contribute to declining fish populations upstream of Robbs Peak Reservoir. The monitoring results will be used to determine whether measures to reduce entrainment, such as fish screens, are needed.

61. Monitoring for bald eagles will provide the Licensee and resource agencies information regarding the location of bald eagle nests and will aid in determining whether changes in UARP operations are necessary to protect the animals, which are dependent on waterfowl and fish for food, and whether the animals may be disturbed by increased construction, recreation and other UARP activity. On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. Even though delisted, bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Rationale for Adaptive Management Program

62. In general, an adaptive management program provides resource managers the opportunity to set resource management goals, establish and implement resource measures to meet those goals, monitor the response to determine whether goals are being met, and then modify resource measures to meet goals that are not being met. Underlying this approach is an ongoing monitoring program that provides the information needed for implementing an adaptive management program. Recommended adaptive management measures were developed to address specific concerns related to water temperature, fish entrainment, sediment management, algae growth, and metals bioaccumulation.

63. Several adaptive management measures address potential adverse impacts to FYL frogs associated with flow fluctuation in SF Silver Creek below Ice House Reservoir Dam and the SF American River below Slab Creek Reservoir Dam. These measures involve canceling or deferring scheduled pulse and/or recreational flows when the temperature cue for FYL frog reproduction is reached so that FYL frog reproductive activities will not be adversely affected. Recreational flows scheduled for October below Slab Creek Reservoir Dam may negatively impact FYL frogs if lower water temperatures due to higher minimum streamflows delay the timing of FYL frog metamorphosis. If monitoring results indicates that FYL frog tadpoles may still be present, recreational flows in October may be canceled. In addition, if monitoring results indicate that the temperature cue for FYL frog reproduction is something other than 12ºC, the temperature cue will be changed. The water temperature that initiates FYL frog breeding is thought to be site-specific, thus temperatures suitable for breeding on one river may not be appropriate for another river.

64. Monitoring results from the continuing geomorphic evaluation of representative stream channels will be used to determine whether sediment dredged from a UARP reservoir by the Licensee for project operations should be placed in the stream channel downstream of that reservoir. The current practice of depositing dredged material away from stream channels reduces important habitat elements in stream ecosystems, such as spawning gravels or other materials that form habitat features like river bars.

65. The development of additional adaptive measures may be required to address excessive algae growth that is found to occur anywhere in the UARP vicinity,

including in the Silver Creek stream reach [3] below Junction Reservoir Dam and in the SF Rubicon River below Robbs Peak Reservoir Dam, if the new streamflow conditions do not reduce or eliminate excessive algae growth so that it is not adversely affecting water quality.

66. Metals bioaccumulation in resident fish may not only lead to human health risks associated with fish consumption, but may also affect the health of aquatic species. Results from the metals bioaccumulation monitoring will be examined in light of published scientific research on ecological risk associated with metals bioaccumulation to determine whether additional studies are needed and/or whether adaptive management measures will be necessary.

Rationale for Miscellaneous Conditions

67. Project dams prevent the downstream movement of large woody debris, which can lead to a reduction in habitat diversity and loss of cover for aquatic species. Habitat quality downstream of Robbs Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, and Slab Creek Reservoir Dam will improve with a requirement that ensures mobile large woody debris moves downstream, provided that safe and reasonable access and working conditions are achievable.

68. Penstocks and/or canals that are drained due to emergency situations or for planned maintenance activities can lead to erosion or cause adverse water quality impacts. Canal and penstock release points will be evaluated for potential improvement measures, which will be implemented according to the plan required in Condition 11 (Canal and Penstock Emergency and Maintenance Release Points) to minimize adverse water quality impacts when the release points are used.

69. The USFS, CDFG, USFWS and the State Water Board will annually review ecological conditions, implementation of specific management measures, and an annual operation and maintenance plan to assess whether resource objectives are being met. This will allow the agencies to determine, in consultation with the Licensee, whether to recommend or implement changes in UARP operations or in monitoring.

70. The Licensee must develop and implement a Transportation System Management Plan that is approved by USFS and is periodically updated throughout the license term. The most current plan must be submitted to the Deputy Director within 30 days of USFS approval. To ensure that the activities identified in the plan receive adequate environmental review and include measures to reduce water quality impacts, the plan must identify road construction or rehabilitation projects that are likely to require water quality certification and a nationwide or individual Section 404 permit, include USFS and US Army Corps of Engineers (ACOE) specifications and best management practices, and are subject to additional requirements imposed by the Deputy Director.

[3] The term “stream reach” as used in this water quality certification includes reservoirs built on the stream channel.

71. The SA requires that the Licensee implement a specific set of recreation measures on USFS lands that involve both construction of new facilities and the reconstruction and restoration of existing facilities. The Licensee will also be required to periodically review with the USFS all UARP-related recreation facilities and to implement appropriate maintenance, rehabilitation, construction and repair work as needed. These construction activities have the potential to affect surface water quality, while the operation of sanitary facilities may affect surface water and groundwater quality. The Licensee will be required to prepare a plan and schedule for implementing the recreation improvements that include consultation with the State Water Board and Central Valley Regional Water Quality Control Board (Central Valley Water Board) to determine the need for regulatory permits that would require actions to reduce or avoid impacts to water quality. The permits that may be required[4] will address the type of construction impacts, including the need to de-water a construction site, the size of the area affected, the proximity to water bodies, and identification of appropriate mitigation measures.

72. The operation of the UARP, including future operations of Iowa Hill, may exacerbate mercury bioaccumulation by mobilizing mercury or by creating conditions that promote mercury methylation, the process by which inorganic mercury is transformed to an organic form that can more readily enter the aquatic food chain. This water quality certification includes a reservation of authority to require the Licensee to develop and implement a mercury management plan that allows for the use of future research and/or monitoring data to inform decisions regarding the need for actions to reduce mercury bioaccumulation within the UARP.

73. A requirement for the Licensee to prepare and implement a hazardous waste plan will assure that oil and hazardous substances that are utilized for UARP operation or maintenance are properly stored and that appropriate equipment and supplies are available and appropriate corrective actions are taken in the event of a spill.

74. A requirement for the Licensee to prepare a vegetation and invasive weed management plan, that includes adaptive management measures to address aquatic invasive weeds, will assure that noxious aquatic weed infestations, should they occur in the UARP vicinity, will be addressed. The plan will also include provisions for the conservation of Valley Elderberry plants, which provide habitat for the Valley Elderberry Longhorn Beetle, an endangered species that may be present in the UARP vicinity.

[4] Permits that may be required include: individual waste discharge requirements; the General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Water Quality Order 2009-0009-DWQ and NPDES No. CAS000002, as amended by Order No. 2010-0014-DWQ); Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters (Order No. R5-2008-0081/NPDES Permit No. CAG995001) and/or coverage under Water Quality Order 97-10; and General Waste Discharge Requirements for Discharges to Land by Small Domestic Wastewater Treatment Systems to address potential impacts to groundwater quality.

Construction and Operation of Iowa Hill

75. Detailed design and construction plans for Iowa Hill will not be available prior to issuance of either this certification or the new Commission license for the UARP. The Licensee will be required to consult with the State Water Board, USFWS and CDFG to assure that the design of the intake/outlet structure incorporates features that will reduce potential negative operational impacts. Specific concerns to be considered during the consultation process include the potential for fish entrainment or other adverse impacts on fish populations associated with the intake structure, increased sediment mobilization and/or turbidity within and downstream of Slab Creek Reservoir, and the creation of dangerous hydraulic conditions within Slab Creek Reservoir. The Deputy Director will have approval authority over those aspects of the intake/outlet design that relate to sediment mobilization, turbidity, fish entrainment and the creation of dangerous hydraulic conditions. The Licensee will receive such approval before submitting any final design and construction plans to the Commission for approval, if necessary.

76. Additional permitting actions may be necessary before construction of Iowa Hill can begin. Before the State Water Board can determine whether additional permitting actions are necessary, the Licensee must provide a complete project description and a plan for the associated construction activities. The Licensee will be required to consult with the State Water Board and other state and federal agencies to assure that appropriate measures are implemented that will minimize or avoid potential adverse environmental impacts. This consultation process will be used to identify the necessary regulatory permitting requirements and the scope of the additional environmental review required under CEQA prior to the construction of Iowa Hill. Before construction can proceed, the Licensee must receive approval from the Deputy Director, and if required, an amended water quality certification that includes additional measures to protect water quality and the environmental during the construction and subsequent operation of Iowa Hill.

77. The Licensee will prepare, file and implement a Stormwater Pollution Prevention Plan for the construction of Iowa Hill in conformance with General Permit for Storm Water Discharges Associated with Construction and Land Disturbance activities (Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) No. CAS0000002, as amended by Order No. 2010-0014-DWQ) (Construction General Permit) that was adopted by the State Water Board. This Construction General Permit requires the Licensee to implement best management practices to prevent adverse impacts to water quality that may result from the construction of Iowa Hill and to establish a monitoring program to document compliance.

78. Tunneling and excavation activities associated with the construction of Iowa Hill may affect surface and groundwater resources and may require the discharge of groundwater to surface water. The Licensee will be required to consult with the Central Valley Water Board to identify permitting requirements associated with groundwater resources and will need to develop and implement a plan to manage and monitor groundwater quantity and quality during the construction of Iowa Hill.

79. Hardhead, a California species of special concern, is present both within Slab Creek Reservoir and in the SF American River downstream of Slab Creek Reservoir Dam. Monitoring the spatial distribution of all hardhead life stages before and after Iowa Hill initiates operations will provide information about the hardhead population's response to Iowa Hill, the risk of entrainment into the intake/outlet structure and/or other potential negative impacts associated with discharge velocities near the structure. Monitoring water temperatures in Slab Creek Reservoir's shallow water edge habitat will help to identify whether Iowa Hill operations adversely affect preferred habitat conditions and/or hardhead distribution. Focused-entrainment monitoring that will be required at the intake/outlet structure in Slab Creek Reservoir will establish whether additional measures to reduce entrainment are necessary.

80. Iowa Hill operations will be prohibited from reducing the water temperature below 12°C during summer months in the SF American River downstream of Mosquito Bridge (approximately three miles downstream of Slab Creek Reservoir Dam) to minimize potential disruption of FYL frog reproduction. Temperature monitoring required as a condition of this certification will be used to assess compliance with this prohibition. Similarly, Iowa Hill operations will not be permitted to cause flow fluctuations in the reach below Slab Creek Reservoir Dam, to assure that adverse impacts to aquatic species associated with such fluctuations are minimized.

Water Quality Certification

81. The Federal Clean Water Act (33 U.S.C. §§ 1251-1387) was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (33 U.S.C. § 1251(a).) Section 101 of the Clean Water Act (33 U.S.C. § 1251) requires federal agencies to "co-operate with the State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources."

82. Section 401 of the Clean Water Act (33 U.S.C. § 1341) requires every applicant for a federal license or permit which may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the Clean Water Act, including water quality standards and implementation plans promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Section 401 of the Clean Water Act directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the Clean Water Act and with any other appropriate requirement of state law. Section 401 further provides that certification conditions shall become conditions of any federal license or permit for the project. The State Water Board is the state agency responsible for such certification in California. (Wat. Code § 13160.) The State Water Board has delegated this function to the Executive Director by regulation. (Cal. Code Regs., tit. 23, § 3838, subd. (a).)

83. SMUD originally applied for water quality certification for the UARP on September 22, 2006, and subsequently withdrew its application on September 6, 2007; re-filed it on October 19, 2007, and withdrew the application on September 24, 2008; re-filed it on October 2, 2008, and withdrew the application on September 15, 2009; re-filed it on October 13, 2009, and withdrew the application on September 9, 2010; and re-filed it on October 1, 2010; and withdrew and re-filed the application on September 16, 2011. The State Water Board provided public notice of the application pursuant to California Code of Regulations, title 23, section 3858 on November, 17, 2009, and posted information describing the UARP on the Division of Water Rights' website.

84. The California Regional Water Quality Control Boards adopt, and the State Water Board approves, water quality control plans (basin plans) for each watershed basin in the State. The basin plans designate the beneficial uses of waters within each watershed basin and water quality objectives designed to protect those uses. Section 303 of the Clean Water Act requires the states to develop and adopt water quality standards. (33 U.S.C. § 1313.) The beneficial uses together with the water quality objectives contained in the basin plans and the state and federal anti-degradation requirements constitute State water quality standards under section 303.

85. The Central Valley Water Board adopted, and the State Water Board and the US Environmental Protection Agency (USEPA) approved, the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan). The Basin Plan designates the beneficial uses of waters to be protected along with the water quality objectives necessary to protect those uses.

86. The Basin Plan identifies the beneficial uses for the SF American River watershed from the source to Placerville as: municipal and domestic supply; hydropower generation; water contact recreation; canoeing and rafting; non-contact water recreation; cold freshwater habitat; wildlife habitat; and coldwater spawning, reproduction, and/or early development. Warm freshwater habitat is also identified as a potential use. The beneficial uses designated for the Middle Fork American River watershed from the source to Folsom Lake include: municipal and domestic supply; irrigation, stock watering, hydropower generation; water contact recreation; canoeing and rafting; non-contact water recreation; cold freshwater habitat; wildlife habitat; and coldwater spawning, reproduction, and/or early development. Warm freshwater habitat is also designated as a potential use. The beneficial uses designated for Buck Island and Rubicon reservoirs, located in Desolation Valley, are: water contact recreation; non-contact water recreation; cold freshwater habitat; wildlife habitat; and coldwater spawning, reproduction, and/or early development.

California Environmental Quality Act Compliance

87. SMUD is the lead agency for the purpose of CEQA compliance, while the State Water Board is a responsible agency. SMUD issued Scoping Document 1 and Notice of Preparation on August 8, 2003, and held two formal scoping meetings in Sacramento (September 9 and 10, 2003) and one in Placerville (September 11, 2003) to solicit public input regarding environmental issues related to the relicensing proceeding.

SMUD also issued Scoping Document 2 on May 17, 2004, which provided responses to comments received during the initial scoping process.

88. SMUD determined that the Final Environmental Impact Statement (Final EIS) prepared by the Commission and the USFS pursuant to the National Environmental Policy Act and released on March 14, 2008, satisfied requirements under CEQA for preparation of an Environmental Impact Report except for certain resource areas. SMUD therefore relied upon the environmental analysis contained in the Final EIS except for the specific resource areas that were addressed in a Draft CEQA Supplement that SMUD issued for a 45-day public comment period on May 2, 2008. The Draft CEQA Supplemental Analysis also included a Draft Mitigation and Monitoring Program. A public meeting was held on June 2, 2008, for the purpose of receiving oral and written comments on the Draft CEQA Supplement, at which time SMUD announced it was extending the comment period an additional two weeks until June 30, 2008. As a responsible agency under CEQA, the State Water Board provided comments on SMUD's Draft CEQA Supplemental Analysis on June 30, 2008.

89. SMUD released a Final CEQA Supplement to the Final EIS (State Clearinghouse Number 2008052009) on August 22, 2008, which contained responses to the comments received during the public comment period, including those from the State Water Board. On September 18, 2008, the SMUD Board adopted a resolution certifying that the Final EIS and Final CEQA Supplement comply with the requirements of CEQA, including the CEQA Guidelines, and reflect the SMUD Board's independent judgment and analysis. SMUD has not yet made CEQA findings or issued a Notice of Determination because this will be completed as part of the SMUD Board's final action, which involves approval to accept the new Commission license, which requires issuance of a Section 401 Water Quality Certification.

90. The State Water Board reviewed and considered the Final EIS and Final CEQA Supplement for the UARP prepared by SMUD. As a responsible agency under CEQA, the State Water Board must make findings that address those resource areas over which it has statutory authority. Attachment A of this certification provides the CEQA findings that address potentially significant impacts and the mitigation measures that are required to reduce those impacts to a less-than-significant level. No significant, unavoidable impacts to water resources were identified in either the Final EIS or SMUD's CEQA Supplement.

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER BOARD CERTIFIES THAT CONSTRUCTION AND OPERATION OF THE UPPER AMERICAN RIVER PROJECT BY THE SACRAMENTO MUNICIPAL UTILITY DISTRICT will comply with sections 301, 302, 303, 306, and 307 of the Clean Water Act, and with applicable provisions of State law, if SMUD complies with the following terms and conditions during the UARP activities certified herein.

Conditions Related to Instream Flow and Reservoir Levels

CONDITION 1. MINIMUM INSTREAM FLOW CONDITIONS

General Information

The Licensee shall, beginning as early as reasonably practicable and within three months after license issuance, maintain minimum streamflows as specified in this section in Rubicon River below Rubicon Reservoir Dam, Little Rubicon River below Buck Island Reservoir Dam, Gerle Creek below Loon Lake Reservoir Dam, Gerle Creek below Gerle Creek Reservoir Dam, SF Rubicon River below Robbs Peak Reservoir Dam, SF Silver Creek below Ice House Reservoir Dam, Silver Creek below Junction Reservoir Dam, Silver Creek below Camino Reservoir Dam, Brush Creek below Brush Creek Reservoir Dam, and SF American River below Slab Creek Reservoir Dam.

