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MATTHEW RODRIGUEZ  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

## State Water Resources Control Board

**DEC 15 2017**

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

Ms. Debbie Powell  
Senior Director, Power Generation Operations  
Pacific Gas and Electric Company  
P.O. Box 770000  
San Francisco, CA 94177

Dear Secretary Bose and Ms. Powell:

### COMMENTS ON PROPOSED STUDY PLAN AND STUDY PLAN MEETING ANNOUNCEMENT FOR POTTER VALLEY HYDROELECTRIC PROJECT, FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 77; MENDOCINO AND LAKE COUNTIES

Pacific Gas and Electric Company (PG&E) owns and operates the Potter Valley Hydroelectric Project (Project), also known as Federal Energy Regulatory Commission (FERC) Project No. 77. On September 14, 2017, PG&E filed the *Proposed Study Plan and Study Plan Meeting Announcement* (PSP) with FERC. The PSP contains studies PG&E proposes to implement to evaluate Project impacts to environmental resources and inform the FERC relicensing process.

Item 3(b) of the *Pre-Application Filing Activities Under the Integrated Licensing Process (ILP)* section of the Memorandum of Understanding (MOU) executed between FERC and State Water Board on November 19, 2013<sup>1</sup> states, "*The State Water Board will, to the extent possible, identify studies and information necessary for water quality certification... In its [State Water Board] comments on the proposed study plan (Box 8), the State Water Board will note what studies it anticipates will be needed for issuance of water quality certification.*"

On August 4, 2017, during the Pre-Application Document (PAD) comment period, the State Water Board filed comments and study requests for the Project. The State Water Board's PAD comment letter identified seven studies that the State Water Board determined were necessary to inform the water quality certification process. The included studies were:

- 1) Water Quality Monitoring Study
- 2) Water Temperature Model Study
- 3) Water Balance/Operations Model Study

<sup>1</sup> A copy of the MOU is available online at:  
[http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/water\\_quality\\_cert/ferc\\_mou/index.shtml](http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/ferc_mou/index.shtml)

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- 4) Instream Flow Study
- 5) Fluvial Processes Study
- 6) Fish Population Study in the East Branch Russian River
- 7) Special Status Amphibians and Reptiles Study

Additionally, the State Water Board's letter advised FERC that it is likely the State Water Board will consider fish passage at Scott Dam in its California Environmental Quality Act (CEQA) document as part of the Clean Water Act Section 401 water quality certification process.

Following the State Water Board's comments and study request on PG&E's PAD, PG&E filed its PSP which included all of the above studies. State Water Board staff appreciates PG&E's willingness to work with the State Water Board and relicensing participants to develop and refine studies needed to inform the Project's FERC relicensing process. Please see *Attachment A – Comments on Pacific Gas and Electric Company's Proposed Study Plan for Potter Valley Hydroelectric Project (Attachment A)* for State Water Board staff's specific comments on the PSP. Additionally, please see *Attachment B – Study Requests on Pacific Gas and Electric Company's Pre-Application Document for Potter Valley Hydroelectric Project (Attachment B)* for detailed information on the State Water Board's study plan requests (duplicate of an attachment provided as part of State Water Board staff's August 4, 2017, comments on the Project PAD).

If you have questions regarding this letter, please contact me at (916) 341-5321 or by email at [Parker.Thaler@waterboards.ca.gov](mailto:Parker.Thaler@waterboards.ca.gov). Written correspondence should be directed to:

State Water Resources Control Board  
Division of Water Rights  
Water Quality Certification Program  
Attn: Parker Thaler  
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Sincerely,



Parker Thaler  
Senior Environmental Scientist, Specialist  
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Division of Water Rights

Attachments:

- Attachment A – Comments on Pacific Gas and Electric Company's Proposed Study Plan for Potter Valley Hydroelectric Project
- Attachment B – Study Requests on Pacific Gas and Electric Company's Pre-Application Document for Potter Valley Hydroelectric Project

cc on next page

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ATTACHMENT A:  
COMMENTS ON PACIFIC GAS AND ELECTRIC COMPANY'S PROPOSED STUDY PLAN  
FOR POTTER VALLEY HYDROELECTRIC PROJECT  
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**General Comment**

As the California Environmental Quality Act (CEQA) lead agency for the Potter Valley Hydroelectric Project (Project) the State Water Resources Control Board (State Water Board) is required to examine environmental effects associated with Pacific Gas and Electric Company's (PG&E) Project as well as alternatives. Given public interest in Project removal expressed during the Federal Energy Regulatory Commission (FERC) scoping process and PG&E's recent decision on the Desabla-Centerville Hydroelectric Project, the State Water Board recommends that FERC consider a dam removal alternative in its relicensing proceedings.<sup>2</sup>

On August 18, 2017, FERC issued a Scoping Document 2 (SD2) that clarified that FERC would be considering a dam decommissioning alternative in its National Environmental Quality Act (NEPA) process. The State Water Board appreciates FERC's inclusion of information in its process that is also necessary for the State Water Board's water quality certification and CEQA process.

To accurately evaluate a dam decommissioning alternative, various studies would be necessary to examine impacts to environmental resources and inform a dam decommissioning project description for items such as reservoir slope stability, floodplain, cultural resources, and sediment. The amount and content of reservoir sediments can be a primary factor in the environmental impacts associated with a dam decommissioning. Characterization of reservoir sediments and identification of one or more potential strategies for managing sediments are therefore necessary to inform a dam decommissioning alternative description and associated environmental analysis. State Water Board staff encourages FERC and PG&E to undertake a study to evaluate the quantity and composition of reservoir sediment in both Lake Pillsbury and Van Arsdale Reservoirs, as this information is necessary to fully evaluate a dam decommissioning alternative.

**Pacific Gas and Electric Company Specific Study Plan Comments**

On August 4, 2017, the State Water Board filed comments with FERC on Pacific Gas and Electric Company's (PG&E) Pre-Application Document (PAD) (see Attachment B) and requested the following seven studies:

- 1) Water Quality Monitoring Study
- 2) Water Temperature Model Study
- 3) Water Balance / Operations Model Study
- 4) Instream Flow Study
- 5) Fluvial Processes Study
- 6) Fish Population Study in the East Branch Russian River
- 7) Special Status Amphibians and Reptiles Study

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<sup>2</sup> See similar comment in State Water Board staff's August 4, 2017 Pre-Application Document comment letter.

