ENVIRONMENTAL ASSESSMENT

Pine Creek Mine Hydroelectric Project—FERC Project No. 12532-006

California

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

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ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
Applicant	Pine Creek Mine, LLC
California DFW	California Department of Fish and Wildlife
cfs	cubic feet per second
CNPS	California Native Plant Society
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D2SI	Division of Dam Safety and Inspections
DPS	distinct population segment
EA	Environmental Assessment
ESA	Endangered Species Act
˚F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Department of Agriculture, U.S. Forest Service
FPA	Federal Power Act
FWS	U.S. Department of the Interior, U.S. Fish and Wildlife Service
GPS	Global Positioning System
HPMP	Historic Properties Management Plan
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
mg/L	milligrams per Liter
MW	megawatt
MWh	megawatt-hour
NAGPRA	Native Graves Protection and Repatriation Act of 1992
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act of 1966
PCE	primary constituent elements
PCM	Pine Creek Mine, LLC (applicant)
SHPO	State Historic Preservation Officer
SWAMP	Surface Water Ambient Monitoring Program
TCP	traditional cultural property
TDS	total dissolved solids
WQC	water quality certification
WQPP	water quality protection plan

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1.0 INTRODUCTION

1.1 APPLICATION

On February 12, 2016, Pine Creek Mine, LLC (PCM) filed an application for an original license to construct, operate, and maintain the proposed 1.5-megawatt (MW) Pine Creek Mine Tunnel Hydroelectric Project (Pine Creek Mine Project) No. 12532. The proposed project would generate an estimated 5,600 megawatt-hours (MWh) of energy annually. The project would be located mostly inside the existing Pine Creek Mine adjacent to Morgan Creek and Pine Creek in Inyo County, California (Figure 1). The project would occupy subsurface federal lands managed by the U.S. Forest Service (Forest Service) within the Inyo National Forest.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the proposed Pine Creek Mine Project is to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to PCM for the project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing a license for the project would allow PCM to generate electricity at the project for the term of the license, making electric power available from a renewable resource.

This environmental assessment (EA) evaluates the effects associated with constructing and operating the project, alternatives to the proposed project, and makes recommendations on whether to issue an original license, and if so, includes recommended terms and conditions to become a part of any license issued.

In the EA, we assess the effects of constructing and operating the project: (1) as proposed by PCM; (2) PCM's proposal as modified by staff (staff alternative); and (3) the staff alternative with mandatory conditions. We also consider the effects of taking no-action (no-action alternative), in which the project would not be licensed or constructed. Environmental issues that are addressed include construction and operation effects on aquatic and terrestrial resources.

1.2.2 Need for Power

The Pine Creek Mine project would be located in the California-Mexico Power area of the Western Electricity Coordinating Council (WECC). To anticipate how the demand for electricity is expected to change in the region, we reviewed the WECC's projected regional power needs. For the period from 2017 through 2026, WECC's 2016 Long-Term Reliability Assessment forecasts the need for over 4,000 MW of new power resources to maintain adequate capacity reserves in the assessment area. Therefore, the Pine Creek Mine Project could help meet part of these future load requirements.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

Any license for the proposed project would be subject to the requirements of the FPA and other applicable statues, as summarized below.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretary of the U.S Department of Commerce or the Secretary of the U.S. Department of the Interior. No fishway prescriptions or requests for reservation of authority to prescribe fishways have been filed for the project under section 18 of the FPA.

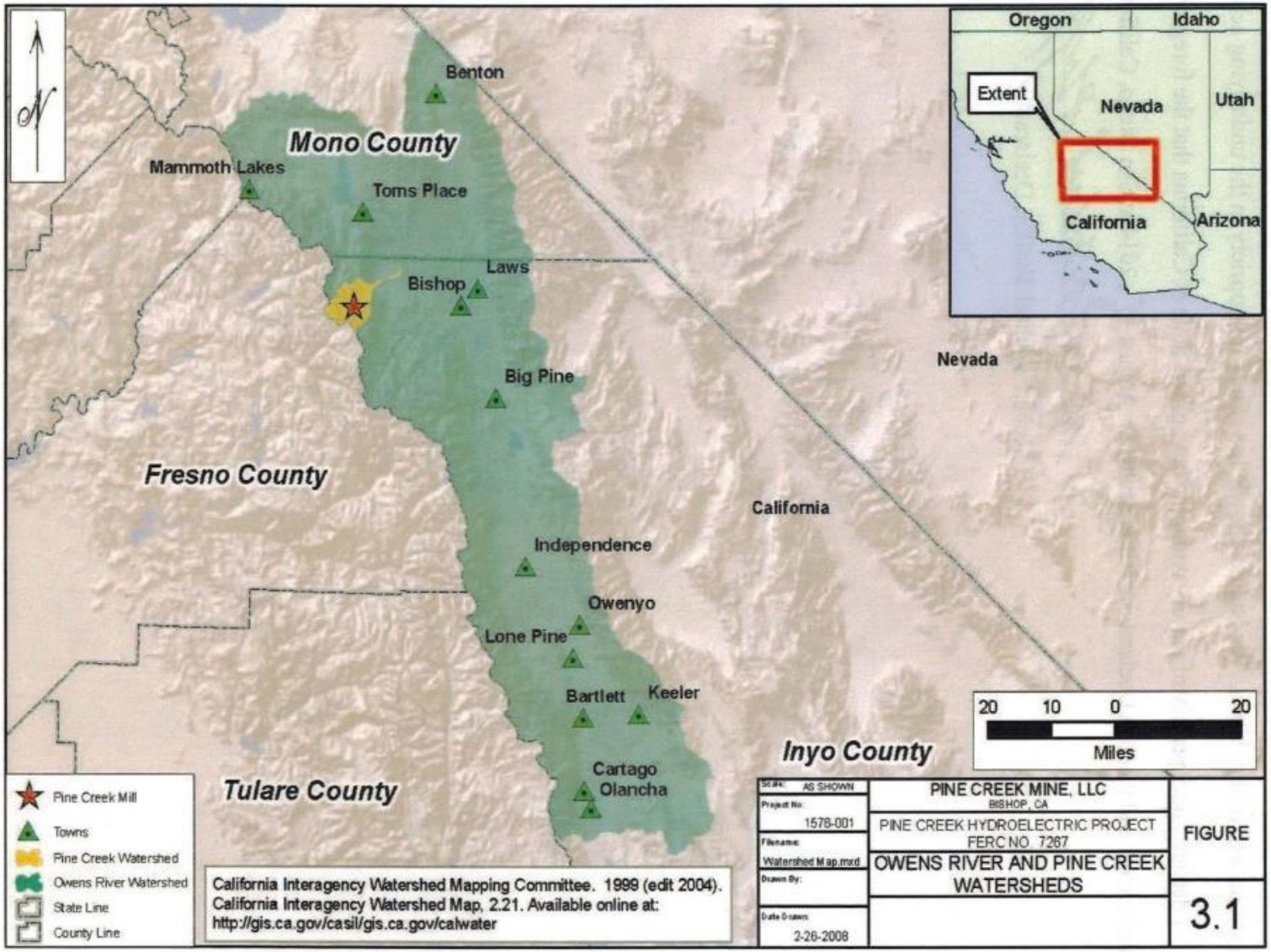

Figure **1**. Location of the proposed Pine Creek Mine Hydroelectric Project (Source: PCM, as modified by staff).

1.3.1.2 Section 4(e) Federal Land Management Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. Forest Service filed preliminary conditions on September 30, 2016, and an addendum on November 29, 2017, pursuant to section 4(e) of the FPA (Appendix B). These preliminary conditions are described under section 2.2.5, *Modifications to Applicant's Proposal–Mandatory Conditions*.

1.3.1.3 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

On September 27, 2016, the California Department of Fish and Wildlife (California DFW) timely filed recommendations filed under section 10(j), as summarized in section 5.3, *Recommendations of Fish and Wildlife Agencies*. In section 5.3, we also discuss how we address the agency's recommendations and comply with section 10(j).

1.3.2 Clean Water Act

Under section 401 of the Clean Water Act (CWA), a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. On August 30, 2016, PCM applied to the California State Water Resources Control Board (Water Board) for water quality certification (WQC) for the project. The Water Board received this request on September 1, 2016. On August 28, 2017, PCM simultaneously withdrew and refiled its application, which was received by the Water Board that same day. The Water Board has not yet acted on the request. The WQC is due by August 28, 2018. However, on September 26, 2016, the Water Board filed 36 preliminary terms and conditions pursuant to section 401 of the CWA (Appendix C). These conditions are described under section 2.2.5, *Modifications to Applicant's Proposal—Mandatory Conditions*.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. PCM's application identified such species that are known to occur or may occur within the proposed project area. On September 21, 2017, staff accessed the U.S. Fish and Wildlife Service's (FWS) Information, Planning, and Conservation System (IPaC) website to determine if additional federally listed species potentially occur in the proposed project area.

Four endangered species, the Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), the northern distinct population segment (DPS) of the southern mountain yellow-legged frog (*Rana muscosa*), the Sierra Nevada yellow-legged frog (*Rana sierra*), the Sierra Nevada bighorn sheep (*Ovis Canadensis sierrae*), and one threatened species, the Yosemite toad (*Anaxyrus canorus*) were identified as potentially occurring in the vicinity of the proposed project or in downstream areas. In addition, one candidate for listing, the whitebark pine (*Pinus albicaulis*), and one proposed threatened species, the North American wolverine (*Gulo gulo luscus*), were also listed as potentially occurring in the project area.

After reviewing the current range of the Lahontan cutthroat trout, staff determined it does not occur in the Owens River Basin[1] where the project is located. The range of the northern DPS of the southern mountain yellow-legged frog occurs south of a ridge dividing the middle and south forks of the Kings River (Vredenburg et al. 2007), which is more than 30 miles to the south of the proposed project. Therefore, the proposed project would have no effect on these two species and we do not address them further in this EA.

The proposed project is located within designated critical habitat for the Sierra Nevada bighorn sheep and Yosemite toad. In addition, designated critical habitat for the Sierra Nevada yellow-legged frog is located within 0.5 miles of the boundary of the proposed project.

Our analysis of potential project effects on whitebark pine, Yosemite toad, Sierra Nevada yellow-legged frog, North American wolverine, and Sierra Nevada bighorn sheep is presented in section 3.3.5, *Threatened and Endangered Species* and our recommendations are in section 5.1, *Comprehensive Development and Recommended Alternative*. Based on these analyses, we conclude that constructing and operating the Pine Creek Mine Project, as provided for in the staff alternative with mandatory conditions, is not likely to adversely affect the Yosemite toad, Sierra Nevada yellow-legged frog, or Sierra Nevada bighorn sheep and would have no effect on the whitebark

[1] The Owens River Basin is a closed hydrologic basin, terminating in Owens Lake.

pine and the North American wolverine. We also conclude that no adverse modification to designated critical habitat for the Yosemite toad, Sierra Nevada yellow-legged frog, or Sierra Nevada bighorn sheep would result from the proposed project.

We intend to seek concurrence from the FWS regarding our conclusions for the Yosemite toad, Sierra Nevada yellow-legged frog, and Sierra Nevada bighorn sheep and their respective critical habitats.

1.3.4 Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of PCM's certification.

The project is not located within the state-designated Coastal Management Zone, which generally extends 1,000 yards inland from the mean high tide line and the project would not affect California's coastal resources. Therefore, the project is not subject to California coastal zone program review and no consistency certification is needed for the action. By letter filed February 2, 2018, the California Coastal Commission concurred.

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that federal agencies "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register.[2]

[2] In the case that human remains are discovered on federal lands, and that such remains are native and not associated with a crime, the Native Graves Protection and Repatriation Act of 1992 (NAGPRA) would be implemented by the federal land manager where the remains were located. With this proposed project, the Forest Service would have jurisdiction under NAGPRA and would secure the remains and contact the Lone Pine Band Paiute-Shoshone Tribe, Fort Independence Community of Paiute Indians Bridgeport Paiute Indian Colony of California Bishop Paiute Tribe, Big Pine Band of the Owens Valley Shoshone Tribe, and the Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation who would be the likely descendants.

No historic properties were located within the project's area of potential effects (APE) and as a result, the proposed project would have no effect on such properties. The California State Historic Preservation Office (California SHPO) was consulted and concurs with the finding that no historic properties would be adversely affected by the proposed project.[3] Commission staff also concurs with this finding, and as a result, the section 106 process has been completed for this undertaking.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R., sections 5.1 – 5.16) require that applicants consult with appropriate resource agencies and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. A scoping document (SD1) was distributed to interested agencies and others on May 20, 2011. It was noticed in the Federal Register on May 27, 2011. Two scoping meetings were held on June 21, 2011, in Bishop, California, to obtain comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission's public record for the project. In addition to the comments provided at the scoping meetings, the following entities have filed written comments:

Commenting Entities	Date Filed
California Water Quality Control Board	July 20, 2011
U.S. Forest Service	July 22, 2011

1.4.2 Interventions

On July 28, 2016, the Commission issued a notice that PCM had filed an application for an original license for the Pine Creek Mine Project. This notice set September 26, 2016, as the deadline for filing protests, and motions to intervene. In response to the notice, the entities listed below filed for intervenor status. None of the interventions filed are in opposition to the proposed project.

[3] The California SHPO filed its concurrence letter with the Commission on December 2, 2015.

Intervenor	Date Filed
Twain Resources LLC	September 26, 2016
U.S. Forest Service	September 27, 2016*

* Late intervention granted on November 21, 2017.

1.4.3 Comments on the Application

A notice requesting comments, preliminary terms and conditions, and recommendations was issued on July 28, 2016. The following entities commented:

Commenting Entity	Date Filed
U.S. Department of the Interior	September 23, 2016
Twain Resources LLC	September 26, 2016
California State Water Resources Control Board	September 26, 2016
California Department of Fish and Wildlife	September 27, 2016
U.S. Forest Service	September 30, 2016
U.S. Forest Service	November 28, 2017[4]

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Pine Creek Mine Hydroelectric Project would not be constructed and would not generate an estimated average annual generation of 5,600 MWh. Under this alternative, environmental resources in the project vicinity would not be affected.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities and Operation

The proposed 1.5-MW Pine Creek Mine Project would develop hydro generation from the head and flow potential of the Easy-Go Tunnel at the Pine Creek Mine that is located adjacent to the confluence of Morgan Creek and Pine Creek in Inyo County, California (Figure 2). The project would use an existing concrete plug in the mine to store up to 200 acre-feet of groundwater in existing tunnels, creating a gross head of up to 1,320 feet for power generation. The 12-foot-wide, 12-foot-high, and 30-foot-thick

[4] Forest Service filed an addendum to their preliminary 4(e) conditions.

concrete plug is located inside the mine 2,500 feet from the Easy-Go portal at an elevation of 8,080 feet above sea level. The plug includes discharge piping facilities to control flows, but does not currently store water. Groundwater in the mine currently flows through an opening in the plug and discharges to a rock trench leading to the intake for the existing 150-kW Pine Creek Mine Water Discharge System Sites 1 and 2 Project No. 13163 (Discharge System Project) conduit exemption, located just inside the mine portal (Figure 2 and Figure 3). After making power at the Discharge System Project, water is released into Pond 7 which then flows over a concrete spillway into Morgan Creek.

To construct the project, PCM would install an 18-inch-diameter, 120-foot-long steel penstock, from a valve in the existing concrete plug to a 1.5-MW Pelton turbine generator to be located about 2,400 feet inside the mine. A 2,400-foot-long underground transmission line and 60-foot above ground line would connect the generator to an existing PCM-owned substation and an existing 640-foot transmission line. With the exception of upgrades to the existing substation and staging of equipment/materials, no construction activities would occur outside of the mine tunnels.

PCM proposes to operate the project in "run-of-mine," in which flow releases from the project would approximate groundwater inflows to the mine. Flows from the mine into the Discharge System Project currently range from 7 to 14 cubic feet per second (cfs) (average 10 cfs)). PCM proposes to ensure run-of mine operation through the use of a pressure sensor on the supply line to the turbine or a static bypass line connected to the pressurized section of the tunnel. The discharge from the project would flow through the existing hard rock trench and enter the intake sump for the Discharge System Project. Following power generation, flows from the proposed project would enter Morgan Creek, which flows into Pine Creek about 1,000 feet downstream of that project's discharge point.

The project would be operated manually by personnel located at the existing Pine Creek Mine property. PCM proposes to monitor seepage at the plug and inspect the plug following any magnitude 5.0 earthquakes that may occur in the area.

2.2.2 Project Safety

As part of the licensing process, the Commission would review the adequacy of the proposed project facilities. Special articles would be included in any license issued, as appropriate. Commission staff would inspect the licensed project both during and after construction. Inspection during construction would concentrate on adherence to Commission-accepted plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.

PCM proposes to monitor seepage at the plug and inspect the plug following any magnitude 5.0 earthquakes that may occur in the area. We recommend that the seepage monitoring and inspection of the plug also occur following any earthquake magnitude that is felt on the project site.

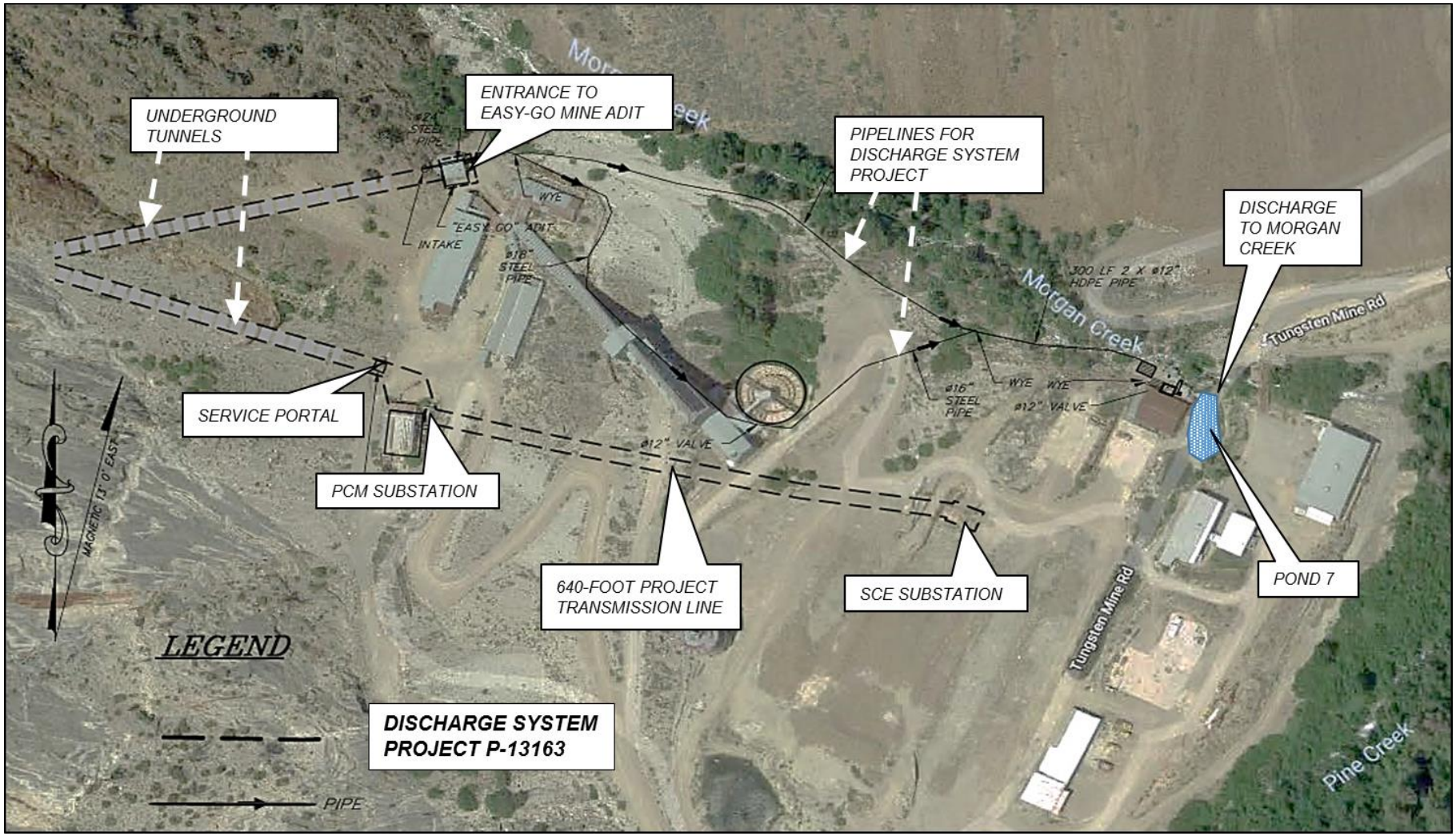

Figure 2. The proposed Pine Creek Mine Project (P-12532) and exempt Discharge System Project (P-13163). Dashed line represents the proposed project's boundary. Locations and features are approximate and not to scale. (Source: PCM 2016, as modified by staff).

Figure 3. Pine Creek Mine property, displaying the existing P-13163 penstock (red line); looking south from Pine Creek Road above the mine site (Source: PCM 2016, as modified by staff).

2.2.3 Proposed Environmental Measures

PCM proposes the following environmental measures for the Pine Creek Mine Project.

- Operate the project in a run-of-mine mode, whereby at any point in time, flows used for generation would approximate groundwater flows entering the project's reservoir.

- Develop a water quality protection plan (WQPP) with provisions for pollution and spill prevention and contaminant procedures during construction, operation and maintenance of the project.

- Monitor water quality parameters including stream flow, temperature, and turbidity at certain locations and frequencies during construction and operation of the project.

- Consult with the California SHPO, Forest Service, and involved Indian tribes if any previously unidentified cultural resources are discovered during the course of constructing, maintaining, or operating project works or other facilities and develop a historic properties management plan (HPMP), as needed.

2.2.4 Modification to Applicant's Proposal – Mandatory Conditions

The following preliminary conditions have been provided and are evaluated as part of PCM's proposal.

Section 4(e) Land Management Conditions

The Forest Service filed 29 preliminary conditions under section 4(e) for the project, which are shown in appendix B. We consider conditions 1 – 18 and 29 to be administrative in nature and as such they are not addressed further in the EA. The remaining conditions are summarized below.

- Condition 19 – Plug Safety: Provide the Forest Service with evidence that the existing concrete plug is capable of safely impounding water. If plug safety cannot be ensured, remove the existing plug and, after a geotechnical and hydrogeological study to determine if the mine is structurally suitable to serve as a reservoir, design and install a new plug. Perform a seismic safety hazard to ensure the new plug can withstand the maximum credible earthquake for the area.

- Condition 20 – Minimum Streamflow Requirements and Measurement: Develop appropriate minimum streamflows for project reaches. Schedule the timing and notify the Forest Service of any planned outages to avoid negative ecological effects of resultant spills. Install, operate, and maintain a gage at the plug and in Pine Creek near Rovana.

- Condition 21 – Water Quality and Temperature Monitoring: Develop a Water Quality and Temperature Monitoring Plan that includes monthly sampling at the mine outflow and three locations in Pine Creek for a minimum of a five year period, with provisions for toxicity testing for freshwater organisms four weeks into the sampling.

- Condition 22 – Groundwater: Conduct a study to identify the long-term impacts of the project on the groundwater aquifer and groundwater quality.

- Condition 23 – Terrestrial Biological Management and Monitoring: Develop a terrestrial biological monitoring plan and a management and monitoring plan for Forest Service special-status wildlife species affected by the project that includes occupation and population monitoring, periodic surveys, and reporting of survey and monitoring results. Annually consult with the Forest Service to identify newly listed special-status species occurring on Forest Service or project-affected lands to determine if a study plan should be developed and implemented to assess project effects on the species. Develop an avian collision and electrocution hazards plan that minimizes adverse interactions between project transmission lines and avian species. All new and rebuilt power poles shall conform to current APLIC guidelines (APLIC 1996) and repair/replace poles to meet APLIC guidelines that are involved in bird fatalities.

- Condition 24 – Aquatic Biological Management and Monitoring: Develop an Aquatic Biological Management Plan that includes Forest Service special status species potentially affected by the project on Forest Service lands, provisions for surveys once every 3 years for the first 9 years of the license period, and then once every 5 years for the term of the license, for fish and benthic macroinvertebrates in Pine Creek and, for macroinvertebrates, Morgan Creek. For newly listed Forest Service special status species, if the Forest Service determines that the species is likely to occur on such Forest Service lands and waters, develop a study plan to reasonably assess the effects of the project on the species.

- Condition 25 – Hazardous Substance Management: Within 1 year of license issuance, and at least 60 days before any land-disturbing activities on Forest Service lands, develop a plan for oil and hazardous substances storage and spill prevention and cleanup.

- Condition 26 – Road and Transportation Facility Management Plan: Within 1 year of license issuance, develop a plan to protect and maintain project and project-affected roads that are on, or affect, Forest Service lands.

- Condition 27 – Fire and Fuels Management Plan: Within 1 year of license issuance, develop a Fire and Fuels Management Plan that details PCM's responsibility for the prevention, reporting, and emergency response to fires in the vicinity of the project resulting from project operations.

- Condition 28 – Heritage Resources Management and Monitoring: Within 1 year of license issuance develop a Historic Properties Management Plan (HPMP). PCM should cease work in any area where previously unidentified cultural resources are identified and do not resume work until written approval is received from the Forest Service.

Section 401 Water Quality Certificate Conditions

The Water Board has not yet acted on PCM's request for a WQC. However, by letter filed September 26, 2016, the Water Board provided 36 preliminary mandatory conditions under section 401 of the Clean Water Act, which are contained in appendix C. We consider conditions 2, 6, 11, 12, and 20 - 36 to be administrative and therefore they are not analyzed in our EA. The remaining preliminary conditions, summarized below, are resource-specific and are analyzed in this EA.

- Condition 1 – To prevent potentially adverse effects of rapid changes in regulated streamflow, project operations will likely be subject to ramping rates to be specified at a later date.

- Condition 3 – Annually consult with relevant resource agencies for the term of the license to review current lists of rare, special-status, threatened, and endangered wildlife and plant species to identify species that have the potential to be adversely impacted by the proposed project.

- Condition 4 – Develop an Initial Fill Plan that includes, at a minimum, the following provisions: 1) a minimum outflow during the Easy-Go Tunnel fill; 2) coordination efforts with downstream water right holders; and 3) consultation activities with relevant resource agencies.

