STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of Water Quality Certification for the

PACIFIC GAS AND ELECTRIC COMPANY

POE HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2107

SOURCE: North Fork Feather River

COUNTY: Butte

PACIFIC GAS AND ELECTRIC COMPANY

POE HYDROELECTRIC PROJECT
FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2107
WATER QUALITY CERTIFICATION
TABLE OF CONTENTS

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of Water Quality Certification for the

PACIFIC GAS AND ELECTRIC COMPANY

POE HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2107

SOURCE: North Fork Feather River

COUNTY: Butte

WATER QUALITY CERTIFICATION FOR FEDERAL PERMIT OR LICENSE

1.0 Background and Project Description

On December 16, 2003, Pacific Gas and Electric Company (PG&E or Licensee) filed an application for new license with the Federal Energy Regulatory Commission (Commission or FERC) for the Poe Hydroelectric Project (Project), FERC Project No. 2107. The original license for the Project was issued by FERC on October 26, 1953 and expired on September 30, 2003. The Project is currently operating under an annual license, which extends the term of the original license.

PG&E owns and operates the Project, which is located on the North Fork Feather River in Butte County. The Project boundary encompasses approximately 340 acres in the vicinity of the community of Pulga. Project land is owned by various parties including: 182 acres of PG&E-owned land; approximately 145 acres of National Forest System land; approximately 12 acres of privately-owned land; and one acre of California Department of Transportation land.

The Project primarily consists of Poe Dam, Poe Reservoir, Poe Bypass Tunnel and Penstock, Poe Powerhouse, Big Bend Dam and Reservoir, and recreation facilities. Recreation facilities at Poe Powerhouse, Poe Beach, Bardees Bar, and Sandy Beach are not included in the existing FERC license but have been proposed to be included in a new license by PG&E, FERC, and other relicensing participants. The Project is operated primarily as a peaking and baseload

power facility.[1] Primary Project facilities are briefly described below and illustrated in Figure 1 and Figure 2.

- **Poe Dam** is 400-foot-long by 60-foot-tall with four 50-foot-wide by 41-foot-high radial flood gates, a 20-foot-wide by 7-foot-high small radial gate, and a small skimmer gate.

- **Poe Reservoir** stretches from Poe Dam upstream to just below the Cresta Powerhouse.[2] Poe Reservoir is 53 surface-acres. Under existing Project operations, the average hydrologic residence time in Poe Reservoir is seven hours.

- **Poe Bypass Tunnel and Penstock** facilities divert North Fork Feather River flows at Poe Dam into the 19-foot diameter Poe Bypass Tunnel, which is approximately 6.25 miles long. The Poe Bypass Tunnel terminates at an underground steel penstock that is approximately 1,000-feet long and 14-feet in diameter. Water from the penstock discharges into the North Fork Feather River at the Poe Powerhouse.

- **Poe Powerhouse** is located on PG&E owned property, 7.6 river miles downstream of Poe Dam. Poe Powerhouse is 175-feet-long by 114-feet-wide and has a total authorized installed capacity of 142.83 megawatts (MW), with an average annual generation of 583 gigawatt-hours (GWh).

- **Big Bend Dam and Reservoir** are approximately 4,500 feet downstream of Poe Powerhouse. Big Bend Dam is a 370-foot-long by 61-foot tall, concrete gravity dam. Big Bend Dam impounds a 42 surface-acre reservoir.

- **Recreational facilities** associated with the Project are located at Sandy Beach, Bardees Bar, Poe Beach, Poe Powerhouse, and Poe Reservoir. Each of these facilities includes parking facilities for contact and non-contact recreation opportunities, including swimming and whitewater boating. These facilities have existed for a number of years but were not included in the previous FERC license that expired in 2003.

2.0 Regulatory Authority

2.1 Water Quality Certification and Related Authorities

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

---

[1] Peaking power plants are operated during peak hours of the day when electricity is most valuable. This typically occurs early in morning and late in the afternoon when less solar and wind energy is available and during the summer when electrical demands are high. Baseload plants consistently generate enough energy to satisfy minimum energy demand.

[2] Cresta Powerhouse is associated with the Rock Creek-Cresta Hydroelectric Project (FERC Project No. 1962), which is also owned by PG&E.

Section 401 of the Clean Water Act (33 U.S.C. §1341) requires every applicant for a federal license or permit which may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the Clean Water Act, including water quality standards and implementation plans promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Clean Water Act section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the Clean Water Act and with any other appropriate requirement of state law. Section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the project. The State Water Resources Control Board (State Water Board) is designated as the state water pollution control agency for all purposes stated in the Clean Water Act and any other federal act (Wat. Code Section 13160.). The State Water Board's Executive Director is authorized to issue a decision on a water quality certification (certification) application. (Cal. Code Regs., tit. 23, § 3838, subd. (a).)

PG&E originally applied for certification on February 18, 2005. PG&E has annually withdrawn and re-applied for certification, and the most recent application for certification was received by the State Water Board on June 20, 2017. On March 4, 2005, the State Water Board provided notice of receipt of a complete application for the Project to the applicable parties pursuant to California Code of Regulations, title 23, section 3835, subdivision (c). On July 14, 2009, the State Water Board provided public notice of the application pursuant to California Code of Regulations, title 23, section 3858 by posting information describing the Project on the State Water Board's website. The State Water Board released a draft certification for the Project on June 14, 2017. A notice soliciting comments on the draft certification for the Project was sent to Project interested parties and the State Water Board's "Water Rights Water Quality Certification" Email Subscription list on June 14, 2017. In response to the notice, the State Water Board received comment letters from the following stakeholders: Pacific Gas and Electric Company, California Department of Fish and Wildlife, United States Forest Service, Butte County, Plumas County, and a joint letter from California Sportfishing Protection Alliance and American Whitewater. Comments are posted on the State Water Board Project webpage at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/poe_ferc2107.shtml

Water Code section 13383 provides the State Water Board with authority to "establish monitoring, inspection, entry, reporting and recordkeeping requirements… and [require] other information as may reasonably be required" for activities subject to certification under section 401 of the Clean Water Act that involve the diversion of water for beneficial use. The State Water Board delegated this authority to the Deputy Director of the Division of Water Rights (Deputy Director), as provided for in State Water Board Resolution No. 2012-0029. In the *Redelegation of Authorities Pursuant to Resolution No. 2012-0029* memo issued by the Deputy Director on October 19, 2017, this authority has been redelegated to the Assistant Deputy Directors of the Division of Water Rights.

2.2 Water Quality Standards and Water Quality Control Plans

The California Regional Water Quality Control Boards have primary responsibility for the formulation and adoption of water quality control plans for their respective regions, subject to State Water Board and United States Envrionmental Protection Agency approval, as appropriate. (Wat. Code, §13240 et seq.) The State Water Board may also adopt water quality control plans, which will supersede regional water quality control plans for the same waters to

the extent of any conflict. (Wat. Code, §13170.) For a specified area, the water quality control plans designate the beneficial uses of water to be protected, water quality objectives established for the reasonable protection of those beneficial uses or the prevention of nuisance, and a program of implementation to achieve the water quality objectives. (Wat. Code, §§ 13241, 13050 subd. (h), and 13050 subd. (j).) The beneficial uses together with the water quality objectives that are contained in the water quality control plans, and state and federal anti-degradation requirements constitute California's water quality standards. Water Code section 13247 requires state agnciees, in carrying out activities that may affect water quality, to comply with water quality control plans in most instances.

The Central Valley Regional Board adopted, and the State Water Board and the United States Environmental Protection Agency approved, the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (SR/SJR Basin Plan). The SR/SJR Basin Plan designates the beneficial uses of water to be protected along with the water quality objectives necessary to protect those uses. The existing beneficial uses for the North Fork Feather River identified in the SR/SJR Basin Plan include: municipal and domestic supply; power; contact recreation; canoeing and rafting; noncontact recreation; cold freshwater habitat; cold freshwater spawning; and wildlife habitat.

The State Water Board has listed the North Fork Feather River, upstream of Lake Oroville, on the Clean Water Act Section 303(d) list. The North Fork Feather River is impaired for temperature, mercury, polychlorinated biphenyls (PCBs), and toxicity. The State Water Board has cited hydromodification and flow regulation/modification as potential sources of the temperature impairment (State Water Board Resolution No. 2006-0079). The Project is a source of both hydromodification and flow regulation.

2.3 Project Water Rights

PG&E operates the Project under a number of water rights administered by the State Water Board, Division of Water Rights. Water Right license number 9871 gives PG&E the right for continuous diversion and use of up to 3,500 cubic feet per second (cfs) of water for hydropower generation and Water Right permit number 20864 gives PG&E the right to continuously divert and use up to 800 cfs of water for hydropower generation. Additionally, PG&E has submitted an initial Statement of Diversion and Use (number S010395) for the Project claiming additional bases of right not subject to the State Water Board's permitting authority.

2.4 Construction General Permit

The State Water Board has adopted a Construction General Permit,[3] which applies to activities that disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres. Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but do not include regular maintenance activities performed to restore the original line, grade, or capacity of a facility.

---

[3] Water Quality Order 2009-0009-DWQ and National Pollutant Discharge Elimination System No. CAS000002, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ.

2.5 California Environmental Quality Act

The State Water Board is the lead agency under the California Environmental Quality Act (CEQA) in connection with issuance of certification for the Project. (Pub. Resources Code, §§ 21000-21177.) On September 8, 2017, the State Water Board released, for public comment, a Draft Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration (SCH No. 2017092021) for the Project. The comment period for the Draft Initial Study/Mitigated Negative Declaration (IS/MND) concluded at 12:00 PM (noon) on October 11, 2017. The IS/MND, together with the Mitigation Monitoring and Reporting Plan, reflect the State Water Board's independent judgment and analysis.