For compliance purposes, the point of measurement for each required minimum streamflow is described in the introduction to the minimum streamflow schedule, set out below, for that particular stream reach. All specified streamflows are in cfs. The schedules specify minimum streamflows, by month and water year type, for each of the specified stream reaches. The Licensee shall report any deviation from the required minimum flows to the State Water Board and furnish electronic streamflow records upon request.

The minimum streamflows specified in the schedules may be temporarily modified if required by equipment malfunction or operating emergencies reasonably beyond the control of the Licensee. If the streamflow is so modified, the Licensee shall provide Notice to the Commission, USFS, USFWS, CDFG, and the Deputy Director as soon as possible, but no later than 10 days after such incident. The minimum streamflows specified may also be temporarily modified for short periods in non-emergency situations five days after Notice to the Commission, and upon approval by the Deputy Director.

Where facility modification is required to maintain the specified minimum streamflows, the Licensee shall complete such modifications as soon as reasonably practicable and no later than three years after license issuance. Prior to such required facility modifications, the Licensee shall provide the specified minimum streamflows within the capabilities of the existing facilities. In order for the Licensee to adjust operations to meet the required minimum streamflows, the Licensee shall have a three-year period after the license is issued or three years after completion of necessary facility modifications, whichever occurs later, in which daily mean streamflows may vary up to 10 percent below the amounts specified in the minimum streamflow schedules, provided that the average monthly

streamflow in any given month equals or exceeds the required minimum streamflow for the month. After the applicable period, the Licensee shall meet the minimum streamflow requirements specified in the minimum streamflow schedules.

Water Year Types

The minimum streamflow schedules have been separated into five water year types: Wet, AN, BN, Dry, and CD. In addition, a Super Dry (SD) water year is defined for the purpose of reservoir level management. The Licensee shall determine the water year type based on the water year forecast of unimpaired runoff in the American River below Folsom Lake published near the beginning of each month from February through May in the California Department of Water Resources (DWR) Bulletin 120 "Report of Water Conditions in California". Specifically, the "American River Below Folsom Lake" forecast is currently shown in the "Water Year Forecast" column of the "Water Year Unimpaired Runoff" table in DWR Bulletin 120. The water year types are defined as follows:

Year Type	American River Water Year Forecast
Wet	greater than or equal to 3.500 Million Acre-Feet (MAF)
AN	greater than or equal to 2.600 MAF but less than 3.500 MAF
BN	greater than or equal to 1.700 MAF but less than 2.6.00 MAF
Dry	greater than or equal to 0.900 MAF but less than 1.700 MAF
CD	less than 0.900 MAF
SD	any CD year that is immediately preceded by a Dry or CD year or any Dry year that is immediately preceded by any combination of two Dry or CD years

Each February through May, the Licensee shall determine the water year type based on the DWR Bulletin 120 forecast and shall operate for that month based on that forecast beginning three days after issuance of the forecast and continuing until two days after issuance of a subsequent monthly forecast. The May forecast shall be used to establish the final water year type for the remaining months of the water year and the month of October. The water year type for the months of November through January shall be based on DWR's Full Natural Flow record for the American River at Folsom (California Data Exchange Center Site AMF sensor 65) for the preceding water year, and the Licensee shall operate based on that record beginning November 1. The Licensee shall provide notice to the Commission, USFS, USFWS, CDFG, and the Deputy Director of the final water year type determination within 30 days of the May forecast.

1.A. Rubicon River below Rubicon Reservoir Dam

The Licensee shall maintain the minimum streamflow specified in the following schedule (Table 3) based on month and water year type. During the months of March, April, and May, required modifications to minimum streamflows may occur within a 14-calendar-day window beginning seven days prior to the first day of the month, if inclement weather conditions prevent access to the minimum streamflow release valve. However, the May minimum streamflow shall be no less than 30 days in duration. Minimum streamflows shall be measured at either United States Geological Survey (USGS) gage 11427960, located

at the outlet structure on the Rubicon Reservoir Dam, or a new gaging station that is approved through the Streamflow and Reservoir Elevation Gaging Plan (Condition 6).

Table 3. Rubicon River below Rubicon Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
November	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
December	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
January	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
February	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
March	6 or NF*	8	15	15	15
April	8	12	20	20	20
May	10	15	35	35	35
June	6 or NF*	8	15	15	15
July	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
August	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*
September	6 or NF*	6 or NF*	6 or NF*	6 or NF*	6 or NF*

*If Natural Flow (NF) measured in the Rubicon River above Rubicon Reservoir is below 1 cfs, the minimum streamflow shall be 1 cfs. In CD water year types, if the useable storage in Rubicon Reservoir is less than 60 ac-ft and the Licensee cannot maintain 1 cfs due to lack of NF into and storage in Rubicon Reservoir, the Licensee shall make every effort to notify USFS, USFWS, CDFG, and State Water Board at least 30 days prior to the date upon which the Licensee will not meet the streamflow, or as much in advance as possible. After notification of USFS, USFWS, CDFG, and State Water Board, the Licensee may reduce minimum flows below 1 cfs, but at no time shall the minimum streamflow be less than the NF into Rubicon Reservoir, until sufficient water is available to resume prescribed minimum streamflow releases.

For the protection of aquatic species, the Licensee shall maintain an over-wintering minimum pool elevation of 6,527 feet in Rubicon Reservoir once the reservoir begins to freeze. When the reservoir elevation drops below an elevation of 6,527 feet, streamflow releases from Rubicon Reservoir shall equal the lesser of either the applicable flow listed in the table or the natural flow into Rubicon Reservoir.

1.B. Little Rubicon River below Buck Island Reservoir Dam

The Licensee shall maintain the minimum streamflow specified in the following schedule (Table 4) based on month and water year type. During the months of March, April and May, required modifications to minimum streamflows may occur within a 14-calendar day window beginning seven calendar days prior to the first day of the month, if inclement weather conditions prevent access to the minimum streamflow release valve. However, the May minimum streamflow shall be no less than 30 days in duration. Minimum streamflows shall be measured at USGS gage 11428400, located at the outlet structure on Buck Island Reservoir Dam.

Table 4. Little Rubicon River below Buck Island Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	1*	1*	1*	1*	1*
November	1*	1*	1*	1*	1*
December	1*	1*	1*	1*	1*
January	1*	1*	1*	1*	1*
February	1*	1*	1*	1*	1*
March	1*	2	3	3	3
April	2	3	5	5	5
May	2	3	8	8	8
June	1*	2	3	3	3
July	1*	1*	1*	1*	1*
August	1*	1*	1*	1*	1*
September	1*	1*	1*	1*	1*

*If NF measured in Highland/Rockbound Creek above Buck Island Reservoir is below 1 cfs, the minimum flow shall be 1 cfs. In CD water year types, if the useable storage in Buck Island Reservoir is less than 60 ac-ft and the Licensee cannot maintain 1 cfs due to lack of NF into and storage in Buck Island Reservoir, the Licensee shall make every effort to notify USFS, USFWS, CDFG, and State Water Board at least 30 days prior to the date upon which the Licensee will not meet the streamflow, or as much in advance as possible. After notification of USFS, CDFG, USFWS, and State Water Board, the Licensee may reduce minimum flows below 1 cfs, but at no time shall the minimum streamflow be less than the NF into the Buck Island Reservoir, until sufficient water is available to resume prescribed minimum streamflow releases.

1.C. Gerle Creek below Loon Lake Reservoir Dam

The Licensee shall maintain the minimum streamflow specified in the following schedule (Table 5) based on month and water year type. Minimum streamflow shall be measured at USGS gage 11429500, located approximately 0.3 mile downstream from Loon Lake Reservoir Dam.

Table 5. Gerle Creek below Loon Lake Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	7	11	16	20	23
November	7	11	16	20	23
December	8	13	18	22	26
January	12	15	19	23	28
February	14	18	22	27	32
March	19	24	30	37	44
April	23	32	40	49	58
May	25	32	40	49	58
June	10	16	22	27	32
July	5	14	22	27	32
August	5	10	14	17	20
September	5	10	14	17	20

1.D. Gerle Creek below Gerle Creek Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 6 based on month and water year type. Minimum streamflow shall be measured at a gaging device located immediately downstream of Gerle Creek Reservoir Dam.

Table 6. Gerle Creek below Gerle Creek Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	5	9	10	10	10
November	4	4	6	6	6
December	4	5	6	6	6
January	5	6	6	6	6
February	5	6	6	6	6
March	7	10	12	9	9
April	9	12	15	9	9
May	9	12	15	15	15
June	9	12	15	15	15
July	7	10	13	15	15
August	5	9	12	12	12
September	5	9	10	10	10

1.E. South Fork Rubicon River below Robbs Peak Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 7 based on month and water year type. Minimum streamflow shall be measured at a gaging device located immediately downstream of Robbs Peak Reservoir Dam.

Table 7. South Fork Rubicon River below Robbs Peak Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	3	3	3	3	3
November	1	2	3	3	3
December	1	3	4	4	4
January	2	5	7	7	7
February	2	5	8	8	8
March	3	7	11	9	9
April	4	9	13	10	10
May	4	9	13	13	13
June	4	9	13	13	13
July	3	5	6	13	13
August	3	5	6	11	11
September	3	5	6	6	6

1.F. South Fork Silver Creek below Ice House Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 8 based on month and water year type. Minimum streamflow shall be measured at USGS gage 11441500, located approximately 0.4 mile downstream from Ice House Reservoir Dam.

Table 8. South Fork Silver Creek below Ice House Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	5	10	15	15	15
November	5	7	8	8	8
December	5	8	11	11	11
January	6	12	18	18	18
February	6	12	18	18	18
March	8	16	24	24	24
April	15	28	41	41	41
May	30	46	68	68	68
June	25	31	46	46	46
July	21	21	30	30	30
August	14	14	15	15	15
September	10	10	15	15	15

1.G. Silver Creek below Junction Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 9 based on month and water year type. Minimum streamflow shall be measured at USGS gage 11441800, located at the outlet structure on Junction Reservoir Dam.

Table 9. Silver Creek below Junction Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	5	10	15	15	15
November	5	7	20	20	20
December	5	8	20	20	20
January	6	12	20	20	20
February	6	12	20	20	20
March	8	16	25	25	25
April	15	28	42	42	42
May	30	46	68	68	68
June	25	31	50	59	59
July	21	21	30	35	35*
August	14	14	15	18	18*
September	10	10	15	18	18*

* The Licensee may be required to release additional water below Junction Reservoir Dam in Wet years (see Condition 1.I. – Adaptive Water Temperature Management in Silver Creek below Junction and Camino Reservoir Dams, below).

1.H. Silver Creek below Camino Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 10 based on month and water year type. Minimum streamflow shall be measured at USGS gage 11441900, located approximately 0.4 mile downstream from Camino Reservoir Dam. Facilities improvements to provide these flows may include new release valves and/or installation of a new minimum flow turbine.

Table 10. Silver Creek below Camino Reservoir Dam
Minimum Streamflow by Water Year Type (cfs)

Month	CD	DRY	BN	AN	WET
October	5	10	15	15	15
November	5	7	20	20	20
December	5	8	20	20	20
January	6	12	20	20	20
February	6	12	20	20	20
March	8	16	25	25	25
April	15	28	42	42	42
May	30	46	68	68	68
June	25	31	50	59	59
July	21	21	30	35	35*
August	14	14	15	18	18*
September	10	10	15	18	18*

* The Licensee may be required to release additional water below Camino Reservoir Dam in Wet years (see Condition 1.I. – Adaptive Water Temperature Management in Silver Creek below Junction and Camino Reservoir Dams, below).

1.I. Adaptive Water Temperature Management in Silver Creek below Junction and Camino Reservoir Dams

The Licensee shall be required to annually release additional water into Silver Creek below Junction Reservoir and Camino Reservoir Dams as shown in Table 11 in the months of July, August, and/or September in Wet water year types for temperature control upon approval of the Deputy Director in accordance with the plan described below. A block of water shall not exceed the acre-feet of water described in Table 11.

Table 11. Adaptive Management Block of Water for Water Temperature Moderation at Silver Creek below Junction Reservoir and Camino Reservoir Dams (Wet Years Only)

Month	Water Quantity (acre-feet)
July	1,044
August	491
September	475

The block of water specified shall be the total amount of additional water available for release in the specified time periods. The block of water shall be made available during

the first Wet year that occurs once the initial minimum streamflows are implemented and for all subsequent Wet years through the remainder of the license term.

Within one year of license issuance, the Licensee shall, in consultation with the State Water Board, CDFG, USFWS, and USFS, develop a plan for the block of water that addresses, at a minimum: notification protocols for temperature exceedances, emergency temperature operation contingencies, and ecological monitoring needs associated with use of the block of water. The plan shall be approved by the Deputy Director[5] prior to submitting it to the Commission, if Commission approval is needed. The Deputy Director may require modifications as part of the approval.

The Licensee shall release the block of water as directed by the approved plan to maintain mean daily water temperature of 20ºC or below in Junction and/or Camino Dam reaches. The block of water shall be made available if water temperature exceeds a daily mean water temperature of 20ºC in Silver Creek below Junction Reservoir Dam, as measured in Silver Creek immediately upstream of Camino Reservoir, and below Camino Dam immediately upstream of the confluence with the SF American River (at or near discontinued USGS gage 11442000, Licensee station SC1).

The Licensee shall install and maintain a temperature gage on Silver Creek immediately upstream of Camino Reservoir to measure water temperature in Silver Creek below Junction Reservoir Dam. The Licensee shall also install and maintain a temperature gage on Silver Creek upstream of SF American River at or near the site of discontinued USGS gage 11442000 (Licensee station SC1). Within two years of license issuance, the Licensee shall develop and install a telemetry system on Silver Creek upstream of the confluence with the SF American River that provides daily access to hourly temperature monitoring data. The Licensee shall, promptly but not later than within 24 hours, notify the State Water Board, CDFG, USFWS, and USFS if the water temperatures in Silver Creek below Junction Reservoir Dam or below Camino Dam exceed the 20ºC water temperature objective.

If the water temperature objective is exceeded, the Licensee may be required to monitor for the presence of FYL frogs prior to and after the release of the block of water according to the approved plan described above.

1.J. Brush Creek below Brush Creek Reservoir Dam

The Licensee shall maintain the minimum streamflow specified below in Table 12 based on month and water year type. Minimum streamflow shall be measured at USGS gage 11442700, located at the outlet structure on Brush Creek Reservoir Dam.

[5] Throughout this water quality certification, the Deputy Director's or State Water Board's approval authority includes the authority to withhold approval or to require modification of a proposal or plan prior to approval. The State Water Board may also take enforcement action if the Licensee fails to provide and implement a required plan in a timely manner.

Table 12. Brush Creek below Brush Creek Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs)					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	4 or NF*	4 or NF*	4 or NF*	4 or NF*	4 or NF*
November	6 or NF*	7 or NF*	8 or NF*	9 or NF*	9 or NF*
December	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
January	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
February	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
March	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
April	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
May	6 or NF*	7 or NF*	8 or NF*	9 or NF*	10 or NF*
June	6 or NF*	7 or NF*	8 or NF*	9 or NF*	9 or NF*
July	5 or NF*	5 or NF*	5 or NF*	5 or NF*	5 or NF*
August	4 or NF*	4 or NF*	4 or NF*	4 or NF*	4 or NF*
September	3 or NF*	3 or NF*	3 or NF*	3 or NF*	3 or NF*

* If NF measured in Brush Creek above Brush Creek Reservoir is below 1 cfs, the minimum flow shall be 1 cfs.

1.K. South Fork American River below Slab Creek Reservoir Dam

The Licensee shall maintain the minimum streamflow specified in the following schedule (Table 13) based on month and water year type for Years 1 through 3 of the new license in order to allow facility modifications to be completed at this location. In months with more than one minimum streamflow, the Licensee shall maintain each minimum streamflow listed for 1 week prior to implementing the next minimum streamflow for the month. Minimum streamflow shall be measured at USGS gage 11443500, located approximately 500 feet upstream from Iowa Canyon Creek.

Table 13. South Fork American River below Slab Creek Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs): Years 1 through 3					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	63	63	70	80	90
November	63	63	70	80	90
December	63	63	70	80	90
January	63	63	70	80	90
February	63	63	70	80	90
March	63	101	110-130-150-180	110-130-150-180	110-130-150-180
April	100	101-132-156-183	188-197-213-222	188-197-213-222	188-197-213-222
May	109	164-145-126-107	229-236-247-263*	229-236-247-263*	229-236-247-263*
June	90	90	228-193-158-123	228-193-158-123	228-193-158-123
July	77	90	90	90	90
August	63	70	70	70	70
September	63	63	70	70	70

* Or maximum capacity of the existing valve, whichever is less.