- Condition 5 – Develop a Water Quality Monitoring Plan that includes a provision for monitoring for over 100 constituents and associated mitigation plan to remove metals, and other pollutants from the project discharge water, to meet Basin Plan water quality objectives.

- Condition 7 – In the event pesticides are used to control vegetation and have the potential to impact water quality, develop a Pesticide Use Plan that includes provisions for emergency action in case of spill or discharge to surface waters and restricting application of pesticides (as defined by the Basin Plan).

- Condition 8 – Develop a Fish Habitat Assessment Plan that includes provisions for monitoring habitat features (such as water temperature, stream depth, flow velocities, water quality, sediment transport, etc.) associated with resident fish populations and ESA and CESA-listed fish species potentially found within the project area.

- Condition 9 – Develop an Amphibian Monitoring Plan that includes provisions for monitoring all life stages of California red-legged frog, Foothill yellow-legged frogs, and Cascades frogs on Pine Creek and providing annual reports.

- Condition 10 – Develop a Vegetation and Invasive Weed Plan that addresses both aquatic and terrestrial non-native, invasive weeds and species of special concern, within and adjacent to the project boundary, and includes provisions for the protection of special-status plant species and adaptive management to reduce existing occurrences and prevent the spread of non-native invasive aquatic weeds.

- Condition 13 – Notify the Water Board at least one week prior to ground-disturbing activities, provide construction schedule to Water Board upon request, and allow Water Board staff reasonable access to project site.

- Condition 14 – Implement erosion and sediment control measures during construction activities to prevent erosion or sediment discharges to surface waters.

- Condition 15 – Pre-wash all imported rip-rap, rocks, and gravels used for construction within or adjacent to any watercourses. Contain and dispose of wash water in accordance with applicable laws, ordinances, and regulations.

- Condition 16 – Prevent construction debris from entering surface water. Dispose of all construction debris off-site in compliance with applicable laws, ordinances, and regulations.

- Condition 17 – Prevent unset cement, concrete, grout, damaged concrete, concrete spoils, or wash water used to clean concrete surfaces from entering surface waters. Dispose of hardened concrete, grout, and wash water in an authorized landfill in compliance with applicable laws, ordinances, and regulations.

- Condition 18 – Wash equipment free of sediment, debris, and foreign matter prior to transport to project site. Steam clean equipment to be used in direct contact with surface waters. Maintain spill and containment equipment for equipment using gas, oil, hydraulic fluid or other petroleum products.

- Condition 19 – On-site containment for hazardous chemicals shall be away from watercourses and include secondary containment and appropriate management.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include PCM's proposed measures, with the exception of the section 4(e) and WQC conditions outlined in section 2.4 below, and the following staff-recommended modifications and additions.

- Develop a run-of-mine implementation and monitoring plan to ensure that run-of-mine operation is maintained.

- Modify the Water Board's required Initial Fill Plan (preliminary WQC condition 4) to include down-ramping rates during the initial fill as well as ramping rates and minimum and maximum flow releases during any subsequent draining and refilling of the reservoir during project operation for maintenance purposes.

- Modify the Forest Service's required avian collision and electrocution hazards plan (preliminary 4(e) condition 23) to include provisions for monitoring, documenting, and reporting any bird fatalities and injuries to ensure that hazardous sections of the transmission line are identified and repaired or replaced, as needed.

- Consult with California DFW and FWS to determine the appropriate timing of project construction to minimize the potential for effects on federally endangered Sierra Nevada bighorn sheep during its sensitive lambing period.

2.4 STAFF ALTERNATIVE WITH MANDATORY CONDITIONS

We recognize that the Commission is required to include valid Forest Service 4(e) conditions and Water Board 401 WQC conditions in any license issued for the project. Thus, the staff alternative with mandatory conditions includes staff-recommended measures along with the following mandatory conditions that are not included in the staff

alternative: (1) plug safety (4(e) condition 19); (2) minimum streamflow releases and measurement (4(e) condition 20); (3) water quality and temperature monitoring (4(e) condition 21); (4) groundwater effects and contaminant testing (4(e) condition 22); (5) terrestrial biological management and monitoring (excluding the avian collision and electrocution hazards plan) (4(e) condition 23); (6) aquatic biological management and monitoring (4(e) condition 24); (7) ramping rates (WQC condition 1); (8) water quality monitoring plan (WQC condition 5); (9) fish habitat assessment plan (WQC condition 8); (10) amphibian monitoring plan (WQC condition 9); and (11) vegetation and invasive weed plan (WQC condition 10).

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area, with historic and current conditions described first. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative*.[5]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The proposed project lies within the Owens River Basin on the east side of the Sierra Nevada Mountain Range in Inyo County, California. The basin encompasses a total of 3,130 square miles. A small portion of the northeast corner of the watershed extends into the State of Nevada (PCM 2016).

The Owens River is the largest drainage on the eastern face of the Sierra Nevada Range flowing south parallel to the mountains. It is approximately 120 miles long, originating in southwestern Mono County, approximately 25 miles east of Yosemite Village and south of Mono Lake (USGS 1981). It travels southeast through the Lake Crowley Reservoir, then descends to the Owens River Gorge. The Owens River flows in a closed hydrologic basin, terminating in Owens Lake.

[5] Unless otherwise indicated, our information is taken from the license application for this project and subsequent responses to Commission staff's additional information requests which are included in PCM's revised final license application (PCM 2016).

Decades ago the Los Angeles Department of Water and Power installed an aqueduct that collects Owens River water for export to Southern California, essentially drying up the Owens Valley. In late 2006, a restoration project was implemented to restore 5 percent of the post-aqueduct flows to the lower river. The Owens River Basin and the adjacent Mono Lake Basin are the source of 80 percent of the water used by the City of Los Angeles. Diversions from the Owens River and its tributaries into the Los Angeles Aqueduct have resulted in the evaporation of Owens Lake at the end of the river, which formerly covered 108 square miles.

The proposed project is located north of Bishop, California, at the top of Pine Creek Canyon, above the confluence of Morgan and Pine Creeks, two of many tributaries in the Owens River Basin. Morgan Creek is largely an ephemeral creek only becoming perennial below 7,864 feet above mean sea level and flowing for a total of 2.7 linear miles from its headwaters at 9,200 feet elevation to its terminus at 7,800 feet elevation, to its confluence with Pine Creek. Pine Creek is a total of 9.9 linear miles in length from its origination at an elevation of 11,120 feet, at Pine Creek Pass, to its terminus at 7,800 feet elevation, where it joins Morgan Creek. The proposed project has a unique subterranean project boundary in that the underground mine tunnel system would house all of the proposed project facilities.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing National Environmental Policy Act of 1969 (40 C.F.R., section 1508.7), a cumulative effect is the impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Our SD1, issued May 20, 2011, was developed based on our review of PCM's Pre-Application Document, filed February 29, 2008. SD1 identified aquatic resources, water quality and water quantity as resources that could be cumulatively affected by the construction and operation of the proposed Pine Creek Mine Project.

On July 8, 2016, PCM filed an amended final license application for the project. The amended application changed the proposed mode of operation of the project from peaking, where generation, and hence discharge, from the project could vary on a daily basis based on electrical demand, to a run-of-mine operation, where generation is continuous, and outflow from the project is equal to inflow to the project. This change in mode of operation would result in the avoidance of the potential cumulative effects identified in SD1.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that have the potential to be affected are addressed in this EA. Based on this, we have determined that geology and soils, aquatic resources, terrestrial resources, recreation and land use resources, aesthetic resources, and cultural resources may be affected by the proposed action and action alternatives. We present our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative*.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

The project site is located along the base of the Sierra Nevada eastern escarpment near the western edge of Owens Valley. The escarpment serves as the boundary between the Great Basin and Sierra Nevada geologic provinces. The Sierra Nevada province is a north-northwesterly trending, asymmetric, tilted fault-block. Predominant basement rock types of the Sierra Nevada include Cretaceous granitic with associated Paleozoic roof pendant rocks.

More specifically, the site is located at the western boundary of the Excelsior-Coaldale section of the Walker Lane Belt (WLB). The WLB is approximately 700 kilometers (km) long and 100 to 300 km wide and is characterized by Quaternary faults extending from the Garlock fault northward into northeastern California.

The project, with the exception of its 700-foot transmission line and substations, would be located entirely within portions of the existing Pine Creek Mine. The project's reservoir would be contained within voids created during historical mining operations. Water within the reservoir would be retained by a concrete plug constructed in the Easy-Go adit, which is located below the reservoir. The 32-foot-thick plug was affixed to the diorite (granite) walls of the adit. The plug has three pipes traversing through it, one of which would be used to provide water to the project's 30-foot penstock.

3.3.1.2 Environmental Effects

PCM does not propose any measures specifically addressing geology or soils issues. However, PCM proposes to inspect the concrete plug following any earthquake in

the area exceeding magnitude 5.0 to check for structural damage. PCM also proposes to develop a maintenance and repair plan to monitor any seepage that may occur in the vicinity of the plug and effect any needed repairs.

The Water Board would require PCM to implement a number of construction-related measures, including: notification of ground-disturbing activities (preliminary WQC condition 13); erosion and sediment controls (preliminary WQC condition 14), washing of imported rip-rap, rocks and gravels used for construction (preliminary WQC condition 15); proper disposal of construction materials and debris and preventing them from entering surface waters (preliminary WQC condition 16); preventing unset concrete, concrete spoils, or concrete wash water from entering surface waters (preliminary WQC condition 17); washing of all equipment prior to transport to the project site, steam cleaning of equipment used in direct contact with surface water, and containment of spills (preliminary WQC condition 18); and containment of hazardous materials away from waterways (preliminary WQC condition 19).

Our Analysis

Because installation of the hydroelectric unit would occur about 2,500 feet from the mine portal, construction would not disturb any land. During operation, leakage from the plug could cause erosion below the tunnel and therefore, we agree with the need for the applicant's proposed maintenance and repair plan to monitor for seepage at the plug and decide if possible repairs are needed.

The Water Board's preliminary WQC conditions 13 – 19 would provide additional protection to reduce potential environmental effects of project construction. Although the proposed project would neither use nor discharge directly into surface waters, and would not involve significant ground-disturbing activities or construction, implementation of these measures, to the extent applicable, would serve to prevent construction-related activities from negatively affecting surface waters.

3.3.2 Water Resources

3.3.2.1 Affected Environment

Water Quantity

The water source for the proposed project is groundwater draining from the underground mine workings. Mining operations have been conducted at Pine Creek since 1918. The Easy-Go Adit (tunnel) was opened in the 1960's, and encountered significant quantities of underground water. The water emanates from fissures, fractures, and boreholes formed and encountered during the tunneling and mining activities. The quantity of groundwater draining into the tunnel varies seasonally, ranging from about

7 – 14 cfs seasonally as an indirect function of snowmelt. Average inflow is estimated to be about 10 cfs. Based on an average inflow of 10 cfs, the volume of the 200-acre-foot reservoir would be replaced every 10 days.

During project operation, water would be released through the concrete plug, penstock, and turbine at a rate approximating inflow to the reservoir, as determined by a pressure sensor. Water exiting the turbine would enter into an existing v-shaped channel within the tunnel and flow down-gradient to the intake for the Discharge System Project, located just inside the adit. This water is then routed downhill through that project's penstock and turbine, and discharged into that project's Pond 7, from which it flows over that pond's concrete spillway and into Morgan Creek, shortly above its confluence with Pine Creek.

Water Quality

The Water Board manages and administers water quality in California. Water quality in the project area is governed by the Lahontan Regional Water Quality Control Board (Region 6), and is outlined in the Water Quality Control Plan for the Lahontan Region (Basin Plan). The established water quality objectives (standards) for the Lahontan Basin are provided in the Basin Plan.

When ore was being extracted from Pine Creek Mine, which ended in 2000, the untreated water contained suspended particulate derived mainly from granite, garnet and mica. Most of these solids were removed in the mine water treating facility, before the flow was discharged to Morgan Creek. Now that the mine is no longer in production, the water quality of the mine discharge is very high, with total dissolved solids (TDS) concentrations of less than 70 parts per million.

The quality of the groundwater entering the mine and currently exiting the Easy-Go adit reflects the geology of the area. The quality of the source of the groundwater (i.e., atmospheric precipitation, primarily snowmelt) is changed very little, by percolation through the thin soils and travel through the mine workings, since the rock is essentially insoluble. Nonetheless, the geology likely imparts some "signature" to the water as it passes from snow to mine outflow. During project operation, approximately 200 acre-feet of water would be impounded by the concrete plug and then, at a rate approximating inflow to the mine, passed through the concrete plug to the turbine, and into the v-shaped channel before flowing to the intake sump for the Discharge System Project.

The quality of the water exiting the mine, specifically dissolved oxygen concentration and water temperature was evaluated in 1999 – 2001. The same water quality parameters were monitored downstream at the confluence of Morgan Creek with Pine Creek and in Pine Creek near the town of Rovana, about 7 miles downstream, in 1999, 2001, and 2001 – 2003. The results of this sampling are presented in Table 1.

Table 1. Results of dissolved oxygen (milligrams/liter (mg/L)) and water temperature (degrees Celsius (ºC)) monitoring conducted on Pine Creek Mine discharge and at two sites on Pine Creek (Source: PCM 2016, as modified by staff).

CONSTITUENT MINE DISCHARGE (1999 TO 2001 ONLY)*

		1999^	2000^^	2001"	2002^	2003"
Dissolved Oxygen (mg/L)	Min	8.13	7.75	8.15	-	-
	Max	9.75	8.65	9.15		-
	Avg.	8.75	8.18	8.55	-	-
Water Temp C	Min	6.0	7.0	5.5	-	-
	Max	12.0	8.0	6.4	-	-
	Avg.	7.7	7.6	6.0	-	-
Morgan - Pine Creek Confluence (R1)						
Dissolved Oxygen (mg/L)	Min	8.80	-	8.40	-	-
	Max	11.10	-	9.00	-	-
	Avg.	9.51	-	8.66	-	-
Water Temp C	Min	3.5	-	3.1	3.6	2.8
	Max	10.5	-	9.3	15.6	13.3
	Avg.	6.6	-	6.0	10.0	8.5
Pine Creek at Rovana (RW)						
Dissolved Oxygen (mg/L)	Min	7.60	-	8.00	-	-
	Max	9.40	-	8.35	-	-
	Avg.	8.58	-	8.19	-	-
Water Temp C	Min	5.0	-	4.8	4.2	4.4
	Max	11.0	-	10.3	15.6	14.2
	Avg.	7.8	-	7.4	9.3	9.7

** Monitoring only required for 1999 - 2001*

^ Monthly sample

"" Quarterly sample

Following installation of the concrete plug in the fall of 2002, the valves on the pipes traversing the plug were closed and water filled the mine voids to establish about 1,000 feet of head. In August 2004, in response to a December 29, 2003 Forest Service request, the valves on the plug were opened, the mine was drained and extensive water quality testing of the drained water was conducted to address a concern that impoundment of the water within the mine would have resulted in the

leaching of contaminants from the mine workings into the mine water. Over 100 constituents were analyzed Table 2).

Table 2. Constituents analyzed by PCM during mine drawdown and drainage, in Morgan Creek, 2004 (Source: PCM 2016, as modified by staff).

Turbidity	Total Dissolved Solids
Specific Conductance	Purgeable Aromatics and Organics
pH	Total Petroleum Hydrocarbons Diesel
Water Temperature	Range Organics Gasolime Range
Total Dissolved Solids	Organics a,a,a-Trifluorotoluene
Total Sulfide	Benzene
Total Phosphorus	Bromodichloromethane
Nitrate/Nitrite	1,2-Dichlorobenzene 1,3-
Ammonia	Dichlorobenzene 1,4-
Kjeldahl (N)	Dichlorobenzene 1,1-
Total Nitrogen	Electrical Conductivity
Dichloroethane 1,2-	Total Cyanide
Dichloroethane 1,1-	Hardness as CaCO3
Dichloroethane	Organochlorine Pesticides and PCB's
trans-1,2-Dichloroethene 1,2-	(full sampling suite)
Dichloropropane	Oil and Grease
cis-1,3-Dichloropropene trans-1,3-	1,1,2-Trichloro-1,2,2-
Dichloropropene Ethylbenzene	trifluoroethane
Methylene chloride 1,1,2,2-	Vinyl chloride
Tetrachloroethane Tetrachloroethene	Total Xylenes
Toluene	Methyl t-butyl ether
1,1,1-Trichloroethane 1,1,2-	1-2-Dichloroethane-d4
Trichloroethane Trichloroethene	Toluene-d8
Trichlorofluoromethane	4-Bromofluorobenzene
Bromoform	Nitrite as N
Bromomethane	Ortho-Phosphate
Carbon tetrachloride	Dissolved Antimony
Chlorobenzene	Dissolved Arsenic
Chloroethane	Dissolved Berylilum
Chloroform	Dissolved Cadmium
Chloromethane	Dissolved Chromium
Dibromochloromethane	Hexavalent Chromium
Tetracosane	Dissolved Copper
Calcium	Dissolved Iron
Magnesium	Dissolved Lead
Sodium	Dissolved Manganese
Potassium	Dissolved Mercury
Total Cations	Dissolved Nickel
Hydroxide Alkalinity as CaCO3	Dissolved Selenium
Carbonate Alkalinity as CaCO3	Dissolved Silver

Bicarbonate Alkalinity as CaCO3 Sulfate Chloride Nitrate as N Fluoride Bromide Total Anions Anion / Cation Balance	Dissolved Thallium Dissolved Zinc Base Neutral and Acid Extracables Organic Analysis (full sampling suite) Asbestos Dissolved Tungsten

According to PCM, the vast majority of the lab analyses documented that dissolved metals, PCBs, organochlorine pesticides, oil and grease, petroleum hydrocarbons, and volatile organic compound levels were below the Practical Quantitation Limit (PQL).[6] Dissolved arsenic and zinc were detected in the samples at concentrations of 1.1 and 12 micrograms per liter (ug/L), respectively, well below drinking water standards of 10 ug/L and 5 milligrams per liter, respectively (Bishop Tungsten Development LLC. 2008).

Additional water quality measurements were made in the fall of 2012, as part of a baseline aquatic habitat survey using Surface Water Ambient Monitoring Program (SWAMP) sampling protocols and including a benthic macroinvertebrate (BMI) bioassessment of Pine Creek above and below its confluence with Morgan Creek. Table 2 shows the results of water sampling conducted during that effort, conducted both upstream and downstream of the confluence of Morgan Creek and Pine Creek.

Table 3. Results of water sampling conducted upstream and downstream of the confluence of Morgan Creek and Pine Creek in fall 2012.

Sampling Information	**Fall 2012**	
	Pine Creek Upstream	**Pine Creek Downstream**
Date Sampled	9/10/2012	9/11/2012
Time Sampled	13:30	10:05
Specific Conductance (mS/cm)	0.03	0.07
Dissolved Oxygen (mg/L)	8.24	9.17
Water Temperature (°C)	14.35	10.64
Turbidity (NTU)	0.00	0.00
pH	9.68	9.44

[6] The PQL is the lowest level at which a substance can be routinely quantified and reported by a laboratory.

Salinity (ppt)	0.00	0.00
ORP (mV)	183.00	134.00
Total Dissolved Solids (g/L)	0.02	0.05

3.3.2.2 Environmental Effects

Water Quantity

PCM proposes to operate the project in a run-of-mine mode, where outflow from the project approximates inflow to the reservoir. PCM proposes to ensure run-of mine operation through the use of a pressure sensor on the supply line to the turbine or static bypass line connected to the pressurized section of the tunnel. PCM states that the pressure transducer would have a direct readout as well a connection to a data logger and/or controller for the turbine/generator unit.

Forest Service preliminary 4(e) condition 20 would require PCM to: (1) develop minimum instream flow requirements; (2) release minimum flows; and (3) install, operate, and maintain two streamflow gages, one at the tunnel plug and the second on Pine Creek near Rovana, about 7 miles downstream of the project. California DFW recommends that any license for the project require unspecified minimum flows and seasonal hydrograph variation.

The Water Board (preliminary WQC condition 1) specifies that, to prevent potentially adverse effects from rapid changes in regulated streamflow, the operation of the project will likely be subject to ramping rates, to be specified at a later date.

The Water Board also expressed concerns regarding the quantity of water that would be released during the initial filling of the reservoir. Accordingly, Water Board preliminary WQC condition 4 would require PCM to prepare an initial fill plan, in consultation with the relevant agencies that would document procedures to be followed during initial filling of the reservoir, when releases from the mine to downstream would need to be reduced in order to fill the reservoir. California DFW also expressed concern about impacts to instream resources during reservoir filling.

Forest Service preliminary 4(e) condition 22 would require PCM to conduct a study to identify the long-term impacts to the groundwater aquifer from project operation, including impacts from periodically draining the underground reservoir.

Our Analysis

Operation of the project in a run-of-mine mode would not change the timing or quantity of water being discharged from the mine under existing conditions. In addition, water exiting the turbine would empty into the hard rock trench and be collected by the non-project intake sump inside the mouth of the adit, just as water passing through the concrete plug does now. As such, the proposed mode of operation would provide the seasonal hydrograph variation recommended by California DFW; however, the need for developing, releasing, and monitoring minimum streamflows during normal project operation, such as those specified in Forest Service preliminary 4(e) condition 20, or as recommended by California DFW, does not appear to be unnecessary due to the project's proposed run-of-mine operation and the absence of a bypassed reach. Similarly, the development of ramping rates for normal project operation, as specified in Water Board preliminary condition 1, does not appear to be necessary because the proposed project operation is not expected to result in large or sudden fluctuations in downstream flow releases. However, as noted below, we do recognize that the development of minimum flows and ramping rates associated with the initial fill, and any subsequent draining and refilling for maintenance purposes, of the project reservoir would help to minimize any effects on downstream aquatic resources resulting from the decrease in flow releases that would be needed to fill the reservoir and increase in flow releases needed to drain the reservoir.

The temporary reduction in flow releases from the project for the filling of the reservoir would reduce available flows and associated generation at the Discharge System Project as well as downstream flows in Morgan and Pine Creeks. Conversely, should the project need to drain the reservoir for maintenance purposes during the term of any license, flow releases from the project would need to be increased, which would result in higher downstream flows in Morgan and Pine Creeks. The rates and magnitudes of these flow reductions and increases have the potential to affect downstream aquatic organisms. Therefore, development and implementation of an initial fill plan, as required by preliminary WQC condition 4, that includes minimum flows and ramping rates associated with the filling of the reservoir would serve to ensure that resulting reduction of flow does not adversely affect downstream aquatic resources Morgan or Pine Creeks. In addition, having the plan address ramping rates associated with instream flow increases resulting from any draining of the reservoir for project maintenance purposes would also help to ensure the protection of downstream aquatic resources.

We note that PCM's proposed mechanism for ensuring run-of-mine operation lacks detail. If run-of-mine operation would be a license requirement, it is important that the system for maintaining run-of-mine operation be demonstrated to be appropriate and reliable. In addition, developing a run-of-mine implementation and monitoring plan that details how the project would maintain and document run-of-mine operation, would provide a means for operation compliance monitoring.

With respect to the groundwater study required by Forest Service preliminary 4(e) condition 22, we note that as a result of the tungsten mining operations, which ended in 2000, water that had previously percolated though the thin soils and proceeded downhill along the soil-hard rock interface now seeps through fissures and into the mine workings, ultimately exiting through mine adits, primarily the Easy-Go adit. This likely lowered the water table in the area. The use of the mine as a reservoir would likely serve to raise the water table in the area, restoring a more natural condition. We also note that the hydrogeology of the mine area has already been studied (see Hydrologic Consultants, Inc. (HCI), 1990, cited in Sierra Geotechnical Services, Inc. (SCSI), 2012. Further, a similar study request by the Forest Service during the study plan development phase of this proceeding was denied in the OEP Director's Study Plan Determination, issued April 2, 2012, because of the adequacy of the existing information, including the HCI and SCSI reports. Therefore, a groundwater study is not needed.

Water Quality

PCM proposes to develop, in consultation with the Water Board, a water quality protection plan (WQPP). PCM states that typical WQPPs include a stormwater pollution prevention plan, spill prevention and containment procedures, procedures for application of herbicides, pesticides, fungicides, and disinfectants, and associated water quality monitoring.

PCM also proposes to monitor select water quality parameters such as stream flow, temperature, and turbidity at unspecified locations and frequencies to determine whether and how these parameters would be influenced by project operation.

Forest Service preliminary 4(e) condition 21 would require PCM to file with the Commission a water quality and temperature monitoring plan that is approved by the Forest Service, as it relates to aquatic habitats managed by the Forest Service.

Water Board preliminary WQC condition 5 would require PCM to develop and implement a water quality monitoring plan to ensure that discharges from the project meet Basin Plan water quality objectives.

Water Board preliminary WQC condition 7 specifies that if pesticide is used to control vegetation at the project and has the potential to impact water quality, PCM would be required to develop and implement a pesticide use plan in consultation with relevant resource agencies. The Water Board states that the plan would include a plan for emergency action in case of spill or discharge to surface waters and also provisions that restrict application of pesticides (as defined by the Basin Plan) to protect federal and state-listed species and associated habitat in or downstream of an application area.

Our Analysis

Previous water quality sampling has established that water quality exiting the mine, entering Morgan Creek, and in Pine Creek is of high quality and supportive of robust benthic macroinvertebrate and fish communities in Pine Creek. Due to the results of the water quality sampling conducted in 2004 of the impounded water in the mine, the proposed project operation is not expected to adversely affect water quality exiting the mine. Although PCM proposes to develop a WQPP in consultation with the Water Board and to also monitor water quality, it provides no details as to what measures would be implemented, what water quality parameters would be monitored, where the monitoring would occur, or when. However, the development of a WQPP that details procedures for preventing stormwater pollution, preventing and containing any spills, and the application of herbicides, pesticides, fungicides, and disinfectants would minimize the effects of project construction and operation on downstream water quality. The proposed provisions of this plan appear to also be consistent with the Water Board preliminary WQC condition 7, which specifies the need for a pesticide use plan.