The mitigation measures described in the MND that pertain to protection of resources within the State Water Board's purview have been incorporated into conditions of this certification to meet the requirements of Public Resources Code section 21081.6, subdivision (a)(1). Monitoring and reporting requirements are incorporated into certification conditions to ensure the implementation and completion of mitigation measures in accordance with California Code of Regulations, title 14, section 15097. Table A, below, identifies the potential impact areas within the State Water Board's purview for which the MND described mitigation measures to reduce potential impacts to less than significant levels. Table A also identifies the certification conditions that mitigate these potential impacts and associated monitoring and reporting requirements.

Table A. Potential Impacts and Certification Conditions with Related Mitigation, Monitoring, and Reporting

MND Resource Area	MND Identified Potential Impacts	Applicable Certification Condition(s)[4]
Geology and Soils Section 5.4.7(b)	Substantial soil erosion or loss of topsoil	Conditions 8, 12 and 17
Hazards and Hazardous Materials Section 5.4.9(b)	Release of hazardous materials into the environment	Conditions 8, 12, 17, 19 and 24

The documents and other materials, which constitute the record, are located at the State Water Board, Division of Water Rights, 1001 I Street, Sacramento, California. State Water Board staff will file a Notice of Determination within five days of the issuance of this certification.

3.0 Rationale

When preparing the conditions in this certification, State Water Board staff reviewed and considered: (a) PG&E's final FERC license application; (b) comments on the final license application submitted by agencies and interested parties; (c) United States Forest Service (Forest Service) 4(e) Conditions (16 U.S.C. § 797(e)); (d) FERC Environmental Assessment (EA) prepared pursuant to the National Environmental Policy Act (42 U.S.C §§ 4321 et seq.);

[4] Monitoring and reporting requirements are included within referenced certification conditions.

(e) PG&E's application for certification; and (f) Project-related comments by interested parties, including comments received on the draft certification. State Water Board staff also considered the SR/SJR Basin Plan, existing water quality conditions, Project-related controllable factors, and other information in the record.

The following describes the rationale used to develop the conditions in the certification. Any conditions that require development of a plan will require review, modification (if necessary), and approval by the Deputy Director. In addition, other regulatory agencies have specific authorities to approve plans and reports.

3.1 Minimum Instream Flows

In 2001, PG&E conducted an Instream Flow Incremental Methodology (IFIM) study using a Physical Habitat Simulation (PHABSIM) model in conjunction with a habitat suitability criteria (HSC) study to examine the effects of increased instream flows on aquatic resources. Specifically, these studies were aimed at determining the change in available habitat for several fish species, in different life stages,[5] within the Poe bypass reach. PG&E designed and conducted these studies in consultation with relicensing participants, including but not limited to, State Water Board staff, California Department of Fish and Wildlife (CDFW),[6] Forest Service, Butte County, Plumas County, National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), American Whitewater, California Sportfishing Protection Alliance (CSPA), and the National Park Service (NPS).

On October 26, 2006, the State Water Board adopted the *2006 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments for California* (Resolution No. 2006-0079). This list update included adding two impairments on the North Fork Feather River for temperature and mercury concentration. The water temperature listing was identified as impairment to the cold freshwater habitat beneficial use. Specifically, the SR/SJR Basin Plan identified hydromodification and flow regulation/modification as potential sources for elevated water temperatures.

In 2006, as part of comments on the Draft EA, resource agencies participating in the relicensing process requested that FERC evaluate all new information and proposed flow regimes. This included higher instream flow proposals to support cold water fisheries, as a result of the 2006 303(d) listing of the North Fork Feather River for temperature. FERC's 2007 Final EA included an increased instream flow schedule that would increase the weighted usable area (WUA) for many aquatic resources.

The instream flow requirements outlined in Condition 1 will result in reduced water temperature[7] in some Project sub-reaches and better mimic the unimpaired annual hydrograph of the North Fork Feather River. Simulating a natural hydrological springtime recession is an important environmental cue for breeding and migration (Zweifel, 1955). Decreased temperatures

---

[5] Species and life stages analyzed include juvenile and adult rainbow trout, juvenile and adult Sacramento sucker, juvenile and adult Hardhead, juvenile and adult Sacramento pikeminnow, and adult Smallmouth bass.

[6] CDFW was formerly known as the California Department of Fish and Game.

[7] Results of SNTEMP (Stream Network Temperature) modeling for the Poe bypass reach. Table 10, page 47. (FERC, 2007).

throughout the year and the implementation of a spring recession may also help restore historical fish assemblages in the Poe bypass reach (Kiernan et al. 2012). Increased habitat for resident fish and other aquatic biota in the Poe bypass reach has the potential to decrease intraspecies and interspecies competition. Current instream flow requirements reduce the amount of submerged spawning gravels with adequate flows, thus significantly reducing available spawning habitat for rainbow trout (FERC, 2007). Greater instream flows will reduce water temperatures for cold freshwater habitat during the summer and improve WUA for native fish species while providing for hydropower generation.

3.2 Water Year Types

Designation of water year types is necessary to appropriately consider water supply and instream flow needs and protect the associated beneficial uses of water designated for the North Fork Feather River (see Section 2.2). Condition 1 of the certification relies on the Department of Water Resources (DWR) Bulletin 120 water year type determination in a given year. Unimpaired runoff projections provide the basis for water year type designations provided by DWR in Bulletin 120 in February, March, April, and May of each year. Unimpaired runoff projections in Bulletin 120 are commonly used throughout the state as a reliable metric for determining water year types.

Climate change has the potential to increase ambient temperatures and affect precipitation patterns in California. This potential change in timing and availability of water resources may make it necessary to revise water year type criteria during the 30-50 year license term. Condition 1 allows PG&E to request a modification of water year types. A modification of water year types may result in modification of instream flows.

3.3 Planning for Extremely Dry Conditions

California's history of drought and dry years illustrates the importance of contingency planning for multiple dry years or drought. It is difficult to anticipate the specific impacts of consecutive Dry years, consecutive Critically Dry years, or a drought, and identify where limited water supplies may be best used during times of shortage. Condition 3 provides PG&E the opportunity, following consultation with State Water Board staff, USFWS, Butte County, Plumas County, Forest Service and CDFW, to request Deputy Director approval of a Revised Operations Plan during consecutive Dry, consecutive Critically Dry, or drought years. This condition provides flexibility for adaptive management during times of extreme water shortage.

3.4 Pulse Flows and Sediment Management

Since the Project commenced operation in the 1950s, the Project has regulated flows of the North Fork Feather River from Poe Reservoir to the Oroville Facilities Hydroelectric Project (FERC Project No. 2100). As a result of consistently lower flows and diminished natural variability during this period, Project operations have potentially resulted in the deposition and accumulation of fine grain sediment and organic matter. California's Mediterranean to dry climate results in a highly variable precipitation regime that can result in different storm magnitudes from year to year. This means that even in Normal water years there is the potential that flows are of an insufficient magnitude to flush fine grain sediments.

Pulse flows will help flush fine grain sediment and organic matter down the Poe bypass reach and mimic natural geomorphic processes associated with the natural hydrograph. During the

relicensing process, PG&E and the resource agencies discussed proposals for pulse flows. PG&E commented on Forest Service preliminary 4(e) conditions that flows should be triggered before water temperatures exceed 10 degrees Celsius (10°C) to avoid impacts to rainbow trout spawning. The pulse flow and sediment management condition will protect the beneficial uses of the North Fork Feather River, as described in PG&E's comment and associated resource agencies' input. Pulse flows and restoration of a more natural flow regime support the integrity of aquatic life by maintaining habitat of sufficient size, character, diversity, and connectivity, and by providing natural sediment and organic material. Additionally, the implementation of seasonal pulse flows provides environmental cues for resident aquatic resources during different life stages.

Condition 4 requires PG&E to implement a 20-hour flow release schedule for the mobilization of fine grain sediment prior to water temperatures in the Poe bypass reach exceeding 10°C. Pulse flows are triggered when monitoring finds a 25 percent increase in fine grain sediments in the Poe bypass reach. Monitoring will be conducted according to the Sediment Monitoring Plan, which PG&E must submit to the Deputy Director for approval.

3.5 Ramping Rates

The foothill yellow-legged frog (FYLF) (*Rana boylii*) is a candidate species for protection under the California Endangered Species Act (CESA) and a Forest Service Sensitive Species. It is believed that FYLF populations have declined in the majority of their historical range and FYLF are considered extinct in a number of watersheds they historically inhabited. Variable instream releases as a result of hydromodification from hydroelectric project operations are considered to be a contributing factor in declining FYLF reproductive success (Kupferberg et al. 2009). Significant stage changes can cause scouring and stranding of FYLF egg masses, as well as increased benthic macroinvertebrate (BMI) drift (Yarnell et al. 2012). Maintaining more consistent marginal habitat conditions provides buffers against significant velocity increases that may otherwise be affected by Project operations and effect FYLF reproductive success (Kupferberg 1996; Yarnell et al. 2012). Considering FYLF tadpole's sensitivity to changes in velocity and that egg masses are generally deposited at shallow depths, the implementation of ramping rates will offer increased reproductive protection. Development of a ramping rate plan is the most effective measure to ensure the Project is protective of FYLFs when considering the importance of FYLF protections, the need for infrastructure upgrades, involvement of multiple regulatory agencies with similar concerns and responsibilities, and the influence of ramping operations at the upstream Rock Creek-Cresta Project.

Interim ramping rates at Poe Dam offer interim protection for aquatic resources while a more permanent ramping rate plan is developed. More conservative long-term ramping rates are required from March 1 through September 30 to protect FYLF breeding, egg masses, tadpoles, frog metamorphs, and juveniles.

3.6 Recreational Flows

The Project and associated facilities offer a unique opportunity for whitewater recreation because of their close proximity to population centers in Oroville and Chico. Since the beginning of Project operations in 1958, the Project has not provided high enough flows for whitewater recreation during the recreation season (April–September). The Poe bypass reach offers multiple segments with various whitewater skill levels (class rapids) and drop-in access sites at Sandy Beach and Bardees Bar. Furthermore, the North Fork Feather River as a whole

offers a regionally unique and stunning backdrop of deeply incised canyon walls for potential recreationalists. Per Condition 6, in Normal and Wet water years the Recreation Technical Review Group (RTRG) will schedule whitewater recreational flows in the Poe bypass reach when biological monitoring indicates flows will not impact FYLFs.