The Licensee shall maintain the minimum streamflow specified in the following schedule (Table 14) based on month and water year type for Years 4 through the end of the new license term. In months with more than one minimum streamflow, the Licensee shall maintain each minimum streamflow listed for 1 week prior to implementing the next minimum streamflow for the month. Minimum streamflow shall be measured at USGS gage 11443500, located approximately 500 feet upstream from Iowa Canyon Creek. Facilities improvements may include new release valves and/or higher capacity minimum flow turbine upgrades to current facilities.

Table 14. South Fork American River below Slab Creek Reservoir Dam					
Minimum Streamflow by Water Year Type (cfs): Years 4 through License Term					
Month	**CD**	**DRY**	**BN**	**AN**	**WET**
October	63	63	70	80	90
November	63	63	70	80	90
December	63	63	70	80	90
January	63	63	70	80	90
February	63	63	70	80	90
March	63	101	110-130-150-180	110-130-150-180	110-130-150-180
April	100	110-130-150-183	222-236-247-263	222-236-247-263	222-236-247-263
May	109	164-145-126-107	272-286-297-303	272-316-367-395	272-337-387-415
June	90	90	255-210-165-120	324-256-188-120	352-274-197-120
July	77	90	90	90	90
August	63	70	70	70	70
September	63	63	70	70	70

CONDITION 2. PULSE FLOW CONDITIONS

General Background

The Licensee shall, beginning as early as reasonably practicable and within three months after license issuance, but not prior to the implementation of the new minimum streamflows, provide annual pulse flow events in Rubicon River below Rubicon River Reservoir Dam, Gerle Creek below Loon Lake Reservoir Dam, and SF Silver Creek below Ice House Reservoir Dam as specified in the following pulse flow schedule by water year type.

For compliance purposes, the point of measurement for each required pulse flow is included. All specified pulse flows are in cfs. Pulse flows do not need to be implemented in water years where natural spill events provide flows of equivalent magnitude and duration during either: (1) spring snowmelt runoff; or (2) a natural storm event that occurs in the months of January through May in the specific watershed in which a pulse flow is required. The Licensee shall furnish the streamflow records that show compliance with the pulse flow requirements to the State Water Board upon request.

The pulse flows specified in the following schedule may be temporarily modified if required by equipment malfunction or operating emergencies reasonably beyond the control of the Licensee. If a pulse flow is so modified, the Licensee shall provide Notice to the

Commission, USFS, USFWS, CDFG, and the State Water Board as soon as possible but no later than 10 days after each such incident commences. The pulse flows specified may also be temporarily modified for short periods in non-emergency situations upon approval of the Deputy Director.

Where facility modification is required to provide the specified pulse flows, the Licensee shall make such modifications as soon as reasonably practicable and no later than three years after license issuance. Prior to such required facility modifications, the Licensee shall provide evidence (such as flow records) to the Deputy Director by July 1 of each year that shows whether the specified pulse flows have been delivered within the capabilities of the existing facilities.

2.A. Rubicon River below Rubicon Reservoir Dam

The Licensee shall provide a pulse flow in Rubicon River below Rubicon Reservoir Dam in BN, AN, and Wet water years to coincide with winter storm events or spring snowmelt runoff in the Rubicon River watershed. The objective is to provide at least 600 cfs of flow for three days during this time period. A natural spill of 3,600 acre-feet or more within three consecutive days that coincides with a winter storm event or spring snowmelt runoff satisfies the pulse flow requirement for the water year.

If a pulse flow does not occur naturally, the pulse flow shall be provided by using the existing flashboards at the Rubicon tunnel headworks. Prior to pulse flow events, the Licensee shall meet with USFS, CDFG, State Water Board, and USFWS to evaluate snowpack conditions in the Rubicon River watershed and determine the appropriate gate elevation (at or above 6,539 feet) and timing for tunnel gate installation. Upon agreement of the parties and approval of the USFS for action within the Desolation Valley Wilderness Area, the Licensee shall install and lower the tunnel gates as agreed to in said meeting.

The tunnel gates may be removed after one of the following events occurs: (1) the April or May DWR Bulletin 120 indicates a Dry or CD water year type; (2) the flashboards have been installed for a minimum of 60 days; (3) a pulse flow event of 3,600 acre-feet occurs within three consecutive days; or (4) at least 3,600 acre-feet of water has spilled over the main and auxiliary dams over a 10-day period.

Subsequent to removal of the tunnel gates, the Licensee shall meet with the USFS, CDFG, State Water Board, and USFWS to evaluate whether or not the pulse flow objective was met and how tunnel gate operations might be changed to meet the pulse flow objective in future years. The quantity and/or duration threshold in item 4 in the preceding paragraph may also be re-evaluated during said meeting.

The pre- and/or post-pulse flow meetings described above may be discontinued if the Licensee, CDFG, State Water Board, and USFWS agree upon a tunnel gate operation plan approved by the USFS that governs future tunnel gate operations for pulse flow events. However such meetings may be reinstated at the request of the Licensee, CDFG, State Water Board or USFWS if the pulse flow objectives are not being met.

The pulse flows shall be measured at either USGS gage 11427960, located at the outlet structure on Rubicon Reservoir Dam, or at a new gaging station located downstream of the confluence of the spillway on the main dam and the spillway on the auxiliary dam.

2.B. Gerle Creek below Loon Lake Reservoir Dam

The Licensee shall provide pulse flows timed to coincide with spring snowmelt runoff as specified in the following schedule (Table 15) based on month and water year type. The pulse flows shall be measured at USGS gage 11429500, located approximately 0.3 miles downstream from Loon Lake Reservoir Dam.

Table 15. Gerle Creek below Loon Lake Reservoir Dam Pulse Flows (cfs)

	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.

Within two years of license issuance and prior to implementing the pulse flows in Gerle Creek below Loon Lake Reservoir Dam, the Licensee shall complete the following investigations to develop the information necessary to determine the appropriate magnitude of pulse flows:

1. A sensitive site investigation to address the potential for stream bank erosion resulting from pulse flows, which includes additional permanent cross-sections to characterize the upper and middle geomorphology study sites LL-G1 and LL-G2.[6] Areas of unstable banks and downed logs obstructing streamflow shall be mapped. A professional riparian ecologist shall participate in the investigation.

2. Test pulse releases shall be made from the outlet works at different levels up to the prescribed 740 cfs or the maximum capacity of the outlet works, whichever is less, to determine the appropriate pulse flows for the desired channel conditions. The desired outcomes from the pulse flows are to redefine the stream channel, sort the spawning gravel and transport the bedload and fine material downstream.

3. Analysis of the effects of the pulse flows on downstream features including bridges, campgrounds, and day-use areas for potential impacts from the pulse flows.

Once these items are completed, USFS, with the concurrence of the Deputy Director, may adjust the prescribed pulse flows if the results of the investigation indicate this is necessary to reach the objectives of restoring the stream channel to a proper functioning condition. The final pulse flows shall not exceed those described in the pulse flow schedule.

[6] Study site designations and locations are described in the Channel Morphology Technical Report prepared during the relicensing proceeding.

2.C. South Fork Silver Creek below Ice House Reservoir Dam

The Licensee shall provide pulse flows as specified in the following schedule (Table 16) based on month and water year type. Pulse flows may be timed to coincide with winter storm events in the period between December 15 and April 10. Pulse flow events timed with winter storm events prior to April 10 shall be based on the prior water year type and shall be deemed complete regardless of revisions in water year type occurring after the pulse flow event takes place. The Licensee shall notify USFS, CDFG, USFWS, and State Water Board prior to or immediately after the pulse flow event.

Pulse flows after April 10 shall be timed to coincide with spring snowmelt runoff. The Licensee shall notify the Deputy Director regarding the specific timing of such pulse flow events prior to the pulse flow event. The pulse flows shall be measured at USGS gage 11441500, located approximately 0.4 mile downstream from Ice House Reservoir Dam.

Table 16. South Fork Silver Creek below Ice House Reservoir Dam Pulse Flows (cfs)

	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

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

CONDITION 3. RAMPING RATES

The Licensee shall, beginning as early as reasonably practicable and within three months after license issuance, use a ramping rate of 1 foot per hour when making the following Licensee-controlled releases:

A. Pulse flow releases in Gerle Creek below Loon Lake Reservoir Dam and SF Silver Creek below Ice House Reservoir Dam.

B. Minimum streamflow releases in Silver Creek below Junction Reservoir Dam, Silver Creek below Camino Reservoir Dam, and SF American River below Slab Creek Reservoir Dam.

C. Recreational streamflow releases in SF Silver Creek below Ice House Reservoir Dam and SF American River below Slab Creek Reservoir Dam.

The ramping rate shall be measured at the streamflow gaging stations located immediately downstream of each of the release points. Where facility modification is required to provide the specified ramping rates, the Licensee shall complete such modifications as

soon as reasonably practicable and no later than three years after license issuance[7]. Prior to such required facility modifications, the Licensee shall make a good faith effort to provide the specified ramping rates within the capabilities of the existing facilities. When recreational streamflow releases are made during the time period prior to facility modification at Slab Creek Reservoir Dam, the Licensee shall provide flow records or other information to the Deputy Director by December 1 of each year that show whether the ramping rates specified above have been achieved.

Upon request, the Licensee shall make available to the State Water Board the streamflow records related to ramping rates. The Licensee shall be excused from complying with the ramping rate requirements in the event of law enforcement or search and rescue activities, Division of Safety of Dams compliance requirements, equipment malfunction or failure that is directly related to providing the specified ramping rates, or a large storm event that is beyond its ability to control. The Licensee shall provide notice to USFS, CDFG, USFWS, and the State Water Board within 10 days after such an event occurs and shall provide a report within 1 month after such an event occurs documenting the reason that ramping rates were not followed.

CONDITION 4. RECREATION STREAMFLOWS[8]

4.A. South Fork American River below Slab Creek Reservoir Dam

Initial Period

Within three months of license issuance, the Licensee shall provide recreational streamflows in the SF American River below Slab Creek Reservoir Dam as follows. In BN, AN, and Wet water years, the Licensee shall spill water from Slab Creek Reservoir to provide streamflows between 850 and 1,500 cfs between the hours of 10:00 am and 4:00 pm for six days in no less than three events in the period beginning March 1 and ending May 31. One of the events may be replaced with a three-day event on the Memorial Day weekend, in which case the total number of days for the year will be increased to seven days.

These recreational streamflows shall be provided until Iowa Hill is constructed, or if Iowa Hill is not constructed, until Year 15 after license issuance. If Iowa Hill is not constructed, and the triggers described below for increase in recreational streamflow days have not been met by Year 15 after license issuance, these recreational streamflows shall continue to be provided after Year 15.

[7] SMUD has the ability with its current infrastructure to monitor and report on ramping rates at the five facilities where ramping rates are specified (Loon Lake, Ice House, Junction, Camino, and Slab Creek dams). Recreational streamflow releases from Slab Creek Dam may require facility modification depending upon future boating use (see Condition 4 below). Recreational streamflow releases will be made by spilling at Slab Creek Dam during the time period prior to any future facility modification.

[8] The provisions for determining the water year type and the notification requirements regarding water year type are the same as those described above in Condition 1 - Minimum Instream Flow Conditions.

Future Recreational Streamflows

The Licensee shall provide recreational streamflows in the SF American River below Slab Creek Reservoir Dam as shown in Table 17 either: (1) after Iowa Hill is constructed, or (2) in Year 15 of license issuance if the triggers described below for increase in recreational streamflow days have been met.

Table 17. Recreation Flows: South Fork American River below Slab Creek Dam

Water Year Type	Month	Flow (cfs)	Time	Duration	Purpose
CD	April	850-950 **Plus*** 1400-1500 850-950	10 am-1 pm **Plus*** 10 am-1 pm 1:30 pm-4 pm	4 weekend days **Plus*** 2 weekend days	Kayak **Plus*** Rafting Kayak
D	March/April	850-950 **Plus*** 1400-1500 850-950	10 am-1 pm **Plus*** 10 am-1 pm 1:30 pm-4 pm	4 weekend days **Plus*** 6 weekend days	Kayak **Plus*** Rafting Kayak
	October**	850-950	10 am-1 pm	2 weekend days	Kayak
BN	April/May	850-950 **Plus*** 1400-1500 850-950	10 am-1 pm **Plus*** 10 am-1 pm 1:30 pm-4 pm	3 weekend days*/holidays **Plus*** 9 weekend days***/holidays	Kayak **Plus*** Rafting Kayak
	October**	850-950	10 am-1 pm	6 weekend days	Kayak
AN	April/May	1400-1500 850-950	10 am-1 pm 1:30 pm-4 pm	12 weekend days***/holidays	Rafting Kayak
	October**	850-950	10 am-1 pm	6 weekend days	Kayak
W	March/April/ May	1400-1500 850-950	10 am-1 pm 1:30 pm-4 pm	12 weekend days***/holidays	Rafting Kayak
	October**	850-950	10 am-1 pm	6 weekend days	Kayak

* During CD, D and BN water years, a split flow schedule is required to allow the preferred rafting flow and kayaking flow to occur during the same day, which is in addition to the requirement to provide the specified kayak flows.

** Refer to October Flows section below.

*** Priority shall be given to recreational streamflows on Memorial Day weekend.

October Flows

The Licensee shall only provide the October recreation streamflows specified above in Table 17 upon a determination by the Deputy Director that such streamflows can be provided in compliance with water quality standards and without unacceptable environmental impact. The determination made by the Deputy Director shall be based on an investigation of the potential for ecologically suitable recreational streamflow based on monitoring identified in Condition 8.C. – Amphibian and Reptile Monitoring, below. The initial evaluation and determination shall be made within five years of license issuance. Absent a determination that such streamflows can be provided, the Licensee shall annually request that the subject be reconsidered by the USFS, State Water Board, USFWS, and CDFG for the first ten years after the initial determination.

If October flows specified in Table 17 cannot be provided for operational, environmental, or other reasons, the equivalent flow volume will be provided in addition to the specified recreational streamflows for the following spring upon approval of the Deputy Director. Scheduled boating days shall not exceed the total displayed in the table above. However, if October flows are provided the following spring, the boating days in the spring may exceed those displayed in the table. In addition, the frequency and magnitude of the boating flows may be adjusted within the total volume of water displayed in the table after consultation with USFS, State Water Board, CDFG, USFWS, and BLM, and upon approval of the Deputy Director.

Modification of Recreational Flows

Recreational streamflows may be modified or suspended in response to the following events:

- State or federal electrical emergencies where specific orders are issued or specific actions are mandated by an authority that require the Licensee to produce electricity outside normal planned operations;
- System events that cause SMUD's Operating Reserves to drop below the Western Energy Coordinating Council Minimum Operating Reliability Criteria;
- Equipment malfunction, public safety emergency, or law enforcement activity;
- Control of spill events at Slab Creek Reservoir Dam that may cause the Licensee to spill Loon Lake, Union Valley, or Ice House Reservoirs within seven days of the recreational spill event; or
- The Licensee determines expected inflows from SF American River into Slab Creek Reservoir are not controllable to 1,500 cfs.

In the event boating days are modified or suspended, the Licensee shall reschedule days as soon as practicable. However, the Licensee shall not be obligated to provide such days if weather or other operational conditions do not permit such days to be rescheduled by May 31. Preference for rescheduled days shall be weekend days; however, weekdays may be substituted if there are not sufficient weekend days prior to May 31.

Consultation and Monitoring

Consultation shall take place among the Licensee, USFS, BLM and the State Water Board no later than February 15 of each year to determine a preliminary flow schedule, if any is required based on the circumstances. Additional consultation shall take place as necessary, and final notification to the agencies of days of flow will be made no less than three days in advance.

Within three months of license issuance and continuing at least through Year 5, the Licensee shall monitor all boating use taking place on days when recreational streamflows are provided. The monitoring plan shall include but is not limited to a complete accounting of all boating users entering the SF American River in the 1/2 mile below Slab Creek Reservoir Dam, a description of the type of watercraft being used, and, to the extent possible, a determination of the location where the boaters are ending their trip.

If Iowa Hill construction has not commenced at the end of Year 5 after license issuance, monitoring shall continue and the Licensee shall, in cooperation with USFS, State Water Board, and BLM, prepare a Whitewater Boating Recreation Plan (Boating Plan) that describes whitewater recreation use and impacts and establishes triggers based on actual boating use that would determine if the Licensee shall install a valve or make other facility modifications sufficient to deliver the recreational streamflows described in Table 17. The Licensee shall implement the Boating Plan upon approval by the Deputy Director and upon receipt of any other necessary regulatory approvals. The Deputy Director may require modifications as part of the approval.

If construction of Iowa Hill has not commenced at the end of Year 10 after license issuance, the Licensee shall, in cooperation with USFS, State Water Board, and BLM, determine if the facility must be modified based on the information collected as a result of the Boating Plan. This determination shall be filed with the Commission, following approval by the Deputy Director.

If Iowa Hill is not constructed, and if the triggers specified in the Boating Plan have not been met by Year 10, boating use will continue to be monitored and a new determination will be made every 5 years as to whether the triggers have been met. Once they are met, the facilities will be modified and the recreational streamflows described in Table 17 shall be implemented through the term of the license.