The development of a water quality monitoring plan in consultation with the Water Board that would include provisions to monitor for streamflow, temperature, and turbidity would serve to identify any unexpected water quality effects caused by project construction and operation. Although PCM does not specify how long it proposes to monitor water quality, monitoring during construction and for the first 3 years of project operation, with the option for additional monitoring if effects are identified, would be sufficient. Based upon the water quality sampling conducted to date, including the 2004 sampling during the draining of the reservoir, the extensive water quality sampling programs detailed in Forest Service condition 21 and Water Board condition 5, which would include the monitoring for all of the parameters specified in table 2 for the term of the license, do not appear to be necessary. The 2004 sampling showed that the monitored parameters detailed in table 2 were either below the PQL or the applicable drinking water standard. Under the proposed project operation there would be a greater expected turnover in water retained in the project reservoir than what was had occurred during the reservoir fill prior to the 2004 sampling, where the reservoir remain filled for a period of almost 2 years. Therefore, monitoring the additional water quality parameters recommended by the Forest Service and Water Board does not appear to be necessary.

With respect to groundwater study and contaminant testing specified by the Forest Service (preliminary 4(e) condition 22), as noted above the quality of water impounded in the mine has already been extensively tested during draining of the impounded mine in 2004 and we do not expect that storage of water in the reservoir would have a different effect on water quality now than it did in 2004.

3.3.3 Fisheries Resources

3.3.3.1 Affected Environment

No fish or aquatic habitat exists within the mine where the Pine Creek Mine Project would be located, or the existing water delivery system for the Discharge System Project. Some fish are thought to exist in Pond 7, which receives flow from the Discharge System Project and from which flows exit over a concrete weir into Morgan Creek. Natural habitat for fish and other aquatic organisms exists from that point downstream in Morgan Creek and Pine Creek.

Morgan Creek flows intermittently upstream of the point where flows enter from the Discharge System Project; whereas, Pine Creek is a permanent stream in the project vicinity. Both creeks at the proposed project site consist of steep slopes and strong currents. As a result, fish are rarely found in the immediate project vicinity. Brook trout, brown trout, and rainbow trout are known to inhabit Pine Creek upstream and downstream of the project. According to California DFW, Pine Creek also supports a well-documented recreational trout fishery composed of rainbow-golden trout hybrids. Pine Creek downstream of the project was previously stocked with brown and rainbow trout on an annual basis. However, due to government budgeting constraints, no stocking has occurred in recent years in Pine Creek.

3.3.3.2 Environmental Effects

Other than the proposed run-of-mine operation and development of a WQPP and a water quality sampling program in consultation with the Water Board, discussed above, PCM does not propose any measures specifically directed at aquatic resources.

Forest Service preliminary 4(e) condition 24 would require PCM to develop and implement an aquatic biological management and monitoring plan. The plan would include provisions for assessment of fish and aquatic macroinvertebrate populations and community structure conducted every three years, initially, then every five years for the remainder of the license term.

Water Board preliminary WQC condition 8 would require PCM to develop, in consultation with the agencies, and implement a fish habitat assessment plan. The plan would include monitoring of habitat features (such as water temperature, stream depth, flow velocities, water quality, sediment transport, etc.) associated with resident fish populations and special status fish species potentially found within the project area.

Our Analysis

Project construction would consist of connecting the 30-foot penstock to an existing valve on the concrete plug on one end and to the turbine/generator on the other end, as well as installation of the transmission line from the generator inside the mine about 2,400 feet to the service portal and then about 60 feet to an existing private substation. Because project construction would not involve significant ground-disturbing activities and because of the use of best management practices (BMPs), as stipulated by the Water Board (preliminary WQC conditions 14 – 19), effects on fisheries resources resulting from project construction should be negligible.

During the initial filling of the project's reservoir, flow to the Discharge System Project and subsequently Morgan Creek and Pine Creek would temporarily need to be reduced and the potential for short-term effects to downstream aquatic organisms would exist. Development and implementation of the Water Board's initial fill plan (preliminary WQC condition 4), with staff's additions including ramping rates, maximum flows, and applicability to filling or draining related to maintenance activities, would serve to ensure that flow reductions or increases during these short-term periods do not adversely affect fish and benthic macroinvertebrates in those water bodies.

Once the reservoir is full and the proposed project is operating in a run-of-mine mode, water quality and the timing and magnitude of flow releases to Morgan and Pine Creeks would be the same as currently occurs. As a result, there is no reason to expect any negative long-term project effects on fishery resources. As California DFW points out in their August 26, 2015 letter, previous studies have shown that the constant temperature of mine water discharge provides a benefit to fisheries resources by sustaining high trout production. Mine water discharge warms Pine Creek flows in the winter (thus prolonging the growing season) and cools Pine Creek flows in summer, ameliorating thermal stress. The short-term storage of water in the project reservoir may enhance this thermal benefit. Therefore, the development and implementation of aquatic resource monitoring plans as conditioned by the Forest Service and Water Board would not be necessary.

3.3.4 Terrestrial Resources

3.3.4.1 Affected Environment

Vegetation

Approximately 60 acres of proposed project lands encompassing the mine tunnels and proposed subterranean reservoir lie subsurface to Inyo National Forest and thus contain no vegetation. Surface lands in the proposed project boundary (about 3 acres), and the exempt Discharge System Project, lie entirely within the existing 39.5-acre

footprint of the mine property which has been highly disturbed and developed since the mine was established in 1918. The mine property currently includes several buildings, access roads, including facilities for the Discharge System Project (Figure 2) and supports only sparse remnants of vegetation. The natural areas surrounding the mine property consist of Great Basin sage scrub, mixed conifer forest, and large areas of sparsely vegetated exposed rock and talus slopes.

Vegetation mapping and focused surveys for special-status plant and noxious weed species were conducted by Glenn Lukos Associates, Inc. (GLA) biologists in June, July, August, and September 2012 (GLA 2013). Surveys encompassed the surface lands in the proposed project boundary, the disturbed mine area including the Discharge System Project, and a 250-foot riparian buffer beginning upstream from the mine portal on Morgan Creek to about 2,000 feet downstream from the confluence of Morgan and Pine Creeks.

Riparian and Wetland Vegetation

A 50 to 200-foot riparian woodland corridor occurs along Morgan and Pine Creeks that includes a water birch vegetation alliance that is tracked due to concern regarding its decreasing range. An emergent wetland (0.23 acres) exists at the edge of the mine property about 250 feet east of MWDS Pond 7 (GLA 2013).

Non-native, Invasive Weed Species and Special-status Plants

One noxious weed species, wooly mullein (*Verbascum thapsus*), a biennial or annual forb, has been observed in three locations along Pine Creek Road (GLA 2013). Wooly mullein occurs throughout California, but is particularly abundant in dry valleys on the eastern side of the Sierra Nevada and high population densities have been observed in moist meadows and creek drainages near Mono Lake and Owens Valley. Wooly mullein is listed as an invasive plant by the California Invasive Plant Council (Cal-IPC) with an inventory rating of limited.[7]

The California Natural Diversity Data Base (CNDDB) and California Native Plant Society Inventory of Rare Plants included five plant species with potential suitable habitat in the project area (Table 4). No special-status plants were detected in the project area during surveys in 2012.

[7] Cal-IPC describes species with an inventory rating of limited as those that are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Further, their reproductive biology and other attributes result in low to moderate rates of invasiveness.

Table 4. Special-status plant species potentially occurring in the project area.

Species	**Status**	**Habitat**
Mono milk-vetch (*Astragalus monoensis*)	Federal: None State: Rare CNPS: List 1B.2	Pumice (gravelly or sandy) in Great Basin scrub and upper montane coniferous forest.
Raven's milk-vetch (*Astragalus ravenii*)	Federal: None State: None CNPS: List 1B.3	Gravelly soils in alpine boulder and rock fields, and upper montane coniferous forest.
Western single-spiked sedge (*Carex scirpoidea* ssp. *pseudoscirpodea*)	Federal: None State: None CNPS: List 2.2	Mesic (often carbonate) soils in alpine boulder and rock fields, meadows and seeps, and rocky subalpine coniferous forest.
Sierra draba (*Draba sierra*)	Federal: None State: None CNPS: List 1B.3	Granitic or carbonate soils in alpine boulder and rock fields.
Father Crowley's lupine (*Lupinus padre-crowleyi*)	Federal: None State: None CNPS: List I B.2	Decomposed granitic soils in Great Basin scrub, riparian forest, riparian scrub, and upper montane coniferous forest.

Wildlife

As described above, the 3 acres of proposed surface project lands outside of the mine tunnel support only sparse vegetation and thus provide limited suitable habitat for wildlife. Beyond the proposed project lands, the area contains habitat for a variety of wildlife species. Field surveys of the project area conducted in June, July, August, and September 2012 documented either directly (by observation) or indirectly (by tracks, burrows, scat, vocalizations, or other evidence) the presence of 30 bird, 13 mammal (including six bat species), three reptile, and six butterfly species (GLA 2013).

The area surrounding proposed project lands contains suitable habitat for several bat species, including some listed as species of conservation concern by California DFW. Rocky outcrops and crevices in cliff faces in the vicinity of the proposed project, as well as the proposed project's two existing mine tunnels (the Easy-Go Adit and service portal)

potentially provide sites for roosts, winter hibernacula, or maternity colonies which usually consist of dozens to hundreds of individual female bats and their offspring. Generally, the environmental conditions (e.g., temperature and humidity) within suitable habitats are important determinates when bats select sites for roosts and maternity colonies.

Given the subterranean location of the proposed project, four bat surveys were conducted within the two mine tunnels that would be used by the project by biologists with Brown-Berry Biological Consulting (BBC) including two summer out-flight surveys (August 21, 2011 and June 1, 2012) and two winter surveys (January 2, 2012 and February 16, 2012). All surveys included visual inspection of suitable habitat for bats and their sign (e.g., guano) within both mine tunnels to the existing concrete plug (GLA 2013). Summer out-flight surveys also used acoustic ultrasound detectors[8] and night vision equipment to identify bats potentially using, and flying near, the mine tunnels. Bats entering and exiting the mine tunnels were counted by biologists. In addition, GLA biologists also surveyed for bats in the mine tunnels on four evenings in June, July, August, and September 2012.

No bats were detected during winter surveys. Summer out-flight surveys documented several bat species at or near the mine portals, including the big brown bat (*Eptesicus fuscus*), Yuma myotis (*Myotis yumanensis*), and long-legged myotis (*Myotis volans*). Spotted bat (*Euderma maculatum*), a California Species of Special Concern was also detected near the project's mine portals. Summer out-flight surveys in 2011 observed four bats exiting and two bats entering the mine tunnels whereas in 2012 only a single bat was observed exiting the mine.

The following special-status species potentially occur in the vicinity of the proposed project.

Mount Lyell Salamander

The Mount Lyell salamander (*Hydromantes platycephalus*) is designated as a California Species of Special Concern as they are endemic only to the Sierra Nevada Mountains of California. This terrestrial salamander inhabits moist environments within massive rock areas in mixed conifer, red fir, lodgepole pine, and subalpine habitats at elevations from 4,130 feet to 11,940 feet. Mount Lyell salamanders are nocturnal, residing mainly under rocks in areas with little to no vegetation, appearing on the surface only where free water in the form of seeps, drips, or spray is available. While this species will use the splash zones of streams, it does not inhabit other stream habitats during any

[8] Bats communicate acoustically using very high frequency, species-specific sounds inaudible to the human ear, but detectable to special recording devices that can be used to identify bat species and quantify their activity patterns.

life stage. Reproduction, winter hibernation, and summer refugia occurs in damp terrestrial habitats under rocks.

Focused surveys for the Mount Lyell salamander were conducted in conjunction with the federally listed Yosemite toad and Sierra Nevada yellow-legged frog (see section 3.3.5, *Threatened and Endangered Species*) during all site visits in 2012. Surveys included both daytime and nighttime visual inspection surveys of all suitable habitat primarily within the reaches of Morgan Creek and Pine Creek, but also within the man-made ponds and slow-moving areas of the creeks in order to search for egg masses, tadpoles, and/or adults. Because this species has been detected in mines in other areas (GLA 2013), biologists surveyed inside the mine that would be used by the proposed project from the portal entrances to the existing concrete plug using flashlights to scan the mine interior.

PCM also conducted a literature review of sensitive amphibian locations within the vicinity of the proposed project from a variety of sources which include, but were not limited to: (1) California Natural Diversity Database, (2) personal communication with California DFW Fisheries Biologist James Erdman, (3) review of California DFW High Mountain Lake (HML) surveys provided by Mr. Erdman, and (4) review of Mt. Lyell salamander location data from Chris Fichtel (October 2004), provided by Mr. Erdman (GLA 2013).

No evidence of Mount Lyell salamander was found on proposed project lands during field surveys; however, California DFW personnel identified Mount Lyell salamanders on Pine Creek, downstream from the proposed project in June 2015 and note that the California Natural Diversity Database includes four records of Mount Lyell salamanders in the vicinity of the proposed project.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (described below) are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, which prohibit the "take" of eagle eggs, nests, and offspring, and can also include substantially disturbing normal breeding and feeding activities, except as permitted by regulation. Bald eagles are also state-listed as endangered and fully protected in California.

Bald eagles typically forage over water and other open habitats. Bald eagles nest in mature trees and snags and on cliffs, rocks, and artificial structures, generally within 1 mile of water. Nesting activity occurs from January through August.

Golden Eagle

Golden eagles (*Aquila chrysaetos*) prefer open to semi-open terrain, especially around mountains, hills, and cliffs up to 12,000 feet in elevation. Golden eagles breed from late January through August nesting on steep cliffs or large trees. They primarily forage in grasslands and other open terrain habitats. Golden eagles are also designated as "fully protected" in California.

No incidental observations of bald or golden eagles were recorded during surveys of the proposed project area conducted in 2012. Nest sites for bald or golden eagles are not known to occur in the proposed project area.

3.3.4.2 Environmental Effects

Vegetation

No activities during construction or operation would require ground or vegetation disturbance outside of the mine tunnel, including upgrades to the existing substation and transmission line and staging of equipment and materials. Access to the project site would occur on Pine Creek Road and limited to 5 to 10 vehicle trips during the estimated six-week construction period. PCM proposed no specific environmental measures related to vegetation.

As described in section 3.3.2.2, *Water Resources, Environmental Effects*, Water Board preliminary WQC condition 4 would require that PCM prepare an initial fill plan to document the procedures to be followed during the initial filling of the reservoir, when releases from the mine downstream would need to be reduced in order to fill the reservoir.

The Water Board notes that project features related to the spread of non-native, invasive weeds include, but are not limited to, roads and transmission lines. Water Board preliminary WQC condition 10 would require PCM to develop and implement a vegetation and invasive weed management plan to address both aquatic and terrestrial non-native, invasive weed species, and provide protection for special-status plant species, within and adjacent to the project boundary. Water Board preliminary WQC condition 18 would require that all equipment must be washed prior to transport to the project site and must be free of sediment, debris, and foreign matter.

The Water Board (preliminary WQC condition 3) specifies that PCM should consult annually with relevant resource agencies to review current lists of rare, threatened and endangered species and special-status plant and wildlife species to identify species that have the potential to be adversely impacted by the project, and develop or update species-specific study plans whenever new potential effects or newly listed species are

identified. PCM would then be required to conduct studies for species identified as vulnerable to effects from project construction or operations.

Our Analysis

Construction and operation of the proposed project is not expected to disturb or destroy vegetation, including special-status plant species, in the project area as all construction- and operation-related activities would be confined to the mine tunnel or within the footprint of the existing mine property. Further, no ground disturbance is proposed outside of the mine tunnel, including proposed upgrades to the existing substations and transmission line.

Riparian and Wetland Vegetation

As discussed in section 3.3.2, *Water Resources*, PCM's proposed operation in a run-of-mine mode would not change the timing and quantity of water discharged from the mine from existing flow conditions. Groundwater provides the water source for the project by draining into the existing subterranean mine network that comprises the underground reservoir. PCM's proposed operation to use a pressure sensor to ensure outflow from the project approximates inflow to the reservoir should therefore approximate seasonal inflows into Morgan Creek. This mode of operation is not expected to affect discharge rates into Morgan Creek that would deprive water to downstream riparian and wetland vegetation.

The initial filling of the subsurface reservoir would temporarily result in reduced outflows to Morgan Creek. The rate and magnitude of the flow reduction has the potential to affect downstream riparian and wetland vegetation. Development and implementation of an initial fill plan, would reduce potential adverse effects on downstream vegetation caused by any short-term stream flow reduction arising from the initial filling of the reservoir.

The small emergent wetland identified at the edge of the mine property is not likely to be affected by the project. No project construction or operation activities are proposed near the wetland. In addition, PCM's proposed operation combined with the measures discussed above would ensure that existing flows are maintained that could potentially affect the wetland's hydrology.

Non-native, Invasive Weed and Special-status Plant Species

Construction of the project has low potential for introducing or spreading noxious weeds into native vegetation communities. Project construction would occur primarily underground and no ground-disturbing activities are proposed above ground that would allow weed species to become established and spread into ground-disturbed sites. Only

one weed species, wooly mullein, was recorded in the project area. Wooly mullein's limited occurrence, distance from construction areas (1,000 feet or greater from staging area), and minimal increases in vehicular traffic along Pine Creek Road during project construction are unlikely to cause its further spread.

With one exception, the project's potential for introducing or spreading invasive weed species or affecting special-status plants is negligible and therefore there is minimal to no need for a vegetation and invasive weed management plan. However, seeds and propagules of weed species could be transported on vehicles and other equipment and deposited in the project area particularly along Pine Creek Road and around equipment staging areas. Water Board preliminary WQC condition 18 would help to prevent the introduction of non-native, invasive weed species by ensuring that construction equipment is free of any materials (e.g. soil, debris, etc.) that could potentially contain seeds or propagules of weed species.

Annual consultation to review current lists of rare, threatened and endangered, and special-status species could help identify and protect species and their habitats that have the potential to be adversely impacted by the project over the term of a license. However, considering the project's limited footprint and the fact that nearly all construction and operation activities would occur underground, such consultation is not needed.

Wildlife

Construction and operation activities are not proposed for surface lands lying above the subterranean portion of the proposed project. For the remaining surface lands in the proposed project boundary, construction activities would be restricted to about 3 acres within the existing mine property and limited to upgrades to the existing substation and transmission line and staging of equipment/materials. Equipment would arrive pre-assembled to the site and construction personnel would lodge at the mine property during the duration of the construction period.[9] Within this area and Pine Creek Road, activity associated with construction personnel, vehicles, and other equipment would increase. All other construction, including installation of the generating facilities, would be restricted to the mine tunnels.

Operation and maintenance activities would include routine maintenance and inspection of project facilities, including the Discharge System Project, by staff that currently reside on site in existing facilities (GLA 2013).

[9] Described by the applicant in response to staff's August 26, 2015 comments on PCM's Preliminary Licensing Proposal.

Excluding the proposed run-of-mine operation and development of a water quality monitoring program and protection plan in consultation with the Water Board, described in section 3.3.2, *Water Resources*, PCM does not propose any measures specific to wildlife resources.

Forest Service preliminary 4(e) condition 23 specifies the development and implementation of a terrestrial biological monitoring plan that includes: 1) occupation and population monitoring for wildlife species and reporting of results; 2) periodic surveys throughout the term of the license; 3) Forest Service approved pre-construction/pre-disturbance surveys for Forest Service special-status species; 4) limited operating periods; 5) unspecified mitigation measures; 6) annual review of special-status wildlife species that may occur on proposed project lands in consultation with the Forest Service and; 7) development and implementation of an avian collision and electrocution hazards plan. Forest Service preliminary 4(e) condition 25 would require PCM to develop a hazardous substance management plan, approved by the Forest Service and filed with the Commission, which includes provisions for oil and hazardous substance storage, spill prevention, and cleanup.

Water board preliminary WQC condition 9 would require PCM to develop and implement an amphibian monitoring plan in consultation with relevant resource agencies that includes monitoring for, and reporting on, all life stages of the California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), and Cascades frog (*Rana cascadae*) on Pine Creek.

California DFW recommends that all construction activities be scheduled to avoid the nesting season for all bird species present or potentially occurring in the proposed project area. If the nesting season cannot be avoided, they recommend that a qualified and California DFW approved biologist survey all potential habitat for nests within the proposed project area using current agency protocols.

Our Analysis

The proposed project would have minimal impacts on wildlife resources because construction activities would be limited to the mine tunnels and a 3-acre portion of existing mine property that contains only marginal wildlife habitat. No ground or vegetation disturbance on surface lands outside of the mine tunnel are proposed during project construction or operation that would result in habitat loss or degradation or wildlife mortality.

With the exception of federally listed Sierra Nevada bighorn sheep (section 3.3.5, *Threatened and Endangered Species*, for further discussion), wildlife disturbance caused by noise and movement from increased human, equipment, and vehicular activity is expected to be minor during project construction. No substantial construction activities

are proposed outside of the mine tunnels. Pre-assembling equipment offsite and lodging construction personnel at the mine property, as proposed by the applicant, would reduce additional sources of disturbance caused by assembly and commuting vehicles. Therefore, the intensity and duration of potential noise and activity should be of low magnitude and result in only brief and minor disruption for wildlife species occurring in the immediate area. As such, adjusting the construction schedule to avoid the nesting season for birds as recommended by California DFW would have very minor benefits.

In their study report, BBC biologists concluded that the bats documented during summer out-flight surveys were likely males roosting in a side drift of the mine, where ambient temperatures are higher than that of the major tunnels. The low number of bats detected suggests there is very low potential for a maternity colony to occur within the mine. Additionally, during winter surveys, temperatures inside the mine were noted as being too warm to support hibernating bats. Given the low number of bats recorded using the mine tunnels and the marginal conditions for hibernacula, the proposed project is not expected to affect bat species.

Excluding potential impacts associated with project transmission lines, discussed below, operation of the proposed project is expected to have negligible effects on terrestrial resources. The proposed project boundary outside of the mine consists of about 3 acres surrounding the existing transmission line and substations and lies within the mine property footprint that has a long history of disturbance, and therefore provides at most, marginal habitat for wildlife species. No vegetation management, ground-disturbing activities, or other operations and maintenance (O&M) activities are proposed that could affect wildlife habitat. The routine inspection and maintenance of facilities by current resident staff should not increase noise or other disturbance resulting from human presence or vehicles from what currently exists on proposed project lands.

Based on the location and limited footprint of the proposed project's surface lands and its low potential for negatively affecting terrestrial resources, the terrestrial biological management and monitoring plan specified by the Forest Service would provide minimal to no benefits for terrestrial resources, and is not needed. Furthermore, the plan does not indicate how the information would be used to identify project-related effects. Monitoring and surveys alone would not provide protection, mitigation, or habitat enhancement for wildlife species. The annual consultation included in the plan is unnecessary, as explained above (section 3.3.4.2, *Environmental Effects, Vegetation*) the Commission typically includes in its licenses a standard reopener article that serves the same function.

The water source for the proposed subterranean reservoir is groundwater that naturally infiltrates the existing underground network of mine tunnels as currently exists thus no water source is diverted that could deprive wildlife species or their habitat of water. The initial filling of the proposed project reservoir would reduce flows to Morgan

Creek and Pine Creek with the potential for effects to wildlife associated with riparian habitats, including the Mount Lyell salamander and other amphibian species potentially present. However, development and implementation of the Water Board's stipulated initial fill plan would ensure that flow reductions during this short-term period would minimize adverse effects to wildlife using this riparian corridor. Once the reservoir is full and the proposed project is operating in a run-of-mine mode, the timing and magnitude of flow releases to Morgan and Pine Creeks would be the same as currently occurs.

As discussed in section 3.3.2, *Water Resources*, extensive testing for numerous contaminants and water quality parameters establish that water exiting the mine and discharging into Morgan Creek is of high quality and thus not expected to affect wildlife species using this riparian corridor. However, post-license implementation of the water quality monitoring plan developed by PCM and the Water Board would further ensure risks to riparian habitat and wildlife using the creeks are monitored and minimized.

The amphibian monitoring plan stipulated by the Water Board would require monitoring for three amphibian species (California red-legged frog, foothill yellow-legged frog, and Cascades frog) that do not occur near the proposed project area. As discussed above, the project is expected to have minimal impacts on the aquatic resources amphibian species inhabit thus this condition appears to be unnecessary.

If not properly managed, oil and other hazardous substances have the potential to negatively impact terrestrial (and aquatic) species through toxic exposure causing direct mortality or injury, reduced survival and reproduction from contamination, and degradation or loss of habitat. Implementation of a hazardous substance management plan would minimize environmental damage to terrestrial (and aquatic) resources potentially resulting from the storage, spill, and cleanup of oil and hazardous substances during operation of the proposed project.

Transmission Line Effects on Birds

Collisions and electrocutions at transmission lines represent a major source of bird mortality (Loss et al. 2014). The proposed 60-foot and existing 640-foot transmission line to be used to transmit project power could present a collision risk and electrocution hazard for avian species that reside within, or traverse the proposed project area, including bald and golden eagles. The risk of avian mortality or injury associated with above-ground transmission lines is greatest on small voltage (69-kV or less) lines because of the close spacing of conductors. Large-bodied birds such as raptors and wading birds are at greatest risk because of their long wing spans that can reach between conductors. Additionally, larger species are often less agile in flight compared to smaller species, and thus are less able to avoid collisions with lines.

PCM proposes to upgrade the existing transmission line and substations, but provides no information as to what the upgrades entail.

To reduce the likelihood of avian injury or mortality from collisions with the transmission line and potential electrocution, the Forest Service requires (part of preliminary 4(e) condition 23) that PCM file with the Commission, an avian collision and electrocution hazards plan developed in consultation with relevant resource agencies to be approved by the Forest Service. Forest service states that the plan must include provisions for all new or rebuilt power poles to be constructed and maintained in accordance with current Avian Powerline Interaction Committee (APLIC[10]) guidance. Further, any pole involved in a bird fatality would be immediately repaired or replaced to meet these guidelines.

Our Analysis

APLIC guidelines provide specific recommendations for conductor spacing and arrangement to reduce risk of avian electrocutions. Additionally, the guidelines include a variety of nest and perch deterrents, perching poles, and nest platforms to further reduce risk to birds flying near conductors. APLIC guidelines also provide descriptions of devices for marking lines to increase visibility and allow birds to avoid collisions. Line-marking devices are most effective when placed at stream crossings, near wetlands, near ridgelines, or at other locations along the line where avian densities are likely to be relatively high and collision risk is greatest.

Design of the transmission line with consideration to the APLIC guidance would reduce the risk of avian mortality and injury due to electrocution or collision with the line. Preparation of an avian collision and electrocution hazards plan would ensure that the risk of effects to birds, including bald eagle and golden eagle, associated with the existing transmission line, proposed upgrades, and new or rebuilt power poles to be constructed, are effectively minimized. Including a provision in the plan for monitoring the transmission line during regular inspections and maintenance of project facilities should be sufficient for discovering injured or dead birds given the length of the line. After discovery of an injured or dead bird, consulting with California DFW and the Forest Service and filing an annual report of the consultations would help to identify potential mitigation to reduce relevant hazards.