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PG&E's Proposed Study Plan (PSP) incorporates all the above requested studies. The State Water Board appreciates PG&E's inclusion of the above requested studies, and its coordination with licensing participants. Comments are provided below in an effort to refine the proposed studies.

**Water Quality Monitoring Study**

PG&E's PSP includes a Water Quality Monitoring Study with an *In-Situ River Water Quality Sampling* effort. State Water Board staff appreciates that PG&E's proposal includes continuous in-situ monitoring for dissolved oxygen, turbidity, pH, specific conductance, and temperature. The two sections of the Eel River proposed by PG&E for monitoring (below Lake Pillsbury and below Van Arsdale Reservoir) are appropriate. Additionally, State Water Board staff requests PG&E include an in-situ station upstream of Lake Pillsbury in the first year of the Water Quality Monitoring Study. Including an in-situ station upstream of Lake Pillsbury during the same year as water quality monitoring below Lake Pillsbury will allow for comparison between water quality entering Lake Pillsbury and water quality discharged from Lake Pillsbury into the Eel River.

**Hydrology and Project Operations Model**

PG&E's PSP includes a Hydrology and Project Operations Model. The Hydrology and Project Operations Model proposes to install temporary stage recorders to determine flow in two locations above Lake Pillsbury "if suitable locations can be found". State Water Board staff strongly encourages PG&E to install stage recorders in both the Eel River and Rick Fork above Lake Pillsbury. The current instream flow releases from the Project are set via a mass balance equation that estimates inflow to Lake Pillsbury to determine outflow requirements of the Project. Verification of the mass balance equation through flow data acquired by stage recorders at major tributaries to Lake Pillsbury can further refine a Hydrology and Project Operations Model.

**Instream Flow Study**

Adequate data on the relationship between current flow schedules and physical habitat attributes are needed to inform the State Water Board's water quality certification and associated CEQA processes. Information from the Instream Flow Study will help inform conditions of the Project's future water quality certification, which become mandatory conditions of a FERC license.

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STUDY REQUESTS ON PACIFIC GAS AND ELECTRIC COMPANY'S PRE- APPLICATION  
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**Study Plan Requests**

Information collected through the implementation of study plans in the Federal Energy Regulatory Commission (Commission) process will be used by the Commission to develop license conditions and fulfill its requirements under the National Environmental Policy Act (NEPA), and by other agencies that must take permitting actions during the Commission's relicensing proceedings. Study plan information will assist the State Water Resources Control Board (State Water Board) in developing water quality certification conditions to ensure compliance with the Clean Water Act and California Environmental Quality Act (CEQA). It is State Water Board staff's understanding that that the State Water Board will act as lead agency for the Potter Valley Hydroelectric Project's (Project) CEQA process.

As a mandatory conditioning agency under the Commission's relicensing process, the State Water Board will act in an advisory role to inform Pacific Gas and Electric Company (PG&E) of the information that is necessary to fulfill the requirements of the water quality certification process. The State Water Board exercises independent authority in issuing water quality certifications therefore its role in any pre-decisional activities is advisory, rather than necessarily reflective of the State Water Board's ultimate determinations.

In this advisory role, State Water Board staff will participate in the Study Plan Development process and submit study plan requests and comments in accordance with the Commission's Integrated Licensing Process (ILP) (included below). If the study plans approved by the Commission do not cover those requested by State Water Board staff, or are otherwise insufficient to provide information needed in connection with the issuance of the water quality certification, the State Water Board may choose to request such information under the Porter-Cologne Water Quality Control Act (Cal. Wat. Code, § 13000 et seq.), Water Code section 13383, or other applicable authority.

In an effort to avoid unnecessary delays in the Project's relicensing process, State Water Board staff strongly encourages PG&E to consider the below requested studies, and to work collaboratively with State Water Board staff and other relicensing participants to resolve differences. When possible, working collaboratively with all relicensing participants often allows for expedited resolution to issues while avoiding However, State Water Board staff understands the Commission's dispute process may be necessary to resolve some issues that may occur during relicensing.

State Water Board staff was disappointed that PG&E deviated from standard practices demonstrated in other Commission relicensing processes<sup>3</sup> of proactively developing and proposing draft study plans in its PAD. State Water Board staff looks forward to working with PG&E and all relicensing participants to develop study plans and ensure they adequately analyze potential Project impacts and meet the regulatory needs of all resource agencies.

The following is the list of seven studies requested by State Water Board staff:

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<sup>3</sup> For example: the Yuba River Development Project (FERC Project No. 2246); and the Pit 3, 4, and 5 Hydroelectric Project (FERC Project No. 233).

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- 1) Water Quality Monitoring Study
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Study plan requests by State Water Board staff are described in detail, using the study plan criteria outlined in Appendix A of the Commission's Scoping Document 1, as follows:

**1. Water Quality Monitoring Study**

*Goal and Objective of the Water Quality Monitoring Study*

The goals and objectives of the Water Quality Monitoring Study are to: (1) characterize existing water quality conditions in the Project reservoirs and Project-affected reaches of the Eel and East Branch Russian Rivers; (2) determine consistency with state and federal water quality objectives, standards, and criteria; and (3) identify potential Project operation and maintenance related causes for any failure to meet water quality objectives or interference with beneficial uses of water identified in the Water Quality Control Plan for the North Coast Region (Basin Plan).

Specifically, State Water Board staff requests PG&E monitor:

- In-situ water quality parameters (dissolved oxygen, pH, temperature, and turbidity)
- General water quality parameters (inorganic ions, nutrients, metals (total and dissolved))
- Bacteria (fecal coliform, *Escherichia coli*, and total coliform)
- Petroleum Hydrocarbons
- Blue Green Algae species and toxins (specifically microcystin and anatoxin-a)

Monitoring locations and frequency should be collaboratively determined with relicensing participants to ensure adequate information is collected. At a minimum the below reaches should be monitored:

- Eel River above Lake Pillsbury (necessary to assess pre-project impacted water quality)
- Lake Pillsbury
- Eel River below Lake Pillsbury and above Van Arsdale Reservoir
- Van Arsdale Reservoir
- Eel River below Van Arsdale Reservoir
- Discharge below the Potter Valley Powerhouse on the East Branch Russian River

*Resource Management Goal of the State Water Board*

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The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and the regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the Commission's relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project as described has the potential to impact water quality in the Eel and East Branch Russian Rivers, including multiple beneficial uses. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on current water quality conditions of Project reservoirs and the Eel and East Branch Russian Rivers with the current flow schedule that was fully implemented in 2007.