3.7 Gage Maintenance

Accurate and real-time streamflow information is necessary for water management and to monitor compliance with instream flow requirements. Condition 7 requires the continued operation and maintenance of Gage 23 and requires PG&E to provide real-time data via the internet within four hours of collection.

3.8 Recreation Improvement and Monitoring

The Project has four recreation sites along the North Fork Feather River, each with differing degrees of access and existing facilities. A 75 to 100 percent increase in recreational visitors and associated usage of Project facilities is projected over the course of a new FERC license (PG&E, 2003). The increased demand is anticipated to be associated with a number of recreation activities including: contact and non-contact water recreation, hiking, fishing, and primitive camping. This increased usage requires various new facilities, including toilets, trash receptacles, and picnic tables at some sites to protect the beneficial uses of the North Fork Feather River. In addition, gravel resurfacing and trail construction are necessary to ensure the continued access and safety of the sites, as well as protection of water quality.

Coordination and approval of the recreation improvements requires PG&E to develop a Recreation Improvement and Monitoring Plan. This plan will also include triggers for sanitation and recreation upgrades based on use. PG&E is required to consult with the Forest Service, CDFW, USFWS, California Department of Boating and Waterways, Butte County, Plumas County, American Whitewater, CSPA, the State Historic Preservation Officer (SHPO), and State Water Board staff in developing the plan, and submit the final plan for Deputy Director approval.

3.8.1 Sandy Beach

Sandy Beach receives the greatest recreation visitation of any of the Project facilities. Its location on Highway 70 makes it a popular attraction for vacationers passing through and nearby residents from Oroville and Chico. The current number of visitors Sandy Beach receives warrants additional facilities to protect the water quality and beneficial uses of the North Fork Feather River. Given the existing and projected increase in use at Sandy Beach, additional supportive facilities, such as parking and toilets, are needed. Condition 8 requires PG&E to submit a plan that includes resurfacing the parking lot and road, installing and maintaining portable toilets and trash receptacles, and trail construction.

3.8.2 Bardees Bar

Existing recreation facilities at Bardees Bar consist of a number of informal features leftover from Project construction. When assessing recreation use at Bardees Bar, PG&E noted that while overall use was low, recreationalists at Bardees Bar tended to stay longer and had a higher percentage of overnight visits. In addition, one recreationalist suggested to State Water Board staff that the greatest use occurs during

deer season and that Bardees Bar serves as a local overnight location for many hunters. The increased overnight use in the early fall and the lack of sanitation facilities at Bardees Bar necessitates installation of supportive facilities. PG&E is required to install and maintain bathroom, picnic, and trash facilities at Bardees Bar.

3.8.3 Poe Beach and Poe Powerhouse Beach

Poe Beach is a small informal recreation site located on the North Fork Feather River off Poe Powerhouse Road. Existing access to Poe Beach consists of approximately 100 feet of narrow, rutted, rope-guided trails that terminate at a small white sand beach. Support ropes on the trail are in poor condition and the slope stability of the trail is relatively poor. Increased user demand, high precipitation events, and changes in vegetation have the potential to render the trail impassable and contribute to erosion and associated sediment discharges. To support continued use of Poe Beach and to alleviate public safety concerns, trail improvements or construction of stairs is required. The specific scale, type, and timing of such improvements will be determined following consultation and reflected in the Recreation Improvement and Monitoring Plan.

Poe Powerhouse Beach is located a short distance from where the outflow from Poe Powerhouse discharges into the North Fork Feather River. Poe Powerhouse Road terminates at the Poe Powerhouse. The access road from Poe Powerhouse to Poe Powerhouse Beach is in poor condition and limits the public's ability to access Poe Powerhouse Beach. In addition, neither Poe Beach nor Poe Powerhouse Beach has publically accessible restroom facilities nearby. This lack of sanitation facilities coupled with projected increases in visitation could impact water quality and beneficial uses. For these reasons, PG&E is required to resurface the access road to the Poe Powerhouse Beach and install a pit toilet.

3.8.4 Poe Reservoir

Due to the steep, narrow nature of Poe Reservoir, no formal boat launch facilities exist. However, understanding the limited opportunities for flatwater boating in the area and to protect the water contact recreation beneficial use of the North Fork Feather River, PG&E is required to provide reasonable access to Poe Reservoir. If, after consultation with State Water Board staff and stakeholders, PG&E determines that access is infeasible based on water quality, security, or financial concerns, PG&E may submit a request for Deputy Director approval to suspend implementation of Condition 8.4. The implementation of Condition 8.4 may be re-evaluated in the future if the basis of the infeasibility determination changes.

3.9 Poe Bypass Reach Biological Monitoring

Changes to the Poe bypass reach's hydrological regime have the potential to change the distribution of biological resources. Following license issuance new baseline data for fish, BMI, and amphibians will need to be established as outlined in Condition 9.

An early study required by FERC as part of the relicensing process suggested there was a link between higher instream flows and the decline of FYLF populations. However, relicensing participants later found scouring and stranding of egg masses were a heavy contributor to declining FYLF populations on the North Fork Feather River. While stage change measures are

important in preventing FYLF egg mass scouring or stranding, higher flows will mimic the more natural hydrograph under which FYLFs evolved. See Condition 5 (Ramping Rates) for more on measures to protect FYLF during stage changes associated with spill events. Additionally, FYLF research has found that in larger channels, breeding sites tend to be found near point bars, tributary confluences, and features that offer spatial stability (Kupferberg, 1996). In some areas, the deeply incised canyon walls prevalent on the North Fork Feather River have the potential to offer less buffering capacity against velocity increases resulting from higher flows. Shifts in habitat distribution, connectivity, and quality as a result of increased instream flows have the potential for varied short-term effects on FYLF populations in the Poe bypass reach. Considering that FYLF surveys often show repeated use of the same breading habitat and that there is a potential for some sites to be more heavily influenced by higher flows, FYLF monitoring is necessary (Kupferberg, 1996).

Operation of the Project modifies the unimpaired hydrograph of the North Fork Feather River by impounding water and decreasing the volume of water (flow) in the Poe bypass reach. This results in increased water temperature in the Poe bypass reach in the summer months because of the decreased volume, depth, and velocity of water in the reach. Increased flows are expected to lower the summer water temperature in the Poe bypass reach. Flow regime restoration has the potential to change fish species composition and relative abundance (Kiernan et al. 2012). Fish monitoring will help track the composition and distribution of fish populations over the term of the license. Monitoring fish populations will provide information on the health of specific cohorts of resident fish populations, and provide information on Project impacts thereto.

Evaluating BMI communities is a useful tool in monitoring water quality trends and responses to new flow regimes. BMI provide an important food source for most salmonids. BMI monitoring will be consistent with State Water Board Surface Water Ambient Monitoring Program (SWAMP) protocols and will be evaluated using the California Stream Condition Index (CSCI) and EPT Index.[8] BMI monitoring data will provide information necessary to evaluate changes associated with implementation of instream flow requirements (Condition 1).

3.10 Temperature Monitoring

To protect beneficial uses, it is necessary to understand and monitor changes in temperature associated with the integrated management of PG&E's North Fork Feather River hydroelectric system, including the Project. Temperature increases following spring recession flows are critical for signaling FYLF breeding. Average daily North Fork Feather River temperatures of 10-16°C trigger the onset of breeding and oviposition (GANDA, 2008). Pulse flows, recreation flows, and ramping rate conditions all rely on temperature monitoring to identify and mitigate potential effects on FYLF. Condition 10 of this certification outlines the timing for plan submittal and facility modification, if necessary.

---

[8] The EPT Index summarizes BMI richness in groups that are generally considered pollution sensitive: *E*phemeroptera / mayflies; *P*lecoptera / stoneflies; and *T*richoptera / caddisflies. This metric was used during relicensing studies on the North Fork Feather River.

3.11 Riparian Vegetation Monitoring

Natural instream flow recessions historically dictated stream channel characteristics. High flow events from snow melt would increase the wetted width of the channel and recruit gravel, cobble and organic material. However, since the Project went online in 1958, variable high flows have been mostly limited to spring runoff peaks before returning to low summer baseflows. Riparian vegetation and large woody debris provide important habitat for cold water fisheries and BMI. A riparian vegetation monitoring plan will help determine how increased flows are affecting riparian vegetation in the Poe bypass reach.

3.12 Road Management

Operations and maintenance of Project roads have the potential to impact water quality. Factors such as local topography, roadbed material, and drainage characteristics can influence the potential for water quality impacts. To avoid and minimize these potential water quality impacts, Condition 12 requires PG&E to develop and implement a Road Management Plan. Condition 12 will help ensure Project roads do not cause discharges in violation of water quality standards.

3.13 Tributary Access

North Fork Feather River stage fluctuations in the Poe bypass reach have the potential to limit resident fish populations' access to Mill and Flea Valley Creeks. Project operations may adversely affect outmigrating juvenile rainbow trout and the accessibility of these tributaries as coldwater refugia for adult or sub-adult rainbow trout. To evaluate potential effects, PG&E is required to develop and implement a Tributary Access Plan to monitor Project effects on fish access to tributaries and implement measures to address accessibility if necessary.

3.14 Bardees Bar Bridge Removal

Construction activities related to the potential removal of Bardees Bar bridge have the potential to impact water quality. PG&E is required to develop and implement a plan that details appropriate erosion control and water quality protection measures if the Bardees Bar bridge is removed.

3.15 Bardees Bar Spoil Pile Revegetation

The Bardees Bar Spoil Pile is a remnant from the construction of the Project that is located on top of the southern bank of the North Fork Feather River near Adit 1 of the Poe Bypass Tunnel. The Bardees Bar Spoil Pile is estimated to be between 500,000 and 600,000 cubic yards and has been visually estimated to be between one and six feet tall. The Bardees Bar Spoil Pile has the potential to increase sedimentation during high flows and creates a visually displeasing viewshed from Highway 70. PG&E is required to revegetate the spoil pile soil and implement measures to prevent potential water quality impacts.