[10] APLIC is a collaboration among numerous electrical utilities and research groups and FWS that was formed to identify the causes of, and develop methods and designs to minimize, avian electrocutions and collisions at power lines. APLIC has released guidelines to address avian electrocution (APLIC, 2006), collision (APLIC, 2012), and the development of national Avian Protection Plan guidelines (APLIC and FWS, 2005).

3.3.5 Threatened and Endangered Species

3.3.5.1 Affected Environment

Threatened and endangered species include those species listed as endangered or threatened and those species that have been proposed for listing or are candidates for listing under the ESA. PCM's application identified such species that are known to occur or may occur within the proposed project area.

Federally listed species include the endangered Sierra Nevada bighorn sheep and Sierra Nevada yellow-legged frog (*Rana sierra*), and the threatened Yosemite toad (*Anaxyrus canorus*). Critical habitat is designated for all three of these species. In addition, the Sierra Nevada yellow-legged frog is listed as state-threatened and the Sierra Nevada bighorn sheep and the southern mountain yellow-legged frog are listed as state-endangered.

On September 21, 2017, staff accessed the FWS IPaC website to determine if additional federally listed species potentially occur in the proposed project area. The IPaC database, identified one endangered species, the northern distinct population segment of the southern mountain yellow-legged frog (*Rana muscosa*) as well as one candidate for listing, whitebark pine (*Pinus albicaulis*), and one proposed threatened species, North American wolverine (*Gulo gulo luscus*), as potentially occurring in the proposed project area. Critical habitat is designated for southern mountain yellow-legged frog.

Whitebark Pine

Whitebark pine is a candidate for listing as threatened or endangered under the ESA[11]. The species is a hardy conifer that tolerates poor soils, steep slopes, and windy exposures and is found at alpine tree line and subalpine elevations from 7,000 to 12,100 feet in California (Forest Service 2017). The primary threat to the species is from disease in the form of the nonnative white pine blister rust and its interaction with other threats.

No whitebark pines were recorded during botanical surveys conducted in the project area in 2012 (GLA 2013).

Yosemite Toad

The Yosemite toad was designated as federally threatened under ESA on April 27, 2014. This species occurs in wet meadows and forests in high montane and subalpine associations (about 4,800 to 12,000 feet). It is predominantly diurnal and emerges from

[11] *Federal Register* Vol. 81, No. 232, December 2, 2016.

winter hibernation as soon as snow-melt pools form with breeding occurring from mid-April to mid-July depending on local conditions (California DFW 2000). The species prefers shallow snowmelt pools on the margins of meadows or very slow moving runoff streams in which to breed, although they have also been found in deeper permanent pools. Females deposit eggs in shallow edges of pools and streams in meadows.

Critical habitat for the Yosemite toad was designated on August 26, 2016, and subsurface lands within the proposed project boundary are located beneath the Humphreys Basin/Seven Gables Recovery Unit (No. 13) (FWS 2016b). The nearest project surface land is the mine portal which is about 1,350 feet to the southeast of the critical habitat boundary (Figure 4). Critical habitat primary constituent elements (PCEs) include: (1) aquatic breeding habitat that consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes, that are inundated during snowmelt, holding water for a minimum of 5 weeks, and contain sufficient food for tadpole development and; (2) upland areas adjacent to or surrounding breeding habitat up to a distance of about 0.78 miles in most cases (i.e., depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders (FWS 2016b). Upland habitat should provide sufficient cover (e.g., rodent burrows, logs, rocks) to provide summer and winter refuge sites as well as to avoid predators, foraging habitat with adequate prey resources, dispersal corridors between breeding habitats, dispersal corridors between breeding and upland habitats, and/or the natural hydrologic regime of aquatic habitats (FWS 2016b). Upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base (FWS 2016b).

Sierra Nevada Yellow-legged Frog

Recently, the species formerly known as the mountain yellow-legged frog (*Rana muscosa*) with a range extending throughout the Sierra Nevada as far north as Plumas County was split into two distinct species – the Sierra Nevada yellow-legged frog (*Rana sierrae*) and the southern mountain yellow-legged frog (*Rana muscosa*) (Vredenburg et al. 2007). The two frog species are segregated geographically by a ridge dividing the middle and south forks of the Kings River with the Sierra Nevada yellow-legged frog to the north and the southern mountain yellow-legged frog to the south (Vredenburg et al. 2007). The proposed project resides more than 30 miles to the north of this dividing line for the two frog species. As such, only the Sierra Nevada yellow-legged frog is potentially found in the proposed project area and hence considered in this EA.

On April 29, 2014, the Sierra Nevada yellow-legged frog was federally listed as endangered under ESA and critical habitat was designated for the species on August 26, 2016 (FWS 2016b). Critical habitat for Sierra Nevada yellow-legged frog (subunit 3E: Evolution/Leconte) is found approximately 0.5 miles upstream of the confluence of Pine Creek and Gable Creek (Figure 5).

The Sierra Nevada yellow-legged frog is a highly aquatic species usually found within in 3.5 feet of water, but are capable of longer distance overland dispersal. The species is associated with streams, lakes, and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitats at elevations from 4,500 feet to 12,000 feet. Adults feed preferentially upon terrestrial insects and adult stages of aquatic insects while on the shore and in shallow water while tadpoles graze on benthic detritus, algae, and diatoms (FWS 2014, FWS 2016b).

Adults emerge from overwintering sites immediately following snowmelt, and will even move over ice to reach breeding sites (FWS 2014), but reproduction does not take place until lakes and streams are free of ice. Breeding at higher elevations usually occurs from June to August (California DFW 2008). Clusters of eggs are laid in shallow waters and left unattached in still waters, but may be attached to vegetation, gravel, or rocks in flowing water (FWS 2016a; California DFW 2008).

Juvenile Sierra Nevada yellow-legged frogs require multiple years to develop into adults. At high elevations both adults and juveniles overwinter under ice in lakes and streams. As such, water bodies that are sufficiently deep to not freeze solid and retain water during droughts are required for successful breeding sites and winter refugia. Breeding and rearing habitats may consist of lakes, permanent pools within intermittent creeks, streams, rivers, and perennial creeks that maintain a natural flow pattern including periodic flooding. Water bodies must also maintain a sufficient prey base for juvenile frogs and be free of introduced predators such as trout and bullfrog (*Lithobates catesbeianus*).

As discussed in section 3.3.4, *Terrestrial Resources*, GLA biologists reviewed multiple data sources and conducted focused surveys for the Yosemite toad and Sierra Nevada yellow-legged frog. Field surveys were conducted on multiple days (June 1 and 2, July 10 and 11, August 7, and September 24 and 25, 2012) and followed accepted amphibian sampling protocols (Crump and Scott 1994; Fellers and Freel 1995; Lind 1997; Seltenrich and Pool 2002; and Thoms et al. 1997). Surveys were concentrated within Pine and Morgan Creek including a 250-foot riparian buffer beginning upstream near the mine portal on Morgan Creek to about 2,000 feet downstream from the confluence of the two creeks, and also the disturbed footprint of the mine including the man-made pools.

A review of the CNDDB, California DFW HML data (GLA 2013), and other sources revealed no records of the Yosemite toad or Sierra Nevada yellow-legged frog in the vicinity of the proposed project. Surveys in 2012 detected no evidence of either frog species including egg masses, juvenile (tadpoles), or adults (GLA 2013).

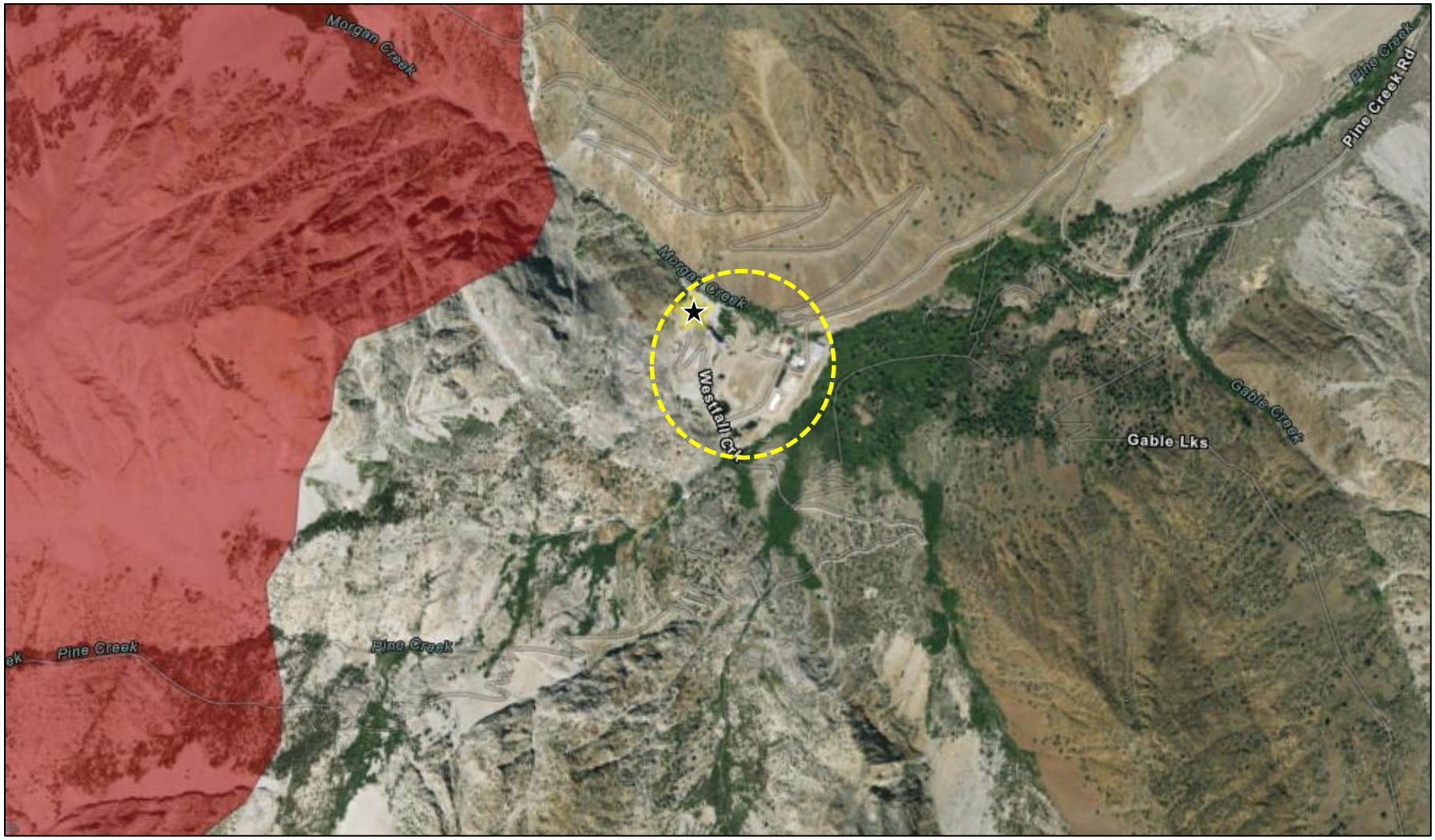

Figure 4. Designated critical habitat for the Yosemite toad (shaded polygon) in relation to the proposed project. The dashed circle and star indicates the approximate location of the mine property and mine portal, respectively. Created by staff using the FWS critical habitat for threatened and endangered species online mapper (FWS 2017a).

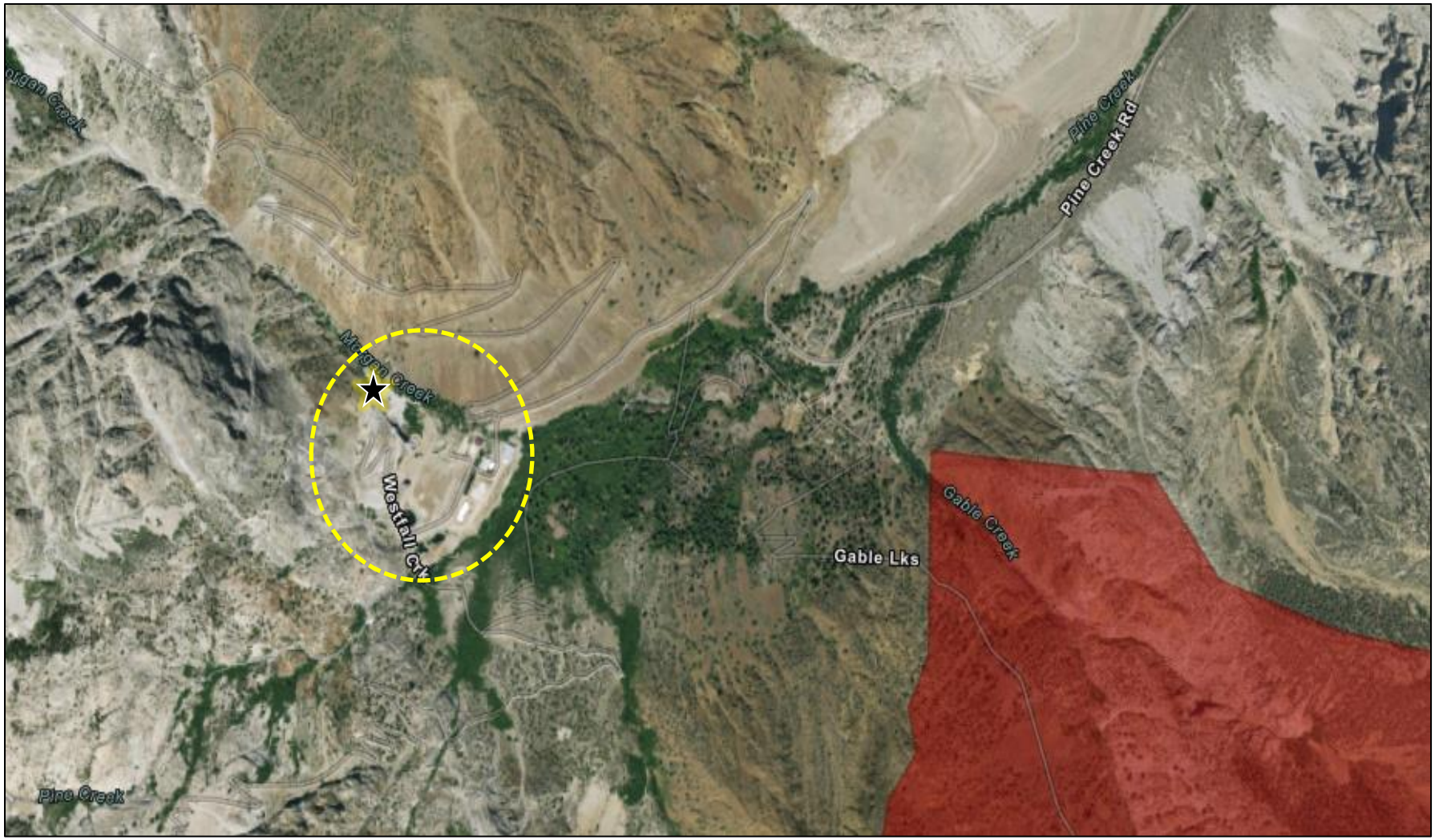

Figure 5. Designated critical habitat for the Sierra Nevada yellow-legged frog (shaded polygon) in relation to the proposed project. The dashed circle and star indicates the approximate location of the mine property and mine portal, respectively. Created by staff using the FWS critical habitat for threatened and endangered species online mapper (FWS 2017b).

Sierra Nevada Bighorn Sheep

The Sierra Nevada bighorn sheep (SNBS) was listed as endangered under the ESA on January 3, 2000 (FWS 2000). Critical habitat for the SNBS was designated on August 5, 2008, and the project is located within the Wheeler Ridge Recovery Unit (Wheeler Ridge herd) (FWS 2008).

According to FWS, designated critical habitat consists of three primary constituent elements (PCEs) that are essential to the conservation of the SNBS: (1) non-forested habitats or forest openings within the Sierra Nevada from 4,000 feet to 14,500 feet in elevation with steep (greater than or equal to 60 percent slope), rocky slopes that provide for foraging, mating, lambing, predator avoidance, and bedding and that allow for seasonal elevational movements between these areas; (2) a variety of forage plants as indicated by the presence of grasses (e.g., *Achnanthera* and *Elymus* spp.) and browse (e.g., *Ribes*, *Artemisia*, *Purshia* spp.) in winter, and grasses, browse, sedges (e.g., *Carex* spp.) and forbs (e.g., *Eriogonum* spp.) in summer; and (3) the presence of granite outcroppings containing minerals such as sodium, calcium, iron, and phosphorus that could be used as mineral licks in order to meet nutritional needs (FWS 2008).

California DFW has monitored the Wheeler Ridge herd continuously since 1979, using a variety of methods including radio telemetry, GPS collars, and ground observations which document SNBS within the project area including the existing mine property and along Pine Creek Road (Figure 7). Between 1999 and 2011, the SNBS population as a whole has increased from 125 animals to approximately 600 (Runcie et al. 2015). The Wheeler Ridge ewe[12] population steadily increased from 1999 to 2007, but since 2007 the population has been less stable (Figure 6) with recent declines largely attributed to mortality caused by avalanches and mountain lion predation as well as reduced fecundity.

The SNBS lambing period typically occurs from mid-April through June, but can extend well into July (GLA 2013). Pine Creek Canyon is regularly used as lambing habitat (California DFW 2015) with a significant number of ewes lambing each year in the red rock above the tailing ponds on the proposed project lands in Pine Creek Canyon (GLA 2013).

[12] Female bighorn sheep are called ewes.

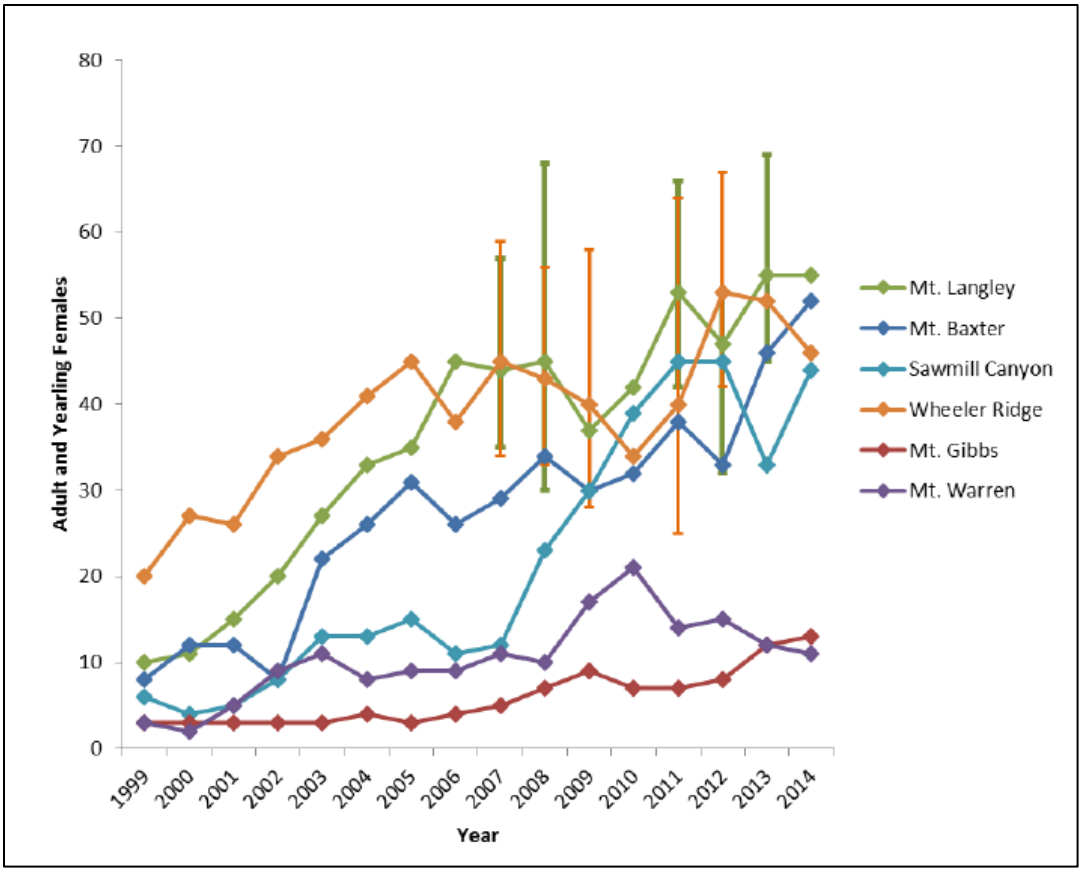

Figure 6. Population trajectories for adult and yearling female (ewes) Sierra Nevada Bighorn Sheep from 1999-2014 based on a combination of population estimates (marked resight and minimum count) for 6 herds in the Sierra with annual population data (Runcie et al. 2015). The proposed project is within the Wheeler Ridge Recovery Unit.

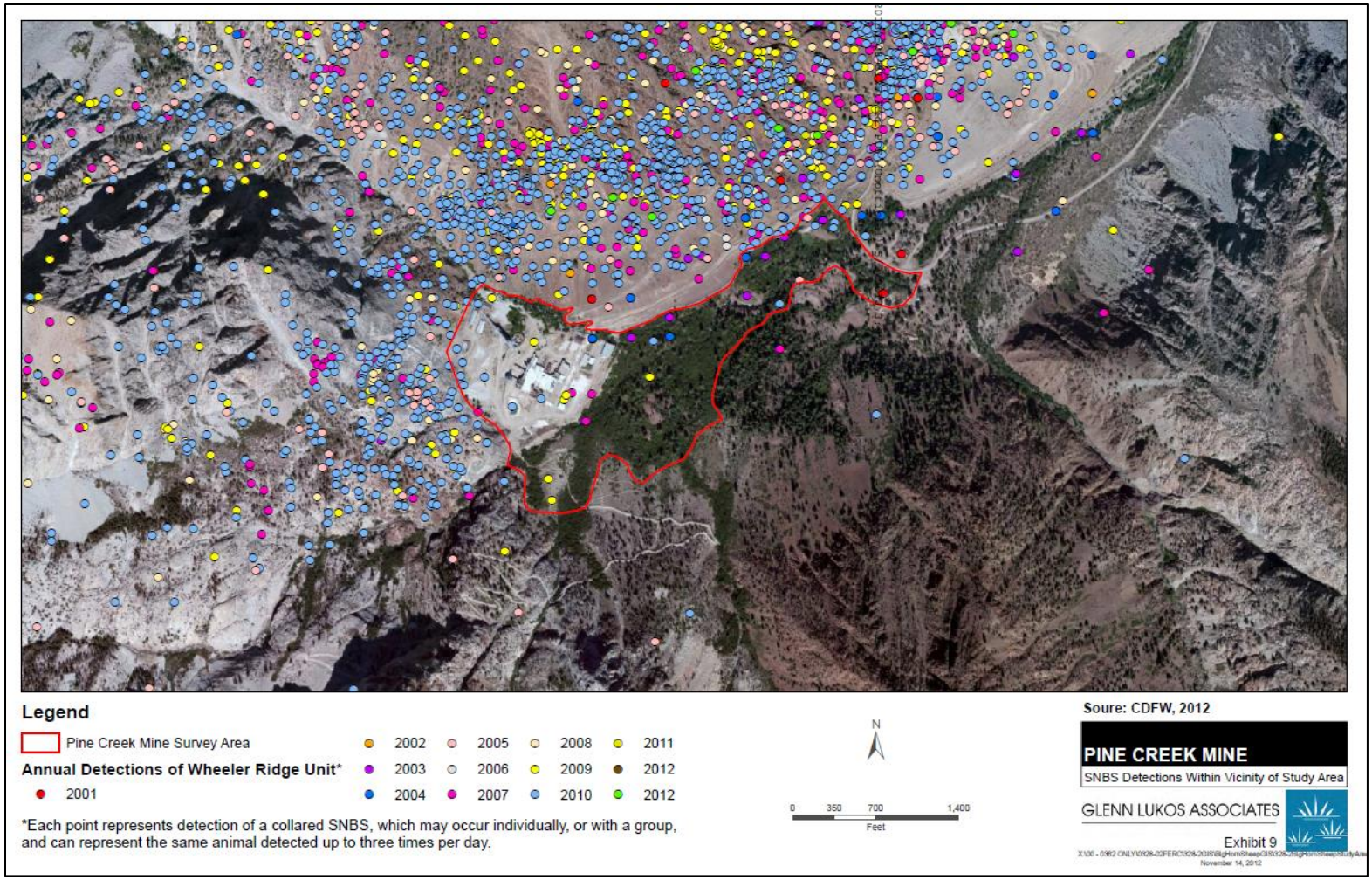

Figure 7. Annual (2002-2012) detections of Sierra Nevada bighorn sheep (SNBS) in the vicinity of the Pine Creek Mine Project. Each point represents detection of a GPS or VHF collared SNBS, which may occur individually, or with a group, and can represent the same animal detected up to 3 times per day. Note the red polygon represents the area where vegetation mapping and plant and special-status species surveys were conducted by GLA in 2012.

North American Wolverine

In the southern Sierra Nevada, North American wolverine occur mostly from 6,400 feet to 10,800 feet (California DFW, no date). Their habitat includes red fir, mixed conifer, lodgepole, subalpine conifer, alpine dwarf-shrub, barren, and probably wet meadows, montane chaparral, and Jeffrey pine preferring areas with little human disturbance. This species uses caves, hollows in cliffs, logs, rock outcrops, and burrows for cover and denning, generally in denser forest stages. Wolverine home ranges typically cover an area of 100 square miles or more where they hunt primarily on small mammals in open areas and feed on carrion.

Biological surveys conducted in 2012 documented no evidence of wolverine presence in the vicinity of the proposed project (GLA 2013).

3.3.5.2 Environmental Effects

PCM proposes no environmental measures specific to threatened and endangered plant or wildlife species.

Whitebark Pine

PCM did not propose any measures, nor were any measures recommended, related to the whitebark Pine.

Our Analysis

Whitebark pines were not documented during botanical surveys conducted in the project area in 2012 (GLA 2013). Though they may occur in the vicinity of the proposed project because no ground-disturbing activities or vegetation management is proposed during project construction or operation and the project is contained almost entirely underground, we conclude there would be no effect on whitebark pine.