Existing Information

PG&E's Pre-Application Document (PAD) Section 5.2.2 describes existing information related to water quality monitoring and the Project. PAD Table 5.2-3 provides ranges (low and high) for analytics for water quality, but does not provide specific values, the number values, the specific sites each value was recorded (table groups several sites together into a range of values), or the project operations in relation to each recorded value. State Water Board staff finds this information insufficient to make adequate determinations of the Project impacts to water quality and beneficial uses of water. In addition, much of the collected water quality information predates the current flow schedule that was implemented in 2007. Comprehensive water quality data collection with the current flow schedule is needed to fully assess the Project's potential impacts to water quality and beneficial uses of water.

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. Project operations and maintenance activities may directly impact water quality in the Eel River below the diversions, East Branch Russian River below the Potter Valley Powerhouse, and in the Project impoundments. In addition, Recreational uses at the Project impoundments and facilities have the potential to impact water quality through human contact (e.g. bacteria and hydrocarbons).

Adequate water quality data with current flow schedules is needed to inform the State Water Board's water quality certification and associated CEQA processes. Water quality information will inform conditions of the Project's future water quality certification which will become mandatory conditions at the issuance of a Commission license.



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Study Methodology

Water quality monitoring with current flow schedules as part of a Commission relicensing process is a standard practice used in most California Commission relicensings to inform project impacts to water quality and conditions of a water quality certification. PG&E Projects including: Bucks Creek Hydroelectric Project (FERC Project No. 619), Pit 3, 4, and 5 Hydroelectric Project (FERC Project No. 233), and McCloud-Pit Hydroelectric Project (FERC Project No. 2106), all conducted water quality monitoring as part of the Commission study plan process. In addition, other recent Commission relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), Placer County Water Agency's Middle Fork American River Hydroelectric Project (FERC Project No. 2079), and South Sutter Water District's Camp Far West Hydroelectric Project (FERC Project No. 2997), all conducted, or are currently conducting, water quality monitoring as part of the Commission study plan process.

As PG&E is proposing no water quality monitoring and State Water Board staff are recommending near standard water quality monitoring practices used in the majority of Commission relicensing processes in California, our recommended methodologies are more appropriate.

The Water Quality Monitoring Study should be performed in eight general steps: (1) select specific water quality parameters; (2) select sampling locations; (3) collect water samples; (4) perform laboratory analyses using standard methods adequately sensitive to determine consistency with state and federal water quality standards; (5) prepare quality assurance/quality control review; (6) determine consistency with Basin Plan objectives and beneficial uses protection needs; (7) consult with relicensing participants; and (8) prepare a report summarizing results. The report should be made available to relicensing participants.

Level of Effort and Cost

The water quality monitoring study should run at a minimum for two consecutive years and include specific monitoring items described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the water quality monitoring study will take additional effort and costs. Based upon previous relicensing processes in California that have conducted similar water quality monitoring, State Water Board staff estimate the cost to be between \$165,000 to \$250,000, with cost dependent on collaborative development of study specifics such as monitoring locations and frequency.

**2. Water Temperature Model**

Goal and Objective of the Water Temperature and Quality Model Study Request

The goal of the Water Temperature Model Study is to accurately quantify the effects of the Project on water temperature at relevant temporal and geographic scales necessary to help inform water quality certification conditions, and accomplish the resource goals and objectives of the State Water Board.

The objectives of the Water Temperature Model Study are to: (1) develop a model to simulate different temperatures given potential flow changes in the Project reservoirs and Project affected reaches of the Eel and East Branch Russian Rivers; (2) accurately reproduce observed

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reservoir and stream water temperatures, within acceptable calibration standards over a range of hydrologic conditions; (3) be sensitive to both flow and meteorological conditions; (4) determine consistency with state and federal water temperature objectives, standards, and criteria; (5) identify potential Project operation and maintenance related causes for any unmet water temperature objectives and beneficial uses of water identified in the *Water Quality Control Plan for the North Coast Region* (Basin Plan). Modeling efforts should focus on operational effects during the summer months (June through September) when high water temperatures can be a limiting factor to aquatic resources, however, modeling efforts should not be limited to the summer months. Specific information and detailed objectives to be obtained from this study request should be collaboratively developed with PG&E, resources agencies, and other relicensing participants.

*Resource Management Goal of the State Water Board*

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and the regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the Commission's relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project has the potential to impact water temperature in the Eel and East Branch Russian Rivers, including multiple beneficial uses. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on water temperature conditions in Project reservoirs and the Eel and East Branch Russian Rivers with the current flow schedule that was fully implemented in 2007.

*Existing Information*

Available water temperature data are described in Section 5.2 of the PAD. PG&E is actively collecting stream water temperature data upstream, within and downstream of the Project area, and is also collecting limited reservoir water temperature data in Lake Pillsbury. The data provided in the PAD needs to be supplemented with increased water temperature monitoring to provide the temporal and spatial resolution of measurements in order to accurately quantify its effects on aquatic habitat and wildlife, and the beneficial uses of water (Water Quality Monitoring Study includes temperature). Particularly, the majority of temperature information collected in the past occurred during the summer months below Scott Dam, but not within Lake Pillsbury.

Water temperature monitoring that is limited to the summer months creates significant data gaps in spring and fall when stratification and de-stratification of temperature dynamics within Lake Pillsbury occur. Understanding temperature stratification occurring in the spring and the associated volume of cold water availability within Lake Pillsbury should inform instream flow

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releases downstream of Scott Dam during the summer months when sustaining preferable summer rearing conditions for cold-water for anadromous fish. The continuation of current temperature monitoring, the extension of the temperature monitoring season (including the spring and fall months), and the addition of real-time water temperature gages to inform block-water type management actions, will help to ensure a complete and accurate data set to inform timely future water operations and for the development of a robust predictive water temperature model downstream of Scott Dam, within Lake Pillsbury, and upstream of Lake Pillsbury.

