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

SACRAMENTO MUNICIPAL UTILITY DISTRICT

UPPER AMERICAN RIVER HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2101

WATER QUALITY CERTIFICATION

TABLE OF CONTENTS

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

BY THE EXECUTIVE DIRECTOR:

Background and Project Description

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.

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.

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

The UARP is located on the western slope of the Sierra Nevada mountain range and uses 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.

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 five to

10 feet is common in the higher elevations, with little or no snow in the lower elevations (below 2,000 feet).

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

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	2,104	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	381,074	--	--	687.6

* Feet above mean sea level

** Typical elevation changes expected under normal operating procedures.

*** Unlike other UARP reservoirs, during emergencies and other limited situations, Brush Creek is used in super peaking mode. Under super peaking operating mode, the daily water level may fluctuate up to 20 feet.

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

Loon Lake Development. The Loon Lake development, the most upstream UARP facility, uses 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, an auxiliary dam, and an earthfill dike that together impound Loon Lake Reservoir;
- Loon Lake Powerhouse Penstock that extends 0.3 miles 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 Transmission Line and the 12.4-mile-long Loon Lake-Union Valley Transmission 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.

Robbs Peak Development. 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.

Jones Fork Development. 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.

Union Valley Development. The Union Valley development consists of:

- Union Valley Dam located on Silver Creek that creates Union Valley Reservoir;
- 268-feet-long Union Valley Tunnel that connects Union Valley Reservoir with Union Valley Penstock;
- 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 that consist of the 11.8-mile-long Union Valley-Camino Transmission Line and the 5.9-mile-long Union Valley-Jaybird Transmission Line.

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

Jaybird Development. The Jaybird development consists of:

- Junction Dam located on Silver Creek that creates Junction Reservoir;
- 4.4-mile-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 Jaybird-White Rock 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.

Camino Development. The Camino development consists of:

- Camino Dam located on Silver Creek that creates Camino Reservoir;
- Camino Tunnel that extends 5 miles to connect 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 miles from Brush Creek Reservoir to the lower end of Camino Tunnel;

- Camino Penstock, an above-ground steel penstock that extends 0.3 miles 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.

Slab Creek/White Rock Development. 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 Project 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

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 proposed location 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 would generate approximately 400 MW and would include the following components:

- A 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; two 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 motors/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;
- Improvements to the existing Slab Creek Reservoir Access Road;

- An 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.

Iowa Hill would generate power by using 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.

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. The Licensee will be required to provide the Deputy Director for Water Rights (Deputy Director) with the design and plans for construction and operation of Iowa Hill. The Deputy Director will review the design and plans to ensure the project is designed, constructed, and operated to comply with water quality standards.

SMUD's State-issued Water Rights

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 SMUD and PG&E Permits 21261 and 21262 (Applications 31595 and 31596) in February 2011. PG&E's interest in the new permits applies only to use of the water at the Chili Bar Project. Table 2 provides a summary of 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 (aka 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 (aka Rockbound/ Highland Creek) Rubicon River, SF Rubicon River 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

SMUD operates the UARP to generate power when it is most valuable 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. SMUD's Balancing Authority is the region within which SMUD maintains and balances its power load and power interchanges with other control areas.

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.

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 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, shall not exceed the combined maximum storage limitations contained in SMUD's existing water right licenses (465,800 ac-ft per year).

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 Iowa Hill 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).

SMUD and PG&E entered into a *Cooperation Agreement Between Sacramento Municipal Utility District and Pacific Gas and Electric Company Regarding Upper American River Project and Chili Bar Project* (Cooperation Agreement) to coordinate UARP and Chili Bar Project 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 the Chili Bar Project. SMUD and PG&E will be required to prepare and implement a plan to coordinate UARP and Chili Bar Project operations as a condition of this water quality certification (Condition 25).

Commission Proceeding and Settlement Agreement

SMUD filed a formal request with the Commission to use the Alternative Licensing Process 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.

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.

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.

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 February 1, 2007. The Settling Parties consist of SMUD, PG&E, USFS, BLM, United States Fish and Wildlife Service (USFWS), National Park Service, California Department of Fish and Wildlife (CDFW)[1], 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 *Rationale Report for Relicensing Settlement Agreement* (Rationale Report) provides CDFW's supporting documentation and the rationale used in developing the recommendations in the SA, and was filed with the Commission on January 31, 2007 by CDFW.

The State Water Board supports the negotiation of agreements regarding the complex allocation of resources 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.

Many of the SA measures require consultation with the Consultation Group[2]. 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 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. Accordingly, those agencies, or successor agencies, should continue to have a role, through 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.

[1] The California Department of Fish and Game (CDFG) is now the California Department of Fish and Wildlife.
[2] The SA defines the Consultation Group as including all parties to the SA with the addition of the State Water Board, the Central Valley Regional Water Quality Control Board and El Dorado County.

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 to protect water quality standards. 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 resources.

Additional Water Quality Concerns

There is a debris pile 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, California 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 debris 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

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 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 increase 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 *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin* (Basin Plan).

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[3], were established after evaluating ecosystem conditions under regulated and unimpaired streamflows (Condition 1). 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 frogs), western pond

[3] 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.

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. The PHABSIM modeling relates trout habitat with instream flow, water temperature modeling results, and the results from a reservoir simulation model (Res-Sim) to evaluate various streamflow and reservoir elevation alternatives.

Minimum streamflows in the Rubicon River below Rubicon Reservoir Dam (Condition 1.A.) are designed to benefit rainbow trout habitat and de-emphasize California roach and speckled dace, which are currently more common than trout in this reach. In contrast to the current conditions characterized by consistent, 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 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. CDFW, 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.

Minimum streamflows in the Little Rubicon River below Buck Island Reservoir Dam (Condition 1.B.) 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.

Minimum streamflows in Gerle Creek below Loon Lake Reservoir Dam (Condition 1.C.) 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 is designed to correspond with the capacity of the Loon Lake Dam outlet works, while the 5-day duration of the pulse flow is 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.

The minimum streamflows in Gerle Creek below Gerle Creek Reservoir Dam (Condition 1.D.) are designed 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.

The minimum streamflows in the SF Rubicon River below Robbs Peak Reservoir Dam (Condition 1.E.) are 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.

Minimum streamflows in SF Silver Creek below Ice House Reservoir Dam (Condition 1.F.) are 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.

Peak flows in the reach below Ice House Reservoir Dam have been greatly reduced since the construction of the Jones Fork Powerhouse in 1985. This has led to excessive 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.

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 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, boating flows and pulse flows may be coordinated to meet both requirements simultaneously.

Minimum streamflows in Silver Creek below Junction Reservoir Dam (Condition 1.G.) are 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 in May gradually decrease during June, July and August to 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.

The minimum streamflows in Silver Creek below Camino Reservoir Dam (Condition 1.H.) are designed 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.

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 (Condition 1.I.). 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.

The minimum instream flows in Brush Creek below Brush Creek Reservoir Dam (Condition 1.J.) are designed 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.

Minimum instream flows in the SF American River below Slab Creek Reservoir Dam (Condition 1.K.) are designed 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.

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 (Condition 2). Simulation of the natural hydrograph provides important cues for amphibian reproduction, especially during the descending limb of the hydrograph, which is 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. Requirements establishing ramping rates for pulse flow releases, minimum streamflow releases, and recreational streamflow releases are designed to prevent detrimental effects to aquatic life in UARP (e.g., fish stranding or impacts to FYL frogs during breeding) (Condition 3).

Recreational streamflows were established for the SF American River below Slab Creek Reservoir Dam (Condition 4) 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 regarding the appropriate magnitude for recreational flows. The recreational flows are designed to provide opportunities for both kayakers and rafters. Recreational flows below Slab Creek Reservoir Dam 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 as defined in a Whitewater Boating Recreation Plan, which will be developed as part of Condition 4 of the certification. 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. Because the required flows are greater than the capacity of the outlet works at the dam, the initial recreational streamflows will be limited to BN, AN and Wet water years and will be implemented by controlled spills at Slab Creek Reservoir Dam. As part of the new Slab Creek Reservoir Powerhouse Project, SMUD is proposing to construct a new powerhouse and a boating flow release valve ¼-mile downstream of Slab Creek Reservoir Dam. If a boating flow release valve is constructed at the site of the new Slab Creek Powerhouse, a boating flow release valve will not be needed at Slab Creek Reservoir Dam.

Rationale for Reservoir Levels; Streamflow and Reservoir Gaging; and Streamflow and Reservoir Level Information

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) (Conditions 5.A through 5.C.). These minimum levels ensure 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 (Conditions 5.D. through 5.F.). 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.

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.

It is possible that consecutively dry years (known as Super Dry [SD] years) may affect the Licensee's ability to maintain the reservoir level requirements in the certification. In an SD year the Licensee is required to develop a plan for approval by the Deputy Director that details any planned changes in reservoir operations and/or reservoir levels (Condition 5.G.).

Minimum reservoir levels may only be modified upon the occurrence of the following events: (1) State or Federal electrical emergencies declared by an appropriate authority where specific orders are issued or specific actions are mandated by said authority that require SMUD to produce electricity outside of normal planned operations; (2) system events that cause SMUD's operating reserves to drop below the Western Energy Coordinating Council Minimum Operating Reliability Criteria; (3) equipment malfunction, public safety emergencies or law enforcement activity; or

(4) abnormally low precipitation patterns. The Licensee will develop a plan that describes how reservoir levels will be managed when reservoir levels are so modified (Conditions 5.H. and 5.I.).

A conference may be requested by the Licensee in years forecast with low unimpaired runoff or in water years that follow a SD water year, and when the Licensee determines that the end-of-month reservoir elevations may not be achievable for that year. The purpose of the conference is to minimize recreational impacts and to address energy and operational requirements during months in which reservoir levels may not be achieved (Condition 5.I.).

The Licensee is required to submit a report to the State Water Board every five years describing whether the target reservoir levels identified in Conditions 5.A., 5.B., and 5.C. were met. The purpose of the report is to provide a record of compliance with the reservoir targets and to identify and resolve issues which may have prevented their achievement (Condition 5.J.).

Streamflow and reservoir gaging is required throughout UARP to ensure that minimum instream flows and minimum reservoir levels are in compliance with the requirements of the certification (Condition 6). Real-time streamflow and reservoir level information will be made available to the public via the Internet (Condition 7). 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 schedule for planned 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

The resource monitoring program outlined in Condition 8 is designed to determine whether streamflows are achieving the 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, metals bioaccumulation in resident fish, fish entrainment and bald eagles. The methods and frequency of monitoring are designed to measure the response of resources to adjustments in streamflow and other conditions and to determine whether resource objectives are being met.

Condition 8 also allows the Deputy Director, based on consultation with or recommendations by the Licensee, USFS, CDFW, and USFWS, the flexibility to alter the monitoring program methodologies and frequencies of data collection. An alteration may be made if it is determined to be an improvement in comparison to the current monitoring requirements or the relevant ecological resource objective has been met or no change in resource response is expected. The Deputy Director may also modify the monitoring schedule to ensure that monitoring occurs during a range of water year types.

Monitoring fish populations will document population response to the new license conditions and identify long-term population trends. Sampling for two-years in the beginning of each 5-year period provides two years of data for comparison to ecological resource biomass objectives[4] as described by Gerstung (1973).[5] Electroshocking effects to individuals will be minimized by only sampling in two-years per 5-year period. This will also allow sufficient response time for fish to acclimate to the new streamflow regimes. Hardhead sampling in Years 2 and 3 will provide data to evaluate the population's initial response to the new flow regime (Condition 8.A.).

[4] See biomass objectives table in Rationale Report (pages 12-13).
[5] Gerstung, E.G. 1973. Fish population and yield estimates from California Trout Streams. Cal-Neva Wildlife.

Monitoring benthic macroinvertebrate assemblages will indicate changes in the stream health condition, and give an estimate of available food resources for fish populations and other aquatic predators (Condition 8.B.). Comparison of sampling sites to reference reaches will inform whether impaired sites show improvement and non-impaired sites are maintaining their baseline population levels. During the relicensing studies three reference sites were used: Big Silver Creek; SF American River at Ice House Road; and Silver Fork American River upstream of Highway 50. Two additional reference sites were used for comparison with the reach downstream of the Chili Bar Project: the North Fork American River at Ponderosa Way; and a site on the Cosumnes River.[6]

Monitoring for FYL frogs will document the population response to the new license conditions and identify long-term population trends. Periodic monitoring for Mountain Yellow-legged Frogs, which were not found within the UARP area during the relicensing studies, will be required in the Rubicon River watershed to provide information on long-term population trends (Condition 8.C.). 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 (Condition 8.D.).

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 (Condition 8.E.). Onetime baseline documentation of algal species is required to document the presence and locations of nuisance algae in Silver Creek (Condition 8.F.). Baseline samples will also be collected in multiple UARP reaches for comparison to future survey results. Additional measures to address nuisance algae are included in Condition 9.G., which describes the required adaptive management measures.

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 (Condition 8.G.). An on-going evaluation of geomorphic conditions using permanent cross-section transects will be conducted. Geomorphic information will be collected at regular intervals 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 (Condition 8.H.).

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 removal of specific monitoring sites if results indicate water temperatures are adequate at those specific locations (Condition 8.I.).

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-detectable levels for a statistically significant period of time. Analyzing fish samples for metals bioaccumulation allows for an evaluation of health risks to humans and wildlife and creates a long-term data set to detect trends in metals bioaccumulation (Condition 8.J.).

[6] Aquatic Bioassessment Technical Report, Devine Tarbell & Associates, Stillwater Sciences 2005, Page 5.

Monitoring is required to determine the timing and magnitude of streamflow associated with fish migration in the SF Rubicon River and Robbs Peak Reservoir to address concerns that entrainment into Robbs Peak Powerhouse may contribute to declining fish populations upstream of Robbs Peak Reservoir (Condition 8.K.). The monitoring results will be used to determine whether measures to reduce entrainment, such as fish screens, are needed (Condition 9.E.).

Monitoring for bald eagles will provide information to the Licensee and resource agencies regarding the location of bald eagle nests. This information will aid in determining whether changes in UARP operations are necessary to protect the animals which are dependent on waterfowl and fish for food. The data collected will also help determine whether the animals are being disturbed by increased construction, recreation, or other UARP activity. On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. Even though federally delisted, bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (Condition 8.L.).

Rationale for Adaptive Management Program

In general, an adaptive management program provides resource managers with 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 to implement 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 (Condition 9).