Yosemite Toad and Sierra Nevada Yellow-legged Frog

Initial filling of the underground reservoir would temporarily alter the timing and magnitude of flows into Morgan and Pine Creeks that may affect Yosemite toad and Sierra Nevada yellow-legged frog, if present.

As discussed in section 3.3.2, *Water Resources*, PCM proposes to release water in a run-of-mine mode and implement a water quality monitoring plan developed in consultation with the Water Board. No ground-disturbing activities are proposed by PCM during construction or operation of the project including vegetation management.

For protection of aquatic resources, Water Board preliminary WQC condition 4 would require PCM to prepare an initial fill plan (see section 3.3.2, *Water Resources*). Water Board preliminary WQC condition 9 would require PCM to develop and implement, in consultation with relevant resource agencies, an amphibian monitoring plan for California red-legged frog, foothill yellow-legged frog, and cascade frog. In addition, if PCM decides to use pesticides to control vegetation, Water Board preliminary WQC condition 7 would require the development and implementation of a pesticide use plan to protect water quality and include provisions to protect state and federally listed species and their associated habitats.

Our Analysis

No construction or operational activities would directly or indirectly adversely affect critical habitat for Yosemite toad or Sierra Nevada yellow-legged frog. PCM proposes no ground or vegetation disturbance outside of the mine tunnel that would affect critical habitat PCEs. Further, critical habitat for both frog species is located a safe distance from where construction activities would occur outside of the mine and upstream from where mine water from the reservoir would discharge into Morgan Creek (Figure 4 and Figure 5). Therefore, we conclude that construction and operation of the proposed project would have no effect on critical habitat for Yosemite toad and Sierra Nevada yellow-legged frog.

The likelihood of Sierra Nevada yellow-legged frog and Yosemite toad occurring in the vicinity of the proposed project area is low. Evidence of the two listed species was not observed during focused surveys or found in records from other data sources. In addition, available habitat in Morgan and Pine Creeks is largely unfavorable for both frog species. The most suitable breeding habitat was found in the area upstream of the confluence of Morgan and Pine Creeks which occasionally contains slower moving water, with patches of wet meadow and emergent vegetation (GLA 2013). The remainder of the reaches surveyed on the two creeks contain habitat that is less suitable. Both creeks have steep gradients, and the force of water flowing through the creeks generally do not provide shallow pools and areas of slow-moving water to support breeding, including a stable environment to deposit and sustain egg masses. In addition, species of non-native trout (e.g., brook, brown) are known to inhabit Pine Creek upstream and downstream of the proposed project that could potentially inhibit the establishment of breeding populations through predation of frog egg masses and juveniles. However, adult Sierra Nevada yellow-legged frogs will utilize streams with high gradients, rapids, and small waterfalls (FWS 2014) and the creeks and adjacent uplands may provide foraging habitat for both frog species.

A temporary reduction in flows would be necessary to initially fill the reservoir, consequently reducing outflows into Morgan Creek and downstream into Pine Creek. The rate and magnitude of the flow reduction has the potential to affect breeding and

non-breeding frog habitat in the creeks. Such changes in flows could deprive egg masses and juveniles residing in the creeks of the water necessary for their survival and result in injury or mortality. If the reservoir were filled during the breeding period, lower flows could reduce the amount of aquatic habitat used for egg deposition. However, the Water Board's stipulated initial fill plan (preliminary WQC condition 4) described in section 3.3.2, *Water Resources*, would ensure that the timing and reduction of stream flows would minimize the potential for adverse effects. As required by the condition, consultation with relevant resource agencies (Forest Service, California DFW, and FWS) would also help identify an appropriate time period(s) and flows that would take into consideration potential effects on Yosemite toad and Sierra Nevada yellow-legged frog. Once the reservoir is full and the proposed project is operating in a run-of-mine mode, the timing and magnitude of flow releases to Morgan and Pine Creeks would be the same as presently exists.

Construction and operation of the proposed project is not expected to alter water quality that could cause adverse effects to Yosemite toad and Sierra Nevada yellow-legged frog. Several construction-related measures covered in section 3.3.1, *Geology and Soil Resources*, would minimize impacts on water quality during construction of the proposed project. In addition, multiple studies, discussed in section 3.3.2, *Water Resources*, establish that water quality exiting the mine, entering Morgan and Pine Creeks is of high quality and supportive of a healthy benthic macroinvertebrate community. Several environmental measures would further ensure water quality is maintained and monitored and would also serve to minimize impacts to aquatic frog habitat, and any frogs potentially using the creeks, including staff's run-of-mine implementation and monitoring plan, PCM's proposed water quality monitoring plan, and Water Board's pesticide use plan (preliminary WQC condition 7).

The proposed project is not expected to affect listed frogs or their aquatic habitat present in Pine Creek upstream of its confluence with Morgan Creek because water from the mine is released into the existing Discharge System Project and then into Morgan Creek about 900 feet upstream of its confluence with Pine Creek.

Based on our analysis, we conclude that the project is not likely to adversely affect the Yosemite toad or Sierra Nevada yellow-legged frog.

Sierra Nevada Bighorn Sheep

Proposed project lands and Pine Creek Road are located within Pine Creek Canyon, which is regularly used as key lambing habitat for SNBS (California DFW 2015). Disturbance resulting from construction activities outside of the mine tunnel could potentially affect SNBS particularly during the lambing period.

No environmental measures related to SNBS were proposed by PCM or resource agencies.

PCM proposes no vegetation or ground-disturbing activities outside of the mine tunnel during construction or operation of the project. Construction activities would largely be restricted to the mine tunnel. Staging of equipment/materials and upgrades to existing transmission lines and substations would all occur within an approximately 3-acre area within the footprint of the existing mine property. Additionally, PCM states that equipment would arrive pre-assembled to the site and construction personnel would lodge at the mine property during the duration of the construction period.

PCM states that noise and movement generated by project O&M could potentially disrupt wildlife for short durations; however, because O&M activities are expected to be very infrequent in scope and duration, the effects are expected to be minimal. During project operation, vehicle trips on Pine Creek Road would be about one to two trips per day, similar to historic usage.

Our Analysis

PCM proposes no construction or operational activities that would directly or indirectly adversely affect SNBS critical habitat PCEs. Further, project lands outside of the mine tunnel, where staging and electrical upgrades would occur, contain only marginal habitat for SNBS because of historical mining activities. No construction or operational activities are proposed that would cause ground or vegetation disturbance outside of the mine tunnel on proposed project lands. Therefore, we conclude that construction and operation of the proposed project would have no effect on SNBS critical habitat.

Operation and maintenance of the proposed project would be conducted by staff that currently lives on site within the existing mine footprint (GLA 2013). As such, increases in human and vehicular activity from existing use of the project area are not anticipated as a result of proposed project operations. In addition, no operational activities are proposed (e.g., land management activities) outside of the mine tunnel that would disturb SNBS.

During PCM's estimated six-week construction period, the proposed project would increase human presence, noise levels, and vehicular traffic within the existing mine property, staging areas, and along Pine Creek Road. These factors have the potential to disturb and disorient SNBS, thereby increasing susceptibility to predators, reducing foraging success and nutrient intake, and disrupting breeding behavior. Ewes and lambs are particularly more prone to disturbance and may demonstrate a pronounced alarm reaction from greater distances (Wehausen et al. 1977). Lastly, the potential for injury or direct mortality from vehicular collisions would also increase for SNBS.

For bighorn sheep, the number of adult ewes determines how quickly a population can grow or recover from losses. Because of this, the health of a population is often gauged by the number of ewes present. Population monitoring since 2007 indicates the Wheeler Ridge ewe population has showed declines in some years, potentially due to reduced fecundity (Figure 6) (California DFW 2015). Proposed project lands and Pine Creek Road are located within Pine Creek Canyon which is regularly used as lambing habitat (California DFW 2015) where construction activities could potentially disturb ewes and lambs during this key breeding period. California DFW states that the SNBS lambing period typically occurs from mid-April through June, but can extend well into July (GLA 2013). As such, avoiding construction during this time period would reduce potential construction-related effects. However, the specific lambing period for the Wheeler Ridge herd may differ from the average time period stated by California DFW. In addition, annual variation in local environmental conditions (e.g. timing and/or amount of snowfall, spring thaw, etc.) could shift the lambing period from year to year. Further, project-specific effects would inform any recommended construction schedule. Therefore, consulting with California DFW and FWS would help define a project-specific schedule between the dates of mid-April through July to reduce any potential for effects on federally endangered Sierra Nevada bighorn sheep during its sensitive lambing period.

Disturbance resulting from construction outside of the lambing period would be temporary and confined to a relatively small area outside of the mine tunnel and along Pine Creek Road. Because no substantial construction activities are proposed outside of the mine tunnels disturbance to SNBS is expected to be minor. Pre-assembling equipment offsite and lodging construction personnel at the mine property, as proposed by PCM, would reduce additional sources of disturbance caused by assembly and commuting vehicles. Therefore, the intensity and duration of potential noise and activity should be of low magnitude and result in only brief and minor disruption of sheep occurring nearby.

Based on the occurrence of this species on proposed project lands, the minimal above-ground activity proposed for the project, and the staff-recommended agency consultation regarding the construction schedule, we conclude that the project is not likely to adversely affect Sierra Nevada bighorn sheep.

North American Wolverine

PCM did not propose any measures, nor were any measures recommended, related to the North American Wolverine.

Our Analysis

Though North American wolverine may potentially occur within the proposed project area, given this mammal's extensive home range and its roving lifestyle, it likely would only intermittently traverse the area for short durations. Additionally, wolverines would likely restrict their activities to higher quality habitat far removed from proposed project lands that occur within the existing mine property. Furthermore, proposed project construction and operation includes no ground-disturbing activities or vegetation management outside of the mine tunnels. Therefore, we conclude that the proposed project would have no effect on North American wolverine.

3.3.6 Recreational Resources

3.3.6.1 Affected Environment

Recreation Facilities

The project would be located almost entirely underground, except for the existing project transmission line and substations. Water discharge facilities for the project would be inside the mine, and would utilize the existing penstock at the FERC exempt Discharge System Project. An existing access road on the private mine property would also be utilized for project purposes, but is not currently identified by PCM as a project facility. The project would use the existing tunnels and existing mine water discharge piping facilities inside the Pine Creek Mine Easy-Go tunnel to capture groundwater and create an opportunity to develop hydroelectric power. Below-ground project facilities would be partly situated beneath land that is privately owned by PCM, and other facilities would be situated beneath public land administered by the Forest Service. The project's surface facilities would be located within the boundary of the private mine property.

There are no existing recreational uses of the lands on which the project is proposed to be constructed. Public access to the private mine property is restricted. "No Trespassing" and "Private Property" signs are posted at a locked gate where Pine Creek Road intersects with the private mine access road, at the private property boundary.

Recreation Use

Regional recreation resources in the vicinity of the proposed project are primarily associated with the INF. The INF encompasses over two million acres of land, and extends approximately 165 miles along the eastern slope of the Sierra Nevada Mountains, near the California and Nevada border. Notable features and areas within the INF include Mount Whitney, the Devil's Postpile National Monument, Mono Lake, Mammoth Lakes, and the Ancient Bristlecone Pine Forest. The INF also includes nine federally-designated wilderness areas; Hoover, Ansel Adams, Owens River Headwaters,

John Muir, White Mountains, Boundary Peak, Inyo Mountains, Golden Trout, and South Sierra.

Year-round recreation opportunities are abundant in the INF, and include sightseeing, wildlife viewing, picnicking, fishing, flatwater and whitewater boating, hiking, backpacking, mountaineering, developed and un-developed/primitive camping, mountain biking, off-highway vehicle trail riding, skiing, snowboarding, snowshoeing, cross country skiing, snowmobiling, and horseback riding. Many of these recreation opportunities are accessible within a 15-mile radius of the proposed project site. One half mile from the proposed project site, day-hikers, backpackers, fishermen, and horseback riders use an existing Forest Service trailhead to access three trails which lead to high-altitude lake and meadow areas above the proposed project site. The Pine Creek Pack Station, which operates seasonally, is adjacent to the trailhead and leads horseback riding and pack animal excursions for visitors on the nearby Pine Creek Pass.

Recreational Fisheries

Brook, golden, brown and rainbow trout are known to inhabit Pine Creek upstream and downstream from the proposed project area. Brook and golden trout are known to occupy higher elevation lakes and streams upstream from the project. The creeks at the project site consist of steep slopes and strong currents. Fish are rarely found in the project vicinity due to steep terrain. Downstream locations were previously stocked with brown and rainbow trout on an annual basis. However, because of state government budgeting constraints, no stocking has occurred in recent years in Pine Creek.

3.3.6.2 Environmental Effects

PCM neither proposed, nor have any other entities recommended, specific measures for protection or enhancement of recreational fisheries.

Our Analysis

There are no existing recreational uses of the private mine land, nor are any recreational facilities being proposed or recommended for construction as part of this project. Subsurface project facilities located below Forest Service land would have no effect on public recreational use of, or access to, those surface lands. However, during periods of project construction, travelers going to nearby recreational sites could be temporarily impacted by slight increases in traffic due to construction vehicle travel along Pine Creek Road, which is used to access the private mine property. PCM estimates construction would occur over a six-week period. Construction-related trips to the mine would consist of one commercial semi-truck for delivery of all pre-assembled equipment. Support vehicles and personnel are estimated to make 5 to 10 round-trips on Pine Creek Road during construction. PCM estimates one to two trips per week for project O&M.

Traffic impacts would be expected to be minor and would not affect the traveler's recreational experience at their final destination.

3.3.7 Land Use and Aesthetic Resources

3.3.7.1 Affected Environment

Land Use

The project is located entirely within Inyo County, California. Land use in the county is guided by the Inyo County General Plan 2001, adopted on December 11, 2001. Land use around the project is designated as Natural Resources and State and Federal Lands (Inyo County, 2001). Above-ground project facilities are located entirely on private land.

PCM maintains a private, non-operating tungsten mine within the project boundary. The project would utilize an existing transmission line and water discharge facilities located entirely within this private property. An existing access road on the private mine property would also be utilized for project purposes, but is not currently identified by PCM as a project facility. Below-ground project facilities would be partly situated beneath land that is privately owned by PCM, and other facilities would be situated beneath Forest Service land. Inyo National Forest surrounds the private mine property.

Aesthetic Resources

The visual setting of the project is characterized by the geologic features of Pine Creek Canyon. The overall characteristic of this landscape is best described as rugged, mountainous, and undeveloped with the exception of the existing Pine Creek Mine site and facilities, Pine Creek Road, and Pine Creek Pack Station. Although mining operations have been sporadic since the mine's opening in 1918, the land upon which the mine site is situated is significantly altered due to nearly a century of mining activities.

The project would be located almost entirely underground, in existing mine tunnels, except for a project transmission line. Water discharge facilities for the project would utilize the existing penstock at the FERC exempt Discharge System Project. Proposed above-ground project facilities would be situated on the existing privately owned Pine Creek Mine site. A 2,500 foot-long transmission line would connect a generator to the existing mine substation which connects to the existing Southern California Edison 34.5 kV-transmission line, adjacent to the mine property.

3.3.7.2 Environmental Effects

Land Use

Above-ground project facilities would be located entirely within the boundaries of the private land owned by PCM. Subsurface project facilities would be located partly below private land owned by PCM, and partly below Forest Service land administered by the INF. PCM proposed no land use measures.

PCM estimates construction would occur over a six-week period. Construction-related trips to the mine would consist of one commercial semi-truck for delivery of all pre-assembled equipment. Support vehicles and personnel are estimated to make 5 to 10 round-trips on Pine Creek Road during construction. PCM estimates one to two trips per week for project O&M. Pine Creek Road, a county maintained road, is the only road to the private mine property. Pine Creek Road is approximately 10 miles in length from its intersection with U.S. Route 395 at Mesa, CA, to the Pine Creek Mine property. Beginning about two miles west of Rovana, Pine Creek Road enters the INF, and is bound on both sides by Forest Service land for approximately 5.5 miles until its intersection with the existing mine access road at the Pine Creek Mine property. Upon entering the private mine property, PCM would use the existing mine access road to reach the mouth of the adit where the subsurface project boundary begins. This access road is a graded, bare-earth roadway entirely within the boundary of the PCM property, and has been used historically by the previous mining companies and owners of the property to gain access from Pine Creek Road to the mine adits and appurtenant mining facilities.

Pine Creek Road is not exclusively used for project purposes. The road is also used by visitors of the Forest Service to access the nearby Pine Creek Pass trailheads and Pine Creek Pack Station, and by local residents to access their properties in nearby Rovana and Round Valley.

Forest Service preliminary 4(e) condition 26 would require PCM to develop a road and transportation facility management plan. The plan would provide guidance for the protection and maintenance of project and project-affected roads that are on, or that affect, Forest Service lands.

Forest Service preliminary 4(e) condition 27 would require PCM to develop a fire and fuels management plan in consultation with appropriate state and local fire agencies. The plan would detail PCM’s responsibility for the prevention, reporting, and emergency response to fires in the vicinity of the project resulting from project operations.

Our Analysis

PCM would use the existing Pine Creek Road, and private mine access road, so that no new roads would need to be constructed to access the proposed project. PCM would use Pine Creek Road to complete construction, and future daily operation and maintenance activities related to the project. Pine Creek Road is the only route to the Pine Creek Pack Station, nearby Forest Service recreational trailhead, and the communities of Rovana and Round Valley. Although PCM would use Pine Creek Road for one trip of a semi-truck and 5 to 10 round trips during construction, and estimates one to two trips per week for project O&M, this amount of use is insignificant relative to current use of Pine Creek Road by the public. For this reason, there would be no need for increased maintenance of the road beyond what is currently conducted by the county. We, therefore, find that a road and transportation management plan as stipulated by Forest Service preliminary 4(e) condition 26 would have no project-related benefits.

Subsurface project facilities, located below Forest Service land, would have no effect on those surface lands. Access to those surface lands by the Forest Service and Forest Service visitors would continue to be unobstructed.

Unlike Pine Creek Road, it does appear that the existing access road within the private mine property would be used predominately for project purposes, which would make it a project facility that would fall under PCM's maintenance responsibilities under any license issued for the project. Implementation of a road and transportation management plan as stipulated by Forest Service preliminary 4(e) condition 26 for the existing private access road would require PCM to inventory, map, and characterize the private access road, develop an annual operations and maintenance schedule, comply with Forest Service guidelines regarding roadway operations and maintenance, develop a road construction schedule, and perform monitoring activities designed to assess traffic use and road capacity. In addition, as currently proposed, condition 26 would seek a memorandum of understanding between PCM and Forest Service addressing shared road management responsibilities, would allow Forest Service unrestricted use of the road, including rights to close the road, and would dictate vehicle and transportation use of the road. There would be no direct benefits to Forest Service lands and resources by implementing this plan, and this is most apparent due to the fact that the access road is not located on, or immediately adjacent to, Forest Service-owned lands. Based on the location of the project access road within the private PCM boundary, and its minimal amount of use as a project road explained above, the road and transportation management plan would provide no benefits for Forest Service lands and resources, and would be unnecessary.

Forest Service preliminary 4(e) condition 27 requiring the development of a fire and fuels management plan is a reasonable measure for the prevention, reporting, and emergency response to fires at and adjacent to the proposed project. PCM states that they

would operate the project in a fire-safe manner, and comply with regulations designed to reduce the risk of wildfires occurring as a result of project O&M; however, they do not specify what regulations they would follow in order to operate the project in a fire-safe manner. Although much of the project facilities are situated below ground, the transmission line is above ground, and some project O&M activities would occur above ground. Implementing a fire prevention plan, as specified by Forest Service, would help prevent potential fires from spreading beyond project lands, and would aid county and agency personnel if a fire were to move beyond the project boundary.

Aesthetics

PCM project facilities would be located almost entirely underground, except for an existing transmission line. Water discharge facilities for the project would be inside the mine, and would utilize the existing penstock at the FERC exempt Discharge System Project. An existing access road on the private mine property would also be utilized for project purposes, but is not currently identified by PCM as a project facility. The project's surface facilities would be located within the boundary of the private PCM property. PCM proposed no aesthetic resources measures.

Our Analysis

Short-term visual and noise effects would be caused by construction traffic on Pine Creek Road, and on a private access road within the private mine site. The above-ground project construction, operation, and maintenance activities would be evident to the public, but would cause only minimal and temporary visual effects to aesthetic quality of the project area. Construction activities would be evident to the public for short durations of time, and only when construction activities would occur above-ground at the mine site, or as project vehicles travel on Pine Creek Road and the existing mine access road. Visual effects would result from construction, operation, and maintenance activities producing traffic and dust on roadways; however, these effects would be temporary and minor.

The project would utilize the existing above-ground transmission line, private mine access road, and the Discharge System Project's penstock that releases water from the mine into Morgan Creek. As a result, it is very unlikely the public would perceive any visual or auditory changes to the existing mine site. The concrete plug and penstock, and turbine generator, would be situated approximately 2,500 feet, and 2,400 feet, from the mouth of the adit, respectively, and would not be audibly and visibly evident to the public.

3.3.8 Cultural Resources

3.3.8.1 Affected Environment

Section 106 of the NHPA (Section 106) requires the Commission to take into account the effects of licensing a hydropower project on properties listed or eligible for listing in the National Register and allow the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment if any adverse effects on historic properties are identified within the project's APE.

Historic properties are defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. In this document, we also use the term "cultural resources" to include properties that have not been evaluated for eligibility for listing in the National Register. In most cases, cultural resources less than 50 years old are not considered eligible for the National Register. Cultural resources need enough internal contextual integrity to be considered historic properties. For example, dilapidated structures or heavily disturbed archaeological sites may not have enough contextual integrity to be considered eligible. Traditional cultural properties (TCPs) are a type of historic property eligible for listing in the National Register because of their association with cultural practices or beliefs of a living community that: (1) are rooted in that community's history or (2) are important in maintaining the continuing cultural identity of the community (Parker and King, 1998). Section 106 also requires that the Commission seek concurrence with the SHPO on any finding involving effects or no effects on historic properties. If TCPs have been identified, section 106 also requires that the Commission consult with interested Native American tribes that might attach religious or cultural significance to such properties.

If existing or potential adverse effects have been identified on historic properties, license applicants need to develop a HPMP to seek to avoid, reduce, or mitigate the effects. Potential effects that may be associated with a hydroelectric project include any project-related effects associated with construction, or the day-to-day operations and maintenance of the project after issuance of an original license.

3.3.8.1.1 Cultural Historic Overview[13]

Native American

The project area lies within the Owens River Basin and falls along the eastern escarpment of the Sierra Nevada Mountains. The eastern escarpment region produces a

[13] This summary was mostly adopted from Herbert, Trew, and Davis-King (2014, 2015). Reference sources can also be obtained from this document.

boundary between the Great Basin and Sierra Nevada physiographic provinces. The project area lies atop of Pine Creek Canyon near Mount Tom, along the confluence of Morgan and Pine Creeks.

Aboriginal occupation of the project area stems back thousands of years. Although archaeological sites are more numerous in the lower elevations along the Mono and Owens Valley, archaeological occupations around the project area have been dated as far back as 3,500 years before the present. Ethnographically, Native American inhabitants of the area were Numic speakers consisting of the Numu, or Northern Paiute. Prior to European contact, Northern Paiute groups (specifically those associated with the Owens Valley Paiute) were hunter-gatherers living in semi-sedentary base camps in the lower elevations and seasonally harvesting wild seed and root crops, as well as acorns from oak trees when available. When Euro-Americans entered the Owens Valley in the 1840s, Native American tribes were artificially irrigating wild crops. Hunting was more fortuitous, but when available, groups of men would pursue deer and mountain sheep.

The rugged terrain and lack of vegetation in the high elevations of the project area was not as suitable for human occupation as in the lower elevations at Owens Valley. However, its remoteness, high altitude, and natural beauty was appreciated as a spiritual area and considered a place of origin for the Northern Paiute in several creation myths that were recorded by ethnographers and known to this day among native peoples living in and around the area. One of the more well-known Northern Paiutes, George Brown (born around 1898) was very familiar with the Morgan and Pine Creek area, and was a muleskinner who hauled goods up and down the nearby canyons before roads were built for vehicular access.

Modern Indian tribes who have traditional ties to the project area include the Lone Pine Band Paiute-Shoshone Tribe, Fort Independence Community of Paiute Indians, Bridgeport Paiute Indian Colony of California, Bishop Paiute Tribe, Big Pine Band of the Owens Valley Shoshone Tribe, and the Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation.

Euro-American

Euro-American development in the project area is essentially synonymous with the inception and development of the Pine Creek Tungsten Mine. Tungsten had been discovered as a metal in the 18th century and was noted for its hardness, resistance to corrosion, and had high melting point of 3400 degrees centigrade. However, the metal was very brittle. It was not until the early 20th century that tungsten had gained any importance when it was used for wire and filament for light bulbs due to its high melting point. At the same time, tungsten became even more important for its use in projectiles for armaments due to its hardness and effectiveness in piercing armor.

Tungsten deposits in the Pine Creek area were originally discovered by a mineral surveyor (M.B. Sherwin) at 11,400 feet in 1916, but was mistaken as silver-lead deposits. Assays shortly thereafter, proved that the deposits were tungsten, and the claim was dropped. At the outbreak of World War I, tungsten became a highly sought after commodity for its military use, and California was one of the leading producers of the metal by the close of the war. Several mines had been established in Inyo County as early as 1916. Bishop, the county seat of Inyo County and about 10 miles northeast of the project area, was established in the second half of the 19th century, first as a trading, mining, and agricultural center along Bishop Creek, and later incorporated as the City of Bishop in 1903. As World War I raged in Europe, prospecting into the mountains west of Bishop intensified for the search of tungsten deposits, and the original 1916 claim at Pine Creek was reestablished and became a prominent place for a future mine site.

In 1918, the Pine Creek Tungsten Company was formed, and a road was graded up towards Mount Tom to the mine site where an adit tunnel (later referred to as the south ore body) was driven into the mountainside, supported with electric power lines coming out from Bishop Creek, water conveyances from the Morgan Lakes, and an onsite mill to crush and process the tungsten ore. At that time, the mill had a working capacity of processing 300 tons of ore a day, and was the highest operating mine in California at 11,300 feet. Due to the end of World War I, and with the imports of cheaper tungsten concentrates from abroad (mainly from China), the demands for domestically mined and produced tungsten dropped dramatically, and in 1919 the Pine Creek Tungsten Mining Company went bankrupt. The demands for locally obtainable tungsten increased over the following decade and in 1924 mining operations at Pine Creek began again under the new establishment of the Tungsten Products Company. Mining operations at Pine Creek were short-lived, however, as heavy snows in 1926 caused the mine to shut down, and in 1927, the Tungsten Products Company went into bankruptcy.

