

# Water Temperature Monitoring Plan

Sacramento Municipal Utility District

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Hydro License Implementation • July 2015

Upper American River Project

FERC Project No. 2101



Powering forward. Together.



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## 1.0 Background and Introduction

This Water Temperature Monitoring Plan (Plan) addresses monitoring set forth in the FERC Order Issuing New License to Project No. 2101 issued July 23, 2014 (FERC 2014) for the Upper American River Project (UARP; FERC Project 2101), owned and operated by the Sacramento Municipal Utility District (SMUD). Condition 8.1 of Appendix A and Condition 1.5.9 of Appendix B address this Water Temperature Monitoring Plan. Appendix A of the License contains the State Water Resources Control Board (SWRCB) Water Quality Certification and Appendix B of the License contains U.S. Forest Service (USFS) 4(e) conditions. The Conditions contained in these License appendices will be referenced as SWRCB Conditions and 4(e) Conditions, respectively, for the remainder of this document. Attachments 1 and 2 contain the language from the two documents as applicable to this monitoring plan. There are small differences between these two License requirements. SMUD followed the more extensive of the two requirements. SMUD also ensured that all stipulations in both requirements were addressed.

The UARP lies within El Dorado and Sacramento counties, primarily within lands of the Eldorado National Forest. The UARP consists of three major storage reservoirs—Loon Lake, Union Valley and Ice House (with a combined capacity of approximately 379,000 acre-feet), eight smaller regulating or diversion reservoirs, and eight powerhouses. The UARP has an authorized installed capacity of 637.3 megawatts (MW). The UARP also includes recreation facilities containing over 700 campsites, five boat ramps, hiking paths, and bicycle trails at the reservoirs.

## 2.0 Monitoring Plan Objectives

The primary objectives and rationale for the water temperature monitoring program, as described in the 401 (SWRCB 2013) are as follows:

*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 8.1).*

This monitoring will help determine if water temperatures in UARP waters meet the Basin Plan beneficial use of Cold Freshwater Habitat<sup>1</sup> (CVRWQCB 1998) and other identified habitats/species needs. If such a study is inconclusive, reservoir temperature profile monitoring may be required to assist in the decision making process. Currently, the 401(SWRCB 2013) requires water temperature monitoring in stream reaches throughout the duration of the license term 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.”* These data will also be utilized to direct the following requirements of the new license:

- Adaptive management decisions regarding initiation of foothill yellow legged frog (FYLF) breeding
- Cancellation of recreational boating releases due to FYLF breeding
- Temperature monitoring related to the ‘block of water’ releases on Silver Creek
- Response of aquatic resources to spill events and pulse flows after thresholds have been reached.

### **3.0 Study Area and Sampling Locations**

Continuous water temperature monitoring of stream reaches will occur at 19 sites throughout the UARP area utilizing fixed stations or dataloggers. In general, these sites will measure water temperatures in diverted stream reaches downstream of UARP reservoirs. Table 1 describes the locations and characteristics of each site. Final site development at a local scale may be determined using proximity to release point, presence of isothermal water column, logistics, and channel morphology. Figure 1 depicts the monitoring site locations relative to the UARP and primary streams and rivers.

### **4.0 Methods**

#### **4.1 Equipment**

The majority of sites (16) will be monitored for water temperature using fixed stations. Monitoring compliance at twelve of these sites will be accomplished using existing streamflow gaging stations located in diverted stream reaches downstream of UARP reservoirs, either at weirs, stilling wells, or tailraces. The remaining four fixed stations that require real-time data are new developments. Each site utilizes a Campbell Scientific datalogger and temperature sensor. At minimum, where required by Condition 8.1 of the 401 Certification (SWRCB 2013), redundant sensors will be installed which measure both stage and temperature. Sensor cables will be

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<sup>1</sup> This plan states, in part, that “At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5° F above the natural receiving water temperature.”

contained inside conduit and the sensors located as close as possible to the stream thalweg where the water is well mixed. A solar shield will prevent exposure to direct sunlight. Depending on the site, power will be supplied either by photovoltaic panels and DC batteries, or through an existing power supply. Data transfer will occur through either radio telemetry or fiber optic network. Currently, most of these stations are capable of measuring water temperature; the remainder will be equipped with the instruments as described in Table 1. At sites where the fixed stations will not be operational within one year post License issuance, water temperature will be accomplished using data loggers as described below until upgrades are completed.