3.16 National Marine Fisheries Service Reservation of Authority

In letters dated December 12, 2005, and November 15, 2006, NMFS reserved its authority to condition fish passage for the Project. If a plan or action to reestablish anadromy for the North

Fork Feather River fisheries is required by NMFS under section 18 of the Federal Power Act, PG&E will consult with relicensing participants in developing passage measures. Fish passage may require evaluation of salmonid habitat characteristics not quantified during relicensing studies or as part of any ongoing monitoring. Project flow regimes, facility limitations, and the availability of spawning gravels and large woody debris are potential limitations to any effort to reintroduce Endangered Species Act listed anadromous fish species. In consultation with relicensing participants, the Project would need to be evaluated to ensure that continued operations are protective of the cold freshwater habitat and spawning beneficial uses.

3.17 Additional Conditions

In order to ensure that the Project operates to meet water quality standards as anticipated, to ensure compliance with other relevant state and federal laws, and to ensure that the Project will continue to meet state water quality standards and other appropriate requirements of state law over its lifetime, this certification imposes conditions regarding monitoring, enforcement, and potential future revisions. Additionally, California Code of Regulations, title 23, section 3860 requires imposition of certain mandatory conditions for all water quality certifications, which are included in this certification.

4.0 Conclusion

The State Water Board finds that, with the conditions and limitations imposed by this certification, the proposed Project will be protective of the state water quality and comply with other appropriate requirements of state law.

//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//
//

5.0 Water Quality Certification Conditions

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER RESOURCES CONTROL BOARD CERTIFIES THAT THE POE HYDROELECTRIC PROJECT will comply with sections 301, 302, 303, 306, and 307 of the Clean Water Act, and with applicable provisions of State law, if the Pacific Gas and Electric Company complies with the following terms and conditions during the Project activities certified herein.

Condition 1. Minimum Instream Flows

Within 60 days of license issuance, the Licensee shall operate according to the minimum instream flows specified in Table 1 as measured at USGS gage No. 11404500 (Gage 23).[9] Flows shall be measured as both a 24-hour average (mean daily) and an instantaneous reading. Instantaneous flows are used to construct the average daily flow value and shall be measured in time increments of not more than 15-minutes. Mean daily flows shall be 24-hour averages of the instantaneous readings from midnight of one day to midnight of the next day. The Licensee shall record instantaneous streamflow as required by USGS standards. Instantaneous flow measurements shall be at least 90 percent of the minimum flow listed in Table 1. Mean daily flows shall be equal to or greater than the minimum flows listed in Table 1.

Table 1. Minimum Instream Releases (cfs) from Poe Dam as measured at Gage 23[1]

Month	Water Year Type[2]			
	Wet	Normal	Dry	Critically Dry
October	250	250	180	180
November	275	275	180	180
December	300	300	180	180
January	325	300	180	180
February	350	325	225	225
March	350	350	300	300
April	400	400	325	300
May	500	400	350	300
June	500	400	350	300
July	500	400	350	300
August	500	400	350	300
September	400	350	300	250

[1] No diversion may occur until the minimum instream flows are satisfied.
[2] Water year types are defined in Condition 2.

The minimum instream flow requirements are subject to temporary modification if required by equipment malfunction, as directed by law enforcement authorities or by FERC, or in emergencies. An emergency is defined as an unforeseen event that is reasonably out of the

[9] Gage 23 is also known as NF 23, and is owned and operated by PG&E.

control of the Licensee and requires the Licensee to take immediate action, either unilaterally or under instruction by law enforcement or other regulatory agency staff, to prevent imminent loss of human life or substantial property damage. An emergency may include, but is not limited to: natural events such as landslides, storms, or wildfires; malfunction or failure of Project works; and recreation accidents. When possible the Licensee shall notify the Deputy Director prior to any temporary stream flow modification. In all instances, the Licensee shall notify the Deputy Director within 24 hours of any temporary stream flow modification. Within 96 hours of the temporary stream flow modification, the Licensee shall provide the Deputy Director with an update of the conditions associated with the modification and an estimated timeline for returning to the required minimum instream flows. Within 30 days of any temporary stream flow modification, the Licensee shall provide the Deputy Director with: (1) photo documentation of the emergency or reason for the stream flow modification; (2) a written description of the modification and its necessity; (3) an updated timeline for returning to the required minimum instream flows or timeline when the minimum instream flows resumed; and (4) a plan to prevent the need for modification of minimum instream flows resulting from a similar emergency in the future.

Condition 2. Water Year Types

Each year the Licensee shall determine the water year type based on forecasted unimpaired runoff of the Feather River at Lake Oroville. Water years shall be categorized into Wet, Normal, Dry, and Critically Dry based on historical unimpaired flows on the Feather River.

Water year determinations will be dictated by spring runoff forecasts in DWR Bulletin 120 reports, published the beginning of February, March, April, and May. The Licensee shall use the May forecast to establish the water year type for the remaining months of the year until the following February, when forecasting shall begin again. Minimum instream flows shall be implemented within two business days following DWR publication of Bulletin 120 unless ramping rate requirements preclude the Licensee from achieving those flows within two days. The Licensee shall provide notice of the final water year determination to State Water Board staff by May 31 of each year. The water year types are defined in Table 2.

Table 2. Water Year Types*

Wet	Greater than or equal to 5,679 thousand acre-feet (TAF)
Normal	Less than 5,679 TAF, but greater than or equal to 3,228 TAF
Dry	Less than 3,228 TAF, but greater than or equal to 2,505 TAF
Critically Dry	Less than 2,505 TAF

*Based on forecasted unimpaired runoff of the Feather River at Lake Oroville provided in DWR's Bulletin 120.

With an increase in ambient temperatures, the presence of cold freshwater-dependent aquatic species, and a decrease in precipitation (snow fall), it may be necessary to revise water year types during the life of the license. After consultation with State Water Board staff, Forest Service, USFWS, and CDFW, the Licensee may submit to the Deputy Director for approval a request to modify how water year types are defined (Water Year Modification). The Licensee

shall include with the Water Year Modification: (i) documentation of consultation with State Water Board staff, Forest Service, USFWS, and CDFW; (ii) copies of comments and recommendations made in connection with the Water Year Modification; and (iii) a description of how the Water Year Modification incorporates or addresses the comments and recommendations of the agencies. The Deputy Director may require modifications as part of any approval. Any changes in flows made in response to changing water year types shall comply with the ramping rates in Condition 5. Upon Deputy Director approval of modifications to the water year types, the new water year types and associated implementation shall be filed with FERC and become a condition of this water quality certification.

Condition 3. Extremely Dry Conditions

In the event of extremely dry conditions, which may include a year in which the Governor of the State of California declares a drought, or multiple consecutive Dry or Critically Dry years, the Licensee may request a modification of the instream flow requirements (Condition 1). The Licensee shall consult with representatives from the State Water Board, Butte County, Plumas County, USFWS, Forest Service, and CDFW to discuss operational plans to manage extremely dry conditions. The Licensee shall submit to the Deputy Director, for review and approval, a proposed revised operations plan and any comments provided during the consultation process. The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director approved revised operations plan with FERC. The Licensee may implement the revised operations plan upon receiving Deputy Director and other necessary regulatory approvals.

Condition 4. Pulse Flows and Sediment Management

Within one year of license issuance, the Licensee shall submit a Sediment Management Plan to the Deputy Director for review and approval. The Sediment Management Plan shall be prepared in consultation with State Water Board staff, Forest Service, USFWS, and CDFW. The Sediment Management Plan shall outline goals and objectives for the management of fine-grained sediment and organic material in riffles and spawning sized stream substrate within the Poe bypass reach, including implementation of pulse flows. The Sediment Management Plan shall include methodologies for sampling and protocols for data sharing between agencies. The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

Triggers for implementation of pulse flows shall be dependent on the results of sediment monitoring. Baseline monitoring shall occur the year following Deputy Director approval of the Sediment Management Plan. The initial baseline sediment accumulation monitoring shall be performed three- to six-months following a flow event with a mean daily magnitude of at least 2,000 cfs.[10] If monitoring shows that fine grain sediment and organic material accumulation has increased by more than 25 percent as compared to the baseline sediment measurements, the Licensee shall either release or augment a spill flow prior to April 1 of the following year. The Licensee shall follow the regime shown in Table 3 while following the ramping rates in Condition 5. In no case will the pulse flow modifications require the release of more than 2,600 acre-feet of water in excess of the required minimum streamflow. Under extremely dry conditions, the

[10] Pulse flows may be accomplished by Project operations or through natural hydrologic conditions.

Licensee may request to modify or delay elements of the Sediment Management Plan. The Deputy Director may make modifications as part of any approval to modify or delay elements of the Sediment Management Plan. The Licensee shall implement pulse flows in accordance with the following requirements:

A. The pulse flow shall be not be implemented after the temperature of the North Fork Feather River exceeds 10°C mean daily water temperature at Gage 23 on two successive days;
B. For the protection of FYLF populations, the pulse flow shall occur prior to the onset of frog breeding in the Poe bypass reach;
C. Pulse flows shall not take place if rainbow trout spawning in the Poe bypass reach is observed and reported to the Licensee by CDFW, USFWS, or Forest Service; and
D. The Licensee shall notify CDFW, Forest Service, USFWS, and State Water Board staff prior to implementation of a non-natural pulse flow.

Table 3. Pulse Flows

Duration (hours)	Flow (cfs)
1	baseflow to 750
1	1,500
6	2,000
2	1,600
2	1,300
2	1,100
2	800
2	600
2	450
	450 to baseflow

The Licensee shall monitor fine-grain sediment and organic material accumulation three- to six-months following a pulse flow event. If monitoring indicates fine-grain sediment and organic material accumulation remains at or above a 25 percent increase as compared to the baseline sediment measurements, the Licensee shall consult with State Water Board staff, CDFW, USFWS, and Forest Service and submit a modified pulse flow schedule, for Deputy Driector review and approval, no later than nine months following post-pulse flow monitoring. Once approved by the Deputy Director, the Licensee shall implement the modified pulse flow schedule as soon as possible within the constraints of this condition and the newly approved modified pulse flow schedule. The Licensee may also request a modified pulse flow schedule, following consultation with State Water Board staff, CDFW, USFWS, and the Forest Service, if the Licensee determines that the expected benefits can be better achieved by a pulse flow of a different magnitude or duration. The request shall be submitted to the Deputy Director for review and approval. The Deputy Director may make modifications as part of any approval. The Licensee shall file any Deputy Director approved plan, and any modifications, with FERC.