By the beginning of World War II, China had fallen under Japanese occupation restricting the import of cheaper tungsten to the United States. At the same time, demands for tungsten armaments rose significantly, along with its increased use in machinery parts, and by 1941, mining operations at Pine Creek were once again in full bloom. During this time, the mine was being run by the U.S. Vanadium Corporation. Construction of a chemical plant onsite for flotation also improved the yield of the tungsten metal from the ore, and at this time, the Pine Creek Tungsten Mine was the largest tungsten mine in the United States and contained the largest tungsten deposits in the world. With the end of World War II in 1945, mining operations at Pine Creek more or less ceased altogether, but again picked up by 70 percent in 1949, and went into full operation in 1951 due to the start of the Korean War a year earlier. By 1951, the Pine Creek Tungsten Mine facilities had been increased and enlarged, including an enlargement of the Zero Tunnel, expanding the mill and associated chemical plants, with the addition of a new crushing, conveying, and sampling plant.

Looking for increased manpower, U.S. Vanadium also hired members of the Shoshone and Paiute Indian tribes who lived in the area locally. It is noteworthy to mention that John Brown was one of the first Native Americans who rose to prominence in and around the Pine Creek area from the beginning and into the 1940s where he and his team of mules were critical for hauling supplies and equipment to the mines. He established Pine Creek Pack Outfit which became known as Brown's Camp, and was used for decades as an important base station for the mine. Brown sold the pack station in 1943. New housing developments, such Rovana Village, for the workers at the mine were also established near the mouth of Pine Creek. A decrease in stockpiling and demand for tungsten resulted in the Pine Creek Tungsten Mine being the only mining establishment in the Bishop area still in operation in 1957, and by 1958, the mine was only one of two remaining tungsten mines in the United States.

With the United States' involvement in Viet Nam in 1960, the mining and production of tungsten started again in earnest, and the Pine Creek Tungsten Mine was considered the largest and most stable operation in the region. The Easy-Go Adit/Tunnel was built at this time. With the end of the Viet Nam War in the 1970s, the Pine Creek Tungsten Mine began to decline once again. This time, it appeared that the vast tungsten ore deposits in the Pine Creek area had been exhausted, and the locations of new ore bodies in 1977 and 1983 failed to be successful. After the Viet Nam War, China also reestablished itself as a principal exporter of tungsten into the United States, and the need for tungsten mining and production in the United States collapsed as a result. After a period of starts and shutdowns, and changes in ownership, the Pine Creek Tungsten Mine reopened for a final time in 1988, and closed permanently in 1994.

3.3.8.1.2 Area of Potential Effects

Pursuant to section 106, the Commission must take into account whether any historic property could be affected by issuance of an original or new license within a project's APE. The APE is defined as the geographic area or areas that an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE for the proposed project encompasses all lands, project facilities and features within the FERC Project Boundary. The architectural APE includes the surface indications of the mining property that may be potentially affected by direct or indirect elements of the proposed project. The APE encompasses the original Pine Creek Tungsten Mine site located at an elevation of 11,300 feet; the mining village and original mill site near Morgan Lake; the switch back road and remains of the aerial tramway; Zero Portal, Easy-Go Adit; Mill Site; and tailing piles east of the main entrance down Pine Creek Canyon. The archeological APE encompasses the Easy-Go Adit Utility Portal, two staging areas, the flat that encompasses the former and extant mine buildings, and the transformer and substation features, and all areas that have the potential to be affected by construction and installation.

3.3.8.1.3 Cultural Resources Investigations

Archaeological Resources

A systematic pedestrian survey for archeological resources was done within the APE on October 19, 2013 by PCM's archaeological consultant, Shelly Davis-King (Herbert, Trew, and Davis-King 2014, 2015). As a result of the systematic investigations, no native terrain or archaeological resources were located within the APE. The absence of any archaeological remains in the APE is probably most attributed to intensive ground disturbing activities associated with the Pine Creek Tungsten Mine.

Traditional Cultural Resources

Davis-King also conducted TCP investigations with participating tribal representatives of the Bishop Paiute Tribe and Big Pine Paiute Tribe in October 2013 (Herbert, Trew, and Davis-King 2014, 2015). Tribal members from the Bishop Paiute Tribe and Big Pine Paiute Tribe also visited the Pine Creek Tungsten Mine in October 2013. There, tribal representatives reinforced the traditional and cultural importance of the Pine Creek canyon area, including the creation myths of the Paiute peoples having originated there, but acknowledged that intensive mining activities over the years have probably obliterated any signs of special areas or TCPs within the APE. Nevertheless, existing water falls associated with the creation myth can still be seen today up in the high mountains outside the proposed project's APE.

Historical Resources

The built environment associated with the Pine Creek Tungsten Mine was also intensively investigated and inventoried by PCM's architectural and historical consultants, Rand Herbert and Leslie Trew (Herbert, Trew, and Davis-King 2014, 2015). Of the 22 structures associated with the Pine Creek Tungsten Mine, 18 are still in existence (Figure 8). Although the Pine Creek Tungsten Mine was one of the more significant mines in California, and across the country, the mine site lacks integrity overall, as various structures were added, modified, removed, and rebuilt from the mine's beginnings on up into the 1980s. The historic mining landscape has been further compromised by the addition of six mine water discharge ponds built in 2005. However, a single building, the metals lab (Building No. 12) does retain enough of its original integrity as a historic structure that was built in 1941, and is considered eligible for the National Register. The California SHPO has also concurred with these findings (See SHPO letters[14] in Attachment A of PCM's revised license application).

[14] Filed to the Commission's public record on December 2, 2015.

3.3.8.2 Environmental Effects

PCM determined that the proposed project would have no adverse effect to historic properties (including Building No. 12), and their findings were submitted to the California SHPO for concurrence, whereupon, the California SHPO concurred (See SHPO letter, dated December 2, 1015 in Attachment A of PCM's revised license application). Both the Bishop Paiute Tribe and Big Pine Paiute Tribe, who participated in the cultural resources investigations, also expressed that they did not have any further comments or concerns on the proposed project as described (Herbert, Trew, and Davis-King 2014, 2015).

Forest Service's preliminary 4(e) condition 28 states that within one year after license issuance, the licensee shall file with the Commission a Forest Service-approved HPMP that has been tiered to a programmatic agreement (PA). Condition 28 also states that in the case of an inadvertent discovery of a cultural resource during ground disturbing activities involving project, all work shall cease within the affected area and the Forest Service shall be contacted.

Our Analysis

The proposed project would have no adverse effects to historic properties. With a finding of no adverse effect, there is no need to execute a PA or implement a HPMP (see 36 CFR 800.5(b) and (d) of the regulations implementing section 106 of the NHPA). Nevertheless, there is always a possibility that unknown archaeological resources may be discovered in the future as a result of the Project's construction, operation, or project-related activities. Consulting with the California SHPO, Forest Service, and involved Indian tribes in the event that a significant cultural resource is inadvertently discovered during project construction, operation, or maintenance activities would ensure that any adverse effects to it can be avoided, reduced, or mitigated.

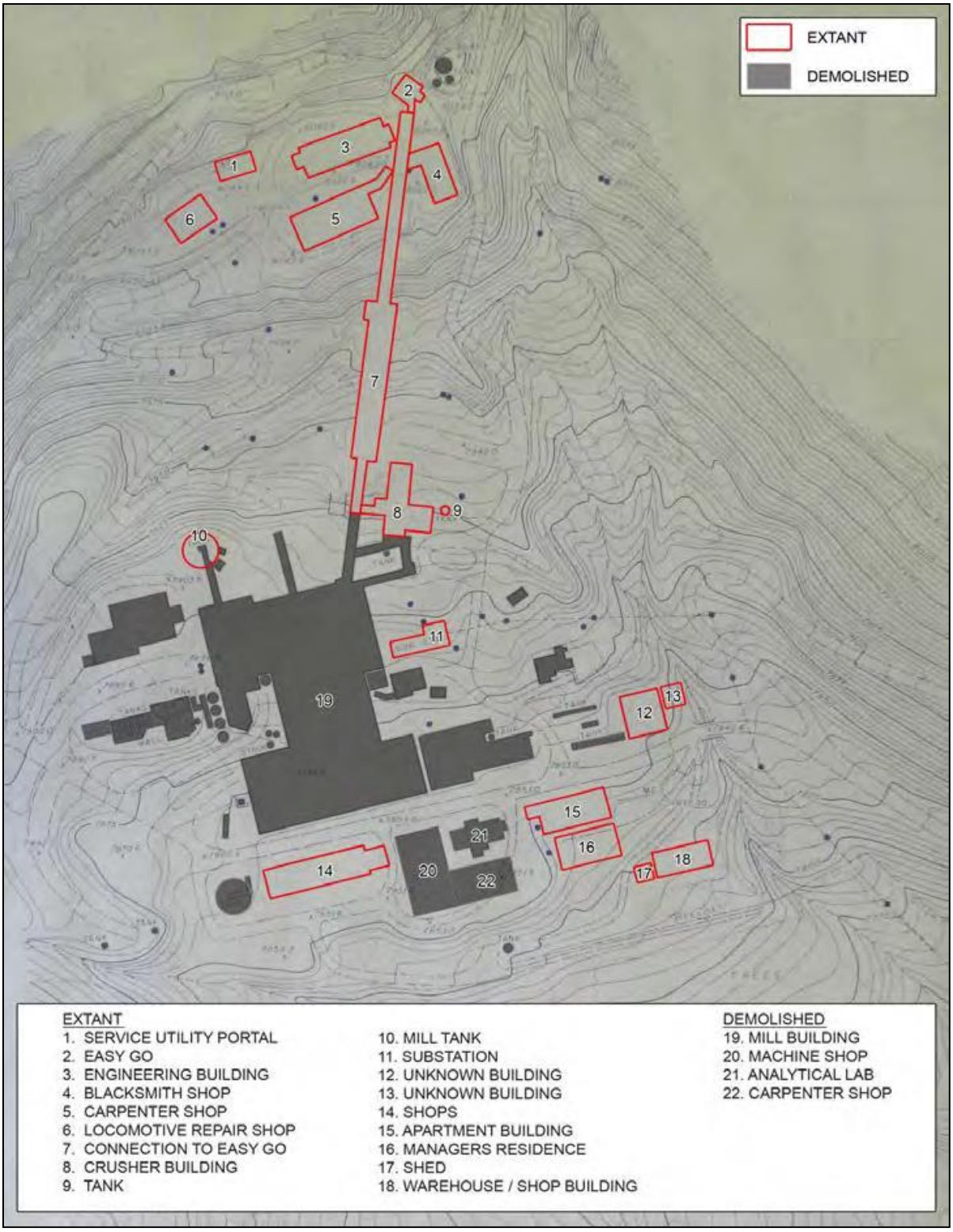

Figure 8. Mill site near Easy-Go showing extant and demolished buildings (Base map, "Pine Creek Mine, Inyo County, California, Property Map," no date; provided by PCM, adopted from Herbert, Trew, and Davis-King 2014).

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative (denial of the application), the Pine Creek Mine Project would not be constructed and would not generate an estimated average annual generation of 5,600 MWh. Under this alternative, environmental resources in the project area would not be affected, including any enhancement measures that were proposed as part of the license application and required by the Forest Service and Water Board.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the proposed project's use of the Pine Creek Mine for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation*,[15] the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corporation*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

[15] See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

Table 5 summarizes the assumptions and economic information we use in our analysis. This information, except as noted, was provided by PCM in its license application (PCM 2016). We find that the values provided by PCM are reasonable for the purposes of our analysis. Costs are provided in 2017 dollars unless otherwise noted.

Table 5. Parameters for the economic analysis of the proposed Pine Creek Mine Project (Source: PCM 2016, as modified by Staff).

Parameter	Value
Period of analysis (years)	30
Financing period (years)	20
Initial construction cost, $	$2,925,000
Operation and maintenance, $/year	$30,500
Energy plus capacity value ($/MWh)[b]	$57.80
Interest rate (%)	5.0
Discount rate (%)[a]	5.0

[a] Discount rate estimated by staff to be the same as the interest rate.

4.2 COMPARISON OF ALTERNATIVES

Table 6 summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and the difference between the cost of alternative power and total project cost for each of the action alternatives considered in this EA (PCM's proposal and the staff alternative).

Table 6. Summary of annual cost of alternative power and annual project cost for the action alternatives for the proposed Pine Creek Mine Project (Source: Staff).

	PCM's Proposal	Staff Alternative	Staff Alternative With Mandatory Conditions
Installed capacity (MW)	1.5	1.5	1.5
Annual generation (MWh)	5,600	5,600	5,600
Dependable capacity (MW)	0.7	0.7	0.7
Annual cost of alternative power ($)	$323,400	$323,400	$323,400
($/MWh)	57.8	57.8	57.8
Annual project cost ($)	$281,000	$282,200	$381,750
($/MWh)	50.2	50.4	68.2
Difference between the cost of alternative power and project cost ($)	$42,400	$41,200	-$58,350
($/MWh)	7.6	7.4	-10.4

4.2.1 No-action Alternative

Under the no-action alternative, the project would not be constructed.

4.2.2 Applicant's Proposal

Under PCM's proposal, the project would have an installed capacity of 1.5 MW, and generate an average of 5,600 MWh of electricity annually. The average annual cost of alternative power would be $323,400, or $57.8/MWh. The average annual project cost would be $281,000, or about $50.2/MWh. Overall, the project would produce power at a cost which is $42,400, or $7.6/MWh, less than the cost of alternative power during the first full year of project operations.

4.2.3 Staff Alternative

The staff alternative includes the same developmental features as PCM's proposal and therefore would have the same capacity and energy attributes. Table 7 shows the added staff-recommended environmental protection and enhancement measures and the estimated cost of each.

Based on an installed capacity of 1.5 MW and an average annual generation of 5,600 MWh, the cost of alternative power would be $323,400, or $57.8/MWh. The

annual project cost would be $282,200 or about $50.4/MWh. Overall, the project would produce power at a cost that is $41,200 or $7.4/MWh, less than the cost of alternative power.

4.2.3 Staff Alternative with Mandatory Conditions

The staff alternative with mandatory conditions includes the same developmental features as PCM's proposal and therefore would have the same capacity and energy attributes.

Based on an installed capacity of 1.5 MW and an average annual generation of 5,600 MWh, the cost of alternative power would be $323,400, or $57.8/MWh. The annual project cost would be $381,750 or about $68.2/MWh. Overall, the project would produce power at a cost that is -$58,350, or -$10.4/MWh, more than the cost of alternative power.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 7 gives the cost of each of the environmental enhancement measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 7. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of constructing and operating the proposed Pine Creek Mine Project (Source: staff).

Enhancement/Mitigation Measures	**Entity**	**Capital Cost (2017$)**	**Annual Cost (2017$)[a]**	**Levelized Annual Cost[b] (2017$)**
Geological and Soil Resources				
Monitor plug for seepage	PCM, staff	$2,000	$0	$130
Plug safety	Forest Service (condition 19)	$25,000 - $925,000 (assume at $925,000)	$0	$60,170
Erosion and sediment control measures	Water Board (condition 14), staff	$3,000	$0	$195
Develop BMP's to address: • Pre-washing all imported materials; contain and dispose of wash water • Construction materials and debris – disposal and surface water protection • Concrete and materials control measures • Washing of equipment and spill containment • Containment of hazardous materials away from waterways	Water Board (conditions 15-19), Forest Service (condition 25), staff	$10,000	$0	$650

Enhancement/Mitigation Measures	Entity	Capital Cost (2017$)	Annual Cost (2017$)[a]	Levelized Annual Cost[b] (2017$)
Aquatic Resources				
Minimum flow release and monitoring	Forest Service (condition 20)	NA	NA	NA
Water quality and temperature monitoring	Forest Service (condition 21)	$7,000	$17,000	$17,455
Groundwater study and monitoring	Forest Service (condition 22)	$160,000	$0	$10,410
Aquatic biology monitoring and management	Forest Service (condition 24)	$30,000 every 3 years then every 5	0$	$10,000
Initial fill plan	Water Board (condition 4), staff	$2,000	$0	$130
Water quality monitoring plan	PCM, staff	$5,000	$15,000	$15,325
Water quality monitoring plan	Water Board condition 5	$5,000	$75,000	$75,325
Pesticide Use Plan	Water Board (condition 7), staff	0$	$0	$0
Fish habitat assessment plan	Water Board (condition 8)	$20,000	$0	$1,300
Run of mine implementation and monitoring plan	staff	$10,000	0$	$650

Enhancement/Mitigation Measures	Entity	Capital Cost (2017$)	Annual Cost (2017$)[a]	Levelized Annual Cost[b] (2017$)
Terrestrial Resources				
Vegetation and invasive weed plan	Water Board (condition 10)	$4,000	$2,000	$2,260
Terrestrial biological management plan and mitigation measures	Forest Service (condition 23)	$8,000	$4,000	$4,520
Special-status species surveys	Forest Service (condition 23), California DFW	0$	$4,000	$4,000
Amphibian monitoring plan	Water Board (condition 9)	0$	$20,000	$20,000
Land Use and Aesthetics Resources				
Road and Transportation Facility Management Plan[c]	Forest Service (condition 26)	NA	NA	NA
Fire and Fuels Management Plan	Forest Service (condition 27)	$4,000	$0	$260

Enhancement/Mitigation Measures	Entity	Capital Cost (2017$)	Annual Cost (2017$)[a]	Levelized Annual Cost[b] (2017$)
Cultural Resources				
In the event that archeological resources are discovered, cease construction and notify Forest Service, California SHPO and involved Indian tribes and develop an HPMP if the resource is determined to be eligible for the National Register[d]	PCM, staff, and Forest Service (condition 28)	NA	NA	NA
Heritage Resources Management and Monitoring	Forest Service (condition 28)	NA	NA	NA

[a] Annual costs typically include operation and maintenance costs and any other costs which occur on a yearly basis.
[b] All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs. Where necessary, costs were escalated to 2017 dollars.
[c] Only road access is maintained by county.
[d] Zero cost assigned to this measure because it is contingent on the discovery of archeological resources.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for licensing the Pine Creek Mine Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on Commission staff's independent review of the environmental and economic effects of the proposed project and its alternatives, we selected PCM's proposal with certain Forest Service 4(e) conditions, Water Board WQC conditions, and certain staff-recommended modifications as the preferred alternative (the staff alternative). We recommend this alternative because: (1) issuance of an original hydropower license by the Commission would allow PCM to build and operate the project as an economically beneficial and dependable source of electrical energy; (2) the 1.5-MW of electric capacity comes from a renewable resource which does not contribute to atmospheric pollution; (3) the public benefits of this alternative would exceed those of the no-action alternative; and (4) the proposed and recommended measures would protect and enhance environmental resources affected by constructing, operating, and maintaining the project.

In the following section, we make recommendations as to which environmental measures proposed by PCM or recommended by agencies should be included in an original license issued for the project. We also recommend two additional staff-recommended environmental measures to be included in any original license issued for the project. In Appendix A, we provide draft license articles.

5.1.1 Measures Proposed by Applicant

Based on our environmental analysis of PCM's proposal in section 3, and the costs discussed in section 4, we recommend including the following environmental measures proposed by PCM that would protect environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

Geology and Soils

- Inspect the concrete plug after any earthquakes in the area of magnitude 5.0 or greater and to monitor the concrete plug for any leakage.

Aquatic Resources

Water Quantity

- Operate the project in run-of mine mode, whereby at any point in time, outflow from the project would approximate inflow to the project.

Water Quality

- Prepare a water quality protection plan with provisions for pollution and spill prevention and contaminant procedures for project construction, operation, and maintenance.

- Monitor select water quality parameters such as stream flow, temperature, and turbidity at certain locations and frequencies during construction and operation to identify any unforeseen adverse effects of project.

Cultural Resources

- Consult with the California SHPO, Forest Service, and involved Indian tribes if any previously unidentified cultural resources are discovered during the course of constructing, maintaining, or operating project works or other facilities and develop a historic properties management plan (HPMP), as needed.

5.1.2 Additional Staff-Recommended Measures

In addition to PCM's proposed measures listed above, we recommend including the additional staff-recommended measures in any license issued for the Pine Creek Mine Project:

- Implement construction-related best management practices specified in the Water Board's preliminary WQC conditions 13 – 19.

- Develop an initial fill plan that includes provisions for: (1) consultation with Forest Service, California DFW, and FWS on the timing of the initial fill of the project reservoir; (2) a minimum outflow during the initial fill, and any subsequent refill, of the reservoir; (3) a maximum outflow during any needed draining of the project reservoir; and (4) ramping rates for changes in downstream flow releases needed to fill or drain the reservoir.

- Develop a run-of-mine implementation and monitoring plan that documents how PCM would ensure compliance with a run-of-mine mode of operation.

- Develop an avian collision and electrocution hazards plan that includes provisions for monitoring, documenting, and reporting bird fatalities and injuries along the project's transmission line, as well as adherence to APLIC guidance for minimizing the potential for transmission lines to electrocute birds or cause injury associated with collisions.

- Define a project-specific schedule, in consultation with California DFW and FWS, to avoid construction during the Sierra Nevada bighorn sheep lambing period that on average, occurs from mid-April through July.

- Develop a hazardous substance management plan that includes provisions to prevent oil and other hazardous substance from negatively affecting terrestrial and aquatic resources.

- Develop a fire and fuels management plan that includes provisions for the prevention, reporting, and emergency response to fires in the vicinity of the project resulting from project operations.

The following section presents the basis for our recommend measures.

Construction-related Best Management Practices

Implementation of the Water Board's construction-related best management practices specified in preliminary WQC conditions 13 – 19, as discussed in section 3.3.1.2, *Geology and Soils, Environmental Effects*, would reduce environmental damage potentially resulting from the construction of the project at a minimal cost, and therefore, we recommend them.

Initial Fill Plan

The initial filling of the project reservoir would result in reduced inflows to the Discharge System Project and into Morgan Creek. The Water Board's preliminary WQC

condition 4 specifies that PCM develop and implement an initial fill plan that would document procedures to be followed during initial filling of the reservoir. As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, an initial fill plan would ensure that the temporary reduction in flows from the project needed for initial filling of the reservoir does not cause adverse environmental effects in either Morgan or Pine Creeks. As discussed in section 3.3.5.2, *Threatened and Endangered Species, Environmental Effects*, Water Board's condition also requires consultation with the Forest Service, California DFW, and FWS which would help identify the timing of the initial fill and associated flows to minimize potential effects on any federally endangered Yosemite toad and Sierra Nevada yellow-legged frog located downstream of the discharge into Morgan Creek and Pine Creek. Further, implementation of the plan following any maintenance of the project that required refilling of the reservoir would have similar benefits. Our modifications to the plan addressing provisions for ramping rates for filling and draining of the reservoir and maximum flows during reservoir draining would provide additional benefits by ensuring that aquatic organisms are not subject to potentially harmful fluctuations in water level or excessive water velocity. Development of this plan as described above would serve to ensure that downstream aquatic resources are protected during any filling or draining of the reservoir at an annualized cost of $2,000. We find that these benefits would be worth the cost, and therefore, recommend the plan as described above.

Run-of-Mine Implementation and Monitoring Plan

As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, a run-of-mine implementation and monitoring plan would assist the Commission in monitoring compliance with PCM's proposed run-of-mine operation. Therefore, we recommend the plan and conclude its compliance monitoring benefits are worth the cost, which is estimated to be $10,000.

Avian Collision and Electrocution Hazards Plan

Collisions and electrocutions at transmission lines represent a major source of bird mortality and injury. APLIC guidance provides a variety of potential measures for minimizing the potential for transmission lines to electrocute birds or cause injury associated with collisions. Preliminary 4(e) condition 23 stipulates that PCM develop and implement an avian collision and electrocution hazards plan. As discussed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, the development and implementation of an avian collision and electrocution hazards plan would ensure new transmission lines involved in any bird mortality or injury are designed with consideration to APLIC guidance, thereby protecting birds at the project.

Including provisions for monitoring, documenting, or reporting of bird fatalities and injuries would help to identify relevant sections of the transmission line in need of

repairs or replacements to prevent further occurrences. Monitoring during regular inspections and maintenance of project facilities should be sufficient for discovering injured or dead birds under or near the transmission line path. After discovery of an injured or dead bird, consultation with California DFW and the Forest Service would allow the inclusion of recommended mitigation in an annual report to the Commission, California DFW, and the Forest Service. This information would further serve to minimize risks to birds associated with the proposed project's transmission line and ensure appropriate repairs are made. The annualized cost of providing these benefits would be about $4,520. We find that the benefits are worth the cost, and recommend development of the plan as described above.

Construction Schedule for Sierra Nevada Bighorn Sheep

Though construction of the proposed project would be confined to a relatively small area over an estimated six-week period, construction-related disturbance and direct mortality and injury from increased vehicular traffic could negatively affect breeding Sierra Nevada bighorn sheep, a federally endangered species. As discussed in section 3.3.5.2, *Threatened and Endangered Species, Environmental Effects*, we recommend consulting with the California DFW and FWS to define a project-specific schedule between the general dates of mid-April through July to avoid construction to reduce any potential for effects on federally endangered Sierra Nevada bighorn sheep during the sensitive lambing period. Given the short construction time for the project and that most of work would be done inside the tunnel, the annualized cost of developing and implementing the schedule would not be significant and we find that the benefits are worth the cost, and recommend development of the plan as described above.

Hazardous Substance Management Plan

Storage, spill, and cleanup of oil and hazardous substances used in project operations and maintenance could adversely affect terrestrial and aquatic species through exposure causing direct mortality or injury, reduced survival and reproduction from contamination, and degradation or loss of habitat. As discussed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, the hazardous substance management plan stipulated by Forest Service preliminary 4(e) condition 25 would serve to prevent oil and other hazardous substance from negatively affecting terrestrial and aquatic resources. The annualized cost of the plan, which we include with the cost of other BMP's, would not be significant when compared to the benefits, therefore we recommend that PCM develop and implement the hazardous substance management plan as stipulated by the Forest Service.