PG&E did not provide information or data of Project impacts on water temperature discharges into the East Branch Russian River below the Potter Valley powerhouse. In order to produce a temperature model that simulates different water temperatures given potential flow changes in the East Branch Russian River, additional data for water temperature records below the Potter Valley Powerhouse in the East Branch Russian River should be obtained and included in the model's analysis in order to determine Project impacts to beneficial uses and aquatic habitat in the East Branch Russian River.

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. The results of water temperature model simulations will be used to: (1) better understand Project effects on water temperature in Project-affected reaches of the Eel and East Branch Russian River; (2) evaluate what Project operation alternative (or combination of alternatives) can best protect aquatic wildlife, such as anadromous fish; and (3) evaluate the effects of Project operational alternatives on the thermal environment and impacts to beneficial uses.

Continued Project operation and maintenance may directly impact water temperature in the Eel River below the diversions, East Branch Russian River below the Potter Valley Powerhouse, and in the Project impoundments. These water temperature effects may be associated with seasonal changes to water quality in Project-affected reaches of the Eel and East Branch Russian River. Anadromous fish species, such as salmonids and lamprey in the mainstem Eel River, may be impacted by water temperatures associated with Project operations. Development of a Water Temperature Model will allow for State Water Board staff and other relicensing participants to assess Project related temperature impacts to the Eel and East Branch Russian River systems under different modeled flow and operations scenarios. The Water Temperature Model will inform certification and license conditions. State Water Board staff believes that the creation of predictive Water Temperature Model would improve the ability to evaluate and manage water temperatures within Project-affected reaches of the Eel and East Branch Russian River. In addition, PG&E's creation of a water temperature model for relicensing will allow all relicensing participants to use the same water temperature model when determining Project impacts.

Study Methodology

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PG&E has implemented a network of temperature monitoring stations listed in section 5.2 of the PAD and within PG&E's Summer Water Temperature Monitoring Plan (PG&E 2005)<sup>4</sup>. In addition to these locations, PG&E should install water temperature loggers that record water temperature at one hour intervals in stream locations that are collaboratively decided upon with relicensing participants.

PG&E should develop a tool comprised of one or more models to predict water temperature in Project-affected stream reaches and Project reservoirs. The model should seamlessly incorporate upstream projects (if any) and inflows, project reservoirs operations and diversions with downstream accretion flows in order to model the Eel River mainstem from above Lake Pillsbury downstream to the confluence with the Middle Fork Eel River. Coupling this with various flow prescriptions discharged from Scott Dam and associated diversions at Van Arsdale, will also provide necessary management tools to best assess impacts of the Project relative to cold-water beneficial uses, such as maintaining anadromous fish cold-water habitat.

It is essential that an instream temperature model is developed for the Potter Valley Project to simulate water temperatures within various reaches and under different hydrologic regimes. There are a number of water temperature modeling platforms that can accomplish the objectives of the study element. For example, the CE-QUALW2 model has been widely used for reservoir and temperature projections using data that was collected from those respective environments. It is expected that PG&E will choose an appropriate platform in an open and transparent manner in collaboration with ILP participants. It is also expected that the model(s) will be calibrated and verified using accepted scientific methodology and the best available data.

A water temperature model with current flow schedules as part of a Commission relicensing process is a standard practice used in several California Commission relicensing processes to inform project impacts to water temperature and conditions of a water quality certification. For example, recent Commission relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), and South Sutter Water District's Camp Far West Hydroelectric Project (FERC Project No. 2997), developed, or are currently developing, water temperature models as part of the Commission study plan process.

As PG&E is proposing no water temperature model and State Water Board staff are recommending standard water temperature modeling practices used in recent Commission relicensing processes in California, our recommended methodologies are appropriate.

Level of Effort and Cost

The Water Temperature Model Study should include items described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the Water Temperature Model Study will take additional effort and costs. State Water Board staff estimate the cost to be between \$100,000 to \$350,000, with cost dependent on collaborative development of study specifics, and amount of additional water temperature data collection necessary.

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<sup>4</sup> Pacific Gas and Electric. 2005. Summer water temperature monitoring plan. Addressing NMFS Measure 8 (in part) and License Article 57. Potter Valley Hydroelectric Project FERC Project No.77.

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**3. Water Balance / Operations Model Study**

*Goal and Objective of the Water Balance / Operations Model Study*

The goal of the Water Balance / Operations Model Study is to develop a water balance and operations computer model (Operations Model) that can be used by all relicensing participants to simulate current and potential future operations of the Project. Study objectives include developing a model that simulates current Project operations for a period of analysis that covers a range of historical hydrologic conditions. The Operations Model should also be able to simulate basic decisions made during Project operations including the management of flood control reservation, water supply management, dam releases, reservoir levels, and hydropower generation. Objectives also include:

- Address operational decisions made during Project operations and maintenance (O&M) including: water supply, recreation, stream flows, and hydropower generation;
- Accurately reproduce observed reservoir levels, reservoir releases, and hydropower generation within acceptable calibration standards over a range of hydrologic conditions;
- Provide output to inform other studies, analyses, and models; and
- Allow simulation of changes in Project O&M to determine effects on reservoir levels, reservoir releases, hydropower generation, and instream flow releases from Scott Dam, Cape Horn Dam, and Potter Valley powerhouse.

*Resource Management Goal of the State Water Board*

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters. In accordance with the State Water Board's reasonable use and public trust responsibilities, they may regulate water diversion and use through the water right priority system. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the Commission relicensing process, State Water Board staff maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project has the potential to impact stream flows and reservoir levels in the Eel and East Branch Russian Rivers, including multiple beneficial uses. The Project's operations require balancing of public trust and interest in water use and water quality.

*Existing Information*

State Water Board staff believes adequate information exists to develop an Operations Model that meets the above objectives, and that PG&E working collaboratively with relicensing participants has the capability to supplement data where gaps currently exist. Section 5.1 in the PAD summarizes the hydrology of Eel and East Branch Russian River including area-storage-elevation information, historical operations data levels, reservoir releases, power generation, and flows downstream of the Project. PG&E also has access to U.S. Army Corps of Engineers'

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flood control requirements and objectives. The existing Commission license specifies historic required releases and flows downstream of the Project. Information on physical capacities of the reservoirs, outlets, and powerhouses is also known by PG&E and listed in the PAD.