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 (Conditions 9.A. through 9.D.). These measures involve the avoidance of untimely spills and the canceling or deferring of 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 indicate 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.

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 UARP operations should be placed in the stream channel downstream of that reservoir (Condition 9.F.). 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.

The development of additional adaptive measures may be required to address excessive algae growth in the UARP vicinity, including the Silver Creek stream reach[7] below Junction Reservoir Dam and the SF Rubicon River below Robbs Peak Reservoir Dam, if the new streamflow conditions do not control or eliminate excessive algae growth so that it is not adversely affecting water quality (Condition 9.G.).

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 (Condition 9.H.).

Rationale for Miscellaneous Conditions

UARP 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 (Condition 10).

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.

It is reasonably foreseeable that anadromous fish may be reintroduced into the waters of the UARP during the term of the Commission license. The anadromous fish reintroduction condition in this certification is intended to facilitate consultation between the Licensee and the resource agencies that have jurisdiction over such a reintroduction (Condition 12). It is expected that early consultation would result in a smoother reintroduction process, which will aid in the protection of beneficial uses associated with anadromous fish (i.e., cold-water spawning habitat).

The USFS, CDFW, 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 (Condition 13). This will allow the agencies to determine, in consultation with the Licensee, whether to recommend or implement changes in UARP operations or in monitoring.

The Licensee must develop and implement a Transportation System Management Plan that is approved by USFS and is periodically updated (Condition 15). Because the Transportation System Management Plan is still to be defined, and some transportation projects have the potential to discharge pollutants into the state's waters or disturb streambeds even with best management practices (BMPs), it is necessary to review the BMPs to ensure that they provide sufficient protection to the state's waters. Projects with discharge or streambed alteration potential are therefore subject to consultation regarding additional State Water Board or Regional Water Quality

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

Control Board (Regional Water Board) permitting and are subject to modification by the Deputy Director.

The SA requires the Licensee to 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 (Condition 14). The permits that may be required[8] will address construction impacts, including de-watering a construction site, the size of the area affected, the proximity to water bodies, and identification of appropriate mitigation measures.

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. Mercury methylation is 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 (Condition 23).

A requirement for the Licensee to prepare and implement a hazardous waste plan will ensure that oil and hazardous substances that are used for UARP operation or maintenance are properly stored, appropriate equipment and supplies are available, and appropriate corrective actions are taken in the event of a spill (Condition 24).

As stated in the Cooperation Agreement signed by SMUD and PG&E, “SMUD agrees to provide to Company [PG&E] Operational Guidance and sufficient water inflows into Chili Bar Reservoir to enable Company [PG&E] to comply with the conditions of the Chili Bar license, and Company [PG&E] agrees to follow such Operational Guidance in a manner that will comply with the flow-related Chili Bar license conditions.” Condition 25 of this certification requires that SMUD and PG&E coordinate UARP operations in order for PG&E to achieve compliance with flow-related requirements (i.e., Conditions 1 through 3) in the Chili Bar Project certification.

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 ensure that noxious aquatic weed infestations, should they occur in the UARP vicinity, will be addressed (Condition 26). The plan will also include provisions for the conservation of Valley Elderberry

[8] Permits that may be required include, but are not limited to: individual waste discharge requirements; the General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ and NPDES No. CAS000002, as amended by Orders No. 2010-0014-DWQ and No. 2012-0006-DWQ, and amendments thereto); Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters (Order No. R5-2008-0081/NPDES Permit No. CAG995001, as superseded by Order R5-2013-0074, and newly adopted orders thereto) 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.

plants, which provide habitat for the Valley Elderberry Longhorn Beetle, a threatened species that may be present in the UARP vicinity.

Local residents have expressed concern that increased public use due to requirements for recreational streamflows below Slab Creek Dam and/or construction activities associated with Iowa Hill will increase fire danger in the SF American River canyon. The State Water Board is not the appropriate agency to mandate fire plans, as residents have recommended. To address any potential water quality issues from fire risk, however, a condition is included in this water quality certification to require that SMUD work cooperatively with the Central Valley Water Board, CDFW, other appropriate state and federal agencies and landowners to identify measures that will protect water quality in the UARP watershed (Condition 27).

Construction and Operation of Iowa Hill

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 CDFW to ensure that the design of Iowa Hill incorporates features that will reduce potential negative operational impacts (Condition 17). 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 State Water Board reserves and delegates to the Deputy Director the authority to condition approval of those aspects of Iowa Hill that relate to water quality and the protection of beneficial uses, including fish entrainment, sediment mobilization, turbidity, and the creation of dangerous hydraulic conditions.

This certification contains conditions that may address discharges from Iowa Hill, insofar as those are identifiable at this point; however, the State Water Board has not received final plans for Iowa Hill. The Licensee must provide a complete project description and a plan for the associated construction activities, including road construction. The Licensee will be required to consult with the State Water Board and other appropriate state and federal agencies to ensure 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 prior to the construction of Iowa Hill. Before construction can proceed, the Licensee must receive approval from the Deputy Director that may include additional measures to protect water quality and the environment during the construction and subsequent operation of Iowa Hill.

The Licensee will prepare, file and implement a Stormwater Pollution Prevention Plan (SWPPP) for the construction of Iowa Hill in conformance with National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance activities (Order No. 2009-0009-DWQ, NPDES No. CAS0000002, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ) (Construction General Permit) that was adopted by the State Water Board. This Construction General Permit requires the Licensee to implement BMPs to prevent adverse impacts to water quality that may result from the construction of Iowa Hill (Condition 18).

Tunneling and excavation activities associated with the construction of Iowa Hill may affect surface and groundwater resources and may result in 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 (Condition 20).

Hardhead, a California species of special concern, is present within both Slab Creek Reservoir and the SF American River downstream of Slab Creek Reservoir Dam. Monitoring the spatial distribution of all hardhead life stages before and after initiation of Iowa Hill operations will provide information about the hardhead population's response to Iowa Hill, the risk of entrainment into the intake/outlet structure and any other potential negative impacts associated with discharge velocities near the structure (Condition 21.A.). 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 (Condition 21.B.). Focused entrainment monitoring at the intake/outlet structure in Slab Creek Reservoir will establish whether additional measures to reduce entrainment are necessary (Condition 21.C.).

The Licensee will be prohibited from operating Iowa Hill in a manner that reduces 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. The results of temperature monitoring required as a condition of this certification will be used to assess compliance with this prohibition. Similarly, Iowa Hill operations that cause flow fluctuations in the reach below Slab Creek Reservoir Dam will not be permitted, to ensure that adverse impacts to aquatic species associated with such fluctuations are minimized (Condition 21.D.).

To minimize the disruption of public recreation activities at Slab Creek Reservoir associated with Iowa Hill, the Licensee will be required to develop a plan that allows public access during the construction and operation of Iowa Hill (Condition 22).

Additional conditions commonly applicable to hydropower projects (Conditions 28-50) are necessary to ensure the protection of water quality standards over the term of the license and any extensions.

Water Quality Certification Authority

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."

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).)

SMUD originally applied for a water quality certification for 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; re-filed the application on October 1, 2010; withdrew and re-filed the application on September 16, 2011; withdrew and re-filed the application on September 6, 2012; and withdrew and re-filed the application on September 3, 2013. The State Water Board provided public notice of the application pursuant to California Code of Regulations, title 23, section 3858 on November, 18, 2009, and posted information describing the UARP on the Division of Water Rights' website. The State Water Board circulated a draft water quality certification on October 7, 2011.

Basin Plan

The California Regional Water Boards adopt, and the State Water Board approves, water quality control plans, also known as basin plans, for each watershed 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. 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 of the Clean Water Act. Section 303 of the Clean Water Act requires the states to develop and adopt water quality standards. (33 U.S.C. § 1313.)

The Central Valley Water Board adopted, and the State Water Board and the United States Environmental Protection Agency (USEPA) approved, the 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.

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. The Basin Plan further identifies discrete water quality objectives aimed at protecting these identified beneficial uses.

Certification that a project will not violate water quality standards is a key component of water quality certification.

California Environmental Quality Act Compliance

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 14, 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 21, 2004, which provided responses to comments received during the initial scoping process.

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 to FERC/USFS Final Environmental Impact Statement for Hydropower License, and Analysis of Iowa Hill Joint Advisory Committee Comments* (Draft CEQA Supplement) that SMUD issued for a 45-day public comment period on May 2, 2008. The Draft CEQA Supplement also included a Draft Mitigation and Monitoring Program. A public meeting was held on June 2, 2008, to receive oral and written comments on the Draft CEQA Supplement, and at that 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 on June 30, 2008.

SMUD released the *Final CEQA Supplemental Analysis to the FERC/USFS Final Environmental Impact Statement for Hydropower License and Analysis of Iowa Hill Joint Advisory Committee Comments* (Final CEQA Supplement) (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, SMUD 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. On July 19, 2012, the SMUD Board adopted a resolution approving the UARP[9], CEQA findings, and an addendum to the Final CEQA Supplement that details the greenhouse gas impacts of UARP. The SMUD Board also adopted a Mitigation and Monitoring Report for UARP. On July 24, 2012, SMUD issued a Notice of Determination (NOD) for UARP.

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 significant impacts to 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 will ensure that any potential UARP impacts are less-than-significant. No significant, unavoidable impacts to water resources were identified in either the Final EIS or SMUD's CEQA Supplement.

[9] The SMUD Board approved the UARP with the understanding that Iowa Hill was not an approved component.

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER RESOURCES CONTROL BOARD CERTIFIES THAT CONSTRUCTION AND OPERATION OF THE UPPER AMERICAN RIVER HYDROELECTRIC 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.

CONDITION 1. MINIMUM INSTREAM FLOWS

General Information

The Licensee shall, beginning as early as reasonably practicable and not later than three months after license issuance, maintain minimum streamflows as specified in this condition 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, CDFW, 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 where facility modification is required, 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 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 2.600 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 month from 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 American River at Folsom [AMF] Station, 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, CDFW, 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 Table 3 based on month and water year type. If inclement weather conditions prevent access to the minimum streamflow release valve 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. However, the May minimum streamflow shall be no less than 30 days in duration, even if this requires extension of the May minimum streamflows into June. 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*

* The minimum streamflow shall be 6 cfs or the NF, whichever is less. NF as used here is natural flow, subject to the following condition: If natural flow measured in the Rubicon River above Rubicon Reservoir is below 1 cfs, the minimum streamflow shall be 1 cfs. In CD water years, if the useable storage in Rubicon Reservoir is less than 60 ac-ft and the Licensee cannot maintain 1 cfs due to lack of natural flow into and storage in Rubicon Reservoir, after notification of USFS, USFWS, CDFW, and the State Water Board, the Licensee may reduce minimum flows below 1 cfs until sufficient water is available to resume prescribed minimum streamflow releases; however, at no time shall the minimum streamflow be less than the natural flow into Rubicon Reservoir. The Licensee shall make every effort to notify USFS, USFWS, CDFW, and the 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.

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 Table 3 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 Table 4 based on month and water year type. If inclement weather conditions prevent access to the minimum streamflow release valve during the months of March, April and May, required modifications to minimum streamflows may occur within a 14-day-window beginning seven calendar days before or after the first day of the month. However, the May minimum streamflow shall be no less than 30 days in duration, even if this requires extension of the May minimum streamflows into June. 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 natural flow measured in Highland/Rockbound Creek above Buck Island Reservoir is below 1 cfs, the minimum flow shall be 1 cfs. In CD water years, 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 natural flow into and storage in Buck Island Reservoir, the Licensee, after notification of USFS, CDFW, USFWS, and the State Water Board, may reduce minimum flows below 1 cfs until sufficient water is available to resume prescribed minimum streamflow releases; however, at no time shall the minimum streamflow be less than the natural flow into Buck Island Reservoir. The Licensee shall make every effort to notify USFS, USFWS, CDFW, and the 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.

1.C. Gerle Creek below Loon Lake Reservoir Dam

The Licensee shall maintain the minimum streamflow specified in 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 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 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 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 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).

1.H. Silver Creek below Camino Reservoir Dam

The Licensee shall maintain the minimum streamflow specified 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).

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

To assist the Licensee in maintaining required temperature control in the river reaches below Camino and Junction Reservoirs, the Licensee shall release up to two blocks of water per month in Wet years during July, August and/or September, for a potential total of six water blocks annually. The volume of water constituting a water block varies depending on the month of release. Upon approval of the Deputy Director, in accordance with the plan described below, one block of water per month shall be released into Silver Creek below Junction Reservoir Dam (Table 11.A.), or one block of water per month shall be released into Silver Creek below Camino Reservoir Dam (Table 11.B.), or both, as needed for temperature control. No block of water shall exceed the monthly quantity described in Tables 11.A. and 11.B.

Table 11.A. Adaptive Management Water Block Release Volumes for Water Temperature Management in Silver Creek below Junction Reservoir Dam (Wet Years Only)

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

Table 11.B. Adaptive Management Water Block Release Volumes for Water Temperature Management in Silver Creek below Camino Reservoir Dam (Wet Years Only)	
Month	**Maximum Water Quantity Released (acre-feet)**
July	1,044
August	491
September	475

Within one year of license issuance, the Licensee shall, in consultation with CDFW, USFWS, USFS, and State Water Board staff, develop a plan for each block of water that addresses, at a minimum: notification protocols for temperature exceedances, emergency temperature operation contingencies, and ecological monitoring associated with the use of each block of water. The Licensee shall submit the plan to the Deputy Director[10] for review and approval after agency consultation but prior to submission to the Commission, if applicable. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Each block of water released shall be equivalent to the total amount of water available for release in the month specified for that reach. The amount of water for each monthly block shall be released as needed to achieve the desired mean daily water temperature described below. The Licensee is not required to release the block of water in its entirety in one release event. Each 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.

The Licensee shall release each block of water as directed by the approved plan to maintain mean daily water temperatures of 20ºC or below in the Junction Dam and Camino Dam Reaches. One block of water shall be made available to the Junction Dam Reach 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. A second block of water shall be made available to the Camino Dam Reach if water temperature exceeds a daily mean water temperature of 20ºC in Silver Creek below Camino Reservoir Dam, as measured in Silver Creek 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 the SF American River at or near the site of discontinued USGS gage 11442000 (Licensee station SC1[11]). 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

[10] 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.

[11] Study site designations and locations are described in the Water Temperature Technical Report (May 2005) prepared for the relicensing proceeding.

within 24 hours, notify the State Water Board, CDFW, USFWS, and USFS if the water temperatures in Silver Creek below Junction Reservoir Dam or below Camino Reservoir 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 water block according to the approved plan described above.