If the Licensee cannot provide recreation streamflows due to construction activities associated with Iowa Hill or other facility modifications, the Licensee shall meet with USFS, State Water Board, and BLM to develop an interim plan to address recreation streamflows. The Licensee shall implement the interim plan upon approval of the Deputy Director and upon receipt of any other necessary regulatory approvals. The Deputy Director may require modifications as part of the approval.

4.B. South Fork Silver Creek below Ice House Reservoir Dam

Initial Period

Within three months after license issuance, the Licensee shall provide the recreation streamflows displayed in Table 18 for the first five years after license issuance:

Table 18. Recreation Flows: South Fork Silver Creek below Ice House Reservoir Dam (First Five Years)

Water Year Type	Month	Flow (cfs)	Time	Duration
CD	May	300	10 am-3 pm	1 weekend day
D	May	300	10 am- 3 pm	3 weekend days
BN	May/June	400 **Plus*** 500	10 am- 3 pm	2 weekend days/holidays **Plus*** 2 weekend days/holidays
AN	May/June	400 **Plus*** 500	10 am- 3 pm	2 weekend days/holidays **Plus*** 4 weekend days/holidays
W	May/June	400 **Plus*** 500	10 am- 3 pm	4 weekend days/holidays or Fridays **Plus*** 5 weekend days/holidays or Fridays

* Two different flow levels are required for the specified number of days.

Consultation and Monitoring

Prior to the end of the five-year period, the Licensee shall prepare a recreation plan that is approved by the Deputy Director to determine triggers based on actual boating use for establishing when the Licensee shall increase the number of days of recreation streamflows to be provided. Within five years of license issuance and every five years thereafter, the Licensee shall, in cooperation with USFS, prepare a report describing whitewater recreation use and impacts, and whether use has exceeded predetermined triggers such that recreation streamflow days should be adjusted. Boating days shall not exceed the total amount displayed in Table 19 below. Table 19 contains the required recreation flows for Silver Creek below Ice House Reservoir Dam for the remainder of the license term subsequent to the initial five-year period following license issuance. However, the frequency and magnitude of the boating flows may be adjusted within the total volume of water displayed in the tables upon approval of the Deputy Director. This report shall be filed with the Commission following approval by the Deputy Director.

Table19. Recreation Flows: South Fork Silver Creek below Ice House Reservoir Dam (Second Five Years and Thereafter)				
Water Year Type	**Month**	**Flow (cfs)**	**Time**	**Duration**
CD	May	300	10 am-3 pm	2 weekend days
D	May	300	10 am- 3 pm	6 weekend days
BN	May/June	400 **Plus*** 500	10 am- 3 pm	5 weekend days/holidays **Plus*** 2 weekend days/holidays
AN	May/June	400 **Plus*** 500	10 am- 3 pm	5 weekend days/holidays **Plus*** 6 weekend days/holidays
W	May/June	400 **Plus*** 500	10 am- 3 pm	7 weekend days/holidays or Fridays **Plus*** 9 weekend days/holidays or Fridays

* Two different flow levels are required for the specified number of days.

Modification of Recreational Streamflows

All provisions for recreation streamflows are subject to the safe operation of the UARP facilities and equipment necessary to provide such streamflows. The Licensee shall maintain all UARP facilities and equipment in good working order. The Licensee shall not schedule discretionary equipment outages in conflict with the recreation streamflows described above. The Licensee shall provide scheduled recreation streamflows on the days when such releases are forecast to occur.

The recreation streamflows described above may be temporarily modified for:

- State or federal electrical emergencies where specific orders are issued or specific actions are mandated by an authority that require the Licensee to produce electricity outside normal planned operations;
- System events that cause the Operating Reserves to drop below the Western Energy Coordinating Council Minimum Operating Reliability Criteria; or
- Equipment malfunction, public safety emergency, or law enforcement activity.

If the described recreation streamflows are so modified, the Licensee shall provide notice to the Commission, State Water Board, and USFS as soon as possible but no later than 10 days after such incident. The described recreation streamflows may also be temporarily modified for short periods in non-emergency situations upon approval of the Deputy Director. If the described recreation streamflows are so modified, the Licensee shall provide notice to the Commission, Deputy Director, and USFS.

CONDITION 5. RESERVOIR LEVELS

The Licensee shall, beginning as early as reasonably practicable and within six months after license issuance, meet or exceed the end-of-month reservoir elevations for Loon Lake, Union Valley and Ice House Reservoirs as shown in the following tables. Compliance will be measured at the Licensee's reservoir elevation gages as published by the USGS.

5.A. Loon Lake Reservoir

Maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 20 below.

Table 20. Loon Lake Reservoir Level by Water Year					
Month	**End-of-Month Elevation (feet)**				
	CD	**DRY**	**BN**	**AN**	**WET**
July	6,388	6,395	6,399	6,400	6,400
August	6,382	6,389	6,394	6,393	6,393
September	6,379	6,385	6,390	6,390	6,390

5.B. Union Valley Reservoir

Maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 21 below.

Table 21. Union Valley Reservoir Level by Water Year					
Month	**End-of-Month Elevation (feet)**				
	CD	**DRY**	**BN**	**AN**	**WET**
July	4,816	4,836	4,856	4,856	4,856
August	4,803	4,827	4,835	4,841	4,842
September	4,796	4,818	4,830	4,830	4,830

5.C. Ice House Reservoir

Maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 22 below.

Table 22. Ice House Reservoir Level by Water Year (feet)					
Month	**End-of-Month Elevation**				
	CD	**DRY**	**BN**	**AN**	**WET**
July	5,435	5,437	5,440	5,441	5,441
August	5,430	5,433	5,434	5,435	5,434
September	5,420	5,429	5,430	5,431	5,430

5.D. Gerle Reservoir

The Licensee shall make every reasonable effort to maintain the water surface in Gerle Reservoir at as high an elevation as practicable, and with a minimum of fluctuation, from

May 1 to September 10 of each year in order to provide maximum recreational benefits, including accessibility and the ability to fish from the fishing pier. If the Licensee anticipates the reservoir will be drawn down below 5,225 feet during this time period, the Licensee shall consult with USFS, State Water Board, USFWS, and CDFG following the direction in Condition 5.H. (Interim Modifications), below.

In addition, the reservoir level at Gerle Creek Reservoir shall be maintained at an elevation that provides fish passage into Gerle Creek from August through October.

5.E. Slab Creek Reservoir

The Licensee shall maintain the reservoir level above 1,830 feet in elevation during daylight hours between 10:00 am and 8:00 pm during the period between July 1 and September 30. The Licensee shall also limit daily fluctuations to less than seven feet per day during daylight hours between 10:00 am and 8:00 pm during the period between July 1 and September 30.

The minimum reservoir elevation and maximum daily fluctuation shall be reassessed and modified if necessary to accommodate: (1) operation of the proposed Iowa Hill Pump Storage Project, should it be constructed; (2) recreational use at Slab Creek Reservoir; and (3) other applicable factors. Any modifications shall be approved prior to implementation by the Deputy Director and by USFS (as described in Appendix 3 to the Settlement Agreement, Draft Forest Service Standard Section 4(e) Conditions).

5.F. Other Reservoirs

The Licensee shall maintain the seasonal reservoir levels at Junction and Brush Creek Reservoirs within the range of elevations measured between 1975 through 2000. This equates to maintaining a water surface elevation no lower than 4,398 feet for Junction Reservoir and no lower than 2,853.6 feet for Brush Creek Reservoir[9]. The Licensee shall maintain the water surface in Rubicon and Buck Island Reservoirs at as high an elevation as practicable, and with a minimum of fluctuation, from May 1 to September 10 of each year in order to secure the maximum recreational benefits. As described in Condition 1.A. (Minimum Instream Flow Conditions, Rubicon River below Rubicon Reservoir Dam), the Licensee shall maintain an overwintering minimum pool of 6,527 feet in elevation in Rubicon Reservoir for the protection of aquatic species.

5.G. Super Dry Water Year

A SD water year is defined as any year that meets the criteria for a CD year that is immediately preceded by a Dry or CD year or any Dry year that is immediately preceded by any combination of two Dry or CD years. In the event of an SD year, the Licensee shall, by March 10, notify USFS, CDFG, and the State Water Board of the Licensee's concerns related to reservoir levels. By June 1 of an SD year, the Licensee shall confer

[9] It is not practical to specify an upper water level elevation because flood conditions can lead to water surface elevations that exceed the level of the spillway, and under flood conditions it is not possible to control the water surface elevation.

with USFS, CDFG, and the State Water Board to discuss reservoir operations plans and reservoir levels during the SD water year. The Licensee may implement the revised operations for an SD year upon approval by the Deputy Director and the Commission.

5.H. Interim Modifications

These reservoir elevations may be modified upon the occurrence of the following events:

- State or federal electrical emergencies where specific orders are issued or specific actions are mandated by an authority that require the Licensee to produce electricity outside normal planned operations;
- System events that cause SMUD's Operating Reserves to drop below the Western Energy Coordinating Council Minimum Operating Reliability Criteria; or
- Equipment malfunction, public safety emergency, or law enforcement activity.

In the event of such an interim modification during July, August, or September, the Licensee shall notify USFS, State Water Board, CDFG, and USFWS and the Commission within three days of determining that reservoir level requirements were not or will not be met. Each notification shall include:

1. A description of the incident, including the reason the reservoir level was not or will not be met;
2. The Licensee's analysis of the implication of the incident on meeting future reservoir levels for that water year; and
3. The Licensee's proposal to manage reservoir levels to minimize recreational impacts and address energy and operational requirements for any months in which reservoir levels will not be achieved.

In addition, the Licensee's proposal shall address:

a. Prioritizing reservoir levels among Loon Lake, Union Valley and Ice House Reservoirs;
b. Developing measures as they relate to impacts on recreational resources, if necessary; and
c. Developing other measures as appropriate.

The measures in the Licensee's proposal will be commensurate with the degree and time period during which reservoir levels are not met, and may include actions to be taken by the Licensee or others, such as increased patrols, extension of boat ramps, or development of/contribution to a mitigation fund. Once the UARP is no longer subject to the event and if the end-of-month reservoir elevations for Loon Lake, Union Valley, and/or Ice House Reservoirs cannot be achieved for that month, the Licensee shall confer with the State Water Board, USFS, CDFG, USFWS and the Commission (Conference) within 10 business days. The purpose of the Conference shall be to review the Licensee's proposal to manage reservoir elevations for the remainder of the recreation season. The Licensee will implement the proposal upon approval by the Commission and the Deputy Director. The Deputy Director may require modifications as part of the approval. Within 10

business days of the Conference, the Licensee shall file with the Commission a letter summarizing the Conference.

5.I. Conferences for Abnormal Precipitation Patterns

The Licensee may request a Conference with USFS, State Water Board, CDFG, and USFWS by June 1 in water years: (1) which either have a forecast April – July unimpaired runoff[10] less than 40 percent of the forecasted total water year unimpaired runoff[11] or that follow a SD water year; and (2) when the Licensee determines that the end-of-month elevations may not be achievable for that year. At least 10 business days prior to the Conference, the Licensee shall provide to USFS, State Water Board, CDFG, and USFWS the Licensee's proposal to manage reservoir levels to minimize recreational impacts and address energy and operational requirements for any months in which reservoir levels will not be achieved. The Licensee's proposal shall address:

a. Prioritizing reservoir levels among the Loon Lake, Union Valley and Ice House Reservoirs;
b. Developing measures as they relate to impacts on recreational resources, if necessary; and
c. Developing other measures as appropriate.

The measures in the Licensee's proposal will be commensurate with the degree to which and time period during which reservoir levels may not be met, and may include actions to be taken by the Licensee or others, such as increased patrols, extension of boat ramps, or development of/contribution to a mitigation fund. The purpose of the Conference shall be to review the Licensee's proposed measures to manage reservoir elevations for the remainder of the recreation season. The Licensee will implement the plan upon approval by the Commission and the Deputy Director. The Deputy Director may require modifications as part of the approval. Within 10 business days following this Conference, the Licensee shall file with the Commission a letter summarizing the plan.

5.J Reservoir Level Monitoring and Adjustment

Within five years of license issuance, and every five years thereafter, the Licensee shall prepare a report describing whether the target reservoir levels as identified in Conditions 5.A., 5.B., and 5.C. have been achieved, and if not, the reasons and time periods when the target reservoir levels were not achieved. The Licensee shall provide a copy of the report to USFS, CDFG, State Water Board, USFWS, and the Commission.

[10] Department of Water Resources, May Bulletin 120 "Report of Water Conditions in California," table "April-July Unimpaired Runoff," row "American River below Folsom Lake," column "Apr-Jul Forecasts."

[11] Department of Water Resources, May 120 Bulletin "Report of Water Conditions in California," table "Water Year Unimpaired Runoff," row "American River below Folsom Lake," column "Water Year Forecast."

CONDITION 6. STREAMFLOW AND RESERVOIR GAGING

The Licensee shall, within one year after license issuance, develop and file with the Commission for approval a Streamflow and Reservoir Elevation Gaging Plan (Gaging Plan) that meets USGS standards. The Licensee shall provide copies of the Gaging Plan to USFS, State Water Board, CDFG, USFWS, and the Commission. The Gaging Plan shall be approved by the Deputy Director prior to filing with the Commission. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Gaging Plan upon approval by the Deputy Director and the Commission. At a minimum, the plan shall address compliance gaging at the following locations:

Streamflow gaging locations:

6.a. Rubicon River below Rubicon Reservoir Dam
6.b. Little Rubicon River below Buck Island Reservoir Dam
6.c. Gerle Creek below Loon Lake Reservoir Dam
6.d. Gerle Creek below Gerle Creek Reservoir Dam
6.e. SF Rubicon River below Robbs Peak Reservoir Dam
6.f. SF Silver Creek below Ice House Reservoir Dam
6.g. Silver Creek below Junction Reservoir Dam
6.h. Silver Creek below Camino Reservoir Dam
6.i. Brush Creek below Brush Creek Reservoir Dam
6.j. SF American River below Slab Creek Reservoir Dam (sufficient to record spills)

Reservoir elevation gaging locations (using Licensee's reservoir elevation gages as published by USGS):

6.k. Rubicon Reservoir
6.l. Loon Lake Reservoir
6.m. Gerle Creek Reservoir
6.n. Ice House Reservoir
6.o. Union Valley Reservoir
6.p. Junction Reservoir
6.q. Camino Reservoir
6.r. Brush Creek Reservoir
6.s. Slab Creek Reservoir

Within two years of license issuance, the Licensee shall install and maintain simple staff gages at the put-ins for the Slab Creek and Ice House recreational boating runs. The Licensee shall perform an investigation to determine whether telemetry equipment can be installed at Rubicon River below Rubicon Reservoir Dam and Little Rubicon River below Buck Island Reservoir Dam to monitor conditions and/or control operations. If the USFS and the Licensee concur that such equipment is economically and technologically feasible and can be installed consistent with law, regulations, and policies applicable to Desolation Wilderness, the Licensee shall seek necessary agency approvals for such installation and shall install this equipment if the necessary approvals are received.

CONDITION 7. STREAMFLOW AND RESERVOIR LEVEL INFORMATION

The Licensee shall, within one year of license issuance, in consultation and coordination with USFS and the State Water Board, submit a plan to the Commission for providing, at a minimum, the following:

A) Real-time (15-minute increments and refresh rates or at the capacity of the reporting technology) lake stage height and storage information for each of the following reservoirs: Rubicon Reservoir, Loon Lake Reservoir, Ice House Reservoir, Union Valley Reservoir, Gerle Creek Reservoir, Brush Creek Reservoir, Junction Reservoir, and Slab Creek Reservoir.

B) Installation of up to two simple staff gages for use by the public on each of the following stream reaches: SF Silver Creek below Ice House Reservoir Dam, and SF American River below Slab Creek Reservoir Dam.

C) Real-time (15-minute increments at refresh rates or at the capacity of the reporting technology) streamflow and reservoir level information that is available to the public year-round via toll-free telephone number or other appropriate technology approved by USFS.

D) Streamflow information in cfs on a website for the following Project-related stream reaches:

- Rubicon River below Rubicon Reservoir Dam
- Little Rubicon River below Buck Island Reservoir Dam
- Gerle Creek below Loon Lake Reservoir Dam
- Gerle Creek below Gerle Creek Reservoir Dam
- SF Rubicon River below Robbs Peak Reservoir Dam
- SF Silver Creek below Ice House Reservoir Dam
- Silver Creek below Junction Reservoir Dam
- Silver Creek below Camino Reservoir Dam
- Brush Creek below Brush Creek Reservoir Dam
- SF American River below Slab Creek Reservoir Dam

The plan shall be approved by the Deputy Director prior to filing with the Commission. The Deputy Director may require modifications as part of the approval. Following Commission approval of the plan, the minimum streamflow and recreational streamflow schedules from Conditions 1 and 4, as well as the current water year type designation, shall also be published on the streamflow information website.