PG&E mentioned in their PAD that the water discharged from the Potter Valley Powerhouse into the East Fork Russian River "...provides inflow to Lake Mendocino and benefits many downstream users". However, PG&E did not provide information or data on how the Project impacts water supply into Lake Mendocino. Preliminary data pertaining to the relationship between the Project and water supply into Lake Mendocino does exist, and has been collected and analyzed by the Sonoma County Agency. PG&E should incorporate this information and data into their draft license application for the Project as changes in Project releases into the East Branch Russian River could impact water in the Russian River.

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse that directly discharges into the East Branch Russian River. The Project is responsible for instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River. Operation of the Project affects reservoir storage levels and releases in both reservoir bodies. This study request seeks to provide a tool for examining water quantity and flow under various potential operational scenarios that may inform development of certification requirements. This modeling tool will aid in assessing multiple preliminary resource issues identified in Scoping Document 1 and will allow relicensing participants, including the Commission, to examine the effects of various flow regimes on water supply and generation while using the same model, vs different models prepared by each relicensing participant to inform their actions on the Project.

Study Methodology

The study area should include Lake Pillsbury and Van Arsdale reservoirs, intake structures, and diversion structures (tunnels, adits, conduits, penstocks, and valve houses). This model should also include Project-affected stream reaches on: (1) Eel River from Scott Dam to Van Arsdale Reservoir; (2) Eel River from Cape Horn Dam and downstream to the confluence of the Eel River and Middle Fork of the Eel River; and (3) East Branch Russian River from Potter Valley Powerhouse to Lake Mendocino. For Project-related impacts downstream of Lake Mendocino, PG&E should consider utilizing the model under development by the Sonoma County Water Agency in coordination with the U.S. Geological Survey and State Water Board staff.

The specific type of model should be developed collaboratively with PG&E, resource agencies, and other relicensing participants. The model should be developed in five general steps that include: (1) model development; (2) model validation; (3) base case development; (4) model documentation; and (5) final report. One type of model that PG&E could consider is the HEC-ResSim or similar platform to develop the Project Water Balance/Operations Model in consultation with relicensing participants. HEC-ResSim is a publicly-available reservoir simulation software package that was developed by the U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-ResSim has been used on numerous recent hydropower licensing proceedings, including the Upper American River Project (FERC No. 2101), the DeSable-Centerville Project (FERC No. 803), the Yuba-Bear Project (FERC No. 2266), the Drum-Spaulding Project (FERC No. 2310), and the McCloud-Pit Project (FERC No. 2106). As PG&E is proposing no water operations model and State Water Board staff is recommending

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standard practices of water operations model development used in other Commission relicensing processes in California, our recommended methodologies are appropriate.

Level of Effort and Cost

Due to the size of the Project, the Operations Model required for the Project may be less complex than those developed for other project relicensing efforts. State Water Board staff estimate cost of Operation Model to be in the range of \$100,000 to \$250,000, with cost dependent on collaborative development of study specifics.

**4. Instream Flow Study**

Goal and Objective of the Instream Flow Study

The goal of the Instream Flow Study is to determine how Project operations affect habitat for aquatic species in Project-affected river reaches. The objective of the Instream Flow Study is to characterize the relationship between instream flow and aquatic habitat for target fish species.

Specifically, State Water Board staff requests PG&E to include the following habitat characteristics in the Instream Flow Study:

- Stream channel topography and cross-sectional area;
- Benthic substrate type and riparian cover type mapping;
- Hydraulic parameters, such as depth and velocity; and
- Water temperature.

Specific study locations should be collaboratively determined with relicensing participants to ensure adequate information is collected to achieve the goal and objectives of the Instream Flow Study. At a minimum, the Project-affected stream reaches listed below should each contain a least one study location:

- Eel River above Lake Pillsbury
- Eel River below Scott Dam
- Eel River below Cape Horn Dam
- East Branch Russian River below Potter Valley powerhouse

Resource Management Goal of the State Water Board

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and to regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

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Throughout the FERC relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project as described has the potential to impact water quality in the Eel and East Branch Russian Rivers, including multiple beneficial uses. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on the relationship between Project operations and the characteristics of aquatic habitat in the Eel and East Branch Russian Rivers with the current flow schedule that was fully implemented in 2007.

Existing Information

PG&E's PAD, Section 5.2, describes existing information related to water use and hydrology, and Section 5.3 describes existing information related to fish and aquatic resources in Project affected reaches. Section 6.2.1.5 lists relevant information compiled by PG&E as it relates to the potential proposed study for Instream Flows. The information described and references listed in the PAD, however, either focus solely on water temperature as the aquatic "habitat" related to flow, or contain data and information on the relationship between physical habitat and discharge in the Eel River that was collected prior to implementation of the 2007 Project flow regime. Regarding the East Branch Russian River, PG&E stated in their PAD that "very little information is available to describe aquatic habitat conditions in the East Branch Russian River."

Overall, the PAD did not contain information that comprehensively described physical habitat attributes, such as stream cross-sectional area, substrate and riparian cover type mapping, and depth and velocity, as they relate to instream flow under the current Project operations that were fully implemented beginning in 2007. State Water Board staff finds PG&E's PAD information to be insufficient to make adequate determinations of Project impacts to beneficial uses of the Eel and East Branch Russian Rivers. Comprehensive data on the relationship between physical habitat attributes and hydraulic parameters that are collected with the current flow schedule is required to be able to fully assess the Project's potential impacts to aquatic habitat and the beneficial uses of water.

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. Project operations and maintenance activities may directly impact aquatic habitat in the Eel River below the diversions, East Branch Russian River below the Potter Valley Powerhouse, and in the Project impoundments.

Adequate data on the relationship between physical habitat attributes and hydraulic parameters with current flow schedules is needed to inform the State Water Board's water quality certification and associated CEQA processes. Information from the Instream Flow Study will inform conditions of the Project's future water quality certification which will become mandatory conditions at the issuance of a Commission license.