Condition 5. Interim and Long-Term Ramping Rates

For the preservation and improvement of aquatic resources in the Project area, the Licensee shall control river flows by ramping stream flow releases from Poe Dam.

5.1 Interim Ramping Rates
Within 60 days of license issuance, the Licensee shall implement interim ramping rates for all Poe Dam flows under the Licensee's control and below 3,000 cfs (as measured at Gage 23) as follows:

A. 250 cfs/hour up-ramp from March 1 through September 30;
B. 400 cfs/hour up-ramp from October 1 through February 28/29; and
C. 150 cfs/hour down-ramp year-round.

5.2 Long-Term Ramping Rates
Within one year of license issuance, the Licensee shall submit a Ramping Rate Plan to the Deputy Director for review and approval. The Ramping Rate Plan shall be developed in consultation with State Water Board staff, CDFW, USFWS, Forest Service, Butte County, Plumas County, CSPA, and American Whitewater. The Ramping Rate Plan shall include a ramping rate schedule and consider operations at the upstream Rock Creek-Cresta Project (FERC Project No. 1962). The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

Where facility modification is required to implement the long-term ramping rates, the Licensee shall complete such modifications as soon as reasonably practicable and no later than three years after license issuance. Prior to completion of such required facility modifications, the Licensee shall make a good faith effort to meet the requirements of this condition within the capabilities of the existing facilities.

In the event that studies or monitoring during the term of the license identify the need to modify ramping rates, the Licensee shall consult with State Water Board staff, CDFW, USFWS, Forest Service, Butte County, Plumas County, CSPA, and American Whitewater to establish more appropriate rates. The revised Ramping Rate Plan shall be approved by the Deputy Director and filed with FERC before implementation. The Deputy Director may make modifications as part of any approval.

Condition 6. Recreational Flows

In Normal and Wet water years, the Licensee shall release 6,000 acre-feet in the Poe bypass reach for recreational boating purposes. Recreational river flows shall occur between the hours of 10 AM and 4 PM (unless otherwise agreed upon by the RTRG) and shall be measured at Gage 23 (USGS gage no. 11404500).

The Licensee shall establish, within six months of license issuance, a RTRG that consists of representatives from the State Water Board, Forest Service, USFWS, CDFW, American Whitewater, CSPA, Butte County, and Plumas County. The Licensee shall develop a Memorandum of Understanding (MOU) that establishes the goals of the RTRG and participant roles. One goal of the RTRG shall be to provide quality whitewater recreation flows while protecting the FYLF spawning window.[11] Within one year of license issuance, the final MOU, signed by all parties except the State Water Board, shall be submitted to the Deputy Director for review and approval. The MOU parties will be notified if the Deputy Director determines

[11] Condition 9 will provide data that may be used to refine the FYLF spawning window.

modifications to the MOU are deemed necessary so that the MOU parties may concur with the proposed modifications prior to Deputy Director approval.

Unless a permanent Project recreation release schedule is developed by the RTRG and approved by the Deputy Director, each Normal and Wet water year the Licensee shall work with the RTRG to develop a recreation release schedule. By May 1 of each year, the Licensee shall submit the proposed recreation release schedule along with any comments in opposition to the proposed recreation release schedule to the Deputy Director for consideration. Unless otherwise directed by the Deputy Director, the Licensee shall implement the proposed recreation release schedule. The Licensee shall maintain and make public via the internet records of RTRG meetings and the recreation release schedules.

Recreation flow releases may be postponed due to a temporary stream flow modification, as outlined in Condition 1. The Licensee shall provide as much notice to the RTRG as reasonably practicable under the circumstances when a recreation flow release is postponed due to a temporary stream flow modification (Condition 1). Unless otherwise directed by the Deputy Director, the Licensee shall reschedule the postponed recreation release as recommended by the RTRG.

Condition 7. Gaging Maintenance

The Licensee shall operate and maintain Gage 23 (USGS gage no. 11404500) for the duration of the license and any extensions. Within one year of license issuance, the Licensee shall submit a Gaging Plan to the Deputy Director for review and approval. The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

The Gaging Plan shall outline how and where the Licensee will provide real-time release and stage change data (Condition 5) as well as a list of best management practices (BMPs) the Licensee will implement for gage installation and maintenance. Real-time flow information shall be available within four hours of collection and shall be accessible to the public via the internet including, but not limited to, the previous seven days of flow information. All provisional streamflow values shall be labeled as: "These provisional data have not been reviewed or edited and may be subject to significant change" or other similar language approved by the Deputy Director. All data recorded by the above-mentioned equipment shall comply with USGS standards and record flows at no less frequently than 15-minute intervals. The Licensee shall document all instream flows in readily accessible formats. Stream flow data collected by the Licensee shall be reviewed by hydrographers as part of a quality assurance/quality control (QA/QC) protocol. Upon completion of the QA/QC process and no later than December 31, the raw and reviewed data for the previous water year (October 1 – September 30) shall be catalogued and made available to USGS in an annual hydrology summary report(s). The Licensee shall provide notice to State Water Board staff when the data are submitted to USGS and provide the location on the internet where the annual hydrology summary report(s) can be found.

Condition 8. Recreation Improvement and Monitoring

Within one year of license issuance, the Licensee shall submit a Recreation Improvement and Monitoring Plan (Recreation Plan) to the Deputy Director for review and approval. The Deputy

Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

The Licensee shall develop the Recreation Plan in consultation with the Forest Service, CDFW, USFWS, California Department of Boating and Waterways, Butte County, Plumas County, American Whitewater, CSPA, State Water Board staff, and SHPO. The Recreation Plan shall outline construction details and schedules for implementation of recreation improvements that are anticipated within the first three years of license implementation, including the improvements outlined in Conditions 8.1 through 8.4. The Recreation Plan shall include proposed monitoring of recreational improvements and triggers for sanitation upgrades. Triggers include, but are not limited to: tipped or flipped toilets; overflowing toilets; exceeding anticipated frequency of pumping during recreation season; presence of human waste outside of toilet facilities; overflowing trash receptacles; and other water quality concerns. After any three occurrences of the triggers included in the Deputy Director approved Recreation Plan, or at the direction of the Deputy Director, the Licensee shall consult with the Forest Service, California Department of Boating and Waterways, Butte County, Plumas County, State Water Board staff, and SHPO, to determine what steps are necessary to protect the beneficial uses of water from impacts associated with recreation. The Licensee shall consult with the parties within six months, and provide an updated Recreation Plan for Deputy Director approval within one year, of the appropriate trigger (third occurrence or other trigger in plan) or receipt of Deputy Director direction. Recreation improvements shall be located in a manner so as to avoid impacts to cultural and historical resources as determined by FERC's programmatic agreement (PA) or SHPO. All recreation improvements shall be completed within three years of license issuance unless otherwise approved by the Deputy Director.

8.1 Sandy Beach Recreation Improvements

A. The Licensee shall resurface with gravel or pave the transition from Highway 70 to the beginning of the Sandy Beach parking lot. The Licensee may submit, to the Deputy Director for approval, a request to be relieved of the requirement to resurface the transition from Highway 70 if Caltrans imposes conditions deemed to be cost prohibitive by the Licensee. The Sandy Beach parking lot shall be resurfaced with gravel or paved.
B. At a minimum, the Licensee shall install and maintain two portable toilets and sufficient trash receptacles with lids to contain trash at the Sandy Beach parking lot. At a minimum, the toilets and trash receptacles shall be in place each year during the recreation season (from Memorial Day through Labor Day). The Licensee shall develop a hardened trail or stairway from the Sandy Beach parking lot to Sandy Beach.
C. The Licensee shall maintain these improvements for proper functionality for the term of the license and any extensions.

8.2 Bardees Bar Recreation Improvements

For the enhancement of recreation opportunities and protection of water quality, at a minimum, the Licensee shall install a vault toilet, permanent picnic table, and garbage facilities at the Bardees Bar parking area. The Licensee shall maintain these improvements for proper functionality for the term of the license and any extensions.

8.3 Poe Beach and Poe Powerhouse Recreation Improvements

A. At a minimum, the Licensee shall provide a vault toilet and trash receptacles at the Poe Powerhouse. The Licensee shall regrade the gravel road that leads to the beach area near the Poe Powerhouse. The scope of the proposed improvements shall be clearly outlined in the Recreation Plan.

B. The Licensee shall improve the access trail to Poe Beach through installation of stairs, a switchback trail, or other means approved in the Recreation Plan. The Licensee shall install signage at Poe Beach highlighting the location of the nearby restroom and trash receptacles at Poe Powerhouse.
C. The Licensee shall maintain these improvements for proper functionality for the duration of the license and any extensions.

8.4 Poe Reservoir Access

The Licensee shall provide access to Poe Reservoir. If, after consultation with State Water Board staff and stakeholders, the Licensee determines that access to Poe Reservoir is not feasible due to water quality, security, or financial concerns, the Licensee may submit a request for Deputy Director approval to suspend implementation of Condition 8.4. The Deputy Director may make modifications as part of any approval. The Deputy Director may require reevaluation of Condition 8.4 if the basis of an infeasibility determination changes.