Simple, non-permanent, calibrated temperature dataloggers (ONSET HOBO Water Temperature Pro V2 or equivalent) will be deployed annually at the remaining three sites (Table 1). Two dataloggers will be installed at each site to guard against data loss in the event of equipment failure or drift. Dataloggers will be deployed in habitat strata where the water is well-mixed, typically at the head of a shallow pool just below a riffle input. Deployment of dataloggers will take place as soon as conditions (e.g. snow melt) permit safe foot access to the sites, and will typically be retrieved in early October. This will ensure that water temperatures are measured during the warmest period of the year. Each datalogger will be secured in the stream and shielded to assure that the sensor stays submerged and is not exposed to direct sunlight.

Table 2 describes the equipment specifications for all sensors selected for water temperature monitoring.

## 4.2 Data Collection

At the fixed stations, temperature readings will be collected at 15 minute intervals, logged by the datalogger, summarized to hourly means, and transmitted every 24 hours. Hourly data from loggers will be downloaded and post-processed using Onset Computer Corporation HOBO Proware<sup>®</sup>, or comparable software. All water temperature data will be stored in a Microsoft SQL database designed for this purpose.

## 4.3 QA/QC

Raw data will be subject to review on a routine basis. Temperature trends inspected will at least include physical range limits, practical range limits, and rates of temperature change. Data obtained from the fixed stations will be checked for validity using stored procedures that will run every 24 hours following data download. In the event of suspected erroneous data, a report will be generated and provided to pertinent SMUD staff daily via e-mail. The same procedures will be run manually following download from the data loggers. Erroneous temperature values will be adjusted manually, but the original raw data will be maintained in the database.

This review, along with graphical analysis and routine equipment inspection, will ensure that sensors are functioning and recording properly. For fixed stations, this will also allow for a timely response if the need arises. Any malfunction requiring a field visit will be addressed during



normal business hours, under safe conditions only. Repairs will be made in as timely a manner as possible.

Table 1. UARP water temperature monitoring site locations and parameters.							
Site Name	Site Description	UTM (NAD 83)		Sensor Type	Data Transfer	Threshold Trigger	Station Status
		Easting	Northing				
RR5	Rubicon River immediately below Rubicon Reservoir Dam	740501	4319200	CS450L	Telemetry	None	Existing
LRR3	Little Rubicon River immediately below Buck Island Reservoir Dam	737558	4320907	CS450L	Telemetry	None	Existing
RR1	Rubicon River below confluence of Little Rubicon River at the Project boundary	736593	4323887	Onset datalogger	Manual	None	NA
GC7	Gerle Creek immediately below Loon Lake Reservoir Dam	732455	4320776	CS450L	Telemetry	None	Existing
GC8	Gerle Creek immediately below Gerle Creek Reservoir Dam	725745	4316219	CS107 or CS450L	Telemetry	None	Existing
SFRR5	South Fork Rubicon River immediately below Robbs Peak Reservoir Dam	726202	4314316	CS450L	Fiber Optic Network	None	2015
SFRR6	SF Rubicon River below confluence of Gerle Creek at the Project boundary	725256	4314907	CS450L	Telemetry	None	Existing
SFRR0.5	SF Rubicon River immediately upstream of the confluence with the Rubicon River	719438	4316236	Onset datalogger	Manual	None	NA
SFSC7	South Fork Silver Creek immediately below Ice House Reservoir Dam <sup>†</sup>	728745	4299871	CS450L	Telemetry	None	Existing
SFSC8	South Fork Silver Creek immediately upstream of Junction Reservoir	721498	4303358	CS450L	Telemetry	7DMAVG	Existing
SC5	Silver Creek immediately below Junction Reservoir Dam	720466	4303467	CS 450L	Fiber Optic Network	None	Existing
SC6	Silver Creek immediately above Camino Reservoir Dam	714119	4301407	CS450L	Telemetry	DAVG	Existing
SC7	Silver Creek immediately below Camino Reservoir Dam <sup>†</sup>	713631	4300155	CS450L	Fiber Optic Network	None	Existing
SC8	Silver Creek immediately upstream of SF American River	709310	4296208	CS450L	Telemetry	DAVG	Existing



Table 1. UARP water temperature monitoring site locations and parameters.