Conditions Related to Ecological Resource Monitoring and Adaptive Management

CONDITION 8. MONITORING CONDITIONS

Background Information

The Licensee shall implement the following Monitoring Program after license issuance and through the term of the new license and any annual licenses, in coordination with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall ensure that the final monitoring plan for each element of the Monitoring Program (as described below) is reviewed by USFS, CDFG, USFWS, and the Deputy Director. The Licensee shall also ensure approval by the Deputy Director prior to implementation of the monitoring element, as described under each monitoring element.

USFS, CDFG, USFWS, and the State Water Board have the flexibility to alter the monitoring program methodologies and frequencies of data collection if it is determined that: (a) there is a more appropriate or preferable methodology or site to use than that described in the individual elements of the monitoring program; or (b) monitoring may be reduced or terminated because the relevant ecological resource objective has been met or no change in resource response is expected. Within the scope of the specified monitoring program, USFS, CDFG, USFWS, and the State Water Board may select an equal number of alternative years to ensure that surveys occur during a range of water year types. Modifications made to the study plans must be approved by the Deputy Director prior to implementing the modified study plan.

For purposes of the ecological resources adaptive management program, each year is defined on a calendar year basis (i.e., January through December). This monitoring program covers monitoring to be conducted during all years until a new license is issued. Where years are specified, Year 1 is the first year during which all initial minimum streamflows required by the license are implemented by May 1.

By June 30 of each year, the Licensee shall file with the Commission an annual report fully describing the monitoring efforts of the previous calendar year. USFS, CDFG, USFWS, and the State Water Board shall have at least 30 days to review and comment on the draft report prior to filing with the Commission. The Licensee shall provide copies of the final annual report to USFS, CDFG, USFWS, and the State Water Board.

The following guidelines shall be used in implementing the Monitoring Program:
(a) monitoring and studies shall be relevant to the UARP; (b) monitoring and studies shall be conducted such that they provide useful information for management decisions or establishing compliance with license conditions; and (c) monitoring and studies shall be as cost-effective as possible.

8.A. Fish Populations

Within two years of license issuance, the Licensee shall develop a fish population monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board that incorporates the elements detailed below. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: The Licensee shall conduct electro-fishing and/or snorkeling surveys (in the same manner as the studies conducted in 2002-2003 by the Licensee) during late summer/fall for brown trout in the Gerle Creek below Loon Lake Reservoir Dam Reach only, hardhead sampling in SF American River below Slab Creek Reservoir Dam Reach only, and for rainbow trout at all stations listed below[12]:

8.A.1. Rubicon River below Rubicon Reservoir Dam (upper and lower sample section of sites RRD-F1 and RRD-F2).

8.A.2. Little Rubicon River below Buck Island Reservoir Dam (upper sample section of site BID-F1).

8.A.3. Gerle Creek below Loon Lake Reservoir Dam (upper and lower sample section of sites LLD-F1 and LLD-F2).

8.A.4. Gerle Creek below Gerle Creek Reservoir Dam (upper and lower sample section of site GCD-F1).

8.A.5. SF Rubicon River below Robbs Peak Reservoir Dam (upper and lower sample section of site RPD-F1).

8.A.6. SF Silver Creek below Ice House Reservoir Dam (upper and lower sample section of sites IHD-F1 and IHD-F2).

8.A.7. Silver Creek below Junction Reservoir Dam (upper and lower sample section of site JD-F1).

8.A.8. Silver Creek below Camino Reservoir Dam (upper and lower sample section of site CD-F1).

8.A.9. Brush Creek below Brush Creek Reservoir Dam (site BCD-F1). (This site shall be surveyed once every 10 years after license issuance.)

8.A.10. SF American River below Slab Creek Reservoir Dam (electro-fishing at upper and lower section of site SCD-F2). Hardhead snorkeling shall be conducted from immediately downstream of Mosquito Road Bridge to and including site SCD-F2.

[12] More details on the sampling locations can be found in the Stream Fisheries Technical Report dated January 2005.

Timing: Rainbow trout and brown trout: Years 5, 6, 10, 11, 15, 16, and thereafter for two consecutive years every 10 years for the term of the license. Hardhead: Years 2, 3, 5, 6, 10, 11, 15, 16 and thereafter for two consecutive years every 10 years for the term of the license.

8.B. Aquatic Macroinvertebrates

Within two years of license issuance, the Licensee shall develop an aquatic macroinvertebrate monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: The Licensee shall use a method developed in consultation with USFS, CDFG, USFWS, and the State Water Board. The results shall be compared to an aquatic health index approved by the Deputy Director. The following sites shall be included:

8.B.1. Rubicon River below Rubicon Reservoir Dam (RR-I3).
8.B.2. Gerle Creek below Loon Lake Reservoir Dam (LL-I2).
8.B.3. Gerle Creek below Gerle Reservoir Dam (impaired reach) (GC-I2).
8.B.4. SF Rubicon River below Robbs Peak Reservoir Dam (RPD-I2).
8.B.5. SF Silver Creek below Ice House Reservoir Dam (impaired reach) (IH-I2).
8.B.6. Silver Creek below Junction Reservoir Dam (JD-I1 and JD-I2).
8.B.7. Silver Creek below Camino Reservoir Dam (CD-I2 and CD-I3).
8.B.8. SF American River below Slab Creek Reservoir Dam (SC-I2).

Reference streams that were sampled as part of the macroinvertebrate monitoring program during the relicensing shall be incorporated into the monitoring program if the Deputy Director determines during the consultation process that they are necessary. Reference sites may be substituted upon approval by the Deputy Director.

Timing: Years 5, 6, 10, 11, 15, 16, and thereafter for two consecutive years every 10 years for the term of the license.

8.C. Amphibian and Reptile Monitoring

Foothill Yellow-legged Frog

Within one year of license issuance, and in consultation with USFS, CDFG, USFWS, and the State Water Board, the Licensee shall develop an amphibian and reptile habitat evaluation and species presence monitoring plan with a primary focus on FYL frogs. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Methods: The Licensee shall conduct protocol surveys for sensitive species, with an emphasis on FYL frogs, using the procedures of PG&E[13] or the most current standard (as determined jointly by CDFG, USFWS and USFS) in a sub-sample of appropriate habitat types to document species presence and distribution. The Licensee shall identify amphibian breeding and larval periods in UARP-affected reaches by periodically surveying reaches of known presence during spring/summer. The Licensee shall also, if encountered, record each incidence of western pond turtles and California red-legged frogs during the amphibian and reptile surveys.

The first year of surveys shall be to determine the timing and success of the following life stages of existing known populations: egg laying, tadpole rearing, metamorphosis, and size/condition of metamorphs in late September to estimate probability of overwintering success.

For Years 1-5, the monitoring shall also include the placement of thermographs in the stream margin habitats associated with known or suitable breeding sites in the reach below Camino Reservoir Dam and the reach below Slab Creek Reservoir Dam. A minimum of six recorders shall be deployed to ensure that an adequate sample size is attained. After monitoring during Year 1, the Deputy Director, after consultation with USFS, USFWS, and CDFG, may approve a subset of survey sites or a less intensive program, based on review of the first year's data. In the future, USFS, USFWS, CDFG, and/or the Deputy Director may request additional breeding site habitat data to assess the cause of unexpected or chronic reproductive failures that may be related to UARP operations.

Foothill Yellow-legged Frog Monitoring Sites:

8.C.1. Silver Creek below Junction Reservoir Dam (site associated with site JDF2).
8.C.2. Silver Creek below Camino Reservoir Dam (C-3 and SFA-4).
8.C.3. SF American River below Slab Creek Reservoir (entire reach between and including SCA-6a and SCA-4).
8.C.4. Rock Creek, a tributary located upstream of the White Rock Powerhouse from the confluence with the SF American River to a point one mile upstream. This distance may be shortened if it is determined that there is a barrier to movement of FYL frogs.
8.C.5. SF Rubicon River from downstream of confluence with Gerle Creek to the confluence with the Rubicon River.

Spill flows that occur after water temperatures rise above 12°C mean daily temperature for a seven-day running average (or as otherwise defined in Condition 9.A. – Cancellation of Pulse and Recreational Streamflows in SF Silver Creek) at the Water Temperature Monitoring Site 8.I.18 (½ -mile upstream of White Rock Powerhouse) shall be monitored for effects to aquatic species (amphibians, fish, and aquatic reptiles) as soon as possible

[13] Seltenrich, C. P. and A. C. Pool. 2002. A standardized approach for habitat assessments and visual encounter surveys for the foothill yellow-legged frog (Rana boylii). Pacific Gas and Electric Company.

after the decline of the spill at FYL Frog Monitoring Site 8.C.3 in the SF American River below Rock Creek and at Site 8.C.2 in the reach below Camino Reservoir Dam

Timing:
1. Silver Creek below Junction Reservoir Dam: Years 2, 3, 5, 10, 15 and thereafter every five years for the term of the license.
2. Spill flows in SF American River below Slab Creek Reservoir Dam and Silver Creek below Camino Reservoir Dam: as soon as possible after the decline of the spill.
3. Silver Creek below Camino Reservoir Dam: Years 1, 2, 3, 5, 6, 10, 11, 15, 16, and thereafter for two consecutive years every five years for the term of the license.
4. SF American River below Slab Creek Reservoir Dam: Years 1, 2, 3, 4, 5, 6, 10, 11, 15, 16, and thereafter for two consecutive years every five years for the term of the license.
5. Rock Creek: Years 1, 2, and 3.
6. SF Rubicon River: Year 1; requirements for subsequent monitoring will depend on results of first year of monitoring.

If California red-legged frogs are encountered during the amphibian surveys described above, the Licensee shall consult with the State Water Board, USFS, USFWS and CDFG and submit a proposal to either continue the measures undertaken for the FYL frogs or to propose additional conservation measures that may be required to ensure that UARP impacts to California red-legged frogs are minimized. The Licensee shall implement the proposal after approval by the Deputy Director and the Commission, if Commission approval is necessary.

Mountain Yellow-legged Frog

Within two years of license issuance, the Licensee shall develop a Mountain Yellow-legged Frog monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: The Licensee shall conduct protocol surveys for sensitive species using the procedures of CDFG (2001) in a subsample of appropriate habitat types to document species presence and distribution. Surveys shall focus on presence of the larval stage at sites by periodically surveying reaches of known presence during spring/summer. If CDFG or USFS collect data associated with Rubicon Reservoir, Rockbound Lake, and Buck Island Reservoir, that information can be used to satisfy this requirement after the Deputy Director, in consultation with USFS, CDFG and USFWS, review results and approve use of these data.

Mountain Yellow-legged Frog Monitoring Sites:

8.C.6. Rubicon Reservoir
8.C.7. Rockbound Lake
8.C.8. Buck Island Reservoir

Timing: Years 5, 10, 15 and thereafter every 10 years for the term of the license.

8.D. Foothill Yellow-legged Frog Flow Fluctuations (Also refer to 8.C above, related to spill flows.)

Within one year of license issuance, the Licensee shall develop an amphibian flow fluctuation monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: The Licensee shall conduct visual surveys for FYL frog in Silver Creek below Camino Reservoir Dam at any time from June through September when: (1) the streamflows are 100 cfs or less; and (2) the flows fluctuate more than 40 cfs over one week's time. Water velocities and streamflow shall be recorded. The Licensee shall provide advance notification to USFS, the State Water Board, USFWS, and CDFG if such fluctuations are going to occur and shall conduct visual surveys as described above prior to and after the fluctuations. The visual surveys can be discontinued if USFS, USFWS, CDFG, and the Deputy Director determine that the flow fluctuations can occur without resulting in egg mass or tadpole displacement.

8.E. Riparian Vegetation Monitoring

Within two years of license issuance, the Licensee shall develop a riparian vegetation monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: The Licensee shall conduct aerial photo flights and analysis using the greenline method[14] at the 15 Intensive Field Study Sites (riparian) that were surveyed in the Riparian Study filed with the Commission as part of the License Application on July 15, 2005. Data collected at each site will include transects to document species composition, percent cover, and quantification of length and width of riparian community.

Timing: Years 5, 10, 15, and thereafter every 10 years for the term of the license.

8.F. Algae Species Identification and Monitoring

Within one year of license issuance, the Licensee shall develop an algal species identification and monitoring plan in consultation with USFS, CDFG, USFWS, and State

[14] The Riparian Vegetation and Wetlands Technical Report defines the greenline as "…the first perennial vegetation that forms a lineal grouping of community types on or near the water's edge…". As described in the Report, each greenline is described by the cumulative distance in feet occupied by each community type.

Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: Collect, identify, and archive samples of the species of algae inhabiting the stream channel of Silver Creek below Junction Reservoir Dam using a laboratory approved by the Deputy Director after consultation with USFS, CDFG, USFWS. Additional baseline samples shall be collected in SF Rubicon River below Robbs Peak Reservoir Dam, Silver Creek below Camino Reservoir Dam, and SF American River below Slab Creek Reservoir Dam. Additional sites or reaches may be added should algal species be deemed to have negative effects upon the aquatic ecosystem.

Timing: A sampling visit is to take place within one year of approval of the Plan to obtain enough material for a positive identification of species. If the Deputy Director, in consultation with USFS, CDFG, and USFWS, determines that additional sampling for algal species identification is needed during the remainder of the license term, the Licensee shall repeat the approved sampling plan, or submit a new plan for approval by the Deputy Director.

8.G. Geomorphology: Sensitive Site Investigation and Mitigation Plan Development

Within six months of license issuance, the Licensee shall develop a geomorphology sensitive site investigation and mitigation monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: A detailed investigation of fluvial geomorphic properties will be carried out in Gerle Creek below Loon Lake Reservoir Dam, at LL-DG1 and LL-G2. (Refer to Condition 2.B. – Gerle Creek below Loon Lake Reservoir Dam). The investigation should focus on determining the most effective method of stabilization for the Gerle Creek channel downstream of Loon Lake.

Frequency: Years 1 and 2.

Within two years of license issuance, the Licensee shall develop a stabilization plan for the Gerle Creek channel below Loon Lake Reservoir Dam. The Licensee will consult with appropriate staff from USFS, USFWS, CDFG, and the State Water Board in the development of the stabilization plan. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

8.H. Geomorphology: Continuing Evaluation of Representative Channel Areas

Within two years of license issuance, the Licensee, in consultation with USFS, CDFG, USFWS, and the State Water Board, shall develop a geomorphology monitoring plan that provides for the continuing evaluation of representative channel areas. The Licensee shall

submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

Method: Establishment and monitoring of permanent cross-section transects, longitudinal profiles, and channel properties in representative channel areas. Measurement of cross-section profile and substrate composition at each transect. The following sites[15] shall be evaluated as described in the Channel Morphology Technical Report[16].

8.H.1. Rubicon River below Rubicon Reservoir Dam (RD-G1).
8.H.2. Gerle Creek below Loon Lake Reservoir Dam (LLD-G1 and LL-G2).
8.H.3. SF Rubicon River below Robbs Peak Reservoir Dam (RPD-G1).
8.H.4. SF Silver Creek below Ice House Reservoir Dam (IH-G1 and IH-G2).
8.H.5. Silver Creek below Camino Reservoir Dam (CD-G1).
8.H.6. SF American River below Slab Creek Reservoir Dam (SC-G1).

In addition, prior to any reservoir dredging, additional downstream, cross sections shall be surveyed as determined necessary by the Deputy Director after consultation with USFS, CDFG, and USFWS.

Timing: Years 5, 10, 15 and thereafter every 10 years for the term of the license.

8.I. Water Temperature

Within one year following license issuance, the Licensee shall develop and file with the Commission a Water Temperature Monitoring Plan that has been approved by the Deputy Director. Within three months of license issuance, the Licensee shall consult with USFS, State Water Board, USFWS, and CDFG on the development of a Plan consistent with the method and frequencies described below. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals

Method: Continuous water temperature recording devices shall be installed and maintained each year that monitoring is required at a minimum of 19 stream temperature stations as designated below, as soon as weather and flow conditions allow safe installation of these devices. Up to five additional monitoring sites may be added by the Deputy Director to the water temperature program, as determined necessary through review of the monitoring data and the annual consultation described in Condition 12

[15] Study site designations and locations are described in the Channel Morphology Technical Report prepared for the relicensing proceeding.
[16] Monitoring shall be equivalent to a Rosgen Level III Channel Condition Assessment as described in the Channel Morphology Technical Report prepared as part of the relicensing proceeding.

(Annual Review of Ecological Conditions) with USFS, CDFG, USFWS, and the State Water Board.

Modifications to the temperature monitoring program and the determination of final monitoring sites shall be made by the Deputy Director. Some locations may eventually be removed if the Deputy Director determines that sufficient data has been collected to show that temperatures are adequate at a given location.

The FYL frog monitoring program (Condition 8.C. – Amphibian and Reptile Monitoring) contains additional water temperature monitoring requirements.

Reservoir temperature profiles may be added if stream temperature problems are identified and the State Water Board determines that reservoir temperatures are a controllable factor.