Condition 9. Poe Bypass Reach Biological Monitoring

Within one year of license issuance, the Licensee shall submit a Poe Bypass Reach Biological Monitoring Plan (Biological Monitoring Plan) to the Deputy Director for review and approval. The Biological Monitoring Plan shall be developed in consultation with State Water Board staff, Forest Service, USFWS, and CDFW. The Biological Monitoring Plan shall describe the fish, BMI, and amphibian monitoring the Licensee will conduct in the Poe bypass reach over the term of the license and any extensions. At a minimum, the Biological Monitoring Plan shall include the following elements: (1) objectives and goals; (2) description of the methodology that will be used for monitoring; and (3) description of possible circumstances that may affect monitoring and whether those circumstances are caused by Project operations. The Licensee shall include documentation of consultation with the above agencies, copies of comments and recommendations made in connection with development of the Biological Monitoring Plan, and a description of how the Biological Monitoring Plan incorporates or addresses agency comments and recommendations. All monitoring shall be consistent with the methods used for upstream monitoring associated with the Rock Creek-Cresta Hydroelectric Project (FERC Project No. 1962) unless otherwise approved by the Deputy Director. The Licensee shall allow a minimum of 30 days for the above agencies to comment and to make recommendations before submitting the Biological Monitoring Plan to the Deputy Director for review and approval. The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

Fish and BMI. Table 5 establishes the years following license issuance that the Licensee shall monitor BMI and fish in the Poe bypass reach. Sampling may be deferred to the following year(s) in a year in which the Governor of the State of California declares a drought, or consecutive Critically Dry water years. A minimum of three sampling locations shall be sampled during each monitoring effort and sampling locations shall be consistent with past locations, unless otherwise approved by the Deputy Director. The Licensee shall submit biological monitoring reports to State Water Board staff within six months following completion of each sampling effort. Within six months of the end of a biological monitoring block period (outlined in Table 5), the Licensee shall consult with the Forest Service, State Water Board staff, USFWS, and CDFW to review the biological monitoring program. If changes to the biological monitoring program are determined appropriate by the agencies, the Licensee shall, within one year of the end of the block, propose updates to the Biological Monitoring Plan for Deputy Director

approval. The Deputy Director may make modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any modifications, with FERC. Possible updates include, but are not limited to, sampling timeframes and protocols. Table 5 outlines the Biological Monitoring Schedule for the first 22 years of the license. Unless otherwise approved by the Deputy Director, the Licensee shall implement biological monitoring at least every five years following the final monitoring completed in Block 2 (i.e., commencing in Year 25) for the remainder of the license and any extensions.

Table 5. Biological Monitoring Schedule

	Block Periods	Monitoring Years*
Initial	1-5	2, 3, 4
Block 1	6-12	6, 8, 10
Block 2	16-22	16, 18, 20

Fish monitoring data shall include, but are not limited to, the following:

A. Fish species composition and relative abundance;
B. Fish species size/age distribution; and
C. Condition of sampled fish.

BMI monitoring shall be consistent with State Water Board SWAMP protocols and be evaluated using the CSCI unless otherwise approved by the Deputy Director. The initial monitoring block shall include analysis using the EPT index, as used in Project relicensing studies.

Amphibian. Following implementation of the new streamflows (Condition 1), the Licensee shall identify occupied and unoccupied FYLF egg-laying and rearing habitats in the Poe bypass reach. Metrics required to identify suitable habitat include but are not limited to: temperature, riparian vegetation establishment, scouring, water depths, water velocities, bank slope condition, and river bar formation/loss. Identification of suitable habitat shall be complete by the end of Year 2 of implementing new license streamflow conditions. Unless otherwise approved by the Deputy Director due to hydrologic conditions, during the fifth year of implementing the new license streamflow conditions, the entire Poe bypass reach shall be surveyed again to identify suitable FYLF egg-laying and rearing habitat.

Monitoring for FYLF eggs shall be conducted annually on 100 percent of the identified suitable habitat for the remaining license period and any extensions. Monitoring shall commence once the temperature of the North Fork Feather River at Gage 23 exceeds 10°C mean daily water temperature on two successive days or April 15 of each year, whichever occurs first, and shall be conducted every seven days until eggs have hatched. The Licensee shall provide the RTRG (Condition 6) with the weekly FYLF monitoring data.

Amphibian monitoring data shall include, but are not limited to, the following:

A. FYLF population trends, distribution, and reproductive success; and
B. Inventory of FYLF suitable habitat and relation to occupied habitat.

Condition 10. Temperature Monitoring

Within six months of license issuance, the Licensee shall file a Temperature Monitoring Plan with the Deputy Director for review and approval. The Temperature Monitoring Plan shall be developed in consultation with Butte County, Plumas County, USFWS, Forest Service, CDFW, and State Water Board staff. The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC. The Temperature Monitoring Plan shall establish how changes in temperatures as a result of increased instream flows in the Poe bypass reach will be measured. The Temperature Monitoring Plan shall include provisions for possible modification of the monitoring program after the completion of the first three years of monitoring. Where facility modification is required for temperature measurement, the Licensee shall complete such modifications no later than 18 months after license issuance.

Ten years after the implementation of new Canyon Dam flow releases associated with the relicensing of the Upper North Fork Feather River Project (FERC Project No. 2105), the Licensee shall consult with Butte County, Plumas County, USFWS, Forest Service, CDFW, and State Water Board staff to evaluate the data collected under the Project's Temperature Monitoring Plan and other related information to evaluate whether changes to the instream flows are appropriate. Consultation shall include an evaluation of potential effects related to potential instream flow changes. No later than 12 years following implementation of the new Canyon Dam flow releases, the Licensee shall provide a report on the outcome of the consultation to the Deputy Director that includes: (i) a recommendation regarding whether a change to instream flows is appropriate; (ii) the proposed instream flows, if such changes are recommended; (iii) comments and recommendations made in connection with the consultation; and (iv) a description of how the Licensee's recommendation incorporates or address agency comments and recommendations. The Deputy Director may require implementation of the recommendation or other alternative deemed appropriate.

Condition 11. Riparian Monitoring

Within one year of license issuance, the Licensee shall prepare, in consultation with State Water Board staff and Forest Service, a Riparian Monitoring Plan for the Poe bypass reach. The Licensee shall file the Riparian Monitoring Plan with the Deputy Director for review and approval. The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC. The Licensee shall conduct initial baseline-monitoring in the year following approval of the Riparian Monitoring Plan. Subsequent surveys shall be conducted in Years 5, 10, 15, 20, 25, 30, and every 5 years thereafter, for the term of the license and any extensions, following the implementation of the new instream flow requirements (unless other intervals are deemed necessary by the Deputy Director to evaluate the effects of flow changes on riparian vegetation).

Condition 12. Road Management Plan

Within one year of license issuance, the Licensee shall file a Road Management Plan with the Deputy Director for review and approval. The Road Management Plan shall prescribe the protection, maintenance, and construction of Project roads in a manner that is protective of water quality. At a minimum, the Road Management Plan shall include the following:

A. An inventory and map of all roads associated with the Project, including locations of drainage structures, streams, and surface water bodies;
B. An assessment of Project roads to determine if any drainage structures or road segments are impacting or have the potential to impact water quality;
C. Proposed measures and an implementation schedule to rehabilitate existing damage and minimize erosion from Project roads. Proposed measures designed to improve drainage should be consistent with the most current United States Department of Agriculture, Forest Service National BMP's [Best Management Practices] Road Management Activities; and
D. A schedule and plan for inspection and maintenance of Project roads throughout the term of the license and any extensions.

The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

Condition 13. Tributary Access

Within one year of license issuance, the Licensee shall consult with the Forest Service, CDFW, USFWS, and State Water Board staff to develop and file a Tributary Access Plan with the Deputy Director for review and approval. The Tributary Access Plan shall include the Licensee's proposal to monitor the effects of Project operations on outmigrating juvenile rainbow trout from Flea Valley Creek and Mill Creek, and the accessibility of these tributaries as coldwater refugia for adult or sub-adult rainbow trout during the summer months. The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

The Tributary Access Plan and subsequent evaluation shall include an assessment of hydrologic connectivity between the North Fork Feather River and Flea Valley Creek and Mill Creek during the summer and fall months (July through October) under new license conditions. The Tributary Access Plan shall also include provisions for long-term monitoring to assess whether geomorphic stream alterations (e.g., gravel deposition) adversely affect tributary access. Unless otherwise approved by the Deputy Director, it is anticipated that long-term monitoring of tributary access for rainbow trout will be done in conjunction with biological monitoring requirements (Condition 9) of this certification.

By January 31 of of the year following tributary access monitoring, the Licensee shall consult with the Forest Service, USFWS, CDFW, and State Water Board staff to review monitoring results from the previous year. Within three months following consultation, the Licensee shall provide a report to the Deputy Director that: (i) summarizes the outcome of consultation, including any comments and recommendations provided by the agencies regarding whether Project operations are adversely affecting the outmigration of juvenile rainbow trout, or adult or sub-adult rainbow trout access to coldwater refuge habitat during summer months; and (ii) proposes feasible modifications to Project operations or other measures to ensure fish access to tributary streams, if necessary. The Deputy Director may require implementation of the proposed feasible modifications or other measures to ensure fish access to tributary streams, or other alternative(s) deemed appropriate.

Condition 14. Bardees Bar Bridge Removal

If the Licensee removes the steel bridge at Bardees Bar, the Licensee shall develop and implement a Bardees Bar Bridge Removal Plan (Bridge Plan). The Licensee shall not proceed with removal of the steel bridge at Bardees Bar without Deputy Director approval. The Bridge Plan shall detail appropriate erosion control and other water quality protection measures that will be implemented, as well as a schedule for planned construction. The Licensee shall submit the Bridge Plan to the Deputy Director for review and approval prior to construction activities. The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC.

Condition 15. Bardees Bar Spoil Pile Revegetation

Within one year of license issuance, the Licensee shall file a Bardees Bar Spoil Pile Revegetation Plan with the Deputy Director for review and approval. The Deputy Director may require modifications as part of any approval. The Licensee shall file the Deputy Director's approval, and any required modifications, with FERC. The Bardees Bar spoil pile shall be revegetated with appropriate local endemic species. The Licensee shall implement erosion control measures at the toe of the spoil pile near the North Fork Feather River.