Site Name	Site Description	UTM (NAD 83)		Sensor Type	Data Transfer	Threshold Trigger	Station Status
		Easting	Northing				
BC4	Brush Creek immediately below Brush Creek Reservoir Dam	706407	4298536	CS107	Fiber Optic Network	None	Existing
SFAR13	SF American River immediately below Slab Creek Reservoir Dam	699644	4294054	CS450L	Fiber Optic Network	7DMAVG	Existing
SFAR7	SF American River at Mosquito Rd Bridge	695572	4294304	Onset datalogger	Manual	None	NA
SFAR15	SF American River approximately ½ mile upstream of White Rock Powerhouse	692576	4292875	CS450L	Telemetry	7DMAVG	Existing
SFAR16	SF American River – to record White Rock Powerhouse discharge temps	692212	4293046	CS450L	Fiber Optic Network	None	Existing

Table 2. Specifications for the various monitoring equipment.

Sampling Equipment	Accuracy	Range	Calibration Interval
Campbell Scientific 107L	<±0.2°C from 0° to 50° C	-35° to +50°C	Annual
Campbell Scientific 450L	±0.2°C from 0° to 50° C	0° to 60°C	Biennial
Onset Computer Corp. HOBO®	±0.2°C from 0° to 50°C	-40° to 50°C	Annual
Campbell Scientific CR 1000 Datalogger	±3 min. per year	Not Applicable	Annual

## 5.0 Analysis

Data will be analyzed at varying frequencies depending on the format of data retrieval (e. g. real-time opposed to retrieved/downloaded). All data will be summarized to include values for daily mean, minimum and maximum temperatures. Further analysis will include calculating the highest seven-day moving average temperature (7DMAVG). For sites associated with trigger thresholds (Table 2), daily minimum, maximum, and average values will be determined to notify SMUD staff if these thresholds are being exceeded. These procedures will be automated in the database including a notification process when threshold triggers have been reached.

### 5.1 Decision-Making Thresholds

SMUD will use real-time water temperature information to make efforts to protect endangered species and Cold Freshwater Habitat. Eventually the 12°C 7DMAVG temperature trigger thresholds below may be adjusted on a site specific basis if data from the FYLF monitoring supports such a change. In particular, SMUD will:

- Use water temperature thresholds to protect foothill yellow-legged frog (FYLF) breeding activities by canceling recreational boating flows in the following reaches when the 7DMAVG exceeds 12°C:
  - SF Silver Creek below Ice House Dam (If FYLF are found in this reach)
  - SF American River below Slab Creek Reservoir
- Monitor for effects to aquatic resources following spills that occur at Camino and Slab Creek reservoirs when the 7DMAVG exceeds 12°C.
- Monitor other temperature thresholds to protect the Cold Freshwater Habitat requirements on Silver Creek, as described in the 401(SWRCB 2013). This involves informing the release of an additional “block of water” during wet water year types when the daily average temperature (DAVG) exceeds 20°C.

- Compare water temperature trends over time with other annual climatic conditions collected by SMUD. This will assist in determining whether the UARP is protecting the Basin Plan beneficial use of Cold Freshwater Habitat (CVRWQCB 1998).

## 6.0 Reporting

Study deliverables will include an annual written report covering the UARP stream water temperature monitoring. The report will include a description of the various sampling locations, methods, QA/QC findings, analysis and results, and any problems encountered. A graph will be generated for each site and will, at a minimum, depict the mean, minimum, and maximum daily temperature conditions. For those sites with corresponding threshold triggers, a description of if and when the threshold was reached and the subsequent actions taken will be included. Discussion appropriate to results and supportive of analyses and conclusions will be provided when applicable.