At a minimum, the temperature plan shall address compliance gaging at the following locations:

8.I.1. Rubicon River immediately below Rubicon Reservoir Dam.
8.I.2. Little Rubicon River immediately below Buck Island Reservoir Dam.
8.I.3. Rubicon River below confluence of Little Rubicon River at the UARP boundary.
8.I.4. Gerle Creek immediately below Loon Lake Reservoir Dam.
8.I.5. Gerle Creek immediately below Gerle Creek Reservoir Dam.
8.I.6. SF Rubicon River immediately below Robbs Peak Reservoir Dam.
8.I.7. SF Rubicon River below confluence of Gerle Creek at the UARP boundary.
8.I.8. SF Rubicon River immediately upstream of the confluence with the Rubicon River.
8.I.9. SF Silver Creek immediately below Ice House Reservoir Dam.
8.I.10. SF Silver Creek immediately upstream of Junction Reservoir.
8.I.11. Silver Creek immediately below Junction Reservoir Dam.
8.I.12. Silver Creek immediately above Camino Reservoir Dam.
8.I.13. Silver Creek immediately below Camino Reservoir Dam.
8.I.14. Silver Creek immediately upstream of SF American River.
8.I.15. Brush Creek immediately below Brush Creek Reservoir Dam.
8.I.16. SF American River immediately below Slab Creek Reservoir Dam.
8.I.17. SF American River at or downstream of Mosquito Bridge.
8.I.18. SF American River approximately ½ mile upstream of White Rock Powerhouse.
8.I.19. A location downstream of White Rock Powerhouse that records the water temperature of discharges from White Rock Powerhouse.

The recorders located in SF Silver Creek below Ice House Reservoir Dam and SF American River below Slab Creek Reservoir Dam shall be installed prior to implementation of the applicable recreational and pulse flow releases in these reaches. Recorders in Silver Creek above Camino Reservoir and

immediately upstream of SF American River shall be installed within six months of license issuance.

Timing: All water bodies identified in the approved Plan shall be monitored from March 15 to September 30 in all years after license issuance until a subsequent license is issued or until the Licensee can demonstrate to the satisfaction of the Deputy Director that operation of the UARP reasonably protects the "cold freshwater" beneficial use at any site for which the Licensee seeks modification to the temperature monitoring requirement. For reservoirs, before a determination as described above may be made by the Deputy Director, seasonal temperature profiles shall be monitored in applicable reservoir(s) during multiple water year types to develop data necessary for decision-making.

8.J Other Water Quality Parameters

Within three months of license issuance, the Licensee shall consult with USFS, BLM, USFWS, CDFG, State Water Board, and Central Valley Water Board on the development of a draft Water Quality Monitoring Program Plan (Monitoring Plan). The Monitoring Plan shall include the water quality monitoring elements listed below, and must: (1) provide detail on field sampling locations, sampling frequency, handling methods and Quality Assurance/Quality Control protocols; and (2) define the laboratory methods and associated reporting and detection limits for all constituents and parameters to be monitored in the various elements of the Monitoring Program.

Following consultation, and within six months of license issuance, the Licensee shall submit the Monitoring Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. After approval by the Deputy Director, the Licensee shall file the Monitoring Plan with the Commission. The approved Monitoring Plan shall be implemented by the Licensee as described, through the life of the license. The Monitoring Plan may be modified pursuant to adaptive management program needs as recommended by USFS, BLM, USFWS, CDFG, State Water Board, and/or Central Valley Water Board, and the new monitoring plan shall be implemented after approval by the Deputy Director.

Method: The Licensee shall conduct a water quality sampling program designed to demonstrate seasonal conditions at all reservoir and stream locations affected by operation of the UARP, as described in the UARP Relicensing Water Quality Study Plan (Plenary approval, January 8, 2003). Laboratory analyses shall be conducted using USEPA analytical methods and/or Standard Methods adequately sensitive to detect constituent levels for determination of compliance with recognized state and federal criteria.

In Situ: In situ physical parameters (pH, water temperature, dissolved oxygen, electrical conductivity, and turbidity) shall be sampled at representative locations on diverted stream reaches below all UARP reservoirs. In situ physical parameters shall be monitored at reservoir profiles collected at 1-

meter intervals in Loon Lake, Gerle Reservoir, Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, Camino Reservoir, and Slab Creek Reservoir.

Frequency: In riverine reaches: once seasonally in spring (April-May), summer (August), fall (November) and winter (January-February, as accessible) each year after license issuance. In reservoirs: once in spring (April-May) and once in fall (October-November) each year. When possible, in situ water quality and water temperature monitoring may be completed coincident with amphibian, fisheries, and macroinvertebrate monitoring.

General chemistry monitoring

The Licensee shall monitor in situ parameters, standard minerals, hardness, nutrients, metals (total and dissolved fractions), oil and grease, and other chemical constituents.

Method: General chemistry samples for the analysis of the set of constituents shown in Table 23 shall be collected from all UARP reservoirs and riverine locations, dam release points from reservoirs, and representative sites along all bypassed stream reaches[17] greater than one mile in length. Reservoir samples shall be collected at the surface and near the bottom at multiple, representative locations within each impoundment. Secchi disk measurements shall be collected at Loon Lake, Ice House Reservoir, Union Valley Reservoir, and Slab Creek Reservoir.

Table 23. List of Water Quality Constituents

Trace Elements*		**Standard Minerals**		**Nutrients**	
Aluminum	Manganese	Calcium	Potassium	Nitrate-Nitrite	Orthophosphate
Arsenic	Lead	Magnesium	Sodium	Ammonia as N	Total Phosphorus
Barium	Nickel	Chloride	Sulfate	TKN as N	
Cadmium	Selenium				
Copper	Silver		**Miscellaneous**		
Iron	Zinc		Oil and Grease	MTBE	TPH
Mercury	Methyl mercury		Total Organic Carbon	Total Suspended Solids	Total Dissolved Solids
* For metals, the analysis shall include quantification of both total and dissolved amounts.			Hardness	Total Alkalinity	Cyanide

Frequency: General chemistry samples shall be collected seasonally in spring, summer, fall, and immediately following either the second or third measurable rain event of the fall-winter period, once every five years beginning in Year 3 after license issuance. Secchi disk measurements shall be collected in summer and fall seasons once every five years after license issuance. After a minimum of three data sets have been collected, if it is demonstrated that exceedances are not occurring at specific locations, the collection frequency may be reviewed to determine if it can be modified. The Licensee, CDFG,

[17] Bypassed stream reaches are those where water is diverted out of the stream for the purpose of power generation.

USFS or the Deputy Director may propose modifications to the sampling frequency contained in the Monitoring Plan. The Deputy Director must approve any revised plan prior to its implementation.

Bacterial Monitoring

Method: The Licensee shall conduct bacterial monitoring for fecal coliform and *E.coli* for protection of the REC-1 beneficial uses at a minimum of 15 shoreline recreational locations within the UARP boundary. Sampling locations shall be selected based on criteria that include: (1) swimming and other water contact recreation activities are known to occur in the area; and (2) existence of sources for potential introduction of pathogens to the water column in the immediate vicinity. Candidate sites for annual REC-1 bacterial monitoring will include developed recreation sites and frequently used sites at reservoir and riverine locations. The bacterial monitoring program shall include sampling at a minimum of four annually-rotating stations at Union Valley Reservoir swim areas, and a minimum of two beach locations each at Buck Island Reservoir, Loon Lake, Ice House Reservoir, and Gerle Creek Reservoir along with three other selected stations. Five near-shore samples shall be collected at each of the 15 sampling locations during the 30-day period that spans either the Independence Day holiday (June-July) or the Labor Day holiday (August-September), using the five samples in 30-day methodology or any other future protocol in an amended Basin Plan. The Licensee, in consultation with USFS, CDFG, State Water Board, USFWS, and Central Valley Water Board shall determine sampling locations for each upcoming field season. The Licensee shall consult with USFS, State Water Board, USFWS, and other listed parties for final determination of the locations to be sampled no later than May 31 of each designated sampling year and shall submit the list of sampling locations to the Deputy Director for approval.

Frequency: Bacterial monitoring shall be conducted annually for the first five years after license issuance, after which it may be decreased in frequency to every other year at reservoir or riverine locations where no exceedances of Basin Plan objectives for protection of REC-1 designated waters have been identified during Years 1-5. The Licensee shall notify the Central Valley Water Board if monitoring data demonstrate bacterial concentrations that present risks to human health at specific reservoir(s) or riverine sites. The Licensee shall also continue annual monitoring at those sites until the Licensee consults with the State Water Board and USFS (and any other interested parties) and agreement is reached that the monitoring frequency can be reduced and the Deputy Director has approved the change in monitoring frequency.

Metals Bioaccumulation Monitoring

Method: The Licensee shall monitor for potential uptake of mercury, copper, lead, and silver through the aquatic food chain resident in UARP-affected

impoundments. Resident fish species from Loon Lake Reservoir, Gerle Reservoir, Ice House Reservoir, Union Valley Reservoir, Camino Reservoir, and Slab Creek Reservoir shall be collected and analyzed to determine tissue residue levels of mercury, copper, lead, and silver. Target species, numbers of individuals, sampling strategy, and analytical methods used shall be consistent with current State Water Board Surface Water Ambient Monitoring Program (or any future water quality monitoring program) needs, and shall be defined prior to each sampling event through Licensee consultation with USFS, CDFG, State Water Board, Central Valley Water Board, USFWS, and the Office of Environmental Health Hazard Assessment (OEHHA) and after final approval by the Deputy Director. The Deputy Director may require modifications as part of the approval. Fish tissue monitoring shall continue through the term of the new UARP License.

Frequency: Once every five years beginning in Year 2 following license issuance.

8.K. Robbs Peak Powerhouse Entrainment

Within six months of license issuance, the Licensee shall develop a Robbs Peak Powerhouse Entrainment monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary approvals.

Method: Fish population monitoring shall be conducted as described in Condition 8.A. (Fish Populations), above, to determine when and at what flow fish migration is occurring using a method approved by State Water Board, in consultation with USFS, USFWS, and CDFG.

Frequency: Years 1 and 2.

8.L. Bald Eagle Monitoring

Within six months of license issuance, the licensee shall develop a bald eagle monitoring plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The licensee shall implement the Plan upon receiving all necessary approvals.

Method: Coordinate with USFS and USFWS to continue monitoring bald eagle nest sites to ensure that the bald eagles are not being affected by UARP-related activities.

Frequency: Annually.

CONDITION 9. ADAPTIVE MANAGEMENT CONDITIONS

The Licensee shall, beginning as early as reasonably practicable and within three months after license issuance, implement an ecological resources adaptive management program as described below. The program generally consists of: (a) implementation of a monitoring program described in Condition 8 (Monitoring Conditions); and (b) specific adaptive management measures that shall be implemented if the Monitoring Program and other scientific information indicate that the applicable ecological resource objectives identified in the Rationale Report will likely not be met without adjustment. Monitoring shall be conducted to determine if the applicable ecological resource objectives are achievable and being met.

Analysis of the monitoring results shall be used to determine the need for adaptive management measures. Adaptive management decisions shall be based on monitoring results and other scientific information and a determination by the relevant agencies (as described below for the individual adaptive management measures) that the applicable ecological resource objectives identified in the Rationale Report are not being met and will likely not be met without application of the adaptive management measures.

For purposes of the ecological resources adaptive management program, each year is defined on a calendar year basis (i.e., January through December). Year 1 is defined as the first year during which all initial streamflows required by the license are implemented by May 1.

9.A. Cancellation of Pulse and Recreational Streamflows in South Fork Silver Creek

If FYL frog are found on SF Silver Creek, and water temperatures in the SF Silver Creek immediately upstream of Junction Reservoir (Site SFSC 1) rise above 12°C mean daily temperature for a seven-day running average (refer to Condition 8.I – Water Temperature) at USGS gage 11441500, the Licensee shall cancel the pulse and recreational flow events in SF Silver Creek unless the State Water Board, in consultation with USFS and CDFG, determines that such events are compatible with protection of FYL frogs and other biological resources. The Licensee shall provide notice to the Commission, USFS, State Water Board, USFWS and CDFG within 10 days of determining that the temperature trigger has been met, causing cancellation of the pulse and recreational flow events. The Licensee shall provide Notice to the Commission if the State Water Board, in consultation with USFS, USFWS and CDFG approves a modification to the water temperature trigger.

If the State Water Board, in consultation with USFS, USFWS, and CDFG, determines that the water temperature that is an indicator of FYL frog breeding initiation (12°C mean daily temperature for a seven-day running average) should be increased or decreased based on aquatic species and water temperature monitoring (as described in Conditions 8.C. – Amphibian and Reptile Monitoring), the State Water Board may increase or decrease the water temperature indicator identified in Conditions 8.C. (Amphibian and Reptile Monitoring), 9.A. (Cancellation of Pulse and Recreational Streamflows in SF Silver Creek), and 9.B. (Cancellation of Recreational Streamflows in SF American River).

The State Water Board will not allow the pulse flows to continue nor will it change the water temperature indicator as contemplated under this subsection if the wildlife agencies advise that doing so would constitute a take of a listed species.

9.B. Cancellation of Recreational Streamflows in SF American River

If water temperatures in the SF American River approximately ½-mile upstream of White Rock Powerhouse (water temperature monitoring location 8.I.18) rise above 12°C mean daily temperature for a seven-day running average (refer to Condition 8.I. – Water Temperature), the Licensee shall cancel the recreational flow events in SF American River below Slab Creek Reservoir Dam unless State Water Board, in consultation with USFS, USFWS, and CDFG, determines that such events are compatible with protection of FYL Frogs and other biological resources. The Licensee shall provide Notice to the Commission, USFS, State Water Board, USFWS, and CDFG within 10 days of determining that the above temperature trigger has been met, causing cancellation of the recreational flow events. The Licensee shall provide Notice to the Commission if the State Water Board approves a modification to the water temperature trigger.

The State Water Board will not allow the recreational flow events to continue as contemplated under this subsection if the wildlife agencies advise that doing so would constitute a take of a listed species.

9.C. Untimely Spill Events below Slab Creek Reservoir Dam and Camino Reservoir Dams

The Licensee shall make every reasonable effort to avoid spilling at Slab Creek Reservoir Dam and Camino Reservoir Dam once FYL frog breeding has been initiated based on a water temperature trigger that is determined through the monitoring program described in Condition 8 (Monitoring Conditions). If a spill does occur, the Licensee shall make every reasonable effort to manage the spill to minimize flow fluctuations in the SF American River. If the Deputy Director determines that spills below Slab Creek Reservoir Dam and/or Camino Reservoir Dam are resulting in unacceptable environmental impacts based on aquatic species and temperature monitoring described in Conditions 8.B., 8.C., and 8.I. (Aquatic Macroinvertebrates, Amphibian and Reptile Monitoring, and Water Temperature, respectively), appropriate mitigation measures shall be developed in consultation with USFS, CDFG, USFWS, and the State Water Board and approved by the Deputy Director. The Deputy Director may require modifications as part of the approval. The Licensee shall

implement the appropriate adaptive management measures upon approval of the Deputy Director and any other necessary regulatory approvals.

9.D. Recreational Streamflows below Slab Creek Reservoir Dam

If the State Water Board, in consultation with USFS, CDFG and USFWS, determines that unacceptable environmental impacts are occurring below Slab Creek Reservoir Dam due to October recreational streamflows based on amphibian monitoring described in Condition 8.C. (Amphibian and Reptile Monitoring), adaptive management measures to address the unacceptable impacts may be proposed by the Licensee or the agencies. Such measures may include, but are not limited to, cancellation of the October recreational streamflows. The adaptive management measures shall be approved by the Deputy Director prior to implementation by the Licensee. The Deputy Director may require modifications as part of the approval.

9.E. Fish Entrainment in South Fork Rubicon River

If monitoring indicates that fish are being entrained in Robbs Peak Powerhouse during fish migration, and USFS, USFWS, State Water Board or CDFG determine that the entrainment is having a substantial negative impact on the South Fork Rubicon fishery, the Licensee shall develop appropriate adaptive management measures that are approved by the Deputy Director, in consultation with USFS, CDFG, and USFWS. The Licensee shall implement the appropriate adaptive management measures upon approval of the Deputy Director, and any other necessary regulatory agency approvals. The Deputy Director may require modifications as part of the approval.

9.F. Sediment Management

Based on results of geomorphology monitoring, if the State Water Board, in consultation with USFS, BLM, USFWS, and CDFG, determines there is a need to place sediment downstream, and if there is a need to dredge reservoirs associated with the UARP during the license term, sediment that results from the dredging shall be placed downstream after consultation with USFS, State Water Board, BLM, USFWS, and CDFG, and after approval by the Deputy Director, and any other necessary regulatory agency approvals. In the event it is necessary to conduct dredging activities, the Licensee shall also notify the State Water Board and ACOE to determine if a Clean Water Act Section 404 Permit (404 Permit) is required. If a 404 Permit is required, the Licensee shall apply to the State Water Board Executive Director for water quality certification pursuant to Section 401 of the Clean Water Act.