1.J. Brush Creek below Brush Creek Reservoir Dam

The Licensee shall maintain the minimum streamflow specified 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.

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*

* The minimum streamflow shall be the value specified in Table 12 or the NF, whichever is less. NF as used here is natural flow subject to the following condition: If natural flow as measured in Brush Creek above Brush Creek Reservoir is less than 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 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 some months, minimum streamflows change weekly. In months with more than one minimum streamflow, the Licensee shall maintain each minimum streamflow listed for one week (seven days) prior to implementing the next weekly minimum streamflow for that month[12]. Minimum streamflow shall be measured at USGS gage 11443500, located approximately 500 feet upstream from Iowa Canyon Creek.

[12] The last weekly minimum flow for each month with four flows (e.g., 180 cfs in March) shall be maintained for more than seven days, through the remainder of that month.

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 theoretical maximum capacity of the existing valve is 263 cfs.

The Licensee shall maintain the minimum streamflow specified in Table 14 based on month and water year type, for Years 4 through the term of the new license and any extensions. In months with more than one minimum streamflow, the Licensee shall maintain each minimum streamflow listed for one week (seven days) prior to implementing the next weekly minimum streamflow for that month[13]. 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 the Term of New License and Any Extensions					
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

[13] The last weekly minimum flow for each month with four flows (e.g., 180 cfs in March) shall be maintained for more than seven days, through the remainder of that month.

CONDITION 2. PULSE FLOWS

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 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.

For compliance purposes, the point of measurement for each required pulse flow is provided in this condition. 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. The Licensee shall furnish the streamflow records that show compliance with the pulse flow requirements to the State Water Board upon request.

Pulse flows may be temporarily modified if equipment malfunction or operating emergencies reasonably beyond the control of the Licensee require it. If a pulse flow is so modified, the Licensee shall provide notice to the Commission, USFS, USFWS, CDFW, 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, CDFW, 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 agencies 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 by the agencies.

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 for 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, CDFW, 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, CDFW, State Water Board, and USFWS agree upon a tunnel gate operation plan, which is approved by the USFS, to govern future tunnel gate operations for pulse flow events. However, such meetings may be reinstated at the request of the Licensee, CDFW, USFS, 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 five-day schedule outlined in Table 15 or as modified by the USFS with concurrence from the Deputy Director.

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 items 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.[14] 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

[14] Study site designations and locations are described in the Channel Morphology Technical Report (January 2005) prepared during the relicensing proceeding.

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 and potential impacts of the pulse flows on downstream features including bridges, campgrounds, and day-use areas.

Once items 1 through 3 are complete, USFS, with the concurrence of the Deputy Director, may adjust the prescribed pulse flows if the results indicate adjustment 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 (Table 15). The pulse flows shall be measured at USGS gage 11429500, located approximately 0.3 miles downstream from Loon Lake Reservoir Dam.

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

The Licensee shall provide pulse flows as specified in Table 16. 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, CDFW, USFWS, and the 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[15]. 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 the Licensee's ability to control. The Licensee shall provide notice to USFS, CDFW, USFWS, and the State Water Board within 10 days after such an event occurs and shall provide a report within one month after such an event occurs documenting the reason that ramping rates were not followed.

CONDITION 4. RECREATION STREAMFLOWS[16]

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 boating usage triggers (see the section "Following Year 5 of License Issuance" below) for increasing the number of recreational streamflow days and facility modification have not been met by Year 15 after license issuance, the initial recreational streamflows defined above shall continue to be

[15] 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). Recreational streamflow releases will be made by spilling at Slab Creek Dam during the time period prior to any future facility modification.

[16] 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 Flows.

provided through the term of the license and any extensions unless and until the Deputy Director, after consultation with the Licensee and BLM, subsequently determines that the usage triggers for increasing the number of recreational streamflow days and facility modification are met.

Consultation and Monitoring

Directly following License Issuance:

Consultation shall take place among the Licensee, USFS, BLM, State Water Board and members of the boating community, no later than February 15 of each year to determine a preliminary recreational flow schedule based on the water year types identified in this certification. Additional consultation shall take place as necessary, and final notification of the number of recreational flow days for that year shall be provided to the agencies no less than three days in advance of the first recreational flow releases. At the time of final notification, the Licensee shall provide the Deputy Director with any comments provided during the consultation process.

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. A recreational boating use monitoring plan shall be developed within 90 days of license issuance, in consultation with USFS, State Water Board, BLM, and members of the boating community. The monitoring plan shall clearly define the monitoring objectives and identify metrics to be used for analysis of the data collected. The data collected shall include, but are not limited to: a complete accounting of all boating users entering the SF American River in the ½ 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.

Following Year 5 of License Issuance:

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, BLM, and members of the boating community, 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 in order to deliver the recreational streamflows described in Table 17 in a controlled fashion. The boating usage triggers will also determine when the recreational flows outlined in Table 17 become effective. If preparation of the Boating Plan is required, the Licensee shall submit the Boating Plan to the Deputy Director for approval no later than five and a half years following license issuance. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission. The Licensee shall implement the Boating Plan upon approval by the Deputy Director and upon receipt of any other necessary regulatory approvals.

Following Year 10 of License Issuance:

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, BLM, and members of the boating community, based on data and triggers identified in the Boating Plan, determine

if the facility must be modified to provide the flows in Table 17. Based on the determination of whether the facility shall be modified, the Licensee shall do one of the following:

- If Iowa Hill is not constructed and the boating usage triggers in the Boating Plan are met by Year 10, the facilities shall be modified and functional within 15 years of license issuance. Once the facilities are modified and functional, the recreational streamflows in Table 17 shall be implemented through the term of the license and any extensions. The plan for facility modification shall be submitted to the Deputy Director for approval. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan for modification prior to submittal to the Commission, if applicable. The Deputy Director may require modification of the plan as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required determination of facility modification, with the Commission.

- If the boating usage triggers specified in the Boating Plan are not met by Year 10, boating use will continue to be monitored and a new determination will be made every 5 years thereafter as to whether the triggers are met. If a determination is made that the triggers are met, the facilities shall be modified. Once the facilities are modified and functional, the recreational streamflows described in Table 17 shall be implemented through the term of the license and any extensions. The plan for facility modification shall be submitted to the Deputy Director for approval as described in the bullet above.

If the Licensee cannot provide recreational streamflows due to construction activities associated with Iowa Hill or other facility modifications, the Licensee shall meet with USFS, BLM, State Water Board and members of the boating community to develop an interim plan to address recreation streamflows. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The interim plan shall be submitted to the Deputy Director for review and approval. The Deputy Director may require modifications of the interim plan as part of the approval. The Licensee shall implement the interim plan and any required modifications upon Deputy Director approval and any other necessary regulatory approvals.

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) if the boating usage triggers identified in the Boating Plan are 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 days, 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. The initial evaluation and determination shall be made within five years of license issuance. Absent a determination that such streamflows can be provided without harm, the Licensee shall annually request that the subject be re-evaluated by USFS, USFWS, CDFW, and the State Water Board 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 Deputy Director approval. Scheduled boating days shall not exceed the total displayed in Table 17. However, if October flows are provided the following spring, the boating days in the spring may exceed those displayed in Table 17. In addition, the frequency and magnitude of the boating flows may be adjusted within the total volume of water displayed in Table 17 after consultation with USFS, CDFW, USFWS, BLM, State Water Board staff and members of the boating community and upon Deputy Director approval. The Licensee shall provide the Deputy Director with any comments provided during the consultation process.

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 appropriate authority, requiring 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.

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

Initial Period

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

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

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 first five-year period, the Licensee shall prepare a Recreation Plan for approval 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. Boating days shall not exceed the total amount displayed in Table 19. Table 19 contains the required recreation flows for Silver Creek below Ice House Reservoir Dam for years subsequent to the initial five-year period following license issuance if the triggers in the Recreation Plan are met. 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. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission.

Within five years of license issuance and every five years thereafter, the Licensee shall, in cooperation with USFS, prepare a report that: (1) describes whitewater recreation use and impacts; (2) notes whether use has exceeded the triggers defined in the Recreation Plan; and (3) makes a recommendation whether the streamflow days should be increased based on the triggers in the Recreation Plan. Boating days shall not exceed the total amount displayed in Table 19. This report shall be provided to the Deputy Director, who shall determine whether the streamflow days should be increased and/or the frequency and magnitude of the boating flows should be adjusted within the total volume of water displayed in the tables based on the triggers in the Recreation Plan. The Deputy Director may require modifications as part of the approval. The Licensee shall implement any changes to the streamflow days upon receiving Deputy Director and all other

necessary approvals. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission.

Table19. Recreation Flows: South Fork Silver Creek below Ice House Reservoir Dam (Year 6 through the License Term and Any Extensions)				
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 recreational 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 UARP facility or equipment outages in conflict with providing the recreation streamflows described in Tables 18 and 19. The Licensee shall provide scheduled recreation streamflows on the days when such releases are forecast to occur, except as described below.

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 appropriate authority, requiring 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, USFS, and members of the boating community 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, State Water Board, USFS, and members of the boating community as soon as possible.

CONDITION 5. RESERVOIR LEVELS

The Licensee shall, beginning as early as reasonably practicable and no later than 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 Tables 20, 21 and 22, respectively. Compliance will be measured at the Licensee's reservoir elevation gages as published by the USGS.

5.A. Loon Lake Reservoir

The Licensee shall maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 20.

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

The Licensee shall maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 21.

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

The Licensee shall maintain the reservoir level to meet the end-of-month reservoir storage elevation shown in Table 22.

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 CDFW following the direction in Condition 5.H. (Interim Modifications).

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

From July 1 through September 30, during daylight hours between 10:00 am and 8:00 pm, the Licensee shall: (1) maintain the reservoir level above 1,830 feet in elevation; and (2) limit fluctuations to less than seven feet per day.

The minimum reservoir elevation and maximum daily fluctuation shall be reassessed and modified if necessary to accommodate: (1) operation of Iowa Hill, should it be constructed; (2) recreational use at Slab Creek Reservoir; and (3) other appropriate factors. The Licensee shall consult with the USFS regarding any modification to the minimum reservoir elevation and maximum daily fluctuation as described in SA Article 1-23.5. Any such modifications must be submitted to the Deputy Director for review and approval prior to implementation. The Deputy Director may require modifications as part of the approval. The Licensee shall implement the proposal upon receiving all necessary approvals.

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 the years 1975 through 2000. This equates to maintaining a water surface elevation of no lower than 4,398 feet for Junction Reservoir and no lower than 2,853.6 feet for Brush Creek Reservoir[17]. 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 Flows, 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 a SD year, the Licensee shall, by March 10, notify USFS, CDFW, and the State Water Board of the Licensee's concerns related to reservoir levels. By

[17] 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.

June 1 of a SD year, the Licensee shall confer with USFS, CDFW, and the State Water Board to discuss reservoir operations plans and reservoir levels during the SD water year. The Licensee shall provide the Deputy Director with any comments provided by the other agencies during the consultation process. The Licensee may implement the revised operations for a SD year upon receiving Deputy Director and all other necessary regulatory approvals. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission.

5.H. Interim Modifications

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 appropriate authority, requiring 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, CDFW, 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. 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 shall be commensurate with the severity 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, CDFW, 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. Within 10 business days of the Conference, the Licensee shall file with the Commission and State Water Board a letter summarizing the Conference and proposal. The Licensee shall obtain Deputy Director approval of the proposal prior to its implementation. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required proposal modifications, with the Commission.

5.I. Conferences for Abnormal Precipitation Patterns

The Licensee may request a Conference with USFS, State Water Board, CDFW, and USFWS by June 1 in water years: (1) which either have a forecast April – July unimpaired runoff[18] less than 40 percent of the forecasted total water year unimpaired runoff[19] or that follow a SD water year; and (2) when the Licensee determines that the end-of-month reservoir 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, CDFW, 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 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 severity and time period during which reservoir levels would potentially 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. Within 10 business days of the Conference, the Licensee shall file with the Commission and State Water Board a letter summarizing the Conference and proposal. The Licensee shall obtain Deputy Director approval of the proposal prior to implementation. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required proposal modifications, with the Commission.

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 the USFS, CDFW, State Water Board, USFWS, and the Commission.

CONDITION 6. STREAMFLOW AND RESERVOIR GAGING

The Licensee shall, within one year of license issuance, develop and file for Commission approval a Streamflow and Reservoir Elevation Gaging Plan (Gaging Plan) that meets USGS standards. The Licensee shall provide copies of the Gaging Plan and USGS review results to BLM, CDFW, USFWS, the Commission, and State Water Board staff for review and comment. Following agency consultation, the Gaging Plan and any comments received from the agencies shall be submitted to the Deputy Director for review and approval prior to filing the Gaging Plan with the Commission. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the

[18] 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."

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

Gaging Plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required Gaging Plan modifications, with the Commission. The Licensee shall implement the Gaging Plan upon receiving all necessary regulatory approvals.

At a minimum, the Gaging 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 and after consultation and coordination with USFS and State Water Board staff, submit a Streamflow and Reservoir Level Information 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 UARP-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 Licensee shall submit the Streamflow and Reservoir Level Information Plan to the Deputy Director for review and approval, after consultation with USFS and State Water Board staff, and prior to filing with the Commission. The Licensee shall provide the Deputy Director with any comments provided by the USFS during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the Streamflow and Reservoir Level Information Plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required Streamflow and Reservoir Level Information Plan modifications, with the Commission. Following Commission and Deputy Director approval of the plan, the minimum streamflow, recreational streamflow, and reservoir level schedules from Conditions 1 (Minimum Instream Flows), 4 (Recreation Streamflows), and 5, (Reservoir Levels) as well as the current water year type designation, shall also be published on the streamflow and reservoir information website.

CONDITION 8. MONITORING PROGRAM

Background Information

The Licensee shall implement the following Monitoring Program after license issuance and through the term of the new license and any extensions, in coordination with USFS, CDFW, 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, CDFW, USFWS, and the Deputy Director. The Licensee shall also receive approval by the Deputy Director prior to implementation of each monitoring element described below. The Licensee shall consult and coordinate with the Chili Bar Project Licensee (PG&E) as appropriate.

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.

USFS, CDFW, USFWS, and the State Water Board may 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 objectives have been met or no change in resource response is expected. Within the scope of the specified Monitoring Program, USFS, CDFW, 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 monitoring plans must be approved by the Deputy Director prior to implementing the modified monitoring plan.