SMUD will submit a draft annual water temperature monitoring report to the U.S Forest Service (USFS), California Department of Fish and Wildlife (CDFW), U.S. Bureau of Land Management (BLM), State Water Resources Control Board (SWRCB), and Central Valley Regional Water Quality Control Board (CVRWQCB) following the conclusion of each calendar year, covering the results of monitoring throughout that year. SMUD will submit the draft report to the resource agencies on or before March 1 of the subsequent year. SMUD will then convene the annual review of ecological conditions meeting by April 1 of each year to discuss the draft report, after which SMUD will allow the resource agencies at least 30 days to review and comment on the draft report. SMUD will also invite all members of the Consultation Group to attend the annual meeting, per the Settlement Agreement (SMUD et al. 2007).

The final annual report will be filed with FERC by June 30. SMUD will include in the final report any comments and recommendations made by the agencies on the draft report. If SMUD does not adopt a recommendation, the filing shall include SMUD's reasons based on project-specific information.

All temperature data will be made digitally available upon request.

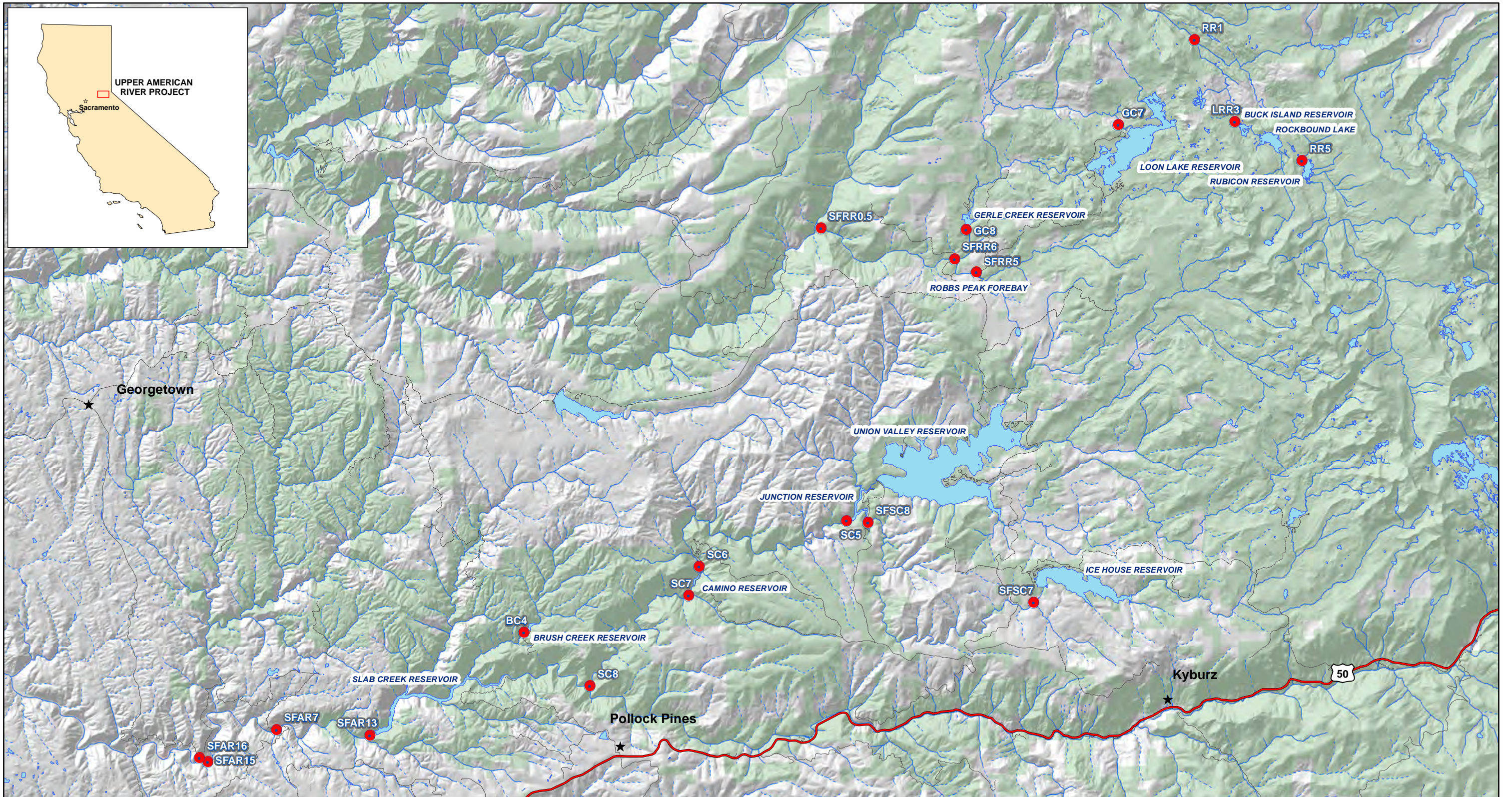
**Literature Cited**

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Federal Energy Regulatory Commission (FERC). 2014. New License for the continued operation of the Upper American River Project, No. 2101. Federal Energy Regulatory Commission, Washington, D.C.