Fire and Fuels Management Plan

Although much of the project facilities are situated below ground, the transmission line and private mine access road are above ground, and some project O&M activities would occur above ground. As discussed in section 3.3.7.2, *Land Use and Aesthetic Resources, Environmental Effects*, developing a fire and fuels management plan, as specified by the Forest Service, would help prevent potential fires from spreading beyond project lands, and would aid county and agency personnel if a fire were to move beyond the project boundary. We estimate that the plan would have a total annualized cost of $4,000. We find that the benefits of the plan would be worth the cost, and therefore, recommend the plan as described above.

5.1.3 Measures Not Recommended by Staff

Forest Service 4(e) Conditions

Condition No. 19 – Plug Safety

Forest Service preliminary 4(e) condition 19 requires PCM to prove to the satisfaction of the Forest Service that the existing plug is engineered and constructed so as to be capable of safely impounding water. Further, if the safety of the existing plug can't be proven, condition 19 requires that the existing plug be removed and a new plug designed and constructed by qualified personnel. Condition 19 also requires PCM to perform a standard seismic safety hazard evaluation and states the tunnel plug must be designed to withstand the maximum credible earthquake for the project area.

As discussed in section 3.3.1.2, a 2011 study by Sierra Geotechnical Services, Inc. (Sierra Geotechnical Services, Inc., 2011) evaluated the safety of the concrete tunnel plug, taking into account site geology, the hydrogeologic setting, faulting, site seismicity, secondary earthquake hazards, and plug construction. The report concluded that plug appears unlikely to fail in any catastrophic mode because it is adequate in length, the walls were well roughened, the stress in the rock is applied uniformly, and the tunnel walls in the area of the plug are tapered, putting much of the contact area into compression.

AS noted in section 2.2.2, the Commission would review the applicant's existing studies on the adequacy of the concrete plug as part of the licensing process and, as appropriate, include special safety articles in any license issued for the project. Therefore, we do not recommend Forest Service preliminary 4(e) condition 19.

Condition No. 20 – Minimum Streamflows and Gaging

Forest Service condition 20 specifies: 1) the development of minimum instream flow requirements; 2) subsequent release of the required minimum flows; and 3) installation, operation, and maintenance of two streamflow gages, one at the tunnel plug and the second on Pine Creek near Rovana, about 7 miles downstream of the project.[16] As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, given that the project would be operated in a run-of-mine mode, there is no project-related need for the measures stipulated by condition 20. Operation of the project in run-of-mine mode would mimic the natural flows currently emanating from the mine. Further, it would not be possible to release specific flow amounts, other than natural flows, under run-of-mine operation. Our recommendation for an initial fill plan would address minimum and maximum flows, as well as ramping rates, during any filling or draining of the reservoir. Other than the monitoring needed to achieve and document run-of-mine operation, streamflow gaging as described in Forest Service condition 20 would have no project-related purpose. Therefore, we do not recommend the measures stipulated by Forest Service preliminary 4(e) condition 20.

Condition No. 21 - Water Quality & Temperature Monitoring

Forest Service preliminary condition 21 requires PCM to develop, in conjunction with applicable agencies, a water quality and temperature monitoring plan that has been approved by the Forest Service. The plan would include monthly sampling for a total of over 50 water quality parameters at the mine outflow and three locations on Pine Creek for a minimum of a five years. The plan would also contain provisions for toxicity testing for freshwater organisms four weeks into the sampling. As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, previous water quality sampling has established that water quality exiting the mine, entering Morgan Creek, and in Pine Creek is of high quality and supportive of robust benthic macroinvertebrate and fish communities in Pine Creek. Development and implementation of the water quality monitoring plan proposed by PCM and stipulated by the Water Board (preliminary WQC condition 5), would serve to ensure and document that releases from the project protect water quality. Therefore, we do not recommend the extensive water quality sampling program detailed in Forest Service condition 21, because its benefits would not be worth its $17,455 levelized annual cost.

[16] We assume this condition refers to normal operation of the project. As we discuss in section 3.3.2.2, minimum flows during reservoir filling and maximum flows during any draining performed for maintenance purposes would protect aquatic resources and are addressed in the Water Board's condition 4, as modified by staff.

Condition No. 22 – Groundwater Study, Including Contaminant Testing

Forest Service preliminary 4(e) condition 22 requires PCM to study the long-term impacts to the groundwater aquifer, including impacts from periodically draining the underground reservoir and to identify impacts to groundwater quality from the long-term storage of water in the reservoir for heavy metals, radon, and other potential contaminants. The condition also requires an assessment of impacts to aquatic and terrestrial flora and fauna from modifying the groundwater aquifer. As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, and our April 2, 2012 Study Plan Determination, these studies would be repetitive with studies that PCM has already conducted or provided for the record, specifically HCI (1990) and SCSI (2012). Further, the hydrogeology of the area was substantially altered from its initial condition as a result of over 80 years of tungsten mining operations, which ended in 2000. Filling of the mine voids with water would benefit groundwater resources by restoring the water table to a more natural level. Extensive contaminant testing of water impounded in the mine was conducted by PCM in 2004 and reviewed by the Water Board. Analysis of over 100 parameters identified no problem constituents, and the concentrations of many tested contaminants were at or below the limits of detection. Given this history and the fact that the in-mine environment has not been altered, along with the high cost (about $160,000) for studies and sampling, we find that the benefits of the measures stipulated by Condition 22 would not be worth the cost, and do not recommend this measure.

Condition No. 23 – Terrestrial Biological Management and Monitoring Plan

The terrestrial biological management and monitoring plan required by Forest Service preliminary 4(e) condition 23 would include occupation and population monitoring and reporting of results, pre-construction and periodic post-licensing surveys, limited operating periods, annual consultation and review of special-status wildlife species that may occur on proposed project lands, and development and implementation of an avian collision and electrocution hazards plan. As discussed in section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, construction and operation of the proposed project would have minimal effects on terrestrial resources as most project facilities would be underground, no ground or vegetation disturbance is proposed on surface lands, and operations would not alter water quality or the timing and magnitude of flow releases to Morgan Creek and Pine Creek from that of current conditions.

Excluding the avian collision and electrocution hazards plan, which we recommend and discuss separately in section 5.1.2, *Additional Staff-recommended Measures*, the plan would provide minimal to no benefits for terrestrial resources, and is not needed. Furthermore, the plan does not indicate how the information would be used to identify project-related effects. Monitoring and surveys alone would not provide protection, mitigation, or habitat enhancement for wildlife species.

In section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, we've identified and assessed potential project effects on all terrestrial species known to occur at the project, including those that do and do not have a special status. Therefore, there is no project-related need for this measure. Should a new species appear at the project or a previously unforeseen adverse effects occur to a terrestrial resource, additional environmental measures as recommended by the appropriate state or federal fish and wildlife agencies could be considered through a standard fish and wildlife reopener provisions included in all Commission-issued license, and after notice and opportunity for hearing. This standard reopener provision retains authority for the Commission to implement any measures that may be needed to protect fish and wildlife resources over the term of any license issued for the project.

Therefore, we find that there is no project-related justification for recommending the measures included in Condition No. 23 outside of the avian collision and electrocution hazards plan, which we recommend and discuss separately in section 5.1.2, *Additional Staff-recommended Measures*.

Condition No 24 - Aquatic Biological Management and Monitoring

Forest Service preliminary 4(e) condition 24 stipulates the development and implementation of an aquatic biological management and monitoring plan. The plan would include provisions for assessment of fish and aquatic macroinvertebrate populations and community structure conducted every three years, initially, then every five years for the remainder if the license term. PCM's biological sampling, discussed in section 3.3.2.1, *Water Resources*, *Affected Environment*, showed healthy macroinvertebrate communities both upstream and downstream of the mine. Because project operation would not alter water quality or the timing and magnitude of flow releases to Morgan and Pine Creeks, there is no reason to expect any effects on fishery resources. Therefore, the benefits of conducting this study appear not worth its $10,000 annual cost.

Condition No. 26 – Road and Transportation Facility Management Plan

Forest Service preliminary 4(e) condition 26 requires PCM to develop a plan for the protection and maintenance of project and project-affected roads that are on, or affect, Forest Service lands. As discussed in section 3.3.7.2, *Land Use*, *Environmental Effects*, Pine Creek Road is a county maintained road, and its use by PCM would be minimal during construction and O&M activities. Construction and O&M activities are not expected to significantly increase the use of Pine Creek Road, nor is it expected to necessitate increased maintenance beyond what is currently conducted by the county. PCM would utilize an existing access road, within the private mine property, to reach the mouth of the adit where the subsurface project boundary begins. Therefore, we find that

the benefits to Forest Service lands is not worth the cost, and do not recommend implementation of the plan.

Condition No. 27 – Fire and Fuels Management Plan

Forest Service preliminary 4(e) condition 27 requires the reduction of fuels in and around developed and dispersed recreational sites. There are no existing recreational uses of the lands on which the project is proposed to be constructed, nor are any recreational facilities being proposed or recommended for construction as part of this project. Therefore, because there are no recreational facilities on the PCM property, or associated with the PCM project, we find that the estimated $260 annual cost of implementing this sub-condition would not provide a benefit to the project, and do not recommend implementation of this recreation-related sub-condition.

Condition No. 28 – Heritage Resources Management and Monitoring

Forest Service's preliminary 4(e) condition 28 would require that PCM, within one year after license issuance, file with the Commission a Forest Service-approved HPMP that has been tiered to a PA. Condition 28 also states that in the case of an inadvertent discovery of a cultural resource during ground disturbing activities involving the project, all work would cease within the affected area and the Forest Service would be contacted. As discussed in section 3.3.8.2, *Cultural Resources, Environmental Effects*, The proposed project would have no adverse effects to historic properties and the crafting of a PA and a HPMP is only necessitated when there has been a finding of an adverse effect to historic properties (see 36 CFR 800.6 of the regulations implementing section 106 of the NHPA). Therefore, we conclude that this part of condition no. 28 is not justified.

California State Water Resources Control Board WQC Conditions

Condition 1 – Ramping Rates

The Water Board's preliminary WQC condition 1 states that to prevent potentially adverse effects of rapid changes in regulated streamflow that are inconsistent with the natural rate of change in streamflow, project operations would likely be subject to ramping rates to be specified at a later date. It defines ramping rates as the rate of change in stream stage height, up or down, over a given time period.

As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, normal operation of the project in a run-of-mine mode of operation would not change the timing and quantity of water being discharged from the mine under existing conditions. Because operation of the project would not alter the flow of water through the mine, no ramping would occur and the development of ramping rates as specified in Water Board condition 1 would appear to serve no project-related purpose and we do not recommend

it. However, as noted in section 5.1.2, *Additional Staff-recommended Measures,*, we do recommend that ramping rates be developed as part of the initial fill plan to address changes in flow releases related to the filling and drawdown of the project reservoir.

Condition 3 – Consultation and Review

Water Board preliminary WQC condition 3 would require PCM to consult annually with relevant resource agencies to review current lists of rare, threatened, and endangered species and special-status plant and wildlife species to identify species that have the potential to be adversely impacted by the project. Species-specific study plans would be developed or updated, in consultation with relevant resource agencies, whenever new potential impacts or newly listed species are identified.

In section 3.3.4.2, *Terrestrial Resources, Environmental Effects*, we've identified and assessed potential project effects on all terrestrial species known to occur at the project, including those that do and do not have a special status. Therefore, there is no project-related need for this measure. Should a new species appear at the project or a previously unforeseen adverse effect occur to a terrestrial resource, additional environmental measures as recommended by the appropriate state or federal fish and wildlife agencies could be considered through the standard fish and wildlife reopener provisions included in all Commission-issued license, and after notice and opportunity for hearing. This standard reopener provision retains authority for the Commission to implement any measures that may be needed to protect fish and wildlife resources over the term of any license issued for the project. Therefore, we find that there is no project-related justification for recommending the measures included in Condition No. 23 outside of the avian collision and electrocution hazards plan, which we recommend and discuss separately in section 5.1.2, *Additional Staff-recommended Measures*.

Condition 5 -- Water Quality Monitoring Plan

Water Board preliminary condition 5 requires PCM to develop, in conjunction with applicable agencies, a water quality monitoring plan. The plan would include monthly sampling at multiple locations developed through consultation with the Water Board and other relevant agencies. Some sampling would be conducted daily during initial filling of the reservoir, then once per month for the duration of the license term. Sampling for the over 100 constituents conducted in 2004 during draining of the mine would be conducted one month after initial filling of the reservoir, then once yearly for the remainder of the license.

As discussed in section 3.3.2.2, *Water Resources, Environmental Effects*, previous water quality sampling has established that the quality of water exiting the mine, entering Morgan Creek, and in Pine Creek is of high quality and supportive of robust benthic macroinvertebrate and fish communities in Pine Creek. Development and

implementation of the water quality monitoring plan proposed by PCM, in consultation with the Water Board, would be adequate to ensure and document that releases from the project protect water quality. Therefore, we do not recommend the extensive water quality sampling program detailed in Water Board condition 5. Any incremental benefits over those provided by PCM's proposed water would not be worth the additional estimated $75,325 annual cost.

Condition 8 – Fish Habitat Assessment Plan

Water Board preliminary WQC condition 8 would require PCM to develop, in consultation with the agencies, and implement a fish habitat assessment plan. The plan would include monitoring of habitat features (such as water temperature, stream depth, flow velocities, water quality, sediment transport, etc.) associated with resident fish populations and special status fish species potentially found within the Project area. However, as discussed in section 3.3.3.2, *Fisheries Resources, Environmental Effects*, because project operation would not alter water quality or the timing and magnitude of flow releases to Morgan and Pine Creeks, there is no reason to expect any effects on fishery resources, and therefore, no project-related justification for the plan. Therefore, we do not recommend it.

Condition 9 – Amphibian Monitoring Plan

Water Board preliminary WQC condition 9 would require PCM to develop and implement a plan in consultation with relevant resource agencies that includes monitoring for all life stages of California red-legged frog, foothill yellow-legged frogs, and Cascades frogs on Pine Creek. Annual reports would be provided to relevant resource agencies and include monitoring data, analysis and evaluation of frog populations, and recommended actions based on amphibian population changes. However, these three frog species do not occur in the vicinity of the proposed project and therefore, would not be affected by the proposed project. As such, there is no project-related justification for this measure, and we do not recommend it.

Condition 10 – Vegetation and Invasive Weed Plan

Water Board preliminary WQC condition 10 would require PCM to develop and implement a vegetation and invasive weed plan in consultation with relevant resource agencies that addresses both aquatic and terrestrial non-native, invasive weeds and plant species of special concern, within and adjacent to the project boundary. The plan would include provisions for special-status plant species to be protected and an adaptive management component to reduce existing occurrences and prevent the spread of non-native invasive aquatic weeds.

Given the subterranean design of the proposed project and that water from the mine does not surface until just before it is discharged into Morgan Creek, there are no project-related activities that would introduce or spread non-native aquatic plant species. Construction and operation of the proposed project does not include any activities involving ground or vegetation disturbance on surface lands that would allow weed species to become established and/or spread into ground-disturbed areas. Pre-washing construction equipment prior to arrival to the proposed project site, as stipulated by preliminary WQC condition 18 and recommended by staff above, would remove attached plant propagules, minimizing the potential for their introduction.

Other than a small number of non-native wooly mullein along Pine Creek Road, no other non-native aquatic or terrestrial plant species were found during surveys. Traffic along Pine Creek Road is not expected to change from current levels during proposed operation and the minimal increases in vehicular traffic along the road during project construction would be unlikely to cause wooly mullein to spread further.

No special-status plant species were found during surveys, however if present, no proposed project-related activities would be expected to adversely affect special-status plants.

Therefore, we find the proposed project has minimal potential for introducing or spreading non-native plant species into native vegetation communities or adversely affecting special-status plant species, and therefore, there is no project-related justification for the plan and we do not recommend it.

California Department of Fish and Wildlife

Construction Schedule to Avoid Nesting Birds

California DFW recommends that all construction activities be scheduled to avoid the nesting season for all bird species present or potentially occurring in the proposed project area, but provides no specific dates. If the nesting season cannot be avoided, they recommend that a qualified, and California DFW approved, biologist survey all potential habitat for nests within the proposed project area using current agency protocols.

As discussed in section 3.3.4.2, *Terrestrial Resources*, *Environmental Effects*, construction activities outside of the mine tunnel would be limited to staging of equipment/materials and upgrades to the substations would occur. Disturbance caused by noise and movement from these activities is expected to be minor. Pre-assembling equipment offsite and lodging construction personnel at the mine property, as proposed by PCM, would reduce additional sources of disturbance caused by assembly and commuting vehicles. As such, the intensity and duration of potential noise and activity

should be of low magnitude and result in only brief and minor disruption of birds nesting in the immediate area.

In addition, within the 3-acre area where staging and upgrades would occur only marginal breeding habitat for bird species exists. No ground or vegetation disturbance is proposed that could affect breeding birds through loss or degradation of habitat.

Therefore, we conclude that there is no justification for adjusting the construction schedule to avoid the nesting season for birds as recommended by California DFW and do not recommend it.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Construction of the project would preclude any future extraction of minerals located in the flooded sections of the Pine Creek Mine. Minor disturbance to wildlife species caused by noise and movement from increased human, equipment, and vehicular activity would occur as a result of construction activities occurring outside of the mine tunnel. As discussed in section 3.3.4.3, *Terrestrial Resources, Environmental Effects*, a small number of bats (less than 10 individuals) were potentially using the mine tunnel that could also be disturbed during construction and operation.

5.3 SUMMARY OF SECTION 10(j) RECOMMENDATIONS AND 4(e)

5.3.1 California Fish and Wildlife 10(j) Recommendations

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. Environmental recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document.

In response to our September 27, 2016 notice accepting the application to license the project and soliciting motions to intervene, protests, comments, recommendations, preliminary terms and conditions, and preliminary fishway prescriptions, California DFW timely filed three recommendations pursuant to section 10(j) of the FPA. Of the three recommendations filed pursuant to section 10(j), we found one of the recommendations

to be within the scope of section 10(j). The remaining two recommendations that we consider outside the scope of section 10(j) are considered under section 10(a) and addressed in specific resource sections of this document and the previous section.

California DFW recommends that PCM release unspecified minimum flows. Because California DFW does not specify what the minimum flows should be, it is not a specific measure for the protection of fish and wildlife resources and does not fall within the scope of section 10(j).

California DFW recommends that PCM operate the project to maintain an unspecified seasonal hydrograph variation. Because California DFW does not specify what the seasonal hydrograph variation should be, it is not a specific measure for the protection of fish and wildlife resources and does not fall within the scope of section 10(j).

California DFW also recommends the construction schedule for the proposed project avoid the nesting season for all bird species that are present or have the potential to be present within the proposed project site, or, if the nesting seasons cannot be avoided, survey all potential nesting areas within the proposed project site for nesting birds using current California DFW or FWS protocols. Because California DFW does not specify the time period during which construction should be restricted, it is not a specific measure for the protection of wildlife resources. In addition, surveying for potential nesting areas is a study that could be conducted prior to license issuance. For these reasons, this recommendation does not fall within the scope of section 10(j).

5.3.2 Land Management Agencies' Section 4(e) Conditions

We discuss the preliminary 4(e) conditions submitted by the Forest Service in the following subsection. We note that section 4(e) of the FPA provides that any license issued by the Commission "for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation." Thus, any 4(e) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative.

5.3.2.1 Forest Service's Section 4(e) Conditions

In section 2.2.5, *Modifications to Applicant's Proposal—Mandatory Conditions*, we list the 4(e) conditions submitted by the Forest Service, and note that section 4(e) of the FPA provides that any license issued by the Commission "for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection

and use of the reservation." Thus, any 4(e) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative.

Of the Forest Service's 29 preliminary conditions, we consider 19 of the conditions (conditions 1 – 18, and 29) to be administrative or legal in nature and not specific environmental measures. We therefore, do not analyze these conditions in this EA. Table 8 summarizes our conclusions with respect to the 10 remaining preliminary 4(e) conditions that we consider to be environmental measures. We include in the Staff Alternative one condition in part with modifications and two conditions in part as specified by Forest Service, and did not recommend six conditions. The measures not adopted, are discussed in more detail above in section 5.1.3, *Measures Not Recommended by Staff*.

Table 8. Forest Service (FS) preliminary section 4(e) for the proposed Pine Creek Mine Project (Source: Staff).

Agency and Condition No.	**Annualized Cost**	**Adopted in staff alternative?**
FS 19 – Concrete Plug Safety	$60,170	No, studies already conducted. However, the safety of the concrete plug will be re-assessed by the Commission's Division of Dam Safety and Inspections.
FS 20 – Minimum streamflow and gaging	NA	No, because the project will operate in run-of-mine mode and thus not alter releases to Morgan Creek, there is no need to monitor streamflow. We recommend a plan to ensure run-of-mine operation.
FS 21 – Water quality monitoring with provisions to monitor over 100 water quality parameters	$17,455	No, we recommend water quality monitoring plan that provides for monitoring only those water quality parameters that could be affected by the project.
FS 22 – Groundwater study and contaminant testing	$10,410	No, groundwater has already been studied and extensive testing of impounded water was conducted in 2004 and did not reveal significant contamination.

Agency and Condition No.	**Annualized Cost**	**Adopted in staff alternative?**
FS 23 – Terrestrial biology management and measurement	$4,520	Partially. Our reason for not adopting the remaining parts of the condition is discussed in more detail in section 5.1.3 *Measures Not Recommended by Staff*.
FS 24 – Aquatic biology management and monitoring plan	$10,000	No, because the quantity, timing, and quality of flow releases don't change, there is no reason to expect any changes in aquatic biota.
FS 25 – Hazardous substance management plan	NA	Yes.
FS 26 – Road and transportation facility management plan		No, because the location of the project access road within the private PCM boundary, and minimal amount of use as a project road, would provide minimal to no benefits for Forest Service lands and resources.
FS 27 – Fire and fuels management plan	$260	Partially. Our reason for not adopting a portion of this condition (reducing fuels in and around recreation sites) is discussed in more detail in section 5.1.3 *Measures Not Recommended by Staff*.

Agency and Condition No.	Annualized Cost	Adopted in staff alternative?
FS 28 – Heritage resources management and monitoring plan	NA	Partially. Our reason for not adopting a portion of this condition (crafting and implementation of a PA and associated HPMP) is discussed in more detail in section 5.1.3 *Measures Not Recommended by Staff*.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C.§ 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 12 comprehensive plans that are applicable to the Pine Creek Mine Project, located in California (Appendix D). No inconsistencies were found.

6.0 FINDING OF NO SIGNIFICANT IMPACT

On the basis of our independent analysis, we find that the issuance of a license for the Pine Creek Mine Project, with our recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

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APPENDIX A – LICENSE CONDITIONS RECOMMENDED BY STAFF

On September 26, 2016, the California Department of Water Resources (Water Board) timely issued the section 401 water quality certification (WQC) containing 36 preliminary WQC conditions (Appendix C). On September 30, 2016, the U.S. Forest Service (Forest Service) filed preliminary 4(e) conditions containing 28 conditions and on November 29, 2017, Forest Service filed one additional preliminary condition as an addendum (Appendix B).

I. MANDATORY CONDITIONS RECOMMENDED BY COMMISSION STAFF

We recommend including the measures stipulated by the following mandatory conditions in any license issued for the project:

> Forest Service's Conditions Nos. 23 (in part), 25, 26, 27 (in part), and 28 (in part).
>
> Water Board's Condition Nos. 4, 5, 7, 13, 14, 15, 16, 17, 18, and 19.

Although we do not recommend the measures stipulated by the Forest Service's conditions nos. 19, 20, 21, 22 and 24 and Water Board's conditions nos. 1, 8, 9, 10 we recognize that any valid mandatory conditions must be included in any license issued for the project.

II. ADDITIONS TO MANDATORY CONDITIONS RECOMMENDED BY COMMISSION STAFF

We recommend following additions to the Water Board's condition 4. This condition would require PCM to develop and implement a plan that would maintain sufficient downstream releases during initial filling of the project reservoir to maintain aquatic habitat downstream in Morgan and Pine Creeks. We add to this condition that the initial fill plan be implemented each time the reservoir is filled, such as after it has been drained for maintenance or other purposes.

III. ADDITIONAL LICENSE ARTICLES RECOMMENDED BY COMMISSION STAFF

We recommend including the following additional license articles in any license issued for the project:

Article 4XX. Commission Approval, Notification, and Filing of Amendments.

(a) Requirement to File Plans for Commission Approval

Various conditions of this license found in the U. S. Forest Service's (Forest Service's) final section 4(e) conditions (Appendix A) and the State Water Resources Control Board's (Water Board) final section 401 Water Quality Certification (WQC) conditions (Appendix B) require the licensee to prepare plans in consultation with other entities for approval by the Forest Service or Water Board for submittal to the Commission and implement specific measures without prior Commission approval. Each such plan must also be submitted to the Commission for approval. The following table indicates the agencies that the licensee must consult before preparing the plans along with the deadline for filing the plans with the Commission for approval.

The following 4(e) conditions and 401 WQC conditions must be applied to all lands within the project boundary, as needed: hazardous substances plan (condition 7); fire prevention and response (condition 9); safety during construction plans (condition 13); pesticide use restrictions (condition 14); erosion control plan (condition 15);

WQC Condition No.	Forest Service Condition No.	Plan Name	Due Date
4		Initial Fill Plan	60 days prior to the initial fill of the reservoir
5		Water Quality Monitoring Plan	within 6 months of license issuance
7		Pesticide Use Plan	within 6 months of license issuance
8		Fish Habitat Assessment Plan	within 6 months of license issuance
9		Amphibian Monitoring Plan	within 6 months of license issuance
10		Vegetation and Invasive Species Monitoring Plan	within 6 months of license issuance
	21	Water Quality and Temperature Monitoring Plan	within one year of license issuance
	23	Terrestrial Biological Management and Monitoring Plan	within one year of license issuance
	23	Avian Collision and Electrocution Hazards Plan	within one year of license issuance
	24	Aquatic Biological Management and Monitoring Plan	within one year of license issuance
	25	Hazardous Substance Management Plan	within one year of license issuance, and at least 60 days before land-disturbing activities

	26	Road and Transportation Facility Management Plan	within one year of license issuance
	27	Fire and Fuels Management Plan	within one year of license issuance
	28	Heritage Resources Management and Monitoring Plan	within one year of license issuance

The licensee must include with each plan filed with the Commission documentation that the licensee developed the plan consultation with the U.S. Fish and Wildlife Service and has received approval from the Water Board and Forest Service, as appropriate. The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan or changes in project operations or facilities, including any changes required by the Commission.