The Licensee shall submit a revised monitoring plan to the Deputy Director for approval based on the Deputy Director's or another agency's recommendations. The Licensee may also submit a revised monitoring plan to the Deputy Director for approval based on its own recommendation. The Licensee shall file the Deputy Director's approval, together with any required modifications to the revised monitoring plan, with the Commission.

The Licensee shall prepare an annual report that fully describes the monitoring efforts of the previous calendar year, including the data collected and analysis of that data. The report shall be filed with the Commission by June 30 of each year for the preceding year. USFS, CDFW, 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, CDFW, USFWS, and the Deputy Director.

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, CDFW, USFWS, and the State Water Board that incorporates, at a minimum, the elements detailed below. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

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: 1) brown trout in Gerle Creek below Loon Lake Reservoir Dam

Reach only; 2) hardhead sampling in SF American River below Slab Creek Reservoir Dam Reach only; and 3) rainbow trout at all stations listed below[20]:

Locations: The sampling locations are as follows:

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 sample section of site SCD-F2). Hardhead snorkeling shall be conducted from immediately downstream of Mosquito Road Bridge up to and including site SCD-F2.

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 and any extensions. 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 and any extensions.

8.B. Aquatic Macroinvertebrates

Within two years of license issuance, the Licensee shall develop an aquatic macroinvertebrate monitoring plan in consultation with USFS, CDFW, USFWS, and the State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

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

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

Locations: At a minimum, 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 so determines. 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 and extensions.

8.C. Amphibian and Reptile Monitoring

Foothill Yellow-legged Frog

Within one year of license issuance, and in consultation with USFS, CDFW, 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 review and approval after agency consultation. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Methods: The Licensee shall conduct protocol surveys for sensitive species, with an emphasis on FYL frogs, using the procedures of PG&E[21] or the most current standard (as determined jointly by CDFW, 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.

[21] 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.

For Years 1-5, the monitoring shall also include the placement of thermographs in 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 CDFW, 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, CDFW, 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-A3 and SFA-A4).
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.

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 and any extensions.
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 and any extensions.
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 and any extensions.
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.

Spill flows at Slab Creek Dam that occur after water temperatures rise above 12°C mean daily temperature for a seven-day running average[22] at 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 after the decline of the spill at FYL Frog Monitoring Site 8.C.3 in the SF American River below Rock Creek.

Spill flows at Camino Dam that occur after water temperatures rise above 12°C mean daily temperature for a seven-day running average at the Water Temperature Monitoring Site 8.I.14 (Silver Creek immediately upstream of the SF American River) shall be monitored for effects to

[22] The temperature trigger may be modified as defined in Condition 9.A – Cancellation of Pulse and Recreational Streamflows in South Fork Silver Creek.

aquatic species (amphibians, fish and aquatic reptiles) as soon as possible after the decline of the spill at FYL Frog Monitoring Site 8.C.2 in the reach below Camino Reservoir Dam.

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 CDFW and submit a proposal to the Deputy Director for approval to either: (1) continue the measures undertaken for the FYL frogs; or (2) propose additional conservation measures that may be required to ensure that UARP impacts to California red-legged frogs are minimized. The Licensee's proposal must be approved by the Deputy Director prior to implementation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the proposal prior to submittal to the Commission, if applicable. The Deputy Director may require modifications of the proposal as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required proposal modifications, with the Commission.

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, CDFW, USFWS, and the State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: The Licensee shall conduct protocol surveys for sensitive species using the procedures of CDFW (2001)[23] 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 CDFW or USFS collects 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, CDFW and USFWS, reviews the results and approves the 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 and any extensions.

[23] CDFW (formerly California Department of Fish and Game) 2001. Fish and Amphibian Inventory Data Sheet Instructions. California Department of Fish & Game Fish/Amphibian Survey Protocols - Version 1.1, July 17, 2001.

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, CDFW, USFWS, and the State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: The Licensee shall conduct visual surveys for FYL frog. Water velocities and streamflow shall be recorded.

Location: Silver Creek below Camino Reservoir Dam

Timing: 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. The Licensee shall provide advance notification to USFS, the State Water Board, USFWS, and CDFW if such fluctuations are going to occur and shall conduct visual surveys as referenced above prior to and after the fluctuations.

The visual surveys can be discontinued if USFS, USFWS, CDFW, 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, CDFW, USFWS, and the State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: The Licensee shall conduct analysis using aerial photo flights and the greenline method[24]. Data collected at each site shall include transects to document species composition, percent cover, and quantification of length and width of riparian community.

Location: Monitoring shall be conducted 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.

[24] The Riparian Vegetation and Wetlands Technical Report (October 2004) 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 Riparian Vegetation and Wetlands Technical Report, each greenline is described by the cumulative distance in feet occupied by each community type.

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

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, CDFW, USFWS, and State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: The Licensee shall collect, identify, and archive samples of the species of algae inhabiting the stream channel using a laboratory approved by the Deputy Director after consultation with USFS, CDFW and USFWS.

Location: Samples shall be collected from the following stream channels:

- Silver Creek below Junction Reservoir Dam
- SF Rubicon River below Robbs Peak Reservoir Dam
- Silver Creek below Camino Reservoir Dam
- 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: Sampling shall 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, CDFW, and USFWS, determines that additional sampling for algal species identification is needed, 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

Within six months of license issuance, the Licensee shall develop a geomorphology sensitive site investigation and mitigation monitoring plan in consultation with USFS, CDFW, USFWS, and the State Water Board. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: A detailed investigation of fluvial geomorphic properties will be carried out. The focus of the investigation shall be to determine the most effective method of stabilization for the Gerle Creek channel downstream of Loon Lake.

Location: 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).

Timing: Years 1 and 2.

Within two years of license issuance, the Licensee shall develop and submit to the Deputy Director for approval a stabilization plan for the Gerle Creek channel below Loon Lake Reservoir Dam. The Licensee will consult with appropriate staff from USFS, USFWS, CDFW, and the State Water Board in the development of the stabilization plan. The Licensee shall provide the Deputy Director with any comments provided by agencies during the consultation process. The Deputy Director may require modifications as part of approval. The Licensee shall implement the plan upon receiving Deputy Director and all other necessary regulatory approvals.

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

Within two years of license issuance, the Licensee, in consultation with USFS, CDFW, 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 provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: Establishment and monitoring of permanent cross-section transects, longitudinal profiles, and channel properties in representative channel areas. Cross-section profiles shall be measured and substrate composition examined at each transect. Sites shall be evaluated as described in the Channel Morphology Technical Report[25].

Location: The following sites[26] shall be evaluated:

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, CDFW, and USFWS.

[25] Monitoring shall be equivalent to a Rosgen Level III Channel Condition Assessment as described in the Channel Morphology Technical Report (January 2005) prepared as part of the relicensing proceeding.

[26] Study site designations and locations are described in the Channel Morphology Technical Report (January 2005) prepared for the relicensing proceeding.

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

8.I. Water Temperature

Within one year following license issuance, the Licensee shall develop and file with the Commission a Water Temperature Monitoring Plan (Temperature 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 CDFW on the development of a Temperature Plan consistent with the requirements described below. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the Temperature Plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required Temperature Plan modifications, with the Commission.

Modifications to the Temperature Plan 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 Deputy Director determines that reservoir temperatures are a controllable factor.

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.

Location: At a minimum, the Temperature Plan shall include temperature stations 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.

Up to five additional monitoring sites may be added to the water temperature program by the Deputy Director, if determined necessary through review of the monitoring data and the annual consultation with USFS, CDFW, USFWS, and the State Water Board as described in Condition 13 (Annual Review of Ecological Conditions).

Timing: All water bodies identified in the approved Temperature Plan shall be monitored from March 15 to September 30 in all years after license issuance through the term of the license and any extensions 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, CDFW, State Water Board and Central Valley Water Board on the development of a draft Water Quality Monitoring Program Plan (WQ Plan). The WQ 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 WQ Plan to the Deputy Director for review and approval. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 60 days to review and approve the WQ Plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required WQ Plan modifications, with the Commission. The approved WQ Plan shall be implemented by the Licensee as described, through the life of the license and any extensions. The WQ Plan may be modified pursuant to adaptive management program needs as recommended by USFS, BLM, USFWS, CDFW, State Water Board, and/or Central Valley Water Board, and the new WQ Plan shall be implemented upon receiving all necessary approvals.

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) contained in the Water Quality Technical Report (May 2005). 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 measured 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 depth intervals in Loon Lake, Gerle Reservoir, Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, Camino Reservoir, and Slab Creek Reservoir.

Frequency: Riverine reaches: once seasonally in spring (April-May), summer (August), fall (November) and winter (January-February, as accessible) each year after license issuance through the term of the license and any extensions.

Reservoirs: once in spring (April-May) and once in fall (October-November) each year through the term of the license and any extensions. 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: Water chemistry samples shall be collected and analyzed for the set of constituents shown in Table 23. Water samples shall be collected from all UARP reservoirs and riverine locations, dam release points from reservoirs, and representative sites along all bypassed stream reaches[27] 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.

Frequency: Water samples for chemical analysis 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 are 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

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

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

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 constituents.			Hardness	Total Alkalinity	Cyanide

Bacterial Monitoring

Method: The Licensee shall conduct bacterial monitoring for fecal coliform and *E.coli* for protection of the recreational water contact (REC-1) beneficial use[28]. 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.

Location: Monitoring shall be conducted at a minimum of 15 shoreline recreational locations within the UARP boundary. Sampling locations shall be selected based on criteria that include: (1) where swimming and other water contact recreation activities are known to occur in the area; and (2) the 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. The Licensee, in consultation with USFS, CDFW, 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 to determine the locations to be sampled and shall submit the list of sampling locations to the Deputy Director for approval no later than May 31 of each designated sampling year. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Deputy Director may require modification as part of the 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

[28] As defined in the Basin Plan.

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. The Deputy Director must approve any change in monitoring frequency prior to implementation.

Metals Bioaccumulation Monitoring

Method: The Licensee shall monitor for potential uptake of mercury, copper, lead, and silver through the aquatic food chain in UARP-affected impoundments. Resident fish species 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) requirements, and shall be defined prior to each sampling event through Licensee consultation with USFS, CDFW, State Water Board, Central Valley Water Board, USFWS, and the Office of Environmental Health Hazard Assessment (OEHHA). Deputy Director approval is required prior to implementation of the metals bioaccumulation monitoring plan. The Licensee shall submit the metals bioaccumulation monitoring plan to the Deputy Director for approval, including any comments provided by the agencies during the consultation process. The Deputy Director may require modifications as part of the approval.

Location: Loon Lake Reservoir, Gerle Reservoir, Ice House Reservoir, Union Valley Reservoir, Camino Reservoir, and Slab Creek Reservoir.

Frequency: Metals bioaccumulation monitoring shall begin in Year 2 following license issuance and be performed once every five years through the term of the license and any extensions.

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, CDFW, USFWS, and the State Water Board to determine if operations of the Robbs Peak Powerhouse are causing fish entrainment. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: Fish population monitoring shall be conducted to determine when and at what flow fish migration is occurring, and at what flow entrainment, if any, is occurring, using a method approved by the Deputy Director, in consultation with USFS, USFWS, and CDFW.

Frequency: Years 1 and 2 following license issuance.

8.L. Bald Eagle Monitoring

Within six months of license issuance, the Licensee shall develop a bald eagle monitoring plan in consultation with USFS, CDFW, USFWS, and State Water Board. The bald eagle is listed as a fully protected endangered species under the California Endangered Species Act (CESA). Further, the Rationale Report directs that measures be taken to maintain, protect and enhance populations of sensitive, threatened and endangered plant and wildlife species. The bald eagle monitoring plan will at a minimum include: (i) a statement of goals and objectives; (ii) a description of all proposed monitoring and monitoring methods; and (iii) specific, measureable criteria to be used to evaluate the data collected and objectively assess the continued viability of this resource. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 60 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

Method: Use a method approved by the Deputy Director, developed in consultation with USFS, CDFW and USFWS, to continue monitoring bald eagle nest sites to determine if bald eagles are being affected by UARP-related activities.

Frequency: Annually for the term of the license and any extensions.

CONDITION 9. ADAPTIVE MANAGEMENT CONDITIONS

The Licensee shall, beginning as early as reasonably practicable and within three months after license issuance, in consultation and coordination with the Chili Bar Licensee (PG&E), implement an adaptive management program as described below. The program generally consists of: (a) implementation of a monitoring program as described in Condition 8 (Monitoring Program); (b) analysis of data for trends to identify and address UARP-related impacts or effects on beneficial uses and/or water quality; and (c) specific adaptive management measures that shall be implemented if the Monitoring Program and other information indicate that the applicable resource objectives identified in the Rationale Report[29] will likely not be met without adjustment.

Analysis of the monitoring results shall be used to determine the need for adaptive management measures. Adaptive management decisions shall be made in consultation with the USFS, BLM, CDFW, and State Water Board staff as part of the Annual Review of Ecological Conditions (Condition 13). Decisions shall be made based on monitoring results, scientific information and a determination 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 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.

[29] *Rationale Report for Relicensing Settlement Agreement* submitted by CDFW to the Commission on January 29, 2007.

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

If FYL frogs are found on SF Silver Creek and water temperatures at SFSC 1 (SF Silver Creek immediately upstream of Junction Reservoir) rises above 12°C mean daily temperature for a seven-day running average (refer to Condition 8.I – Water Temperature), the Licensee shall cancel the pulse and recreational flow events in SF Silver Creek unless the Deputy Director, in consultation with USFS and CDFW, 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 CDFW within 10 days of determining that the temperature trigger has been met, causing cancellation of the pulse and recreational flow events.

If the Deputy Director, in consultation with USFS, USFWS and CDFW, 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 Deputy Director 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 Licensee shall provide Notice to the Commission if the Deputy Director, in consultation with USFS, USFWS and CDFW approves a modification to the water temperature trigger.

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 South Fork American River

If water temperatures rise above 12°C mean daily temperature for a seven-day running average (refer to Condition 8.I. – Water Temperature) at SFAR 6 (in the SF American River approximately ½-mile upstream of White Rock Powerhouse water temperature monitoring location 8.I.18), the Licensee shall cancel the recreational flow events in the SF American River below Slab Creek Reservoir Dam unless the Deputy Director, in consultation with USFS, USFWS and CDFW, 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 CDFW within 10 days of determining that the above temperature trigger has been met, causing cancellation of the recreational flow events.