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

State Water Resources Control Board (SWRCB, 2013). 2013. Water Quality Certification for the Upper American River Project. FERC Project No. 2101. State Water Resources Control Board. Sacramento, CA.

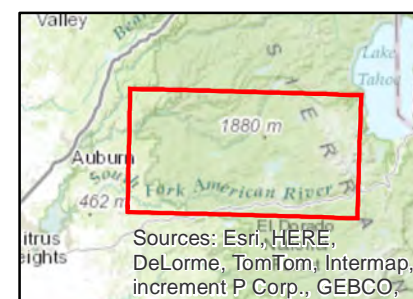


Upper American River Project  
 Water Temperature Monitoring Plan  
 Figure 1. Site Locations.



**Map Features**

- Water Temperature Monitoring Sites
- US Highway 50
- Primary Roads
- National Forest Land



1 in = 3 miles

## Attachment 1

### License Appendix B, Condition 1-5.9 Water Temperature

The licensee shall, within 1 year following license issuance, develop and file with FERC a Water Temperature Monitoring Plan that has been approved by the Chief of the Division of Water Rights for the SWRCB. Within 3 months of license issuance, the licensee shall consult with FS, SWRCB, USFWS, and CDFG on the development of a Plan consistent with the method and frequencies described below. The licensee shall provide the draft Plan for a minimum 90-day review by FS, SWRCB, USFWS, and CDFG.

Method: Continuous recording devices shall be installed and maintained at a minimum of 17 stream temperature stations as designated below, as soon as weather and flow conditions allow safe installation of these devices. Please refer to the FYLF monitoring program (Article 1-5(3)) for additional water temperature monitoring requirements. Reservoir temperature profiles may be added if stream temperature problems are identified and FS, CDFG, USFWS, and SWRCB determine that reservoir temperatures are a controllable factor. Up to five additional monitoring sites may be added to the water temperature program, as determined necessary through review of the monitoring data and annual consultation with FS, CDFG, USFWS, and SWRCB. Modifications to the temperature monitoring program and the determination of final monitoring sites shall be made by FS, CDFG, USFWS, and SWRCB.

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

- a. Rubicon River immediately below Rubicon Reservoir Dam.
- b. Little Rubicon River immediately below Buck Island Reservoir Dam.
- c. Rubicon River below confluence of Little Rubicon River at the Project boundary.
- d. Gerle Creek immediately below Loon Lake Reservoir Dam.
- e. Gerle Creek immediately below Gerle Creek Reservoir Dam.
- f. South Fork Rubicon River immediately below Robbs Peak Reservoir Dam.
- g. South Fork Rubicon River below confluence of Gerle Creek at the Project boundary.
- h. South Fork Silver Creek immediately below Ice House Reservoir Dam.

- i. South Fork Silver Creek immediately upstream of Junction Reservoir.
- j. Silver Creek immediately below Junction Reservoir Dam.
- k. Silver Creek immediately above Camino Reservoir Dam.
- l. Silver Creek immediately below Camino Reservoir Dam.
- m. Silver Creek immediately upstream of SFAR.
- n. Brush Creek immediately below Brush Creek Reservoir Dam.
- o. SFAR immediately below Slab Creek Reservoir Dam.
- p. SFAR approximately ½ mile upstream of White Rock Powerhouse.
- q. A location downstream of White Rock Powerhouse that records the water temperature of discharges from White Rock Powerhouse.

The recorders located in South Fork Silver Creek below Ice House Reservoir Dam and SFAR 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 SFAR shall be installed within 6 months of license issuance.