Condition 16. National Marine Fisheries Service Reservation of Authority

If NMFS determines that anadromous fish passage is required under section 18 of the Federal Power Act, the Licensee shall consult with all interested relicensing participants in developing passage measures.[12] Introduction of anadromous fish may require reevaluation of Project facilities, flow regimes, availability of large woody debris, graveled spawning habitat and access to Project-affected tributaries. The State Water Board reserves the authority to modify or add conditions to this certification based on the outcome of the consultation process. The State Water Board also reserves the authority to require the Licensee to develop and conduct studies if listed species are identified for introduction to the Project area. Such studies shall be designed in consultation with State Water Board staff, NMFS, Forest Service, USFWS, and CDFW, to determine appropriate measures to minimize potential impacts and protect water quality and beneficial uses.

Condition 17. The Licensee shall comply with the State Water Board's Construction General Permit, and amendments thereto. For all construction or other activities that could impact water quality or beneficial uses, including those activities not subject to the Construction General Permit, a Deputy Director-approved water quality monitoring and protection plan shall be prepared and implemented.

Condition 18. Control measures for erosion, excessive sedimentation, and turbidity shall be implemented and in place at the commencement of and throughout any ground clearing activities, excavation, or any other Project activities that could result in erosion or sediment

---

[12] Negotiations between PG&E, DWR, and other stakeholders have been underway since 2005. Implementation of the Feather River Habitat Expansion Agreement (HEA) is dependent on issuance of new FERC licenses for the Oroville Facilities Hydroelectric Project (FERC Project No. 2100), Poe Hydroelectric Project (FERC Project No. 2107), and the Upper North Fork Feather River Project (FERC Project No. 2105). By letters dated December 12, 2005, and November 15, 2006, NMFS has reserved its authority to condition fish passage for the Project.

discharges to surface waters. Erosion control blankets, liners with berms, and/or other erosion control measures shall be used for any stockpile of excavated material to control runoff resulting from precipitation and prevent material from contacting or entering surface waters.

Condition 19. Waters shall be free of changes in turbidity (due to Project activities) that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to Project-controllable water quality factors shall not exceed the turbidity limits as defined in the SR/SJR Basin Plan. Any appropriate averaging period shall be approved by the Deputy Director prior to the start of construction.

The Deputy Director and the Central Valley Regional Board Executive Officer (Executive Officer) shall be notified within 24 hours after monitoring results indicate a turbidity limit exceedance. Activities associated with these exceedances may not resume without approval from the Deputy Director.

Condition 20. All imported riprap, rocks, and gravels used for construction within or adjacent to any watercourses shall be pre-washed. Wash water generated on-site shall not contact or enter surface waters. Wash water shall be contained and disposed of in compliance with state, federal, and local laws, ordinances, and regulations.

Condition 21. Construction material, debris, spoils, soil, silt, sand, bark, slash, sawdust, rubbish, steel, or other inorganic, organic, or earthen material, and any other substances from any Project-related activity, shall be prevented from entering surface waters. All construction debris and trash shall be contained and regularly removed from the work area to the staging area during construction activities. Upon completion of construction, all Project-generated debris, building materials, excess material, waste, and trash shall be removed from all the Project sites for disposal at an authorized landfill or other disposal site in compliance with state, federal, and local laws, ordinances, and regulations.

Condition 22. No unset cement, concrete, grout, damaged concrete, concrete spoils, or wash water used to clean concrete surfaces shall contact or enter surface waters. Any area containing wet concrete shall be completely bermed and isolated. The berm shall be constructed of sandbags or soil and shall be lined with plastic to prevent seepage. No leachate from truck or grout mixer cleaning stations shall percolate into Project area soils. Cleaning of concrete trucks or grout mixers shall be performed in such a manner that wash water and associated debris is captured, contained, and disposed of in compliance with state, federal, and local laws, ordinances, and regulations. Washout areas shall be of sufficient size to completely contain all liquid and waste concrete or grout generated during washout procedures. Hardened concrete or grout shall be disposed of at an authorized landfill, in compliance with state, federal, and local laws, ordinances, and regulations.

Condition 23. All equipment must be washed prior to transport to the Project site and must be free of sediment, debris, and foreign matter. Any equipment used in direct contact with surface water shall be cleaned prior to use. All equipment using gas, oil, hydraulic fluid, or other petroleum products shall be inspected for leaks prior to use and shall be monitored for leakage. Stationary equipment (e.g., motors, pumps, generators, etc.) shall be positioned over drip pans or other types of containment. Spill and containment equipment (e.g., oil spill booms, sorbent pads, etc.) shall be maintained onsite at all locations where such equipment is used or staged.

Condition 24. Onsite containment for storage of chemicals classified as hazardous shall be away from watercourses and include secondary containment and appropriate management as specified in California Code of Regulations, title 27, section 20320.

Condition 25. Unless otherwise specified in this water quality certification or at the request of the Deputy Director, data and/or reports must be submitted electronically in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with Water Code section 13167.

Condition 26. The State Water Board's approval authority includes the authority to withhold approval or to require modification of a proposal or plan prior to approval. The State Water Board may take enforcement action if the Licensee fails to provide or implement a required plan in a timely manner.

Condition 27. The State Water Board reserves the authority to add to or modify the conditions of this water quality certification: (1) if monitoring results indicate that continued operation of the Project could violate water quality objectives or impair the beneficial uses of the North Fork Feather River; (2) to coordinate the operations of this Project and other hydrologically connected water development projects, where coordination of operations is reasonably necessary to achieve water quality objectives or protect beneficial uses of water; or (3) to implement any new or revised water quality objectives and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Act or section 303 of the Clean Water Act including total maximum daily loads (TMDL). This includes, but is not limited to, beneficial uses for tribal traditional and cultural uses, tribal subsistence fishing uses, and subsistence fishing uses by other communities or individuals designated in the SR/SJR Basin Plan.

Condition 28. Future changes in climate projected to occur during the license term may significantly alter the baseline assumptions used to develop the conditions of this water quality certification. The State Water Board reserves authority to add to or modify the conditions in this water quality certification to require additional monitoring and/or other measures, as needed, to verify that Project operations meet water quality objectives and protect the beneficial uses assigned to the Project-affected stream reaches.

Condition 29. The Licensee shall comply with all applicable requirements of the SR/SJR Basin Plan. The Licensee must notify the Deputy Director and Executive Officer within 24 hours of any unauthorized discharge to surface waters.

Condition 30. Notwithstanding any more specific conditions in this water quality certification, the Project shall be operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to section 303 of the Clean Water Act. The Licensee must take all reasonable measures to protect the beneficial uses of waters of the North Fork Feather River.

Condition 31. This water quality certification does not authorize any act which results in the taking of a threatened, endangered, or candidate species or any act, which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish & W. Code, §§ 2050-2097) or the federal Endangered Species Act (16 U.S.C. §§ 1531 - 1544). If a "take" will result from any act authorized under this water quality certification or water rights held by the Licensee, the Licensee must obtain authorization for the take prior to any

construction or operation of the portion of the Project that may result in a take. The Licensee is responsible for meeting all requirements of the applicable Endangered Species Acts for the Project authorized under this water quality certification.

Condition 32. In the event of any violation or threatened violation of the conditions of this water quality certification, the violation or threatened violation is subject to all remedies, penalties, process, or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with the water quality standards and other pertinent requirements incorporated into this water quality certification.

Condition 33. In response to a suspected violation of any condition of this water quality certification, the Deputy Director or the Executive Officer may require the holder of any federal permit or license subject to this water quality certification to furnish, under penalty of perjury, any technical or monitoring reports the Deputy Director or the Executive Officer deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. (Wat. Code, §§ 1051, 13165, 13267 & 13383).

Condition 34. This certification shall not be construed as replacement or substitution for any necessary federal, state, and local Project approvals. The Licensee is responsible for compliance with all applicable federal, state, or local laws or ordinances and shall obtain authorization from applicable regulatory agencies prior to the commencement of Project activities.

Condition 35. Any requirement in this water quality certification that refers to an agency whose authorities and responsibilities are transferred to or subsumed by another state or federal agency will apply equally to the successor agency.

Condition 36. The Licensee must submit any change to the Project, including changes in Project operation, technology, upgrades, or monitoring, that could have a significant or material effect on the findings, conclusions, or conditions of this water quality certification, to the Deputy Director for prior review and written approval. The Deputy Director shall determine significance and may require consultation with state or federal agencies. If the Deputy Director is not notified of a potentially significant change to the Project, it will be considered a violation of this water quality certification. If such a change would also require submission to FERC, the change must first be submitted and approved by the State Water Board, unless otherwise noted in this water quality certification.

Condition 37. The Deputy Director and the Executive Officer shall be notified one week prior to the commencement of ground disturbing activities that may adversely affect water quality. Upon request, a construction schedule shall be provided to agency staff in order for staff to be present onsite to document compliance with this water quality certification. The Licensee must provide State Water Board and Central Valley Regional Board staff reasonable access to Project sites to document compliance with this water quality certification.

Condition 38. This water quality certification is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing with section 3867).

Condition 39. The State Water Board shall provide notice and an opportunity to be heard in exercising its authority to add to or modify the conditions of this water quality certification.

Condition 40. Activities associated with operation and maintenance of the Project that threaten or potentially threaten water quality shall be subject to further review by the Deputy Director and Executive Officer.

Condition 41. Nothing in this water quality certification shall be construed as State Water Board approval of the validity of any water rights, including pre-1914 claims. The State Water Board has separate authority under the Water Code to investigate and take enforcement action if necessary to prevent any unauthorized or threatened unauthorized diversions of water.

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

Condition 43. This water quality certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, division 3, chapter 28.

Condition 44. A copy of this water quality certification shall be provided to any contractor and all subcontractors conducting Project-related work, and copies shall remain in their possession at the Project site. The Licensee shall be responsible for work conducted by its contractor, subcontractors, or other persons conducting Project-related work.

12/28/17

Eileen Sobeck
Executive Director

Date

Attachments: Figure 1: Upstream Project Features
Figure 2: Downstream Project Features

References

CVRWQCB (Central Valley Regional Water Quality Control Board). 2016. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region, The Sacramento River Basin and the San Joaquin River Basin, Fourth Edition - 2016. Central Valley Regional Water Quality Control Board web page. Available at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf Accessed December 18, 2017.