Study Methodology



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Instream Flow studies as part of a Commission relicensing process is a standard practice used in most California Commission relicensing processes to inform project impacts to aquatic habitat and conditions of a water quality certification. PG&E Projects including: Pit 3, 4, and 5 (FERC Project No. 233), McCloud-Pit (FERC Project No. 2106), and Pit 1 (FERC Project No. 2687) all conducted instream flow studies as part of the FERC study plan process. In addition, other FERC relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), Placer County Water Agency's Middle Fork American River (FERC Project No. 2079), Southern California Edison's Six Big Creek Hydroelectric Projects (FERC Project Nos. 67, 120, 2085, 2086, 2174, 2175), and South Sutter Water District's Camp Far West Hydroelectric Project (FERC Project No. 2997), all conducted, or are currently conducting, instream flow studies as part of the Commission's study plan process.

The Instream Flow Study should be performed in seven general steps: (1) select specific physical habitat attributes and hydraulic parameters; (2) select study locations; (3) collect data; (4) prepare quality assurance/quality control review; (5) determine consistency with Basin Plan objectives and beneficial uses protection needs; (6) consult with relicensing participants; and (7) prepare a report summarizing results. The report should be made available to relicensing participants.

PG&E did not propose an instream flow study in their PAD. State Water Board staff is recommending standard instream flow protocols used in the majority of FERC relicensing processes in California, and therefore our recommended methodologies are appropriate.

Level of Effort and Cost

The Instream Flow Study should run for at least two consecutive water-years and include data collection described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the Instream Flow Study will take additional effort and costs. Based upon previous, and concurrent, relicensing processes in California that have conducted similar instream flow studies, State Water Board staff estimate the cost to be between \$200,000 and \$650,000 with cost dependent on collaborative development of study specifics, such as specific habitat attributes and technical methodologies.

**5. Fluvial Processes Study**

Goal and Objective of the Fluvial Processes Study

The goal of the Fluvial Processes Study is to determine how Project operations affect fluvial processes in Project-affected reservoirs and stream reaches. The objectives of the Fluvial Processes Study are to: (1) characterize the relationship between Project operations and fluvial processes; (2) identify the potential impacts of the relationship between Project operations and fluvial processes on aquatic species and habitat; and (3) identify sources of Project-related erosion and sedimentation.

Specifically, State Water Board staff requests PG&E to include the following elements in the Fluvial Processes Study:

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- Quantify sedimentation rates in Lake Pillsbury, and subsequent loss or transport of sediment to: (i) the Eel River below Scott Dam; (ii) Eel River below Cape Horn Dam; (iii) East Branch Russian River below the Potter Valley Powerhouse.
- Quantify large woody material (LWM) frequency and volume trapped on an annual basis by Lake Pillsbury and Van Arsdale Reservoir. In addition, explain the current LWM management practices in Project reservoirs.
- Survey the volume of mobile, coarse sediment stored in the active channel in the Eel River below Scott Dam and Cape Horn Dam.
- Survey the volume of fine sediment stored in the active channel, including pool in-filling, in the Eel River below Scott Dam and Cape Horn Dam.
- Quantify the frequency and volume of LWM stored in the bankfull channel in the Eel River below Scott Dam and Cape Horn Dam.
- Identify areas of significant erosion that are likely caused by Project operations in: (i) Lake Pillsbury and Van Arsdale Reservoir; (ii) the Eel River below Scott Dam and Cape Horn Dam; and (iii) in the East Branch Russian River below the Potter Valley Powerhouse.
- Synthesize results from this study with the results from all other State Water Board study requests, as applicable.

Specific study locations should be collaboratively determined with relicensing participants to ensure adequate information is collected to achieve the goal and objectives of the Fluvial Processes Study.

Resource Management Goal of the State Water Board

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and the regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the Commission relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project as described has the potential to impact fluvial processes in the Eel River and East Branch Russian River, including multiple beneficial uses. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on the relationship between Project operations and fluvial process, and the potential impacts on aquatic species in the Eel and East Branch Russian Rivers with the current flow schedule that was fully implemented in 2007.

Existing Information

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PG&E's PAD, Section 5.7, describes existing information related to Geomorphology. The PAD includes descriptions of recent bathymetric surveys of Lake Pillsbury and sediment evaluation in Van Arsdale Reservoir. However, the information described and many of the references listed in the PAD as it relates to the Project-affected stream reaches in the Eel River, contain data and information that was collected prior to implementation of the 2007 Project flow regime. The PAD also does not contain information on coarse gravel or LWM in Project-affected stream reaches. PG&E has access to the necessary hydrology data, historical operations data on reservoir storage, release, power generation, and observed flows directly downstream of the Project to achieve some the objectives described in this study request.

PG&E states in their PAD that "The Eel River has the highest recorded average suspended sediment load per unit area of any river of its size or larger in the conterminous United States (Lisle 1990)"<sup>5</sup>. However, PG&E did not provide information or data in their PAD that describes Project impacts on the geomorphology and fluvial processes within the East Branch Russian River. It is not known how much, what type, or to what affect the suspended sediment that is transported to the East Branch Russian River may have on beneficial uses and aquatic wildlife.

Overall, the PAD does not contain information that comprehensively described fluvial processes related to the current Project operations that were fully implemented beginning in 2007. State Water Board staff finds this lack of information to be insufficient to make adequate determinations of Project impacts to beneficial uses of the Eel and East Branch Russian Rivers. Comprehensive data on the relationship between fluvial processes and the current operations is required to be able to fully assess the Project's potential impacts to aquatic wildlife and habitat, and the beneficial uses of water.

#### Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. Project operations and maintenance activities may directly impact aquatic habitat in the Eel River below the diversions, East Branch Russian River below the Potter Valley Powerhouse, and in the Project impoundments.

Lake Pillsbury effectively traps large amounts sediment and LWM inputs from the upper Eel River watershed and eliminates the delivery of these key resources for proper channel morphology condition and function to the Eel River below the Project. In addition, the Project has altered the frequency, magnitude, and duration of peak flows to the lower Eel River, which may limit key geomorphic processes such as bed mobilization, fine sediment flushing, channel migration and avulsion, LWM recruitment, riparian vegetation stand establishment, and development and maintenance of a natural bankfull channel dimensions.

This study specifically looks to quantify how resource inputs (sediment and LWM) are removed from the system by entrapment at Lake Pillsbury and Van Arsdale Reservoir, and how this

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<sup>5</sup> Reference cited in the PAD is: Lisle, T.E. 1990. The Eel River, Northwestern California: high sediment yields from a dynamic landscape. In *Surface Water Hydrology, v O-1. The Geology of North America*, M.G. Wolman and H.G. Riggs, eds, pp. 311-314. Geological Society of America.