Frequency: For streams, from March 15 to September 30 in all years after license issuance until a subsequent license is issued or until it can be demonstrated by the licensee that operation of the Project reasonably protects the "cold freshwater" beneficial use as determined by FS, SWRCB, USFWS, and CDFG. For reservoirs, if a determination as described above is made by FS, SWRCB, USFWS, and CDFG, seasonal temperature profiles shall be monitored in applicable reservoir(s) during multiple water year types to develop data necessary for decision-making.

Rationale: Temperature monitoring is needed during summer on an annual basis to determine if the cold water ecological resource objective is being met in designated Project reaches. Temperature monitoring is needed during spring to evaluate breeding conditions for amphibians. Temperature monitoring in the primary storage reservoirs would be needed to understand the extent of cold water availability. Some temperature stations may be deleted if FS, CDFG, USFWS, and SWRCB find sufficient temperature data have been collected and find no temperature issue exists for the relevant area.

## Attachment 2

### State Water Resources Control Board 401 Certification for the UARP Condition 8.I

#### 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.

152 FERC ¶ 62,220  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Sacramento Municipal Utility District

Project No. 2101-115

ORDER APPROVING WATER TEMPERATURE MONITORING PLAN PURSUANT  
TO ARTICLE 401(A)

(Issued September 30, 2015)

1. On July 22, 2015, and supplemented on July 30, 2015, Sacramento Municipal Utility District (licensee) filed its Water Temperature Monitoring Plan with the Federal Energy Regulatory Commission (Commission) pursuant to Article 401(a) of the Upper American River Project license.<sup>1</sup> The project is located on the Rubicon River, Silver Creek, and South Fork American River in El Dorado and Sacramento counties, California and occupies lands within the Eldorado National Forest.

REQUIREMENTS

2. Article 401(a), in part, requires the licensee to file, for Commission approval, a Water Temperature Monitoring Plan (Plan) within 12 months of license issuance, or July 23, 2015. The Plan is also required by the project's Water Quality Certification (WQC), Condition No. 8(i).<sup>2</sup> These requirements specify that the Plan should provide for continuous monitoring of water temperature between March 15 and September 30 at 19 monitoring stations within the project boundary. Monitoring is to occur for the duration of the project license. The purpose of the monitoring is to determine whether project waters meet the beneficial use for cold freshwater habitat and other identified habitat and species' needs. The exact monitoring locations are listed in Condition 8(i). According to Condition 8(i), if the State Water Resource Control Board's (SWRCB) Deputy Director determines that project operations reasonably protect the cold freshwater beneficial use at any monitoring stations, the licensee can request to modify the monitoring requirement under the Plan. The licensee must develop the Plan in consultation with the SWRCB,

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<sup>1</sup> Order Issuing New License. 148 FERC ¶ 62,070 (issued July 23, 2014).

<sup>2</sup> The water quality certification was incorporated into the project license via Appendix A.

U.S. Forest Service (FS), U.S. Fish and Wildlife Service (FWS), and the California Department of Fish and Wildlife (CDFW).

### LICENSEE'S PLAN

3. The licensee's proposed Plan outlines its methods for measuring water temperature and analyzing and reporting data. Of the 19 required monitoring stations, the licensee intends to collect water temperature data at 12 existing stream gages in the project area, which have been installed to comply with other license requirements. Of the remaining seven monitoring stations, four would be established using data logger and temperature sensors located inside of a protective housing. Similar to the stations located at stream gages, the loggers would transmit real-time data via radio telemetry or fiber optic network to a data center. The remaining three monitoring stations would be non-permanent stations that the license would deploy annually prior to the start of each monitoring season. These stations would have two data loggers per site as a precaution against equipment failure or drift, since they would not be located inside a protective housing.

4. The type of monitoring station- permanent or non-permanent- would dictate how often water temperature readings are collected. At permanent sites, readings would be collected every 15 minutes, summarized to hourly averages, and then transmitted every 24 hours. At non-permanent sites, hourly data would be downloaded and post-processed using the data logger-specific software. The licensee would store all water temperature data in a designated database. With regard to quality assurance/quality control, the licensee would review raw data on a routine basis. Data obtained at permanent stations would be reviewed by a computer program every 24 hours after the daily download has occurred. The licensee would apply the same level of review to non-permanent stations, but instead of using a computer program, the licensee would conduct the data review manually after the data loggers have been downloaded. Additionally, the licensee would routinely inspect and calibrate equipment according to the equipment manufacturer's standards.