FERC. 2007. Final Environmental Assessment (EA) for New Major Hydropower License: Poe Hydroelectric Project (FERC Project No. 2107), California. Federal Energy Regulation Commission, Washington, DC. March 29, 2007.

Garcia and Associates (GANDA). 2008. Identifying Microclimatic and Water Flow Triggers Associated with Breeding Activities of a Foothill Yellow-Legged Frog (Rana boylii) Population on the North Fork Feather River, California. California Energy Commission, Public Interest Energy Research Program (PIER) Energy-Related Environmental Research Program. CEC-500-2007-041.

Kiernan, J. Moyle, P., Crain, P. 2012. Restoring native fish assemblages to a regulated California stream using the natural flow regime concept. Ecological Applications 22(5): 1572-1482.

Kupferberg, S.J. 1996. Hydrologic and geomorphic factors affecting conservation of a river-breeding frog (Rana boylii). Ecological Applications. 6: 1332–1344.

Kupferberg, S., Lind, A., Mount, J., and Yarnell, S. 2009. Pulsed flow effects on the Foothill Yellow-Legged Frog (Rana boylii): Integration of empirical, experimental, and hydrodynamic modeling approaches. California Energy Commission, PIER. CEC-500-2009-002.

PG&E. 2003. Final license application for the Poe Project (FERC No. 2107), application for new license. December 16, 2003.

State Water Resources Control Board (SWRCB). 2017. *Final 2014 and 2016 Integrated Report (CWA Section 303(d) List / 305(b) Report* https://www.waterboards.ca.gov/water_issues/programs/tmdl/2014_16state_ir_reports/category5_report.shtml. Accessed December 18, 2017.

United States Forest Service. 2012. Water Quality Management for Forest System Lands in California- Best Management Practices. Accessed December 11, 2017.

Yarnell SM, Lind AJ, Mount JF. 2012. Dynamic flow modeling of riverine amphibian habitat with application to regulated flow management. River Research and Applications 28: 177–191.

Zweifel, R. G. 1955. Ecology, distribution, and systematics of frogs of the Rana boylii group. University of California Publications in Zoology 54: 207–292.

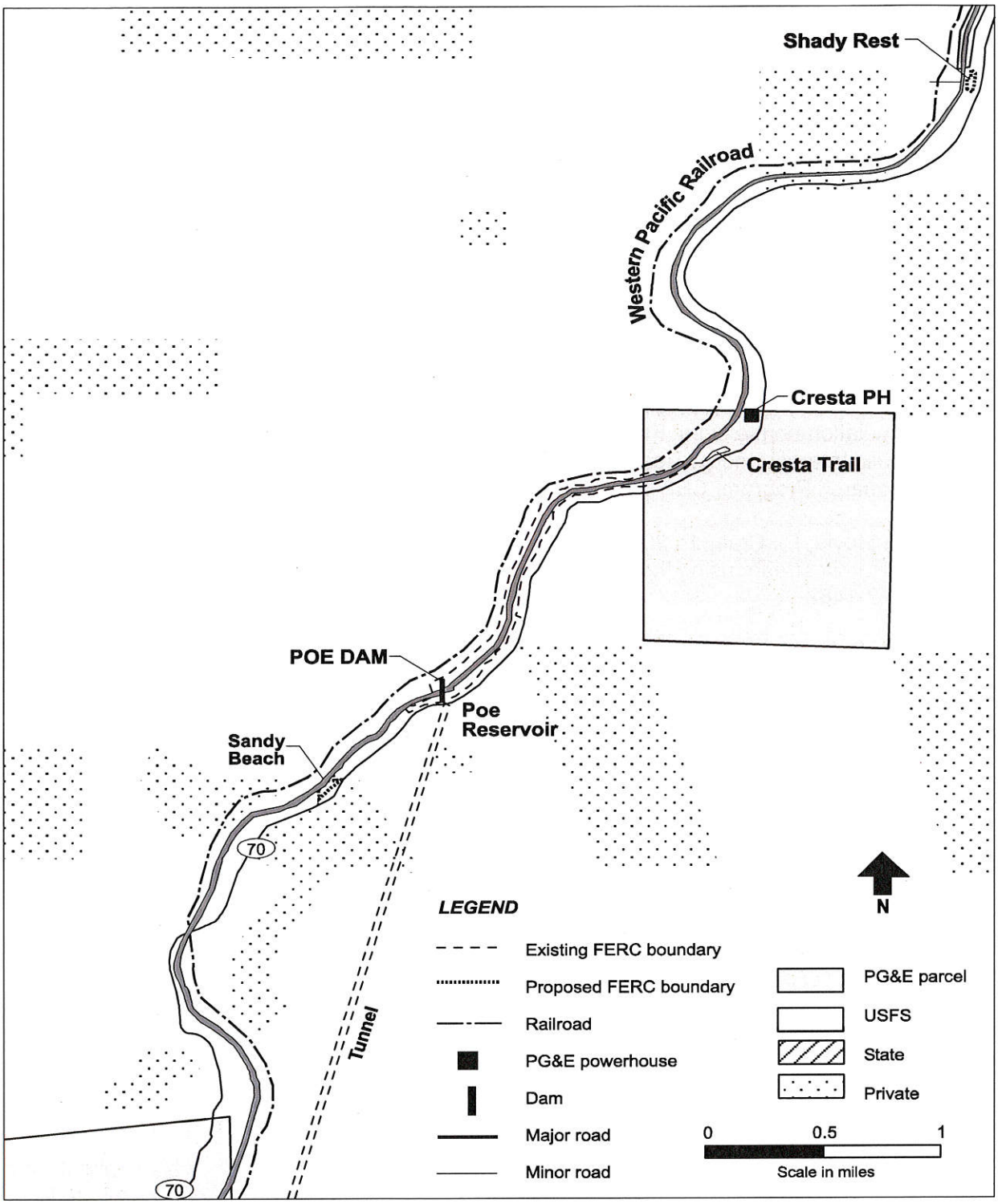

Figure 1: Upstream Project Features
(Source: PG&E, 2003, as modified by FERC staff).

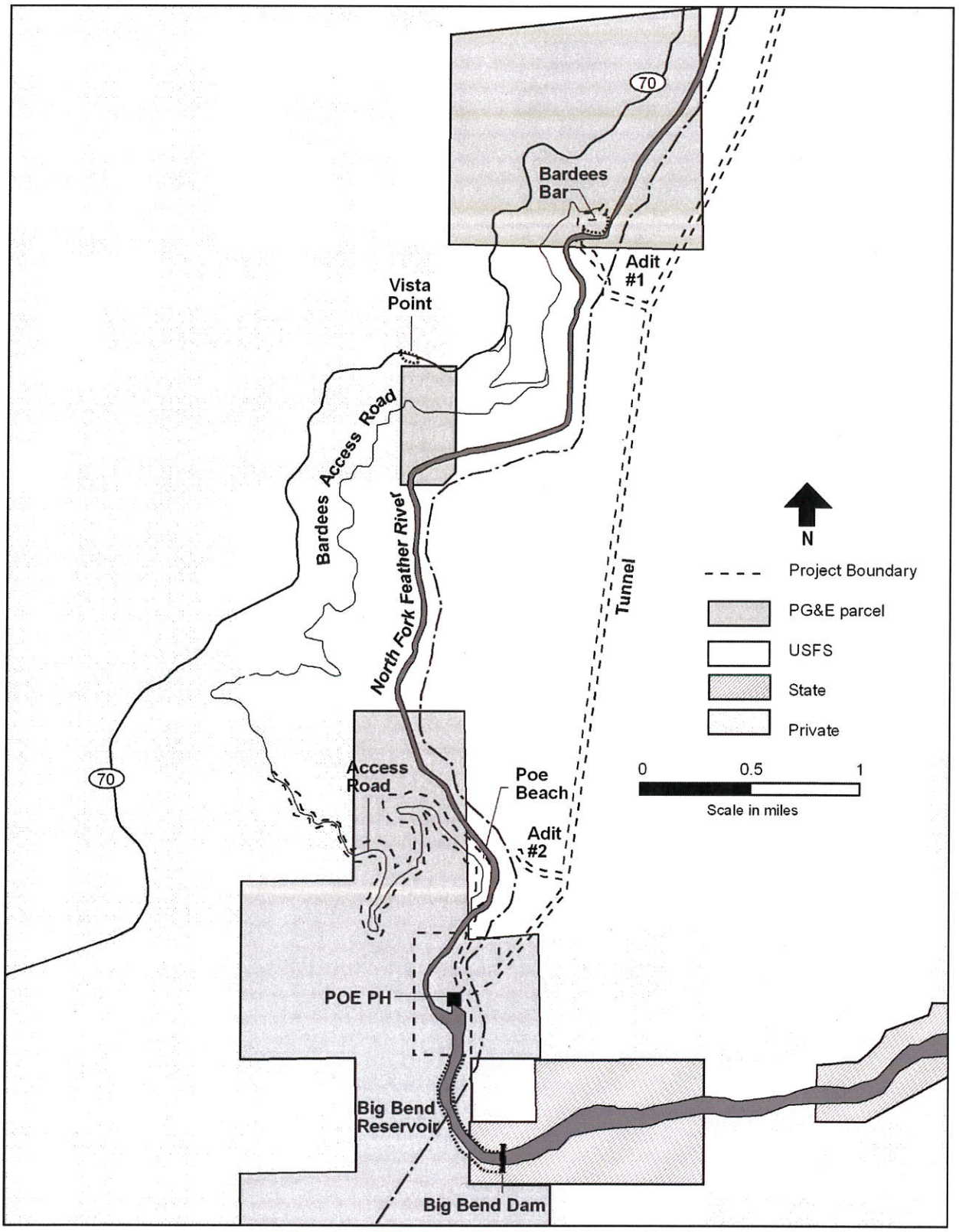

Figure 2: Downstream Project Features
(Source: PG&E, 2003, as modified by FERC staff).