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reduced supply translates into available habitat in the Eel River (e.g., anadromous fish spawning gravel, instream wood, and sediment storage). This study would also provide information on suspended sediment transport to the East Branch Russian River, which is currently an information gap.

Adequate data on the relationship between fluvial processes with current operations is needed to inform the State Water Board's water quality certification and associated CEQA processes. Information from the Fluvial Processes Study will inform conditions of the Project's future water quality certification which will become mandatory conditions at the issuance of a Commission license.

Study Methodology

Fluvial processes studies as part of a FERC relicensing process is a standard practice used in many California Commission relicensing processes to inform project impacts to geomorphology and conditions of a water quality certification. Commission relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), PG&E's McCloud-Pit Hydroelectric Project (FERC Project No. 2106), and South Feather Water and Power Agency's Power Project (FERC Project No. 2088) conducted fluvial processes or geomorphology studies as part of the Commission study plan process.

PG&E did not propose a fluvial processes study in their PAD. State Water Board staff is recommending standard fluvial processes protocols used in the Commission relicensing processes in California, and therefore our recommended methodologies are appropriate.

The Fluvial Processes Study should be performed in seven general steps: (1) develop specific data collection protocols to achieve study goals and objectives; (2) select study locations; (3) collect data; (4) prepare quality assurance/quality control review; (5) determine consistency with Basin Plan objectives and beneficial uses protection needs; (6) consult with relicensing participants; and (7) prepare a report summarizing results. The report should be made available to relicensing participants.

Level of Effort and Cost

The Fluvial Processes Study should run for at least two consecutive water-years and include data collection described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the Fluvial Processes Study will take additional effort and costs. State Water Board staff estimate the cost to be between \$150,000 and \$200,000 with cost dependent on collaborative development of study specifics.

**6. Fish Population Study in the East Branch Russian River**

Goal and Objective of the Fish Population Study in the East Branch Russian River

The goal of the Fish Population Study in the East Branch Russian River is to provide current information on the fish community in the Project-affected stream reach of the East Branch Russian River between the Potter Valley Powerhouse and Lake Mendocino. The objectives of the study are to: (1) characterize fish species composition; and (2) estimate total or relative

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abundance of fish by species, and by native or non-native species status. Specific study location(s) should be collaboratively determined with relicensing participants to ensure adequate information is collected to achieve the goal and objectives of the study.

Resource Management Goal of the State Water Board

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and the regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the Commission relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project as described has the potential to impact fish communities in the East Branch Russian River. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on the fish species composition and abundance in the East Branch Russian River, in conjunction with the current flow schedule and operations that were fully implemented in 2007.

Existing Information

PG&E's PAD, Section 5.3, describes existing information related to fish populations in Project affected reaches. The information described in the PAD primarily contain information on fish populations in the Eel River and does not fully address fish populations in the East Branch Russian River. The PAD discusses that fish stocking occurred in the East Branch Russian River from the 1970s to the mid-1990s, and that it is likely some fish species were entrained in the Van Arsdale intake prior to installation of the current fish screens and now inhabit the East Branch Russian River. The PAD does not contain information on the current fish species composition and abundance in the East Branch Russian River, or how flows from current Project operations may affect fish communities in the East Branch Russian River. Furthermore, Section 6.2.1.9 in the PAD, identifies fish population characteristics in the East Branch Russian River as a potential information gap.

State Water Board staff finds this lack of information to be insufficient to make adequate determinations of Project impacts to fish communities and beneficial uses of the East Branch Russian River. Comprehensive data on the fish community that is collected with the current flow schedule and Project operations is required to be able to fully assess the Project's potential impacts to fish communities and the beneficial uses of water.

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges

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into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. Project operations and maintenance activities may directly impact the fish community in the East Branch Russian River below the Potter Valley Powerhouse.

Adequate data on the fish community in the East Branch Russian River with current flow schedules and Project operations is needed to inform the State Water Board's water quality certification and associated CEQA processes. Information from the study will inform conditions of the Project's future water quality certification which will become mandatory conditions at the issuance of a Commission license.

Study Methodology

Fish populations studies as part of a Commission relicensing process is a standard practice used in most California Commission relicensing processes to inform project impacts to aquatic habitat and conditions of a water quality certification. PG&E Projects including: Pit 3, 4, and 5 (FERC Project No. 233), McCloud-Pit (FERC Project No. 2106), and Pit 1 (FERC Project No. 2687) all conducted fish population studies as part of the FERC study plan process. In addition, other FERC relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), Placer County Water Agency's Middle Fork American River (FERC Project No. 2079), Southern California Edison's Six Big Creek Hydroelectric Projects (FERC Project Nos. 67, 120, 2085, 2086, 2174, 2175), and South Sutter Water District's Camp Far West Hydroelectric Project (FERC Project No. 2997), all conducted, or are currently conducting, fish population studies as part of the Commission study plan process.

PG&E did not propose a fish population study in the East Branch Russian River in their PAD. State Water Board staff is recommending standard fish population sampling protocols used in the majority of FERC relicensing processes in California, and therefore our recommended methodologies are appropriate.

The Fish Population Study in the East Branch Russian River should be performed in six general steps: (1) select study locations and develop sampling protocols; (2) collect data; (3) prepare quality assurance/quality control review; (4) determine consistency with Basin Plan objectives and beneficial uses protection needs; (5) consult with relicensing participants; and (6) prepare a report summarizing results. The report should be made available to relicensing participants.

Level of Effort and Cost

The Fish Population Study should run for two consecutive water-years and include data collection described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the fish population study will take additional effort and costs. Based upon previous, and concurrent, relicensing processes in California that have conducted similar fish population studies, State Water Board staff estimate the cost to be between \$60,000 and \$100,000 with cost dependent on collaborative development of study specifics, such as number of study locations and specific sampling methodologies.

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**7. Special Status Amphibians and Reptiles Study**

*Goal and Objective of the Special Statue Amphibians and Reptiles Study*

The goal of the Special Status Amphibians and Reptiles Study is to provide information regarding the distribution and potential suitable habitat for Foothill Yellow-Legged Frog (FYLF) and Western Pond Turtle (WPT) in Project-affected stream reaches and Project reservoirs.