If the Deputy Director, in consultation with USFS, USFWS and CDFW, 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 Deputy Director 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 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 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 is deemed to have been initiated based on a water temperature trigger that is determined through the Monitoring Program described in Condition 8 (Monitoring Program). 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 adaptive management measures shall be developed in consultation with USFS, CDFW, USFWS, and State Water Board staff and approved by the Deputy Director. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. 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 Deputy Director, in consultation with USFS, CDFW and USFWS, determines, based on amphibian monitoring described in Condition 8.C. (Amphibian and Reptile Monitoring), that unacceptable environmental impacts are occurring below Slab Creek Reservoir Dam due to October recreational streamflows, 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 (described in Condition 4). The adaptive management measures must be approved by the Deputy Director prior to implementation by the Licensee. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. The Licensee shall implement the adaptive management measures upon approval of the Deputy Director and any other necessary regulatory approvals.

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, Deputy Director or CDFW determine that the entrainment is having a substantial negative impact on the South Fork Rubicon fishery, the Licensee shall develop adaptive management measures, in consultation with USFS, CDFW, and USFWS, that shall be submitted to the Deputy Director for review and approval. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. The Licensee shall implement the appropriate adaptive management measures upon approval of the Deputy Director, and any other necessary regulatory agency approvals.

9.F. Sediment Management

Based on results of geomorphology monitoring, if the Deputy Director, after consultation with USFS, BLM, USFWS, and CDFW, determines there is a need to place sediment downstream, and if there is a need to dredge reservoirs associated with the UARP, sediment that results from the dredging shall be placed downstream after the Licensee receives 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 Army Corps of Engineers (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 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 control algal growth in Silver Creek below Junction Reservoir Dam and SF Rubicon River below Robbs Peak Reservoir Dam within two years of license issuance, the Licensee shall control or eliminate the algae using a method approved by the Deputy Director, after consultation with USFS, USFWS, and CDFW. The Licensee shall implement the adaptive management measures upon approval of the Deputy Director, and any other necessary regulatory agency approvals.

If future pervasive algal blooms are identified on UARP-affected stream reaches, and if the Deputy Director, after consultation with USFS, USFWS, and CDFW, determines the algae needs to be controlled or eliminated, the Licensee shall control or eliminate the algae using a method approved by the Deputy Director. The method will be approved after consultation with USFS, USFWS, and CDFW. The Licensee shall file the Deputy Director's approval, together with any required adaptive management modifications, with the Commission. The Licensee shall implement the adaptive management measures upon approval of the Deputy Director, and any other necessary regulatory agency approvals.

9.H. Metals Bioaccumulation

The Licensee shall notify the Deputy Director within 30 days if the results of metals bioaccumulation monitoring indicate concentration of metals in fish tissue exceed OEHHA consumption guidelines, or other public health safety targets. The Deputy Director may require a plan pursuant to Condition 23 (Mercury Management Plan).

If the results of the metals bioaccumulation monitoring indicate metals may be adversely affecting the health of aquatic species, then additional studies may be requested by the Deputy Director, in consultation with USFS, USFWS, and CDFW. The studies may include an examination of adaptive management measures for reducing impacts to aquatic species from metals bioaccumulation. If required by the Deputy Director, the Licensee shall implement the identified measures upon receiving all necessary regulatory approvals.

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 Program) 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 CDFW. The Licensee shall file the Deputy Director's approval, together with any required adaptive management modifications, with the Commission.

CONDITION 10. LARGE WOODY DEBRIS

The Licensee shall ensure that mobile instream large woody debris continues downstream beyond Robbs Peak 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 Robbs Peak Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, and Slab Creek Reservoir Dam. Smaller sizes are also allowed but are not required to be moved beyond these dams. To demonstrate compliance with this condition, the Licensee shall include in the annual monitoring report that is required in Condition 8 (Monitoring Program) a summary of the efforts made during the year to pass large woody debris below the dams.

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 Licensee shall consult with USFS, CDFW, USFWS, and the State Water Board in the development of the plan. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

CONDITION 12. REINTRODUCTION OF ANADROMOUS FISH

It is possible that anadromous fish passage will be restored at Nimbus and/or Folsom Dams on the American River downstream of the UARP during the course of the Commission license term. Per Long-Term Fish Passage Action (LF) 2 of the NMFS Biological Opinion (BO), the "[Bureau of] Reclamation and partner agencies shall submit a plan to NMFS on or before December 31, 2016, which shall describe planned long-term upstream and downstream fish passage facilities and operations, based on the best available information at that time."

Within 90 days of submittal of the plan referenced in LF 2, or an equivalent plan to restore anadromous fish passage to the waters above Folsom Dam, the Licensee shall consult with CDFW, USFWS, NMFS and State Water Board to determine whether changes are needed in the certification conditions to protect beneficial uses associated with anadromous fish.

Federal regulations (50 CFR § 402.16) recognize that reinitiation of formal Endangered Species Act (ESA) consultation may be necessary if new information reveals that a federally licensed project may affect listed species or critical habitat in a manner or to an extent not previously considered. It is anticipated that submittal of the plan referenced in LF 2 or an equivalent plan would trigger either formal or informal ESA consultation. It is further anticipated that consultation will result in issuance of a UARP-specific BO.

To the extent possible, the State Water Board will consider any BO issued by NMFS specifically for the UARP in adding or modifying conditions of this certification pursuant to this condition. In any determination of whether changes are needed in the certification to address anadromous fish, consideration will be given to the need for operational flexibility for Iowa Hill, should it be constructed.

The State Water Board recognizes that the timelines associated with the NMFS BO and the NMFS BO provisions may change over the term of the license. The State Water Board reserves authority to modify or add conditions to this certification based on the outcome of the consultation process or to clarify the trigger for consultation based on new or updated BOs or determinations by state or federal agencies which would have a bearing on anadromous fish reintroduction.

CONDITION 13. ANNUAL REVIEW OF ECOLOGICAL CONDITIONS

Each calendar year, by April 1, the Licensee shall schedule and facilitate a meeting with USFS, CDFW, USFWS, and State Water Board staff 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, CDFW, USFWS, and State Water Board an operations and maintenance plan for the year in which the meeting occurs.

CONDITION 14. RECREATION IMPLEMENTATION PLAN

The Licensee shall develop a Recreation Implementation Plan in coordination with USFS within six months of license issuance. The Recreation Implementation Plan 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 provision to consult with the State Water Board and Central Valley Water Board regarding water quality permitting and approvals necessary for the construction or rehabilitation of recreation facilities and to obtain the required permits or approvals before initiating construction activities. 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. Construction plans for projects identified in the Recreation Implementation Plan that have the potential to affect water quality shall be submitted to the Deputy Director for review and approval. Plans shall at a minimum include proposed BMPs, and erosion and turbidity control measures. The Deputy Director may require modification as part of approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. Projects with the potential to affect water quality shall not be constructed until after receipt of Deputy Director approval and any other necessary regulatory approvals.

CONDITION 15. 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 System lands. The Transportation Plan shall be updated every five years. The Transportation Plan shall identify: (1) the maintenance and reconstruction needs for roads associated with the UARP; and (2) those linear transportation projects for which the Licensee is responsible that are part of or support the UARP and 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 a water quality

certification or other permits or approvals are necessary, and shall obtain such certification, permit(s), or approval(s) before initiating construction activities.

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

Within 30 days of USFS approval and prior to submission to the Commission, the Licensee shall submit the most current Transportation Plan to the Deputy Director for approval. The Licensee shall provide the Deputy Director with at least 60 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director shall have the authority to make changes to the Transportation Plan to protect water quality, if reasonably necessary, beyond the requirements that maintenance and construction shall meet USFS and ACOE specifications and BMPs. The Licensee shall file the Deputy Director's approval, together with any required Transportation Plan modifications, with the Commission. The Licensee shall implement the Transportation Plan and any subsequent updates upon receiving all necessary approvals.

CONDITION 16. FISH STOCKING REQUIREMENTS

The Licensee shall match the type and amount of fish stocked by CDFW at Loon Lake, Union Valley, and Ice House Reservoirs, with up to a total of 50,000 pounds of fish provided by the Licensee per year, to be distributed as determined by CDFW. 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 regarding the arrangements that have been made to stock fish at Loon Lake, Union Valley, and Ice House Reservoirs.

CONDITION 17. CONSULTATION ON IOWA HILL DESIGN, CONSTRUCTION AND OPERATION

The Licensee shall consult with the State Water Board, USFWS and CDFW during the design process for Iowa Hill to ensure that the final design, construction, and operation of Iowa Hill complies with water quality standards. The Iowa Hill design shall incorporate features that achieve the following: operational compliance with water quality standards; 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 intake/outlet structure; and prevent the creation of dangerous hydraulic conditions within Slab Creek Reservoir that may affect recreational activity. Iowa Hill shall also be designed and operated to prevent the current populations of fish present in Slab Creek Reservoir from falling below self-sustaining levels due to Iowa Hill operations.

The design shall clearly identify the assumptions for the expected water velocities and hydraulic conditions in the vicinity of the intake/outlet 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 must include safety features, including boat restraining barriers, warning signs, and other guidance to the public as needed. The design must also follow the Commission *Guidelines for Public Safety at Hydropower Projects*.

The Licensee shall submit the design, construction and operation plan(s) for Deputy Director approval after consultation with the agencies, but prior to submission to the Commission. The elements of the construction portion of this plan are more fully described in Condition 18 below.

The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The design, construction and operation plan(s) shall include monitoring and other appropriate provisions, including those described in Conditions 18 and 22. Monitoring shall be implemented to determine if the intake/outlet structure is adversely affecting the beneficial uses of the water. The design, construction and operation plan(s) shall include information on the design, operations, monitoring and management practices that will be taken to protect water quality and beneficial uses. At a minimum plan(s) must include: (i) a statement of goals and objectives; (ii) a description of all proposed monitoring and actions (as appropriate); (iii) specific, measureable success criteria that can be used in combination with monitoring data to objectively evaluate the effects of the intake/outlet structures on aquatic life, and/or the success of any implemented actions to address adverse effects on aquatic life; (iv) a monitoring, maintenance, and reporting schedule; and (v) information on how the Licensee will operate Iowa Hill in compliance with all applicable conditions of this certification including Conditions 18 through 22. The Deputy Director may reject or require modification of the design, construction and operation plan(s) if the plan(s) do not adequately address water quality, sediment mobilization, turbidity, fish entrainment risk and the creation of dangerous hydraulic conditions within Slab Creek Reservoir. The Licensee shall file the Deputy Director's approval together with any required modifications to the design, construction and operation plan(s), with the Commission.

Water quality monitoring shall be required during and after the construction of Iowa Hill as specified in the Deputy Director approvals related to the design, construction and operation 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 State Water Board staff 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. If operation of Iowa Hill requires modifications to any of the terms or conditions of this certification, the Licensee shall request an amendment of the certification from the State Water Board.

CONDITION 18. IOWA HILL CONSTRUCTION WASTE DISCHARGE AND BEST MANAGEMENT PRACTICES ASSOCIATED WITH IOWA HILL

The Licensee shall consult with State Water Board staff and other state and federal agencies, regarding any additional conditions that may be required before the construction and operation of Iowa Hill can commence. Prior to initiating any Iowa Hill construction-related activities, the Licensee shall provide the Iowa Hill Construction Plan to the Deputy Director for review and approval. The Iowa Hill Construction Plan shall include: (1) the final design plans for construction of Iowa Hill; (2) a detailed construction plan; (3) a proposed timeline for construction; and (4) identification of BMPs and permits that will be implemented to protect water quality and beneficial uses. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. The Licensee must obtain all necessary permits including but not limited to an ACOE Clean Water Act Section 404 Permit, coverage under the Construction General Permit and/or other authorizations or certifications as determined to be 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. Construction activities associated with Iowa Hill cannot begin without approval from the Deputy Director. This plan may be submitted concurrently with, or may be included in, any plans submitted pursuant to Condition 17.

Best Management Practices

BMPs 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

The Licensee shall develop a SWPPP for construction of Iowa Hill in consultation with USFS, CDFW, and the State Water Board. The SWPPP shall be in conformance with the Construction General Permit and amendments thereto. The Licensee shall submit the SWPPP to the Deputy Director for review and approval after agency consultation as part of the Iowa Hill Construction Plan. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission. The Licensee shall implement the Iowa Hill Construction Plan upon receiving all necessary approvals. During construction, operation and maintenance of Iowa Hill, the Licensee shall prevent water pollution by implementing BMPs identified in the SWPPP and any other requirements identified by USFS, State Water Board, and Central Valley Water Board.

Construction of Iowa Hill shall not commence until the Licensee receives all necessary approvals, including, but not limited to, approvals required in Conditions 17-22 of this certification.

CONDITION 19. IOWA HILL WATER RIGHTS

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

CONDITION 20. GROUNDWATER RELATED TO IOWA HILL

Prior to undertaking any construction activities related to Iowa Hill, the Licensee shall prepare a plan for managing groundwater inflows and/or discharge during construction and for groundwater monitoring and management once construction is completed. The plan shall be developed in consultation with USFS and Central Valley Water Board staff. The Licensee shall submit the plan

to the Deputy Director for review and approval after agency consultation. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. The Licensee shall implement the plan upon receiving all necessary regulatory approvals. The plan shall include the following:

a. 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. A method for accurate quantification of groundwater encountered during tunnel boring operations;
d. A method for verifying that groundwater seepage is controlled after tunnel construction;
e. Identification of corrective measures that would 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 Order R5-2013-0074/NPDES No. CAG995001 (Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters) and amendments thereto to address discharges associated with dewatering and other low threat discharges to surface waters.

CONDITION 21. IOWA HILL AQUATIC RESOURCES

21.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 (Hardhead Plan) in consultation with USFS, CDFW, USFWS, and the State Water Board. The Licensee shall submit the Hardhead Plan to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

The Hardhead 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 the SF American River above and below the Iowa Hill intake/outlet structure. Monitoring for the location of hardhead life stages shall take place during, at least, the two years immediately prior to and two years immediately after Iowa Hill operations begin. The Hardhead 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, and 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, CDFW, USFWS, and the Deputy Director for the prior calendar year's monitoring by May 1 of each subsequent year. If monitoring indicates that entrainment is occurring, the Deputy Director will consult with CDFW 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 provide the Deputy Director with at least 90 days to review and approve the measures prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any mitigation measure modifications, with the Commission. The Licensee shall implement the approved mitigation measures upon receiving all necessary regulatory approvals.