9.G. Algae Growth in Project-affected Water Bodies

If the new streamflow regime does not reduce algal growth in Silver Creek below Junction Reservoir Dam and South Fork Rubicon River below Robbs Peak Reservoir Dam within two years of license issuance, the Licensee shall reduce or eliminate the excessive algae growth using a method approved by the State Water Board, in consultation with USFS, USFWS, and CDFG. If any future pervasive algal blooms are

identified on any UARP-affected stream reaches, and if the State Water Board, in consultation with USFS, USFWS, and CDFG, determines the algae needs to be reduced or eliminated, the Licensee shall reduce or eliminate the algae growth using a method approved by the Deputy Director, in consultation with USFS, USFWS, and CDFG.

9.H. Metals Bioaccumulation

If the results of metal bioaccumulation monitoring indicate metals bioaccumulation is adversely affecting the health of aquatic species based on published scientific information on this topic, then additional studies may be requested by the State Water Board, in consultation with USFS, USFWS, and CDFG. The studies may include an examination of adaptive management measures for reducing impacts to aquatic species from metals bioaccumulation. These measures may then be required if the Deputy Director so directs.

9.I. Adaptive Resource Monitoring

If the relevant ecological resource objectives have been met for resources for which monitoring is required as described in Condition 8 (Monitoring Conditions) or no change in resource response due to UARP operations is expected, monitoring for that resource may be reduced or terminated. Changes to the monitoring required in Condition 8 must be approved by the Deputy Director, in consultation with the USFS, USFWS and CDFG.

Miscellaneous Conditions

CONDITION 10. LARGE WOODY DEBRIS

The Licensee shall ensure that mobile instream large woody debris continues downstream beyond Robbs Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, and Slab Creek Reservoir Dam. This requirement will not be in effect when access and working conditions are dangerous or unsafe. At a minimum, all sizes greater than both 20 centimeters wide and 12 meters in length shall be allowed to continue downstream beyond the dams listed above. Smaller sizes are also allowed but are not required to be moved beyond these dams. To assure compliance with this measure, the Licensee shall include in the annual monitoring report that is required in Condition 8 (Monitoring Conditions) a summary of the efforts made during the year to pass large woody debris below the dams mentioned above.

CONDITION 11. CANAL AND PENSTOCK EMERGENCY AND MAINTENANCE RELEASE POINTS

The Licensee shall, within one year after license issuance, file with the Commission a plan, approved by the Deputy Director, 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. The Deputy Director may require modifications as part of the approval. The Licensee shall also consult with USFS, CDFG and USFWS in the development of the plan. The Licensee shall

implement the recommendations contained in the plan upon receiving all necessary regulatory approvals.

CONDITION 12. ANNUAL REVIEW OF ECOLOGICAL CONDITIONS

Each calendar year, by April 1, the Licensee shall schedule and facilitate a meeting with USFS, CDFG, USFWS, and State Water Board to review and discuss the results of implementing the conditions in this certification, as well as to discuss other issues related to preserving and protecting ecological values affected by the UARP. At least two weeks prior to the meeting, the Licensee shall make available to USFS, CDFG, USFWS, and State Water Board an operations and maintenance plan for the year in which the meeting occurs.

CONDITION 13. RECREATION IMPLEMENTATION PLAN

The Recreation Implementation Plan which the Licensee will develop in coordination with USFS within six months of license issuance shall include a construction schedule for the recreation facilities specified in SA Article 1-19, and shall be periodically updated in conjunction with the review of recreation developments required in the SA Article 1-18. The plan shall include a requirement to consult with the State Water Board and Central Valley Water Board regarding water quality permitting associated with the construction or rehabilitation of recreation facilities and to obtain the required permits before initiating construction activities. The permits that may be required include, but are not limited to, individual waste discharge requirements or coverage under the Construction General Permit and/or Water Quality Order 97-10.

CONDITION 14. TRANSPORATION SYSTEM MANAGEMENT PLAN

Within one year of license issuance, the Licensee shall file with the Commission a Transportation System Management Plan (Transportation Plan) that is approved by USFS for roads on or affecting National Forest Service lands, which shall be updated every five years. The Transportation Plan shall identify the maintenance and reconstruction needs for roads associated with the UARP and shall identify those linear transportation projects for which SMUD is responsible that have the potential to cause a discharge to waters of the state or disturb the streambed. The Licensee shall consult with the State Water Board and Central Valley Water Board to determine whether an application for water quality certification or other permits are necessary, and shall obtain such certification or permit before initiating construction activities.

All road maintenance and construction shall meet USFS and ACOE specifications and best management practices. The Licensee shall construct, operate, and maintain Project facilities, including roads, parking and storage lots, reservoir shorelines, bridges, and culverts to maintain natural fluvial and colluvial sediment transport to the UARP reaches.

The Licensee must submit the most current plan to the Deputy Director within 30 days of USFS approval, and prior to submission to the Commission. The Deputy Director shall have the authority to make changes to the plan to protect water quality, if reasonably

necessary, beyond the requirements that maintenance and construction shall meet USFS and ACOE specifications and best management practices.

CONDITION 15. FISH STOCKING REQUIREMENTS

The Licensee shall match the type and amount of fish stocked by CDFG, up to a total of 50,000 pounds each, of fish per year, to be distributed among Loon Lake, Union Valley, and Ice House Reservoirs as determined by CDFG. However, in no case shall the amount of fish provided by the Licensee be less than 25,000 pounds per year. The Licensee shall notify the Deputy Director annually by July 1 of each year regarding the arrangements that have been made for fish stocking at Loon Lake, Union Valley, and Ice House Reservoirs.

Conditions Related to Iowa Hill

CONDITION 16. CONSULTATION ON IOWA HILL DESIGN

The Licensee shall consult with the State Water Board, USFWS and CDFG during the design process for Iowa Hill to assure that the final design for the intake/outlet structure incorporates features that achieve the following: minimize or prevent sediment mobilization and/or increased turbidity in Slab Creek Reservoir and the SF American River downstream of the reservoir; minimize or prevent fish entrainment into the structure; and prevent the creation of dangerous hydraulic conditions within Slab Creek Reservoir. The design process shall clearly identify the assumptions for the expected water velocities and hydraulic conditions in the vicinity of the structure, sediment characteristics within Slab Creek Reservoir, swimming speeds and behavior of various life stages of resident fish, and the expected distribution of resident fish within Slab Creek Reservoir. The design process must follow the FERC *Guidelines for Public Safety at Hydropower Projects*. The Licensee shall submit the design plans to the Deputy Director after consultation but prior to submission to the Commission. The Deputy Director may either disapprove or require modification of design plans that do not adequately address sediment mobilization and turbidity concerns, fish entrainment risk or the creation of dangerous hydraulic conditions within Slab Creek Reservoir.

CONDITION 17. CONSTRUCTION WASTE DISCHARGE AND BEST MANAGEMENT PRACTICES

Prior to initiating any construction activities, the Licensee shall provide design plans, a detailed construction plan and a proposed timeline for construction to appropriate state and federal agencies. The Licensee shall consult with the State Water Board, and other state and federal agencies, regarding any additional conditions required before the construction and operation of Iowa Hill can commence. The Licensee must obtain all necessary permits including but not limited to an ACOE Clean Water Act Section 404 Permit, Streambed Alteration Agreement, coverage under the Construction General Permit and/or other authorizations or certifications as determined necessary under state and federal law. The Licensee will consult with the Central Valley Water Board to determine the need for waste discharge requirements for the disposal of construction spoils to land. The Deputy Director will determine whether an amendment to this certification is

necessary to address impacts to water quality or the environmental associated with the construction and subsequent operation of Iowa Hill. Construction activities associated with Iowa Hill cannot begin without approval from the Deputy Director, and issuance of an amended certification, if required.

Best Management Practices

Best management practices for the control of potential discharges from construction activities shall be implemented, including but not limited to, measures for:

- Drainage control
- Sediment runoff and slope stabilization
- Wind erosion control
- Concrete preparation and finishing
- Vehicle and equipment refueling and maintenance
- Material delivery and storage
- Stockpile management
- Solid waste management
- Hazardous waste management
- Spill prevention and control
- Contaminated soil management
- Concrete waste management
- Sanitary/septic waste management

Stormwater Pollution Prevention

In consultation with USFS and CDFG, the Licensee shall file with the Commission a Stormwater Pollution Prevention Plan that is approved by the Deputy Director. During construction, operation and maintenance of Iowa Hill, the Licensee shall prevent water pollution by implementing management practices identified in the Stormwater Pollution Prevention Plan and any other requirements identified by USFS, State Water Board, and Central Valley Water Board.

Water Quality Monitoring

Water quality monitoring shall be required during and after the construction of Iowa Hill as specified in the water quality certiification, and amendments thereto, for the construction of Iowa Hill. The State Water Board reserves the authority to require additional water quality monitoring in the future to ensure that the construction and on-going operation of Iowa Hill meets applicable water quality standards and other appropriate requirements. If monitoring data indicate that water quality objectives are not being met, the Licensee shall consult with the State Water Board regarding potential changes to Iowa Hill operations that would result in compliance with water quality standards or other appropriate requirements, and shall implement any necessary changes that the Deputy Director requires after such consultation.

CONDITION 18. WATER RIGHTS

The Licensee shall consult with the State Water Board, Division of Water Rights regarding potential modifications that may be required to SMUD's State-issued water right permits and licenses if Iowa Hill is constructed, and shall follow the procedures for any such modification described in State Water Board regulations, California Code of Regulations, title 23.

CONDITION 19. GROUNDWATER

Prior to undertaking any construction activities, the Licensee shall file with the Commission a plan that has been approved by the Deputy Director, in consultation with USFS and the Central Valley Water Board, for managing groundwater inflows and/or discharge during construction and for groundwater monitoring and management once construction is completed. The plan shall include the following:

a. completed survey that encompasses the portion of the Iowa Hill area that would be potentially affected by the proposed tunnel;
b. monitoring of the springs and creeks for five years after the tunneling operation is completed with monitoring data submitted monthly and written monitoring reports submitted to the State Water Board, Central Valley Water Board, and USFS biannually by June 1 and December 1 of each year, or as specified in individual or general permits administered by the Central Valley Water Board;
c. method for accurate quantification of groundwater encountered during tunnel boring operations;
d. method for verifying that groundwater seepage is controlled after tunnel construction;
e. identification of corrective measures that may be taken if the tunnel boring operation encounters more groundwater than originally predicted in the environmental assessment for Iowa Hill or the completed tunnel seeps; and
f. potential mitigation measures for all identifiable impacts.

The Licensee shall consult with the Central Valley Water Board regarding the need to obtain individual waste discharge requirements or coverage under General Order No. R5-2008-081, which addresses discharges associated with dewatering and other low threat discharges to surface waters.

CONDITION 20. IOWA HILL AQUATIC RESOURCES

20.A. Hardhead Monitoring in Slab Creek Reservoir

Prior to initiating construction of Iowa Hill, the Licensee shall develop a Slab Creek Reservoir Hardhead Monitoring Plan in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval.

The Plan shall provide for hardhead monitoring during all four seasons of the year to establish the locations of all life stages (including edgewater locations) within Slab Creek Reservoir and in the water fluctuation zone upstream on SF American River above and below the Iowa Hill intake/outlet structure. Monitoring for the location of hardhead life stages shall take place during the two years prior to and two years after Iowa Hill operations begin. The Plan shall also describe a method to monitor hardhead in Slab Creek Reservoir to determine whether entrainment is occurring due to the operation of Iowa Hill. Monitoring for entrainment shall be implemented during the first two years after Iowa Hill begins to operate, but may be extended if required by the Deputy Director.

An annual report that describes the results of the Slab Creek Reservoir hardhead monitoring activities shall be provided to USFS, CDFG, USFWS, and the Deputy Director by May 1 of each year. If monitoring indicates that entrainment is occurring, the Deputy Director will consult with CDFG and the Licensee, and if appropriate, will require the Licensee to develop appropriate mitigation measures. The Licensee will submit the suggested mitigation measures to the Deputy Director for approval. The Licensee shall implement the approved mitigation measures upon receiving all necessary regulatory approvals.

20.B. Temperature Conditions in Slab Creek Reservoir

The Licensee shall develop a plan to monitor edgewater temperatures between May and September in Slab Creek Reservoir during the two years prior to and two years after Iowa Hill operations begin to document how temperatures in shallow water areas are affected. The monitoring locations shall be selected in consultation with USFS, CDFG, USFWS, and the State Water Board. The Licensee shall submit the Plan (which may be combined with the hardhead monitoring plan described in 20.A) to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the Plan upon receiving all necessary regulatory approvals.

An annual report that describes the results of the edgewater temperature monitoring activities (which may be combined with the hardhead monitoring report described in 20.A), shall be provided to USFS, CDFG, USFWS, and the State Water Board by May 1 of each of these years for the prior year's monitoring.

20.C. Impacts to Hardhead in Slab Creek Reservoir

Results from the monitoring required above in Conditions 20.A and 20.B shall be used to determine whether Iowa Hill operations are adversely affecting hardhead distribution due to changes in edgewater temperatures in Slab Creek Reservoir. The Licensee, after consultation with the State Water Board, CDFG and USFWS, may submit suggested mitigation measures, if needed, to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the approved mitigation measures upon receiving all necessary regulatory approvals.

20.D. Prohibitions Related to Impacts to FYL Frog

To support existing FYL frog populations in the SF American River downstream of Slab Creek Reservoir, operation of Iowa Hill shall not further reduce water temperature below 12°C during the months of June (after the descending limb of the hydrograph), July, and August in the SF American River below Slab Creek Reservoir Dam downstream of Mosquito Bridge. Compliance with this provision shall be determined based on water temperature monitoring specified in Condition 8.I. (Water Temperature).

The Licensee shall ensure that flow fluctuations in the SF American River below Slab Creek Reservoir Dam do not occur as a result of operation of Iowa Hill, with the exception of flow fluctuations that result from specific requirements of the license, such as recreation streamflows.

CONDITION 21. RECREATION ACCESS PLAN FOR SLAB CREEK RESERVOIR

Prior to initiation of Iowa Hill construction, the Licensee shall develop a Recreation Access Plan that addresses recreation 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. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval The Licensee shall implement the plan upon receiving all necessary regulatory approvals.

Additional Conditions

CONDITION 22. MERCURY MANAGEMENT PLAN

The State Water Board reserves the authority to require the Licensee to develop a mercury management plan if future research and/or water quality and metals bioaccumulation monitoring specified in Conditions 8.J. (Other Water Quality Parameters) and 9.H. (Metals Bioaccumulation) indicate that the reservoirs, operations of Iowa Hill or other aspects of power operations increase the mobilization or methylation of mercury. The plan should include a review of potential measures to reduce the amount or rate of increase of methyl-mercury in the watershed (such as changes to power operations, reservoir management, sediment dredging, and/or sediment capping), and an examination of the feasibility of implementing those measures. The plan should also describe any necessary measures to protect human health from exposure through fish consumption (such as posting health warnings at reservoirs, operating recreational fishing as catch-and-release only, or ceasing to stock reservoirs). If, based on the information contained in the plan or other information, the Deputy Director determines there are appropriate and feasible measures the Licensee could implement to reduce methyl mercury and/or protect human health, the Licensee shall develop an implementation plan and submit it to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. Upon receiving all necessary regulatory approvals, the Licensee shall implement the measures identified in that plan.

CONDITION 23. HAZARDOUS WASTE PLAN

Within one year of license issuance or prior to undertaking activities on USFS lands, whichever is earliest, the Licensee shall file with the Commission a plan approved by USFS and the Deputy Director for hazardous substances storage and spill prevention and cleanup. The Deputy Director may require modifications as part of the approval. In addition, during planning and prior to any new construction or maintenance/repair activities not addressed in an existing plan, the Licensee shall notify the USFS and the State Water Board, and the USFS and the Deputy Director shall determine if an additional plan for hazardous substances storage and spill prevention and cleanup is needed. Any such plan shall be filed with the Commission.

At a minimum, the plan must require the Licensee to: (1) maintain a contact list of names and numbers for the Licensee, federal, state and local officials responsible for responding to hazardous waste spills; (2) maintain in the UARP area a cache of spill cleanup equipment suitable to contain any spill from the UARP; (3) periodically inform USFS of the location of the spill cleanup equipment on USFS lands and of the location, type, and quantity of oil and hazardous substances stored in the UARP area; and (4) immediately inform the California Emergency Management Agency, USFS, CDFG, Central Valley Water Board and the State Water Board of the magnitude, nature, time, date, location, and action taken for any spill. The plan shall identify the potential corrective actions and monitoring that will be implemented if a spill occurs.