Specific study objectives include:

- Identify and map habitats in the study areas that are potentially suitable for different life stages of FYLF and WPT, and evaluate the suitability of these habitats for each species by life stage.
- Perform biological surveys in suitable habitats and document the distribution and abundance of FYLF and WPT in the study areas, and determine the approximate period in which breeding and rearing occurs. Identify, compile, and map known occurrences of FYLF and WPT including life history stage and associated habitat information, as available.
- Characterize habitat (water stage, velocity, and temperature) of various flow regimes as it relates to FYLF habitat for various life stages coordination with any flow study or temperature study.
- Identify appropriate ramping rates at know breeding sites in coordination with site specific timing and length of FYLF breeding season.
- Compile incidental observations of other aquatic special-status and non-native species from other aquatic studies that may affect the distribution of FYLF and WPT.

*Resource Management Goal of the State Water Board*

The State Water Board has broad authority under the federal Clean Water Act (33 U.S.C. § 1251-1387), the state constitution, and the state water code and regulations to restore and maintain the chemical, physical and biological integrity of the state's waters, and the regulate water diversion and use through the water right priority system in accordance with the State Water Board's reasonable use and public trust responsibilities. Section 401 of the federal Clean Water Act allows for broad application of appropriate state and federal environmental laws when entities apply for new or renewed federal licenses that may result in a discharge to navigable water of the state. (33 U.S.C. § 1341.)

Throughout the FERC relicensing process the State Water Board maintains independent regulatory authority to condition the operation of the Project to protect water quality and beneficial uses of stream reaches consistent with section 401 of the federal Clean Water Act, the Basin Plan, State Water Board regulations, California Environmental Quality Act, and any other applicable state laws. The Project as described has the potential to impact special status amphibians and reptiles in Project-affected stream reaches and Project reservoirs. The Project's operations require public trust balancing and a balancing of public interest in water use and water quality. The analysis of these potential impacts requires information on the distribution and potential suitable habitat for special status amphibians and reptiles, in conjunction with the current flow schedule and operations that were fully implemented in 2007.

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Existing Information

Existing and relevant information regarding known and potentially occurring locations of special-status amphibians and aquatic reptiles in the Project vicinity were identified by PG&E in their PAD, Section 5.3. Although FYLF and WPT have been incidentally observed within the Project area during other studies, existing information is too general to meet the objectives of the study. Additional information that is needed includes specific and current localities of the species and their habitats in relation to Project facilities; and sufficient information on current Project operations and maintenance activities that might affect populations. Furthermore, PG&E's PAD identifies that FYLF presence is "Unknown" and may occur or likely occur around Lake Pillsbury's tributaries or in the East Branch Russian River. This information is needed in order to inform the certification and Commission license conditions (i.e., instream flow releases and ramping rates).

Project Nexus

The Project has two dams and impoundments on the Eel River, as well as an Eel River water diversion at Van Arsdale Reservoir to the Potter Valley Powerhouse which directly discharges into the East Branch Russian River. The Project is responsible for maintaining minimum instream flows in the Eel River below Cape Horn Dam and in the East Branch Russian River via diversions from the Eel River. Project operations and maintenance activities may directly impact the special status amphibians and reptiles in Project-affected stream reaches and Project reservoirs. For example, Project operations that result in flow fluctuations could create changes in water stage and velocity that could affect the suitability of instream habitat and potentially scour or strand FYLF egg masses and tadpoles. Additionally, water temperature regimes downstream of Project facilities could alter the timing of breeding and subsequent tadpole development.

Adequate data on the distribution and potential suitable habitat for special status amphibians and reptiles with current flow schedules and Project operations is needed to inform the State Water Board's water quality certification and associated CEQA processes. Information from the study will inform conditions of the Project's future water quality certification which will become mandatory conditions at the issuance of a Commission license.

Study Methodology

The study area should consist of suitable aquatic habitats within Project reservoirs and Project-affected stream reaches. For FYLF and WPT this should include the following locations:

- Lake Pillsbury and 1.0 miles upstream of the reservoir tributaries since FYLF could occur depending on lake levels.
- Eel River from Scott Dam to Van Arsdale Reservoir.
- Eel River from Cape Horn Dam to Middle Fork Eel River.
- East Branch Russian River from Potter Valley Powerhouse Tailrace to Lake Mendocino.

The study should be completed in six general steps: 1) identify and map known occurrences of FYLF and WPT; 2) identify and map potential habitat for FYLF and WPT; 3) select survey sites for FYLF and WPT; 4) conduct surveys and compile incidental observations; 5) prepare and perform quality assurance/ quality control on data; and 6) prepare final report and consult with relicensing participants.



ATTACHMENT B:  
STUDY REQUESTS ON PACIFIC GAS AND ELECTRIC COMPANY'S PRE- APPLICATION  
DOCUMENT FOR POTTER VALLEY HYDROELECTRIC PROJECT  
FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 77

Special status amphibian and reptiles studies as part of a Commission relicensing process is a standard practice used in several California Commission relicensing processes to inform project impacts and conditions of a water quality certification. PG&E Projects including: Pit 3, 4, and 5 (FERC Project No. 233), and McCloud-Pit (FERC Project No. 2106), conducted special status amphibian and reptile studies as part of the FERC study plan process. In addition, other FERC relicensing processes such as: Yuba County Water Agency's Yuba River Development Project (FERC Project No. 2246), Placer County Water Agency's Middle Fork American River Hydroelectric Project (FERC Project No. 2079), and Southern California Edison's Six Big Creek Hydroelectric Projects (FERC Project Nos. 67, 120, 2085, 2086, 2174, 2175), conducted special status amphibian and reptile studies as part of the FERC study plan process.

PG&E did not propose a special status amphibian and reptile study in their PAD. State Water Board staff is recommending standard amphibian and reptile study methodologies used in many of FERC relicensing processes in California, and therefore our recommended methodologies are appropriate.

Level of Effort and Cost

The Special Status Amphibian and Reptiles study should run for two consecutive water-years and include data collection described in the goals and objectives section. In addition, PG&E working collaboratively with relicensing participants to further refine the study will take additional effort and costs. Based upon previous relicensing processes in California that have conducted similar amphibian and reptile studies, State Water Board staff estimate the cost to be between \$200,000 and \$320,000 with cost dependent on collaborative development of study specifics and methodologies.