21.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, at least, the two years immediately prior to and two years immediately after Iowa Hill operations begin to document how temperatures in shallow water areas are affected by Iowa Hill operations. The monitoring locations shall be selected in consultation with USFS, CDFW, USFWS, and State Water Board staff. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall submit the plan (which may be combined with the Hardhead Plan described in 21.A) to the Deputy Director for review and approval after agency consultation. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

An annual report that describes the results of the edgewater temperature monitoring activities for the prior calendar year's monitoring (which may be combined with the annual report described in 21.A), shall be provided to USFS, CDFW, USFWS, and the State Water Board by May 1 of each subsequent year.

21.C. Impacts to Hardhead in Slab Creek Reservoir

Results from the monitoring required in Conditions 21.A and 21.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, CDFW and USFWS, may submit suggested mitigation measures, if needed, to the Deputy Director for approval. The Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve any mitigation measures prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any mitigation measure modifications, with the Commission. The Licensee shall implement the approved mitigation measures upon receiving all necessary approvals.

21.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 22. 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 Slab Creek 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 Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any plan modifications, with the Commission.

CONDITION 23. 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 reservoirs, operations of Iowa Hill or other aspects of UARP operations increase the mobilization or methylation of mercury. The plan should include a review of potential measures to reduce the amount of methyl mercury or rate of mercury methylation 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 the amount of methyl mercury, reduce the mobilization or methylation of mercury and/or protect human health, the Licensee shall develop an implementation plan and submit it to the Deputy Director for approval. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission. Upon receiving all necessary regulatory approvals, the Licensee shall implement the measures identified in the implementation plan.

CONDITION 24. HAZARDOUS SUBSTANCES 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 Hazardous Substances Plan, approved by USFS and the Deputy Director, for hazardous substances storage and spill prevention and cleanup. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the plan prior to submittal to the Commission, if applicable. The Deputy Director may

require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

At a minimum, the Hazardous Substances 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, CDFW, Central Valley Water Board and the State Water Board of the magnitude, nature, time, date, location, and action taken for any spill. The Hazardous Substances Plan shall identify the potential corrective actions and monitoring that will be implemented if a spill occurs.

In addition, during planning and prior to any new construction or maintenance/repair activities not addressed in an existing plan approved by the Deputy Director, the Licensee shall notify the USFS and the State Water Board so that the USFS and the Deputy Director can determine if an additional plan for hazardous substances storage and spill prevention and cleanup is needed. If the Deputy Director determines an additional plan or requirements are needed to address hazardous substance storage and spill prevention cleanup for new construction or maintenance/repair activities, the Licensee shall submit a plan for Deputy Director approval describing the measures that will be implemented. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission. The Licensee shall implement the plan upon receiving all necessary regulatory approvals.

CONDITION 25. COORDINATION WITH CHILI BAR PROJECT LICENSEE

The Licensee shall coordinate operations of the UARP with the Licensee of the Chili Bar Project (PG&E), FERC Project No. 2155, to enable the Chili Bar Project Licensee to comply with Condition 1 (Minimum Instream Flows), Condition 2 (Ramping Rates), and Condition 3 (Recreational Streamflows) in the Chili Bar water quality certification. Each licensee's (SMUD and PG&E) responsibilities for achieving coordinated operations of the two projects (UARP and Chili Bar Project) are described in the Cooperation Agreement[30].

As specified in the SA, the Licensees of the UARP (SMUD) and the Chili Bar Project (PG&E) must jointly prepare and file with the Commission within 120 days after license issuance, a plan for coordinated operations of the two projects as described in the Cooperation Agreement. To provide the opportunity for review and approval of the plan by the Deputy Director prior to submittal to the Commission, PG&E shall submit the plan to the Deputy Director within 90 days after issuance of the UARP and Chili Bar Project licenses, or if the licenses are issued separately, the latter of the two. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required plan modifications, with the Commission.

[30] As stated in the Cooperation Agreement, "SMUD agrees to provide to Company *[PG&E]* Operational Guidance and sufficient water inflows into Chili Bar Reservoir to enable Company to comply with the conditions of the Chili Bar license, and Company agrees to follow such Operational Guidance in a manner that will comply with the flow-related Chili Bar license conditions."

In addition to the coordination described above related to compliance with streamflow conditions, the Licensee shall consult and coordinate with the Licensee of the Chili Bar Project (PG&E) as described in the Cooperation Agreement in implementation of Condition 5 (Adaptive Management Program), Condition 6 (Monitoring Program), Condition 7 (Sediment Management Plan), and Condition 11 (Streamflow and Reservoir Level Public Information Services) of the Chili Bar Project water quality certification.

CONDITION 26. VEGETATION AND INVASIVE WEED MANAGEMENT PLAN

Within two years of license issuance, the Licensee shall prepare a Vegetation and Invasive Weed Management Plan (Vegetation Plan) in consultation with USFS, USFWS, the appropriate County Agricultural Commissioner, and the California Department of Food and Agriculture. Invasive weeds will be those weeds defined in the California Food and Agriculture code, and other species identified by USFS. The Vegetation Plan must 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 Vegetation Plan must include the implementation of the USFWS Valley Elderberry Longhorn Beetle Conservation Guidelines[31]. The Licensee shall submit the Vegetation 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 Licensee shall provide the Deputy Director with any comments provided by the agencies during the consultation process. The Licensee shall provide the Deputy Director with at least 90 days to review and approve the Vegetation Plan prior to submittal to the Commission, if applicable. The Deputy Director may require modifications as part of the approval. The Licensee shall file the Deputy Director's approval, together with any required modifications, with the Commission.

The portion of the Vegetation Plan for which approval by the Deputy Director is required must include 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 subsequent plan or amendment to the Vegetation Plan that describes measures designed to address the infestation, as necessary. These actions may include, but are not be limited to: (1) public education and signage at public boat access locations; (2) preparation of an Aquatic Plant Management Plan approved by the Deputy Director, and developed in consultation with other agencies; and (3) boat cleaning stations at boat ramps for the removal of aquatic invasive weeds.

CONDITION 27. FIRE-RELATED WATER QUALITY IMPACTS

In the event of a major fire in the UARP watershed, SMUD shall work cooperatively with the Central Valley Water Board, CDFW, other appropriate state and federal agencies, and landowners to identify measures that will protect water quality in the UARP watershed.

[31] 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.

The following conditions also apply to the UARP in order to ensure compliance with water quality standards over the term of the UARP's license and any extensions.

CONDITION 28. Unless otherwise specified in this water quality certification or at the request of the Deputy Director, data and/or reports must be submitted electronically in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with California Water Code section 13167.

CONDITION 29. No construction shall commence until all necessary federal, state and local approvals are obtained.

CONDITION 30. The State Water Board reserves the authority to add to or modify the conditions of this water quality certification to incorporate load allocations developed in a total maximum daily load developed by the State Water Board or the Central Valley Water Board.

CONDITION 31. The 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 take enforcement action if the Licensee fails to provide or implement a required plan in a timely manner.

CONDITION 32. 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. The Licensee shall take all reasonable measures to protect the beneficial uses of the SF American River, and Middle Fork American River watersheds.

CONDITION 33. This certification requires compliance with all applicable requirements of the Basin Plan.

CONDITION 34. 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 CESA (Fish and Game Code sections 2050 to 2097) or the federal ESA (16 U.S.C. sections 1531 to 1544). If a "take" will result from any act authorized under this certification or associated water rights held by the Licensee, the Licensee shall obtain authorization for the take prior to any construction or operation of the portion of UARP that may result in take. The Licensee shall be responsible for meeting all requirements of the applicable ESAs for UARP authorized under this certification.

CONDITION 35. The authorization to operate the UARP pursuant to this certification requires payment of all applicable fees owed 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. Certification is conditioned upon total payment of any certification fee required and owed by the applicant.

CONDITION 36. When Commission approval is required for a plan, if Deputy Director approval is not received 14 calendar days prior to an applicable Commission deadline, the Licensee may file the plan with the Commission; however, Deputy Director approval is required prior to plan

implementation. The Licensee must amend its filing with the Commission if modifications are made as part of the Deputy Director's subsequent approval.

CONDITION 37. 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 ensure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

CONDITION 38. 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 39. 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 40. 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 41. The Licensee must submit to the Deputy Director for review and approval any change to the UARP facilities, including UARP operations or maintenance, which may have a material effect on the findings, conclusions, or conditions of this certification.

CONDITION 42. 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 43. 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 44. Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a Commission license or an amendment to a Commission license unless the pertinent certification application was filed pursuant to California Code of Regulations, title 23, section 3855, subdivision (b) and that application specifically identified that a Commission license or amendment to a Commission license for a hydroelectric facility was being sought.

CONDITION 45. Future changes in climate projected to occur during the period in which this certification is effective 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 UARP operations meet water quality objectives and protect the beneficial uses assigned to the UARP-affected stream reaches.

CONDITION 46. When exercising its reserved authority as described in this certification the State Water Board shall provide notice and an opportunity to be heard.

CONDITION 47. Nothing in this certification shall be construed as State Water Board approval of the validity of any water rights, including pre-1914 claims. The State Water Board has separate authority under the Water Code to investigate and take enforcement action if necessary to prevent any unauthorized or threatened unauthorized diversions of water.

CONDITION 48. If the parties to the SA modify or clarify the measures contained therein, and approval is granted by the Deputy Director, the conditions of this water quality certification will be updated accordingly.

CONDITION 49. When Deputy Director approval is required, the Licensee shall implement the terms and conditions of this certification, including but not limited to plans, plan updates, proposals and mitigation measures, upon Deputy Director approval and receipt of any other necessary regulatory approvals.

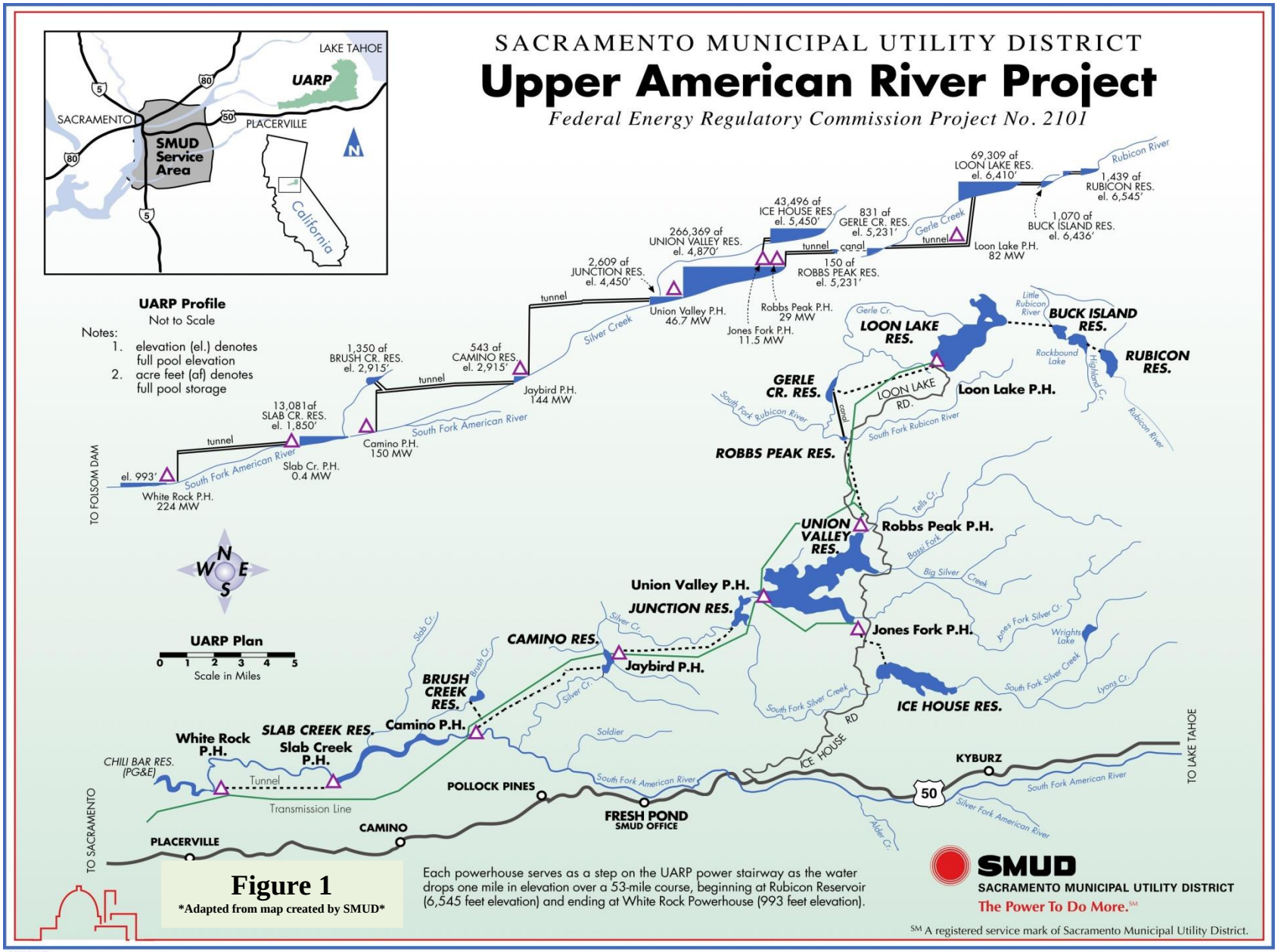
CONDITION 50. Any requirement in this water quality certification that refers to an agency whose authorities and responsibilities are transferred to or subsumed by another state or federal agency, will apply equally to the successor agency.