5. The licensee proposes to analyze water temperature data to determine daily mean, minimum and maximum temperatures. The licensee would also calculate the highest seven-day moving average water temperature. The licensee would use the data collected under the Plan to protect sensitive species, specifically, foothill yellow-legged frog, as well as cold freshwater habitat through the use of threshold triggers. These triggers, which would be activated when the seven-day moving average water temperature exceeds 12°C, would prompt certain actions such releasing additional blocks of water that are designed to mitigate the effects of higher water temperatures and reduce stress on foothill yellow-legged frogs and cold freshwater habitat. Details regarding threshold triggers are described in more detail in the Plan.

6. With regard to reporting, the licensee would develop an annual report containing a description of the monitoring stations, quality assurance/quality control findings, an analysis of water temperature data, results, and a description of any problems that were encountered during the respective year. The reports would also include a discussion of whether any trigger thresholds were reached for that year and if so, the subsequent actions that were taken by the licensee. The licensee would provide the report to the FS, FWS, CDFW, SWRCB, U.S. Bureau of Land Management and the Central Valley Regional Water Quality Control Board by March 1 of the following year in which monitoring took place. In addition to providing the agencies a minimum of 30 days to provide comments, the licensee would discuss the results of the prior year's monitoring during an annual meeting held by April 1 of each year. The licensee would then file the report, along with any agency comments, with the Commission by June 30.

#### AGENCY CONSULTATION

7. The licensee provided its Plan to the agencies for review and comment on September 19, 2014. The agencies provided comments on the Plan, which the licensee incorporated with two exceptions. Both comments pertained to means in which the licensee should provide its data to the agencies. The FS requested that the licensee automatically provide it with hourly water temperature data. The licensee stated that it would provide the information upon request rather than automatically. The CDFW requested that the licensee provide data in a very specific format (DSS format). The licensee responded that it would provide the data in the form of electronic data and agencies can manage the data however they choose. Once addressing agency comments, the licensee filed its final Plan with the SWRCB for approval on January 23, 2015. On July 21, 2015, the SWRCB approved the Plan.

#### DISCUSSION AND CONCLUSIONS

8. The licensee's Plan should provide a comprehensive water temperature monitoring program that evaluates the effect of project operations on water temperature in project reservoirs and streams. The data collected under the Plan should allow the licensee to determine whether project water temperatures meet the beneficial use for cold freshwater habitat and other identified habitat and species' needs, as well as identify long-term trends in water temperature. The reporting component of the Plan should keep the agencies and the Commission apprised of actions taking place under the Plan. The Commission should reserve the right to require changes to the Plan based on data collected under the Plan.

9. According to Condition 8(i), if the SWRCB Deputy Director determines that project operations reasonably protect the cold freshwater beneficial use at any monitoring stations, the licensee can request to modify the monitoring requirement under the Plan. If the Deputy Director and licensee, in consultation with the consulting parties to the Plan,

determine that the Plan should be amended, the licensee should file a request to amend its Plan with the Commission for approval. When filing the amendment request, the licensee should include documentation of consultation with the SWRCB and the other consulting parties to the Plan. The licensee must not implement any changes to the Plan until it is amended by the Commission

10. Sacramento Municipal Utility District's proposed Water Temperature Monitoring Plan fulfills the requirements of the 401(a) in part and Water Quality Certification Condition No. 8(i) should be approved.

The Director orders:

(A) Sacramento Municipal Utility District's Water Temperature Monitoring Plan (Plan), filed on July 22, 2015, and supplemented on July 30, 2015, pursuant in part to Article 401(a) and Water Quality Certification Condition No. 8(i) for the Upper American River Project (FERC No. 2101) is approved.

(B) The Commission reserves the right to require changes to the Plan based on data collected under the Plan.

(C) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 8251 (2012), and the Commission's regulations at 18 C.F.R. § 385.713 (2015). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Thomas J. LoVullo  
Chief, Aquatic Resources Branch  
Division of Hydropower Administration  
and Compliance

Document Content(s)

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