CONDITION 24. COORDINATION WITH CHILI BAR LICENSEE

The Licensee shall coordinate operations of the UARP with the Licensee of Chili Bar, FERC No. 2155, in order to enable the Chili Bar Licensee to comply with the streamflow-related conditions in the Chili Bar water quality certification, if these are as envisioned in the Chili Bar application. The Licensee's responsibilities for achieving coordinated operations of the two projects are described in Exhibit 1 of the January 29, 2007 Cooperation Agreement Between Sacramento Municipal Utility District and Pacific Gas and Electric Company Regarding Upper American River Project and Chili Bar Project (Cooperation Agreement). Within 120 days after issuance of the UARP or Chili Bar license, whichever is later, the Licensee shall, jointly with the Chili Bar Licensee, prepare and file with the Commission for approval a plan for coordinated operations of the two projects as described in the Cooperation Agreement. Prior to filing with the Commission, the Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. Upon Commission approval, the Licensee shall implement the plan, including any changes required by the Commission.

In addition to the coordination described above related to compliance with streamflow conditions, the Licensee shall consult and coordinate with the Licensee of Chili Bar as described in Exhibit 2 of the Cooperation Agreement in implementation of the conditions in the water quality certification for Chili Bar.

CONDITION 25. VEGETATION AND INVASIVE WEED MANAGEMENT PLAN

Within two years of license issuance, the Licensee shall prepare a Vegetation and Invasive Weed Management Plan in consultation with USFS, USFWS, the appropriate County Agricultural Commissioner, and California Department of Food and Agriculture. The Plan shall incorporate the implementation of the USFWS Valley Elderberry Longhorn Beetle Conservation Guidelines[18]. The Licensee shall submit the Plan to the Deputy Director for approval of those elements of the Plan that deal with Valley Elderberry Longhorn Beetle conservation and aquatic invasive weeds prior to submitting the Plan to the Commission. The Deputy Director may require modifications as part of the approval. Invasive weeds will be those weeds defined in the California Food and Agriculture code, and other species identified by USFS. The Plan will address both aquatic and terrestrial weeds within the UARP boundary and adjacent to UARP features directly affecting National Forest System lands including, roads, and distribution and transmission lines.

The portion of the plan for which approval by the Deputy Director is required includes an adaptive management element for prevention of aquatic invasive weeds. If USFS, the State Water Board or the Licensee determines that aquatic invasive weeds are present in the UARP area, the Licensee shall prepare a plan that describes measures designed to address the infestation, as necessary. These actions may include, but may not be limited to: (1) public education and signing of public boat access; (2) preparation of an Aquatic Plant Management Plan approved by the Deputy Director, and in consultation with other agencies; and (3) boat cleaning stations at boat ramps for the removal of aquatic Invasive weeds.

General Conditions

CONDITION 26. Unless otherwise specified in this water quality certification or at the request of the Deputy Director or designee, data and/or reports will be submitted electronically in a format accepted by the Deputy Director or designee to facilitate the incorporation of this information into the State Water Board's water quality database systems such as the Surface Water Ambient Monitoring Program or public reporting systems such as the Monitoring Council's "My Water Quality" webpage.

CONDITION 27. No construction shall commence until all necessary federal, state and local approvals have been obtained.

CONDITION 28. The Deputy Director reserves the authority to modify the conditions of this water quality certification to incorporate load allocations developed in a Total Maximum Daily Load approved by the State Water Board.

CONDITION 29. The Deputy Director's or State Water Board's approval authority includes the authority to withhold approval or to require modification of a proposal or

[18] U.S. Department of the Interior Fish and Wildlife Service, Sacramento Fish and Wildlife Office Conservation Guidelines for the Valley Elderberry Longhorn Beetle, July 1999.

plan prior to approval. The State Water Board may take enforcement action if the Licensee fails to provide or implement a required plan in a timely manner.

CONDITION 30. Notwithstanding any more specific conditions in this certification, the UARP shall be operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the Porter Cologne Water Quality Act or section 303 of the Clean Water Act. Applicant shall take all reasonable measures to protect the beneficial uses of the SF American River, Middle Fork American River and Rubicon River watersheds.

CONDITION 31. This certification is contingent on compliance with all applicable requirements of the Basin Plan.

CONDITION 32. This certification does not authorize any act which results in the taking of a threatened, endangered or candidate species or any act which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any act authorized under this certification, the Licensee shall obtain authorization for incidental take prior to commencing transfer of water. The Licensee shall be responsible for meeting all requirements of the state and federal Endangered Species Acts for the project authorized under this certification.

CONDITION 33. The authorization to operate the UARP pursuant to this certification is conditioned upon payment of all applicable fees for review and processing of the application for water quality certification and administering the State's water quality certification program, including but not limited to the timely payment of any annual fees or similar charges that may be imposed by future statutes or regulations for the State's reasonable costs of a program to monitor and oversee compliance with conditions of the water quality certification.

CONDITION 34. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions provided under any State or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any State law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

CONDITION 35. In response to a suspected violation of any condition of this certification, the State Water Board may require the holder of any federal permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs of reports, shall bear a reasonable relationship to the need for reports and the benefits to be obtained from the reports.

CONDITION 36. In response to any violation of the conditions of this certification, the State Water Board may add to or modify the conditions of this certification as appropriate to ensure compliance in the future.

CONDITION 37. This certification is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing the section 3867).

CONDITION 38. The Licensee must submit any change to the UARP, including UARP operations that would adversely affect water quality, to the Deputy Director for review and written approval. If such a change would also require submission to the Commission, the change must first be approved by the Deputy Director.

CONDITION 39. Activities associated with operation or maintenance of the UARP that threaten or potentially threaten water quality shall be subject to further review by the State Water Board and Central Valley Water Board.

CONDITION 40. The State Water Board may add to or modify the conditions of this certification, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.

CONDITION 41. The State Water Board may add to or modify the conditions of this certification, as appropriate, to coordinate the operations of UARP and other hydrologically connected water development projects, where coordination of operations is reasonably necessary to achieve water quality standards or protect beneficial uses of water.

CONDITION 42. This certification is not intended and shall not be construed to apply to issuance of any FERC license or FERC license amendment other than the FERC license specifically identified in the Licensee's application for certification.

CONDITION 43. The State Water Board reserves authority to modify this certification if monitoring results indicate that construction or operation of the UARP would cause a violation of water quality objectives or impair the beneficial uses and the public trust of the SF American River, Middle Fork American River and Rubicon River watersheds.

CONDITION 44. Future changes in climate projected to occur during the license term may significantly alter the baseline assumptions used to develop the conditions in this certification. The State Water Board reserves authority to modify or add conditions in this certification to require additional monitoring and/or other measures, as needed, to verify that Project operations meet water quality objectives and protect the beneficial uses assigned to the Project-affected stream reaches.

CONDITION 45. When exercising its reserved authority as described in the General Conditions above, the State Water Board may provide notice and an opportunity for hearing.

DRAFT

Thomas Howard
Executive Director

Date

Attachment A: California Environmental Quality Act Findings and Mitigation Monitoring and Reporting Plan

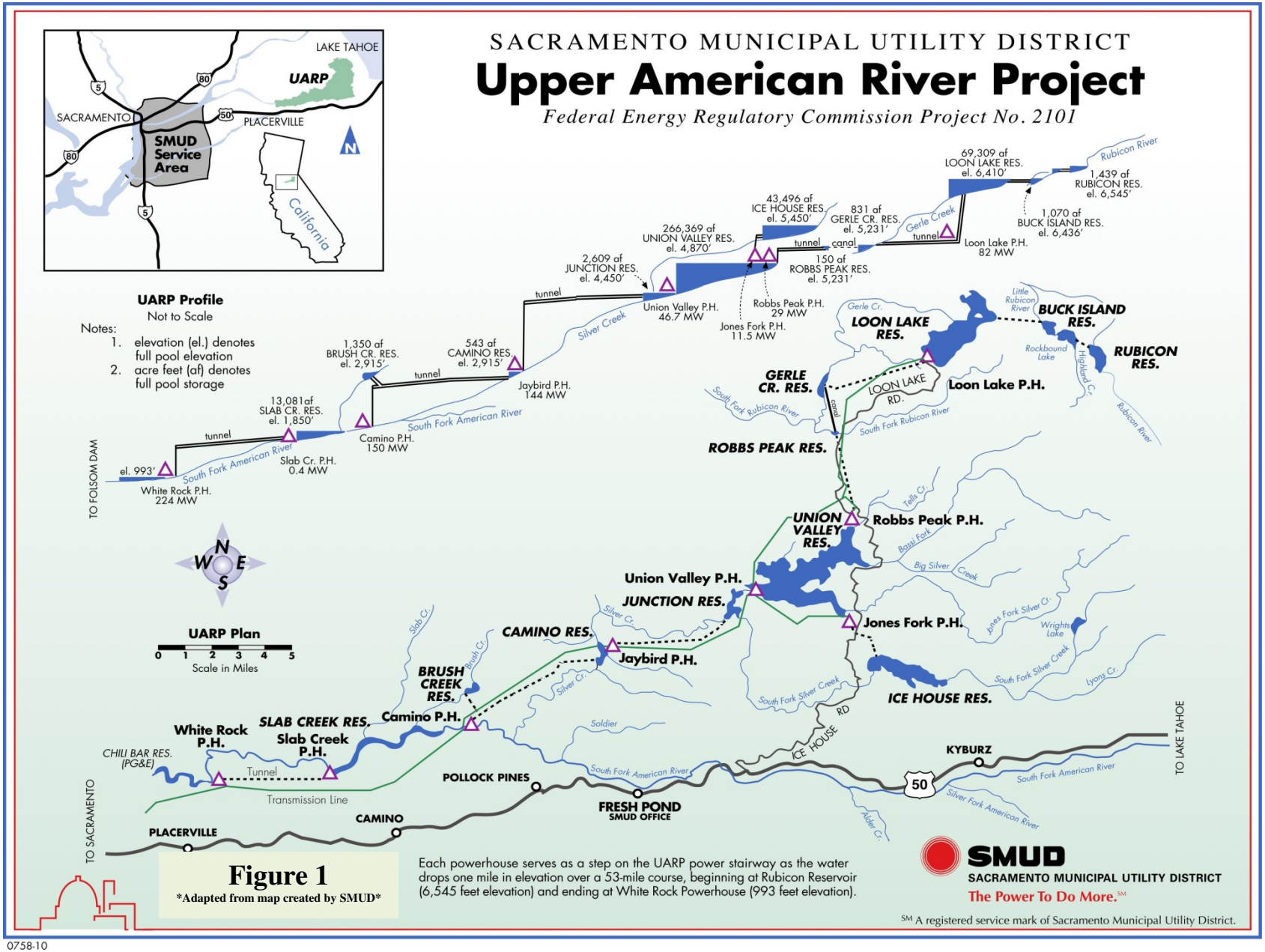

Figure 1
Adapted from map created by SMUD

Each powerhouse serves as a step on the UARP power stairway as the water drops one mile in elevation over a 53-mile course, beginning at Rubicon Reservoir (6,545 feet elevation) and ending at White Rock Powerhouse (993 feet elevation).

SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT
The Power To Do More.℠

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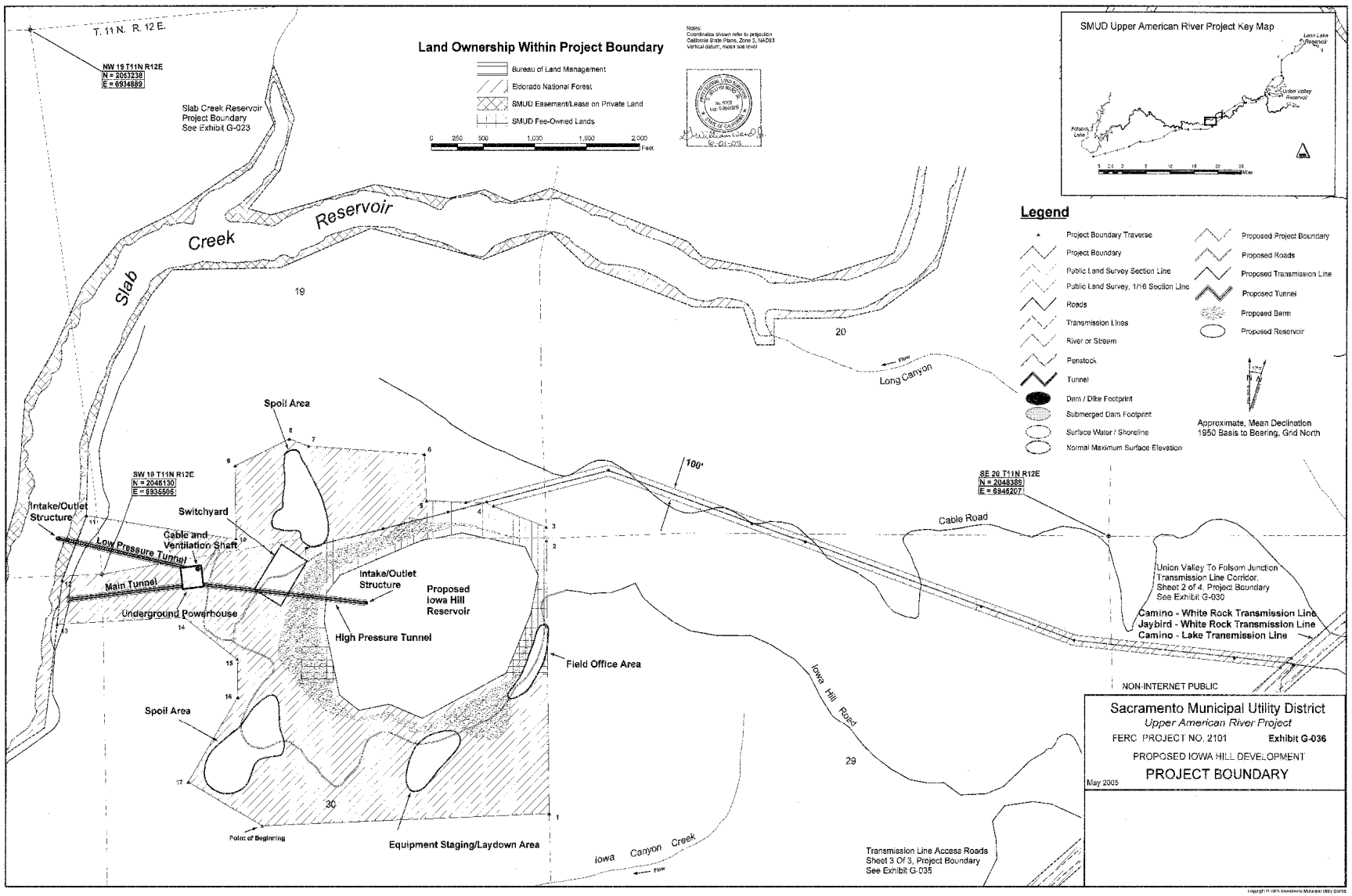
T. 11 N. R. 12 E.
NW 19 T11N R12E
N = 2053238
E = 6934889
Slab Creek Reservoir
Project Boundary
See Exhibit G-023
Land Ownership Within Project Boundary
Bureau of Land Management
Eldorado National Forest
SMUD Easement/Lease on Private Land
SMUD Fee-Owned Lands
0 250 500 1,000 1,500 2,000 Feet
Notes:
Coordinates shown refer to projection
California State Plane, Zone 2, NAD83
Vertical datum, mean sea level
G-01-05
SMUD Upper American River Project Key Map
Folsom Lake
Union Valley Reservoir
Loon Lake Reservoir
Legend
Project Boundary Traverse
Project Boundary
Public Land Survey Section Line
Public Land Survey, 1/16 Section Line
Roads
Transmission Lines
River or Stream
Penstock
Tunnel
Dam / Dike Footprint
Submerged Dam Footprint
Surface Water / Shoreline
Normal Maximum Surface Elevation
Proposed Project Boundary
Proposed Roads
Proposed Transmission Line
Proposed Tunnel
Proposed Berm
Proposed Reservoir
Approximate, Mean Declination
1950 Basis to Bearing, Grid North
Slab Creek Reservoir
19
20
Long Canyon
Flow
Spoil Area
SW 10 T11N R12E
N = 2048130
E = 6936506
Intake/Outlet Structure
Switchyard
Cable and Ventilation Shaft
Low Pressure Tunnel
Main Tunnel
Underground Powerhouse
Intake/Outlet Structure
Proposed Iowa Hill Reservoir
High Pressure Tunnel
Field Office Area
Spoil Area
Point of Beginning
Equipment Staging/Laydown Area
100'
SE 20 T11N R12E
N = 2049389
E = 6946207
Cable Road
Union Valley To Folsom Junction
Transmission Line Corridor,
Sheet 2 of 4, Project Boundary
See Exhibit G-030
Camino - White Rock Transmission Line
Jaybird - White Rock Transmission Line
Camino - Lake Transmission Line
Iowa Hill Road
29
30
Iowa Canyon Creek
Flow
Transmission Line Access Roads
Sheet 3 Of 3, Project Boundary
See Exhibit G-035
NON-INTERNET PUBLIC
Sacramento Municipal Utility District
Upper American River Project
FERC PROJECT NO. 2101
Exhibit G-036
PROPOSED IOWA HILL DEVELOPMENT
PROJECT BOUNDARY
May 2005

Figure 2