Thomas Howard

Thomas Howard
Executive Director

October 4, 2013
Date

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


SACRAMENTO MUNICIPAL UTILITY DISTRICT
Upper American River Project
Federal Energy Regulatory Commission Project No. 2101
LAKE TAHOE
UARP
SACRAMENTO
PLACERVILLE
SMUD Service Area
California
UARP Profile
Not to Scale
Notes:
1. elevation (el.) denotes full pool elevation
2. acre feet (af) denotes full pool storage
69,309 af LOON LAKE RES. el. 6,410'
1,439 af RUBICON RES. el. 6,545'
1,070 af BUCK ISLAND RES. el. 6,436'
43,496 af ICE HOUSE RES. el. 5,450'
831 af GERLE CR. RES. el. 5,231'
266,369 af UNION VALLEY RES. el. 4,870'
2,609 af JUNCTION RES. el. 4,450'
150 af ROBBS PEAK RES. el. 5,231'
Loon Lake P.H. 82 MW
Union Valley P.H. 46.7 MW
Robbs Peak P.H. 29 MW
Jones Fork P.H. 11.5 MW
1,350 af BRUSH CR. RES. el. 2,915'
543 af CAMINO RES. el. 2,915'
Jaybird P.H. 144 MW
13,081af SLAB CR. RES. el. 1,850'
Camino P.H. 150 MW
Slab Cr. P.H. 0.4 MW
el. 993'
White Rock P.H. 224 MW
TO FOLSOM DAM
tunnel
canal
Silver Creek
Gerle Cr.
Gerle Creek
Little Rubicon River
Rockbound Lake
Highland Cr.
Rubicon River
South Fork Rubicon River
South Fork American River
LOON LAKE RES.
BUCK ISLAND RES.
RUBICON RES.
GERLE CR. RES.
LOON LAKE RD.
Loon Lake P.H.
ROBBS PEAK RES.
UNION VALLEY RES.
Robbs Peak P.H.
Tells Cr.
Bassi Fork
Big Silver Creek
Union Valley P.H.
JUNCTION RES.
Jones Fork P.H.
Jones Fork Silver Cr.
Wrights Lake
South Fork Silver Creek
Lyons Cr.
ICE HOUSE RES.
ICE HOUSE RD
CAMINO RES.
Jaybird P.H.
Silver Cr.
Slab Cr.
Brush Cr.
BRUSH CREEK RES.
SLAB CREEK RES.
Camino P.H.
White Rock P.H.
Slab Creek P.H.
CHILI BAR RES. (PG&E)
Tunnel
Transmission Line
Soldier
POLLOCK PINES
FRESH POND SMUD OFFICE
CAMINO
PLACERVILLE
KYBURZ
50
Silver Fork American River
Alder Cr.
TO SACRAMENTO
TO LAKE TAHOE
N
W
E
S
UARP Plan
0 1 2 3 4 5
Scale in Miles
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.SM
SM A registered service mark of Sacramento Municipal Utility District.
0758-10

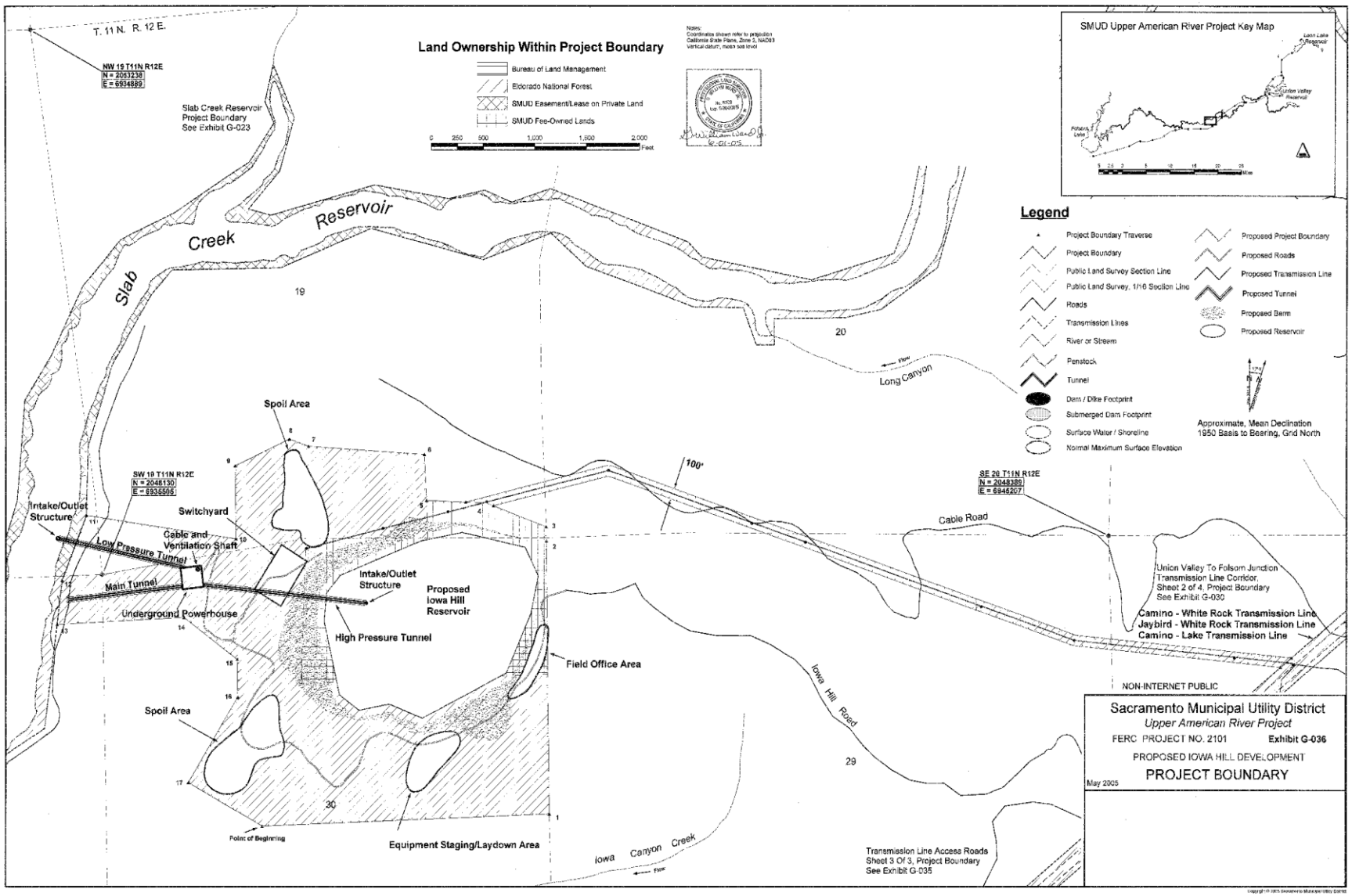

T. 11 N. R. 12 E.
NW 19 T11N R12E
N = 2053238
E = 6934889
Slab Creek Reservoir
Project Boundary
See Exhibit G-023
Land Ownership Within Project Boundary
Bureau of Land Management
Eldorado National Forest
SMUD Easement/Lease on Private Land
SMUD Fee-Owned Lands
0 250 500 1,000 1,500 2,000 Feet
Notes:
Coordinates shown refer to projection
California State Plane, Zone 2, NAD83
Vertical datum, mean sea level
SMUD Upper American River Project Key Map
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
Spoil Area
SW 19 T11N R12E
N = 2046130
E = 6935506
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
30
29
100'
SE 20 T11N R12E
N = 2048389
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
NON-INTERNET PUBLIC
Iowa Canyon Creek
Transmission Line Access Roads
Sheet 3 Of 3, Project Boundary
See Exhibit G-035
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

Water Quality Certification for Upper American River Hydroelectric Project

Attachment A

California Environmental Quality Act Findings and Mitigation Monitoring and Reporting Plan

Sacramento Municipal Utility District
Upper American River Hydroelectric Project
Federal Energy Regulatory Commission Project No. 2101

Sacramento Municipal Utility District (SMUD) is lead agency under the California Environmental Quality Act (CEQA) for purposes of the Federal Energy Regulatory Commission (FERC or Commission) relicensing of the Upper American River Hydroelectric Project (FERC Project No. 2101, UARP). The State Water Resources Control Board (State Water Board), charged with issuing a water quality certification (certification) for the UARP, is a responsible agency under CEQA. CEQA prohibits an agency from approving a project for which significant effects have been identified, unless the agency can make one or more of a set of three findings set forth in Public Resources Code section 21081, subdivision (a):

(1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.

(2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.

(3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report. (See also Cal. Code Regs., tit. 14, § 15091.)

When significant effects are subject to a finding under paragraph (3) of subdivision (a), the public agency must find that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment, if the agency approves the project. (Pub. Resources Code, § 21081, subd. (b).)

CEQA requires public agencies to prepare a program for monitoring or reporting on the revisions which it requires in the project and the measures it has imposed to mitigate or avoid significant environmental effects. (Cal. Code Regs., tit. 14, § 15097, subd. (a).)

SMUD relied on the National Environmental Policy Act (NEPA) Final Environmental Impact Statement (EIS) prepared jointly by the Commission and the United States Forest Service (USFS) together with a supplemental analysis that augmented the NEPA document to ensure consistency with CEQA. Under Public Resources Code section 21002.1, subdivision (d), when issuing an approval for an aspect of a project for which a lead agency has performed CEQA review, a responsible agency considers only the aspects of the project that the agency is required by law to carry out or approve. The State Water Board therefore provides the following CEQA findings and Mitigation Monitoring and Reporting Plan (MMRP) that concern potentially significant impacts to water resources identified by SMUD as part of the CEQA review.

Geology and Soil Resources

Impact G-1: The reduction in streamflow associated with current UARP operations has led to an accumulation of sediment and poor geomorphic conditions in the following stream reaches: Rubicon River below Rubicon Reservoir Dam; Gerle Creek below Loon Lake Reservoir Dam; and South Fork Silver Creek below Ice House Reservoir Dam.

Compliance with the requirement to implement pulse flows as described in Condition 2, the sediment management portion of the adaptive management program in Condition 9-F and the requirement to develop and implement a stabilization plan for the Gerle Creek channel below Loon Lake Dam in Condition 8-G will reduce the impacts to a less-than-significant level. Under Conditions 2, 9-F, and 8-G the geomorphic conditions and sediment load of the affected stream reaches will improve compared to existing conditions.

Implementation of the geomorphology monitoring program required in Condition 8-H throughout the term of the new license and any extensions will ensure that any potential UARP impacts on geology and soil resources are less than significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Water Resources

Impact WR-1: Potential impacts to water quality may occur due to upland erosion and/or sediment deposition into rivers and streams affected by UARP operations or maintenance. Implementation of the UARP includes construction activities associated with the reconstruction, restoration and development of new and existing recreation facilities as well as the use, maintenance and enhancement of roads in the vicinity of the UARP facilities.

Condition 14 of the certification requires that SMUD develop and implement a Recreation Implementation Plan that includes consultation with the State Water Board and the Central Valley Regional Water Quality Control Board (Central Valley Water Board) to determine water quality permitting requirements and obtain coverage, if required, under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ and NPDES No. CAS000002, as amended by Order No. 2010-0014-DWQ and 2012-006-DWQ, and amendments thereto) (Construction General Permit). Compliance with Condition 14 will ensure that adequate measures are implemented to reduce or avoid impacts to water quality from construction activities related to recreation facilities.

In addition, Condition 15 requires that SMUD prepare and implement a Transportation System Management Plan that identifies water quality permits required for road maintenance and construction activities and includes measures to control UARP-related erosion associated with road usage and maintenance. Condition 15 requires that all road maintenance and construction activities meet USFS and Army Corps of Engineers specifications and that construction and maintenance activities maintain natural fluvial and colluvial sediment transport to the UARP reaches, as feasible. The requirement to update the plan every five years and provide the USFS-approved plan to the Deputy Director for Water Rights (Deputy Director) provides a means to monitor implementation of the Transportation System Management Plan and to address changes in conditions through the license term and any extensions.

Implementation of Conditions 14 and 15 will ensure that any potential impacts to water resources associated with erosion or sediment deposition are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-2: Construction and operation of the Iowa Hill Development may cause water quality impairments in Slab Creek Reservoir, such as turbidity due to sediment deposition, erosion or mobilization associated with both construction activities and pump-storage operations.

Mitigation Measure WR-2: Mitigation measures are needed to ensure that the final design of the intake/outlet structure incorporates features that prevent sediment mobilization or deleterious turbidity within Slab Creek Reservoir during operation of Iowa Hill. Condition 17 requires that SMUD consult with the State Water Board to ensure that features that minimize sediment mobilization within Slab Creek Reservoir are incorporated into the final design during the intake/outlet structure design process, and reserves authority for the Deputy Director to reject or require modification of design plans that do not adequately address sediment mobilization and turbidity concerns.

In addition, Condition 18 requires SMUD to obtain coverage under the Construction General Permit prior to initiating construction activities and requires implementation of best management practices, including those identified in the required Stormwater Pollution Prevention Plan. Conditions 32, 33, and 39 require compliance with applicable requirements of the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) and provide the ability for the State Water Board to add to or modify the water quality certification as appropriate to ensure compliance with the certification in response to any violation of certification conditions.

Water quality monitoring described in Condition 17 will allow verification that water quality standards are being met during and after construction of Iowa Hill. Condition 8-J requires in situ measurement of turbidity downstream of Slab Creek Dam four times each year after issuance of the new UARP license throughout the license term and any extensions.

Implementation of Conditions 17, 18, 32, 33 and 39 will ensure that any potential impacts to water resources associated with the construction and operation of Iowa Hill are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-3: Tunnel construction for the Iowa Hill development may lead to adverse impacts to groundwater quantity or quality.

Condition 20 requires that SMUD develop and implement a plan, subject to Deputy Director approval, to manage groundwater inflow during construction, minimize groundwater loss, and to monitor groundwater quality and quantity, including creeks and springs in the vicinity of Iowa Hill, for five years once construction is complete. As described in Condition 20, the plan must identify corrective measures to be taken if the tunnel boring operation encounters more groundwater than originally predicted or the completed tunnel seeps more than expected. The plan must also include identification of corrective measures that would 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 more than expected.

Monitoring and implementation of corrective measures, if necessary, required in Condition 20 will ensure that potential impacts to groundwater resources are mitigated.

Implementation of Condition 20 will ensure that any potential impacts to groundwater resources associated with tunnel construction for the Iowa Hill development are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-4: UARP operations may cause potentially significant impacts to water quantity due to the manipulation of reservoir levels and the timing or quantity of instream flows in UARP-affected stream reaches.

Condition 1 specifies minimum instream flows in UARP-affected stream reaches, and Condition 5 requires that SMUD maintain specified reservoir elevations. Condition 2 requires SMUD to release pulse flows in certain stream reaches. Condition 3 requires SMUD to adhere to certain ramping rates for controlled releases.

Condition 6 requires SMUD to develop and implement a Streamflow and Reservoir Elevation Gaging Plan that specifies the monitoring and reporting required to measure compliance with Conditions 1, 2, 3 and 5.

Implementation of Conditions 1, 2, 3, and 5 will ensure that any potential impacts to water resources associated with UARP operations are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-5: UARP operations may cause potentially significant impacts to water quality by altering streamflow in a manner that violates water quality objectives contained in the Basin Plan.

Condition 1 (minimum instream flows) is expected to maintain adequate water temperatures under most water year types and climatic conditions. Condition 1 also provides for the release of additional water in Silver Creek below Junction and Camino Dams in wet years if the flow requirements do not maintain adequate water temperatures. Condition 23 reserves the authority of the State Water Board to require the Licensee to develop a mercury management plan if research and/or water quality and metals bioaccumulation monitoring specified in Conditions 8-J and 9-H indicate that the reservoirs, operations of Iowa Hill or other aspects of UARP operations increase the mobilization or methylation of mercury.

Monitoring and reporting required in Condition 8-J will provide a means to assess compliance with water quality standards for the list of constituents shown in Table 23 in the water quality certification. Condition 8-I specifies requirements for water temperature monitoring.

Implementation of Conditions 1 and 23 will ensure that any potential impacts to water quality associated with the alteration of streamflow are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-6: Recreational activity within and near UARP reservoirs may increase the concentration of human pathogens, which could lead to a violation of water quality objectives for bacteria.

Monitoring and reporting to assess compliance with water quality standards is required under Condition 8-J for popular swim beaches located within UARP impoundments. Condition 39 allows the State Water Board to add to or modify the water quality certification conditions in response to a violation of the certification conditions. Conditions 32 and 33 require SMUD to comply with applicable requirements of the Basin Plan and to take all reasonable measures to protect the beneficial uses of the South Fork American River (SF American River) and Middle Fork American River watersheds. Condition 14 requires recreation improvements, including sanitation and toilet facility improvements at specific sites.

Implementation of Conditions 8-J, 32, 33, and 39 will ensure that any potential impacts to water quality associated with bacteria related to recreational activity are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-7: Operation of the Iowa Hill Development may lead to potentially significant impacts by reducing water temperature within Slab Creek Reservoir and downstream in the SF American River that could adversely affect hardhead (within Slab Creek Reservoir) and foothill yellow-legged frogs (in the SF American River downstream of Slab Creek Reservoir).

Condition 21, subparts A – C, requires that SMUD develop and implement a hardhead monitoring plan, which includes a requirement to monitor water temperatures in shallow water edge habitat in Slab Creek Reservoir. If temperatures are not supportive of hardhead, the Deputy Director has reserved jurisdiction to require additional measures that will be developed when Iowa Hill becomes operational. Condition 21-D prohibits the operation of Iowa Hill from causing reductions of water temperatures below 12ºC in the SF American River downstream of Mosquito Bridge.

Temperature monitoring and reporting to assess compliance with Condition 21-D is required in Condition 8-I.

Implementation of Conditions 21 and 8-I will ensure that any potential impacts to sensitive native aquatic species associated with the operation of the Iowa Hill Development are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact WR-8: UARP operations may lead to conditions that promote the growth of nuisance algae in UARP-affected stream reaches.

Condition 1, which requires a new streamflow regime throughout the UARP area, is expected to reduce the growth of nuisance algae, which can adversely affect water quality, in the two areas where it is most likely to occur: Silver Creek below Junction Reservoir Dam; and South Fork Rubicon River below Robbs Peak Reservoir Dam. If the flows do not address the problem completely, or if nuisance algae becomes established at levels that adversely affects water quality in any other UARP areas, Condition 9-G requires that SMUD control or eliminate excessive algae growth in any UARP-affected stream reach using a method approved by the Deputy Director.

Monitoring required in Condition 8-F will be used to verify that the new flows are effective at preventing nuisance algae from adversely affecting water quality in the UARP vicinity.

Implementation of Conditions 1 and 9-G will ensure that any potential impacts of UARP operations to water resources associated with the growth of nuisance algae are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Aquatic Resources

Impact AR-1: UARP operations and associated impacts on instream flow have the potential to significantly affect resident fish communities (rainbow trout, hardhead and brown trout) by altering the quantity or quality of habitat, and/or interfering with fish movement into or out of UARP impoundments.

Condition 1 specifies minimum streamflows that have been developed to benefit resident fish communities in UARP-affected stream reaches. Condition 5 requires that SMUD maintain specified reservoir elevations in UARP impoundments and that Gerle Creek Reservoir levels allow upstream fish passage between August and October. The new reservoir level requirements will provide for improved fish movement into and out of UARP impoundments.

Monitoring specified in Condition 6, which requires SMUD to develop and implement a streamflow and reservoir elevation gaging plan, will allow for an assessment of compliance with Conditions 1 and 5. Monitoring required in Condition 8-A for rainbow trout, hardhead and brown trout will provide information to assess the status of fish populations in UARP-affected streams and impoundments to determine whether resource objectives are being met.

Implementation of Conditions 1 and 5 will ensure that any potential impacts to aquatic resources associated with resident fish communities due to UARP operations are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact AR-2: UARP operations require that instream flows be periodically adjusted to provide pulse flows, recreation flows or other flow adjustments that are necessary based on water year type and monthly requirements. Rapid adjustments of instream flow may cause stranding or other adverse impacts to aquatic species.

Condition 3 specifies ramping rates for certain stream reaches. Condition 6, which specifies gaging requirements for streamflow and reservoir elevations, will provide monitoring information to verify compliance with Condition 3.

Compliance with Conditions 3 and 6 will ensure that any potential impacts to aquatic species associated with rapid flow adjustments are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact AR-3: UARP dams and impoundments can hinder the downstream movement of large woody debris, which may lead to adverse impacts to aquatic species due to the reduction in habitat complexity that occurs when large woody debris is absent from the stream channel.

Condition 10 requires that mobile instream large woody debris that accumulates upstream of UARP dams be deposited downstream of the dams when conditions are safe enough to allow the debris to be moved. Condition 10 also requires SMUD to report annually on the efforts made during the year to deposit large woody debris below the dams, which will provide monitoring information to ensure compliance with Condition 10.

Compliance with Condition 10 will ensure that any potential impacts to aquatic species associated with a lack of large woody debris are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact AR-4: Operation of the Iowa Hill Development may cause potentially adverse impacts to aquatic species within Slab Creek Reservoir due to entrainment into the intake/outlet structure that will be located within the reservoir.

Condition 17 requires SMUD to consult with the State Water Board, California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) during the intake/outlet structure design process, to ensure that the final design incorporates features that minimize or prevent fish entrainment into the structure. Condition 17 allows the Deputy Director to reject or require modifications of the design, construction and operations plans if the plans do not adequately address water quality, sediment mobilization, turbidity, fish entrainment risk and the creation of dangerous hydraulic conditions in Slab Creek Reservoir.

Fish community monitoring and reporting for Slab Creek Reservoir as required in Condition 21-A and Condition 21-C will provide information to assess whether entrainment is being successfully prevented or minimized.

Compliance with Condition 17 will ensure that any potential impacts to aquatic species associated with entrainment in Slab Creek Reservoir are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Terrestrial Resources

Impact TR-1: UARP operations affect reservoir levels and instream flows, which may cause potentially-significant impacts to riparian vegetation or wetlands along UARP-affected stream reaches or in the vicinity of UARP impoundments. Diverting flows or reducing the intensity of peak flows may alter riparian vegetation composition, lead to channel encroachment, or decrease riparian cover. Reservoir fluctuation may reduce wetland abundance and species diversity.

Monitoring required by Condition 8-E will provide information to periodically assess the status of the riparian plant community at established study sites throughout the license term and any extensions. Condition 6, which specifies gaging requirements for streamflow and reservoir elevations, will provide monitoring information to verify compliance with Conditions 1 (minimum instream flows), 2 (pulse flows) and 5 (reservoir elevations).

Compliance with Conditions 1, 2 and 5 will ensure that any potential impacts to riparian vegetation and/or wetlands associated with UARP operations are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact TR-2: UARP operations may adversely affect sensitive amphibian species due to flow fluctuations and/or altered water temperature conditions associated with required flow releases.

Condition 3 specifies ramping rates for specific reaches, which are designed to avoid significant impacts on sensitive amphibian species. Conditions 9-A, 9-B, 9-C and 9-D identify adaptive management measures for flow requirements to avoid spill events at times that would negatively impact sensitive amphibians and to establish the appropriate water temperature trigger associated with foothill yellow-legged frog breeding activity. Condition 21-D prohibits the operation of Iowa Hill from further reducing water temperatures below 12ºC in the SF American River downstream of Mosquito Bridge.

Amphibian monitoring and reporting required in Conditions 8-C and 8-D, together with water temperature monitoring required in Condition 8-I, will provide a means to monitor UARP impacts to sensitive amphibian species.

Implementation of Conditions 3, 9-A, 9-B, 9-C, 9-D, and 21-D will ensure that any potential impacts to sensitive amphibian species associated with UARP operation are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact TR-3: UARP operations may adversely impact bald eagles due to the potential for disturbance of bald eagle nesting sites.

Condition 8-L requires that SMUD develop and implement a bald eagle monitoring plan subject to approval by the Deputy Director that identifies bald eagle nesting sites located in the vicinity of the UARP in order to avoid impacts to bald eagles from UARP-related activities. This is consistent with the *Rationale Report for Relicensing Settlement Agreement* (January 29, 2007), which states “populations of threatened and endangered wildlife and plant species shall be maintained or enhanced, and viable populations of sensitive species shall be maintained.”

Compliance with Condition 8-L will ensure that any potential impacts on bald eagles due to UARP operations are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

<u>Threatened and Endangered Species Resources</u>

Impact TE-1: UARP operations and facilities have the potential to adversely impact California red-legged frogs, which are listed as threatened under the federal Endangered Species Act (ESA). Although California red-legged frogs have not been found in or near UARP impoundments or UARP-affected stream reaches, they have been observed in the vicinity (less than five miles) of the UARP as recently as 2003.

Compliance with Condition 8-C, which requires SMUD to develop and implement a monitoring program for sensitive amphibian species, will provide information on the presence of red-legged frogs in the immediate vicinity of the UARP. If monitoring indicates that California red-legged frogs are present in the immediate vicinity of the UARP, Condition 8-C requires that SMUD consult with the State Water Board to determine whether additional measures are necessary to conserve California red-legged frogs. Compliance with Condition 34 disallows any act that will result in take without proper authorization.

Compliance with Conditions 8-C and 34 will ensure that any potential impacts to threatened and endangered species associated with California red-legged frogs due to UARP operations and facilities are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact TE-2: UARP operations have the potential to adversely affect the Valley Elderberry Longhorn Beetle, a species that is listed as threatened under the federal ESA. Elderberry plants, which serve as the habitat for the Valley Elderberry Longhorn Beetle, were found within the UARP area at locations associated with transmissions lines.

Compliance with Condition 26, which requires SMUD to develop and implement a vegetation and invasive weed management plan that incorporates the USFWS' Valley Elderberry Longhorn Beetle Conservation Guidelines[1], will ensure that measures are taken to protect and conserve the habitat of the beetle. Compliance with Condition 34 disallows any act that will result in take without proper authorization.

Compliance with Conditions 26 and 34 will ensure that any potential impacts to threatened and endangered species associated with the Valley Elderberry Longhorn Beetle due to UARP operations are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Recreation Resources

Impact RR-1: Construction and operation of the Iowa Hill Development may prevent or alter recreational access to Slab Creek Reservoir.

Compliance with Condition 22, which requires SMUD to develop, receive Deputy Director approval, and implement a plan that addresses recreational access during and after construction of the Iowa Hill Development, will ensure that any potential impacts to recreation resources associated with recreation access are less-than significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact RR-2: UARP operations affect reservoir elevations in the impoundments, which may significantly affect recreational opportunities. For example, reservoir elevations that are too low may prevent the use of recreational facilities such as boat ramps.

Compliance with Condition 5, which requires that SMUD maintain specified reservoir elevations during the summer recreation season will ensure that any potential impacts to recreation resources associated with recreational opportunities are less-than-significant. Monitoring and reporting of reservoir levels required in Conditions 6 and 7 will provide a means to assess compliance. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact RR-3: UARP operations affect instream flow in UARP-affected stream reaches, which can affect recreational boating opportunities in the UARP vicinity.

[1] United States Department of the Interior Fish and Wildlife Service, Sacramento Fish and Wildlife Office Conservation Guidelines for the Valley Elderberry Longhorn Beetle, July 1999.

Condition 4 requires SMUD to provide specified recreation flows in certain stream reaches, which will increase recreational boating opportunities. Monitoring and reporting of instream flow required in Conditions 6 and 7 will provide a means to assess compliance.

Compliance with Condition 4 will ensure that any potential impacts to recreation resources associated with recreational boating opportunities are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact RR-4: Operation of the Iowa Hill Development may lead to potentially hazardous hydraulic conditions in Slab Creek Reservoir in the vicinity of the intake/outlet structure that may adversely impact recreational activities.

Condition 17 requires that SMUD consult with the CDFW, USFWS and the State Water Board during the intake/outlet structure design process to ensure that the final design minimizes any potentially hazardous hydraulic conditions in Slab Creek Reservoir that may affect recreational activity. The design must include safety features, including boat restraining barriers, warning signs, and other guidance to the public as needed, and must follow the FERC *Guidelines for Public Safety at Hydropower Projects*. The Deputy Director may require changes in the plan to address recreational impacts.

Compliance with Condition 17 will ensure that any potential impacts to recreation resources associated with hydraulic conditions in Slab Creek Reservoir are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Impact RR-5: Operation of the UARP may cause impacts to recreational fishing opportunities in UARP-affected stream reaches and/or UARP impoundments.

Condition 16 requires that SMUD match the type and amount of fish stocked by CDFW at Loon Lake, Union Valley, and Ice House Reservoirs, with up to a total of 50,000 pounds of fish provided by SMUD per year, to be distributed as determined by CDFW. However, in no case shall the amount of fish provided by SMUD be less than 25,000 pounds per year. Condition 16 requires that SMUD provide annual notification to the Deputy Director by July 1 regarding the fish stocking arrangements for that year, which will allow the State Water Board to monitor that the fish stocking requirement is being met.

Compliance with Condition 16 will ensure that any potential impacts to recreation resources associated with recreational fishing opportunities are less-than-significant. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.

Aesthetic Resources

Impact AE-1: UARP operations affect reservoir elevations in the impoundments, which may alter the aesthetic quality for visitors to the UARP.

Compliance with Condition 5, which requires SMUD to maintain specified reservoir elevations, will ensure that any potential impacts to aesthetic resources associated with reservoir elevations are less-than-significant and will improve the aesthetic quality for visitors to the UARP compared to the existing condition. Monitoring and reporting requirements that address reservoir

elevations are contained in Conditions 6 and 7, and will be used to assess compliance with Condition 5. Changes or alterations have been required in, or incorporated into, the UARP which mitigate or avoid any significant effects on the environment.