(b) Requirement to File Reports

Certain conditions of the Water Board's WQC and Forest Service's section 4(e) conditions require the licensee to file reports with other entities. Because these reports relate to compliance with the requirements of this license, each such report must also be submitted to the Commission. These reports are listed in the following table:

WQC Condition No.	Forest Service Condition No.	Description	Due date
9		Annual Report for Amphibian Monitoring Plan	January 31 following each year of monitoring
	21	Annual Report for Water Quality and Temperature Monitoring Plan	January 31 following each year of monitoring
	23	Report on Special-status Species Surveys for Terrestrial Biological Management and Monitoring Plan	As needed
	24	Report on Aquatic Biological Management and Monitoring Plan	As each sampling effort is completed
	24	Report on Special-status Species Surveys for Aquatic Biological Management and Monitoring Plan	As needed

The licensee must submit to the Commission documentation of any consultation, and copies of any comments and recommendations made by any consulted entity in connection with each report. The Commission reserves the right to require changes to project operations or facilities based on the information contained in the report and any other available information.

(c) Requirement to Notify Commission of Planned and Unplanned Deviations from License Requirements

The licensee may deviate from the mandatory conditions related to operations for short periods of time without prior Commission approval after concurrence from the conditioning agency/agencies. The licensee must file a report with the Secretary of the Commission as soon as possible, but no later than two weeks after the onset of the deviation. Each report must include: (1) the reasons for the deviation and whether operations were modified, (2) the duration and magnitude of the deviation, (3) any environmental effects, and (4) documentation of approval from the conditioning

agency/agencies. For deviations from the mandatory conditions exceeding short periods of time, the licensee must file an application and receive Commission approval prior to implementation.

(d) Requirement to File Amendment Applications.

WQC condition 24 contemplate long-term unspecified changes to project operations or facilities for the purpose of coordinating the operations of this project and other hydrologically-connected water development projects. These changes may not be implemented until the licensee has filed an application to amend the license and the Commission has approved the application. In any amendment request, the licensee must identify related project requirements and request corresponding amendments or extensions of time as needed to maintain consistency among requirements.

Article 4XX. *Run-of-Mine Operation*. The licensee must operate the project in a run-of-mine mode. In doing so, the licensee must at all times act to minimize the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that all outflows approximate the sum of inflows to the project on a near instantaneous basis.

Run-of-mine operations may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods, up to 3 weeks, after mutual agreement among the licensee, Forest Service, Water Board, and California Department of Fish and Wildlife. After concurrence from the agency/agencies, the licensee must file a report with the Secretary of the Commission as soon as possible, but no later than 14 calendar days after the onset of the planned deviation. Each report must include: (1) the reasons for the deviation and whether operations were modified, (2) the duration and magnitude of the deviation, (3) any observed or reported environmental effects, and (4) documentation of consultation with the agency/agencies. For planned deviations exceeding 3 weeks, the licensee must file an application for a temporary amendment of minimum flow releases, and receive Commission approval prior to implementation.

If the licensee deviates from the run-of-mine requirement, the licensee must report each incident to the Secretary of the Commission. For any deviation that lasts longer than 3 hours or results in environmental effects, the licensee must file a report as soon as possible, but no later than 14 calendar days after each such incident. The report must include (1) the cause of the event, (2) the duration and magnitude of the deviation, (3) any pertinent operational and/or monitoring data, (4) a timeline of the incident and the licensee's response, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, (6) documentation of any observed or reported environmental effects, and (7) a description of measures implemented to prevent similar deviations in the future.

For deviations lasting 3 hours or less that do not result in environment effects, the licensee must file an annual report, describing each incident up to 1 month prior to the reporting date, including: (1) the cause of the event, (2) the duration and magnitude of the deviation, (3) any pertinent operational and/or monitoring data, (4) a timeline of the incident and the licensee's response, (5) any comments or correspondence received from the resource agencies, or confirmation that no comments were received from the resource agencies, and (6) a description of measures implemented to prevent similar deviations in the future. Any deviations that occur within the month prior to the reporting date should be included in the following year's report.

Article 4XX. *Run-of-Mine Implementation and Monitoring Plan.* Within 6 months of the effective date of this license, the licensee must file with the Commission, for approval, a Run-of-Mine Implementation and Monitoring Plan for the project. The plan must include, but not necessarily be limited to, the following:

(1) a provision to monitor compliance with operating the project in a run-of-mine mode;

(2) a description of the steps the licensee will take to ensure run-of-mine operation continues during planned and emergency shutdowns;

(3) a description of all gages or recording devices that will be used to monitor operation compliance, including the method of calibration of each gage and/or measuring device, and the frequency of recording;

(4) a provision to maintain a log of project operation;

(5) a provision for reporting any deviations during normal operation and in the event of an emergency, along with proposed actions that will be taken to avoid reoccurrence of the deviation; and

(6) an implementation schedule.

The licensee must prepare the plan after consultation with the Forest Service, Water Board, and California Department of Fish and Wildlife. The licensee must include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Project operation must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Article 4XX. *Water Quality Protection Plan.* Within 6 months of the effective date of this license, the licensee must file, for Commission approval, a water quality protection plan, with provisions consistent the pesticide use plan required by the California State Water Resource Control Board's (Water Board) water quality certification condition 7. The plan must also include the following additional measures:

(1) procedures to prevent stormwater pollution prevention during project construction, operation, and maintenance activities; and

(2) procedures to prevent and contain the spill of contaminants during project construction, operation, and maintenance.

The licensee must prepare the plan after consultation with the Forest Service, Water Board, and California Department of Fish and Wildlife. The licensee must include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Project operation must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Article 4XX. *Initial Flow Plan.* Within 6 months of the effective date of this license, the licensee must file, for Commission approval, an initial fill plan, consistent with California State Water Resource Control Board's (Water Board) water quality certification condition 4. The plan must also include the following additional measures:

(1) a provision for a minimum flow release during refilling of the project reservoir after any maintenance drawdowns;

(2) a provision for a maximum flow release during draining of the project reservoir for any maintenance drawdowns; and

(3) a provision for ramping rates for changes in downstream flow releases needed to fill or drain the project reservoir.

The licensee must prepare the plan after consultation with the Forest Service, Water Board, and California Department of Fish and Wildlife. The licensee must include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Project operation must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Article 4XX. *Avian Collision and Electrocution Hazards Plan.* Within 6 months of the effective date of this license, the licensee must file, for Commission approval, an avian collision and electrocution hazards plan, consistent with U.S. Forest Service's (Forest Service) 4(e) condition 23. The plan must also include the following additional measure:

(1) provisions for monitoring, documenting, and reporting bird fatalities and injuries along the project transmission line.

The licensee must prepare the plan after consultation with the Forest Service, Water Board, and California Department of Fish and Wildlife. The licensee must include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Project operation must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Article 4XX. *Timing of Construction.* To protect federally endangered Sierra Nevada bighorn sheep during the sensitive lambing period. In consultation with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service, the licensee must select a mutually agreed upon time period when no construction would occur during the lambing period for Sierra Nevada bighorn sheep (on average, mid-April through July).

Construction may only occur during the time period upon mutual agreement among the licensee, the California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service. The licensee must provide the Commission documentation of mutual agreement with these agencies prior to commencing any construction during the selected time period.

Article 4XX. *Protection of Undiscovered Cultural Resources.* If the licensee discovers previously unidentified cultural resources during the course of constructing, maintaining, or developing project works or other facilities at the project, the licensee must stop all land-clearing and land-disturbing activities in the vicinity of the resource and consult with the California SHPO, Forest Service, Lone Pine Band Paiute-Shoshone Tribe, Fort Independence Community of Paiute Indians Bridgeport Paiute Indian Colony of California Bishop Paiute Tribe, Big Pine Band of the Owens Valley Shoshone Tribe, and the Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation to determine the need for any cultural resource studies or measures. If no studies or measures are needed, the licensee must file with the Commission documentation of its consultation with the California SHPO, Forest Service, Lone Pine Band Paiute-Shoshone Tribe, Fort Independence Community of Paiute Indians Bridgeport Paiute Indian Colony of California Bishop Paiute Tribe, Big Pine Band of the Owens Valley Shoshone Tribe, and the Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation immediately.

If a discovered cultural resource is determined to be eligible for the National Register of Historic Places (National Register), the licensee must file for Commission approval a historic properties management plan (HPMP) prepared by a qualified cultural resource specialist after consultation with the California SHPO, Forest Service, and involved Indian Tribes. In developing the HPMP, the licensee must use the Advisory Council on Historic Preservation and the Federal Energy Regulatory Commission's Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, dated May 20, 2002. The HPMP must include the following items: (1) a description of each discovered property, indicating whether it is listed in or eligible to be listed in the National Register; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding, reducing, or mitigating adverse effects; (4) documentation of consultation; and (5) a schedule for implementing mitigation and conducting additional studies. The Commission reserves the right to require changes to the HPMP.

The licensee must not resume land-clearing or land-disturbing activities in the vicinity of a cultural resource discovered during construction, until informed by the Commission that the requirements of this article have been fulfilled.

Article 4XX. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the

licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file with the Commission a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project lands or waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

APPENDIX B – USDA FOREST SERVICE FEDERAL POWER ACT PRELIMINARY SECTION 4(e) TERMS AND CONDITIONS

Date filed: September 30, 2016

Pine Creek Mine Project
FERC Project No. 12532

PRELIMINARY LICENSE TERMS AND CONDITIONS
NECESSARY FOR THE PROTECTION AND UTILIZATION OF THE
INYO NATIONAL FOREST IN CONNECTION WITH THE
PINE CREEK MINE TUNNEL HYDROELECTRIC PROJECT, FERC NO. 12532
PINE CREEK MINE, LLC

I. GENERAL

The Forest Service (FS) provides the following Preliminary Section 4(e) conditions for the Pine Creek Mine Tunnel Hydroelectric Project, FERC No. 12532 in accordance with 18 CFR 4.34(b)(1)(i). Section 4(e) of the Federal Power Act (FPA), which states the Commission may issue a license for a Project within a reservation only if it finds that the license will not interfere or be inconsistent with the purpose for which such reservation was created or acquired. This is an independent threshold determination made by FERC, with the purpose of the reservation defined by the authorizing legislation or proclamation (see Rainsong v. FERC, 106 F.3d 269 (9th Cir. 1977). The Forest Service, for its protection and utilization determination under Section 4(e) of the FPA may rely on broader purposes than those contained in the original authorizing statutes and proclamations in prescribing conditions (see Southern California Edison v. FERC, 116F.3d 507 (D.C. Cir. 1997)).

The following terms and conditions are based on those resource and management requirements enumerated in the Organic Administration Act of 1897 (30 Stat. 11), the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215), the National Forest Management Act of 1976 (90 Stat. 2949), and any other law specifically establishing a unit of the National Forest System (NFS) or prescribing the management thereof (such as the Wilderness Act or the Wild and Scenic Rivers Act), as such laws may be amended from time to time, and as implemented by regulations and approved Land and Resource Management Plans prepared in accordance with the National Forest Management Act. Specifically, the 4(e) conditions in this document are based on the Land and Resource Management Plan (as amended) for the Inyo National Forest, as approved in 1988 by the Regional Forester of the Pacific Southwest Region.

Pursuant to Section 4(e) of the Federal Power Act, the Secretary of Agriculture, acting by and through the Forest Service, considers the following conditions necessary for the adequate protection and utilization of the land and resources of the Inyo National Forest. License articles contained in the Federal Energy Regulatory Commission's (Commission) Standard Form L-1 (revised October 1975) issued by Order No. 540, dated October 31, 1975, cover general requirements. Section II of this document includes administrative conditions deemed necessary for the administration of National Forest System lands. Section III covers specific resource requirements for protection and utilization of National Forest System (NFS) lands.

II. ADMINISTRATIVE FOREST SERVICE PROVISIONS

Condition No. 1 - Consultation

The Licensee shall, beginning the first full calendar year after license issuance, participate in annual meetings with the Forest Service to present Project operation and maintenance activities planned for the next calendar year. In addition, Licensee shall present results from current year monitoring of noxious weeds and special status species as well as any additional information that has been compiled for the Project area, including progress reports on other resource measures. The goals of this meeting are to share information, mutually agreed upon planned maintenance activities, and identify concerns that the Forest Service may have regarding activities and their potential effects on sensitive resources, and any measures required to avoid or mitigate potential effects.

The date of the consultation meeting will be mutually agreed to by the Licensee and the Forest Service. Representatives from the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDF&G), State Water Resources Control Board (SWRCB) or other interested agency representatives concerned with operation of the Project may request to attend the meeting.

Consultation shall include, but not be limited to:

- A status report regarding implementation of license conditions;
- Results of any monitoring studies performed over the previous year in formats agreed to by the Forest Service and the Licensee during development of study plans;
- Review of any non-routine maintenance;
- Discussion of any foreseeable changes to Project facilities or features;
- Discussion of any necessary revisions or modifications to plans approved as part of this license;
- Discussion of needed protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management

plans that may no longer be warranted due to delisting of species or, to incorporate new knowledge about a species requiring protection;
- Discussion of elements of current year maintenance plans, e.g. road maintenance; and
- Discussion of any planned pesticide use.

A record of the meeting shall be kept by the Licensee and shall include any recommendations made by the Forest Service for the protection of NFS lands and resources. The Licensee shall file the meeting record, if requested, with the Commission no later than 60 days following the meeting.

Copies of other reports related to Project safety and non-compliance shall be submitted to the Forest Service concurrently with submittal to the FERC. These include, but are not limited to: any non-compliance report filed by the Licensee, geologic or seismic reports, and structural safety reports for facilities located on or affecting NFS lands.

The Forest Service reserves the right, after notice and opportunity for comment, to require changes in the Project and its operation through revision of the Section 4(e) conditions to accomplish protection and utilization of NFS lands and resources.

Condition No. 2 - Approval of Changes

Notwithstanding any license authorization to make changes to the Project, when such changes directly affect NFS lands the Licensee shall obtain written approval from the Forest Service prior to making any changes in any constructed Project features or facilities, or in the uses of Project lands and waters or any departure from the requirements of any approved exhibits filed with the Commission. Following receipt of such approval from the Forest Service, and a minimum of 60-days prior to initiating any such changes, the Licensee shall file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of the Forest Service for such changes. The Licensee shall file an exact copy of this report with the Forest Service at the same time it is filed with the Commission. This condition does not relieve the Licensee from the amendment or other requirements of Article 2 or Article 3 of this license.

Condition No. 3 - Maintenance of Improvements on or Affecting National Forest System Lands

The Licensee shall maintain all its improvements and premises on NFS lands to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the Forest Service. Disposal of all materials will be at an approved existing location, except as otherwise agreed by the Forest Service.

Condition No. 4 - Existing Claims

The license shall be subject to all valid claims and existing rights of third parties. The United States is not liable to the Licensee for the exercise of any such right or claim.

Condition No. 5 - Compliance with Regulations

The Licensee shall comply with the regulations of the Department of Agriculture for activities on NFS lands, and all applicable Federal, State, county, and municipal laws, ordinances, or regulations in regards to the area or operations on or directly affecting NFS lands, to the extent those laws, ordinances or regulations are not preempted by federal law.

Condition No. 6 - Surrender of License or Transfer of Ownership

Prior to any surrender of this license, the Licensee shall provide assurance acceptable to the Forest Service that Licensee shall restore any Project area directly affecting NFS lands to a condition satisfactory to the Forest Service upon or after surrender of the license, as appropriate. To the extent restoration is required, Licensee shall prepare a restoration plan which shall identify the measures to be taken to restore such NFS lands and shall include or identify adequate financial mechanisms to ensure performance of the restoration measures.

In the event of any transfer of the license or sale of the Project, the Licensee shall assure that, in a manner satisfactory to the Forest Service, the Licensee or transferee will provide for the costs of surrender and restoration. If deemed necessary by the Forest Service to assist it in evaluating the Licensee's proposal, the Licensee shall conduct an analysis, using experts approved by the Forest Service, to estimate the potential costs associated with surrender and restoration of any Project area directly affecting NFS lands to Forest Service specifications. In addition, the Forest Service may require the Licensee to pay for an independent audit of the transferee to assist the Forest Service in determining whether the transferee has the financial ability to fund the surrender and restoration work specified in the analysis.

Condition No. 7- Protection of United States Property

The Licensee, including any agents or employees of the Licensee acting within the scope of their employment, shall exercise diligence in protecting from damage the land and property of the United States covered by and used in connection with this license.

Condition No. 8 - Indemnification

The Licensee shall indemnify, defend, and hold the United States harmless for:

- any violations incurred under any laws and regulations applicable to, or
- judgments, claims, penalties, fees, or demands assessed against the United States caused by, or
- costs, damages, and expenses incurred by the United States caused by, or
- the releases or threatened release of any solid waste, hazardous substances, pollutant, contaminant, or oil in any form in the environment related to the construction, maintenance, or operation of the Project works or of the works appurtenant or accessory thereto under the license.

The Licensee's indemnification of the United States shall include any loss by personal injury, loss of life or damage to property caused by the construction, maintenance, or operation of the Project works or of the works appurtenant or accessory thereto under the license. Indemnification shall include, but is not limited to, the value of resources damaged or destroyed; the costs of restoration, cleanup, or other mitigation; fire suppression or other types of abatement costs; third party claims and judgments; and all administrative, interest, and other legal costs. Upon surrender, transfer, or termination of the license, the Licensee's obligation to indemnify and hold harmless the United States shall survive for all valid claims for actions that occurred prior to such surrender, transfer or termination.

Condition No. 9 - Damage to Land, Property, and Interests of the United States

The Licensee has an affirmative duty to protect the land, property, and interests of the United States from damage arising from the Licensee's construction, maintenance, or operation of the Project works or the works appurtenant or accessory thereto under the license. The Licensee's liability for fire and other damages to NFS lands shall be determined in accordance with the Federal Power Act and standard Form L-1 Articles 22 and 24.

Condition No. 10 - Risks and Hazards on National Forest System Lands

As part of the occupancy and use of the Project area, the Licensee has a continuing responsibility to reasonably identify and report all known or observed hazardous conditions on or directly affecting NFS lands within the Project boundary that would affect the improvements, resources, or pose a risk of injury to individuals. Licensee will abate those conditions, except those caused by third parties or not related to the occupancy and use authorized by the License. Any non-emergency actions to abate

such hazards on NFS lands shall be performed after consultation with the Forest Service. In emergency situations, the Licensee shall notify the Forest Service of its actions as soon as possible, but not more than 48 hours, after such actions have been taken. Whether or not the Forest Service is notified or provides consultation, the Licensee shall remain solely responsible for all abatement measures performed. Other hazards should be reported to the appropriate agency as soon as possible.

Condition No. 11 – Protection of Forest Service Special Status Species

Before taking actions to construct new project features on NFS lands that may affect Forest Service special status species or their critical habitat, the Licensee shall prepare and submit a biological evaluation (BE) for Forest Service approval. The BE shall evaluate the potential impact of the action on the species or its habitat. In coordination with the Commission, the Forest Service may require mitigation measures for the protection of the affected species.

The biological evaluation shall:

- Include procedures to minimize adverse effects to special status species.
- Ensure project-related activities shall meet restrictions included in site management plans for special status species.
- Develop implementation and effectiveness monitoring of measures taken or employed to reduce effects to special status species.

Condition No. 12 - Access

The Forest Service reserves the right to use or permit others to use any part of the licensed area on NFS lands for any purpose, provided such use does not interfere with the rights and privileges authorized by this license or the Federal Power Act.

Condition No. 13 - Crossings

The Licensee shall maintain suitable crossings as required by the Forest Service for all roads and trails that intersect the right-of-way occupied by linear Project facilities (powerline, penstock, ditch, and pipeline).

Condition No. 14 - Surveys, Land Corners

The Licensee shall avoid disturbance to all public land survey monuments, private property corners, and forest boundary markers. In the event that any such land markers or monuments on NFS lands are destroyed by an act or omission of the Licensee, in connection with the use and/or occupancy authorized by this license, depending on the type of monument destroyed, the Licensee shall reestablish or reference same in accordance with (1) the procedures outlined in the "Manual of

Instructions for the Survey of the Public Land of the United States," (2) the specifications of the County Surveyor, or (3) the specifications of the Forest Service. Further, the Licensee shall ensure that any such official survey records affected are amended as provided by law.

Condition No. 15 - Pesticide-Use Restrictions on National Forest System Lands

Pesticides may not be used on NFS lands or in areas affecting NFS lands to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, trash fish, etc., without the prior written approval of the Forest Service. During the Annual Consultation meeting described in Condition 1, the Licensee shall submit a request for approval of planned uses of pesticides for the upcoming year. The Licensee shall provide at a minimum the following information essential for review:

- whether pesticide applications are essential for use on NFS lands;
- specific locations of use;
- specific herbicides proposed for use;
- application rates;
- dose and exposure rates; and
- safety risk and timeframes for application.

Exceptions to this schedule may be allowed only when unexpected outbreaks of pests require control measures that were not anticipated at the time the report was submitted. In such an instance, an emergency request and approval may be made.

Pesticide use will be excluded from NFS lands within 500 feet of known locations of Sierra Yellow Legged Frog, Yosemite Toad, or known locations of Forest Service Special Status or culturally significant plant populations. Application of pesticides must be consistent with Forest Service riparian conservation objectives.

On NFS lands, the Licensee shall only use those materials registered by the U.S. Environmental Protection Agency and consistent with those applied by the Inyo National Forest and approved through Forest Service review for the specific purpose planned. The Licensee must strictly follow label instructions in the preparation and application of pesticides and disposal of excess materials and containers. The Licensee may also submit Pesticide Use Proposal(s) with accompanying risk assessment and other Forest Service required documents to use pesticides on a regular basis for the term of the license. Vegetation and Invasive Weed Management and Monitoring. Submission of this plan will not relieve the Licensee of the responsibility of annual notification and review.

Condition No. 16 - Modifications of 4(e) Conditions after Biological Opinion or Water Quality Certification

The Forest Service reserves the right to modify these conditions, if necessary, to respond to any Final Biological Opinion issued for this Project by the United States Fish and Wildlife Service; or any Certification issued for this Project by the State Water Resources Control Board.

Condition No. 17 - Signs

The Licensee shall consult with the Forest Service prior to erecting signs related to safety issues on NFS lands covered by the license. Prior to the Licensee erecting any other signs or advertising devices on NFS lands covered by the license, the Licensee must obtain the approval of the Forest Service as to location, design, size, color, and message. The Licensee shall be responsible for maintaining all Licensee-erected signs to neat and presentable standards.

Condition No. 18 – Ground Disturbing Activities

If the Licensee proposes activities that were not specifically addressed in the Commission's NEPA processes, the Licensee, in consultation with the Forest Service, shall determine the scope of work and potential for Project-related effects, and whether additional information is required to proceed with the planned activity. Upon Forest Service request, the Licensee shall enter into an agreement with the Forest Service under which the Licensee shall fund a reasonable portion of Forest Service's staff time and expenses for staff activities related to the proposed activities.

Condition No. 29 – Requirement to Obtain a Forest Service Special Use Authorization[17]

The Licensee shall obtain a special use authorization from the Forest Service for the occupancy and use of National Forest System lands. The licensee shall obtain the executed authorization before beginning ground-disturbing activities and before any operation of the project facilities on National Forest System lands, within one year of license issuance. The Federal Land Policy and Management Act (FLPMA) of October 21, 1976, provides that Forest Service special use authorizations are required for the operation of projects licensed by FERC as of October 24, 1992.

The Licensee may commence ground-disturbing and operational activities authorized by the License and special use authorization no sooner than 60 days following the

[17] Condition 29 was filed separately on November 28, 2017 as an addendum to the Forest Service's preliminary 4(e) conditions.

date the licensee files the Forest Service special use authorization with the Commission, unless the Commission prescribes a different commencement schedule. In the event there is a conflict between any provisions of the license and Forest Service special use authorization, the special use authorization shall prevail to the extent that the Forest Service, in consultation with the Commission, deems necessary to protect and utilize National Forest System resources.

III. ADDITIONAL FOREST SERVICE PROVISIONS

Condition No. 19 – Plug Safety

The tunnel plug was constructed without authorization or oversight. Because of this lack of oversight, the safety of this plug is in question and it is uncertain whether the plug could fail and threaten life and property in the community of Rovana, about 8 miles downstream from the plug site. Tunnel plugs are significant engineering structures that are designed accommodate hydraulic heads far in excess of the highest dams. Additionally, there are only a limited number of consulting firms that specialize in the design and construction of tunnel plugs.

To date, the applicant has not been able to provide satisfactory evidence on the plug's structural integrity (timing of concrete placement, no water content analysis, lack of rebar) and related hazards associated with the plug placement (lack of seismic study, rock erosion around plug, lack of tie-in to adit walls). The applicant must prove to the satisfaction of the Forest Service the existing plug is constructed and engineered, and capable of safely impounding water.

If safety of the existing plug cannot be proven, then the existing plug must be removed and a new plug designed and constructed by qualified personnel.

If a new plug must be constructed, this will occur only after a geotechnical study is completed to assess the geotechnical and hydrogeologic characteristics of the entire project area to determine if the mine is structurally suitable to act as a reservoir and if the existing location is structurally suitable for a tunnel plug. The long-term stability of the as-built tunnel plug for the intended project purpose also needs to be evaluated.

The applicant must also perform standard a seismic safety hazard evaluation using updated information and standard assessment procedures as applied by a California licensed Professional Geologist or Professional Engineer. This work will follow all practices and procedures identified in Guidelines for Evaluating and Mitigating Seismic Hazards in California – Special Publication 117 (Adopted March 13, 1997 by the State Mining and Geology Board in Accordance with the Seismic Hazards Mapping Act of 1990). A phenomena known as the "water hammer" occurs when an earthquake occurs in a long tunnel with a tunnel plug. The earthquake creates a shock

wave in the water that will propagate the length of the tunnel and create a much greater pressure on the plug that may result in its failure. The tunnel plug must be designed to accommodate the maximum credible earthquake for this area.

Condition No. 20 - Streamflow

Part 1. Minimum Streamflow Requirements and Measurement

Licensee shall maintain specified minimum streamflows in project reaches in accordance with provisions that will be developed once the Inyo National Forest receives adequate information from the applicant about operations and receives results of the initial study requests that the Forest submitted to FERC Secretary Bose on July 20, 2011. Because the Forest has not received any study results from the applicant, including the results of instream flow studies, we cannot at this time recommend minimum streamflow requirements. The applicant will work with the Forest to develop instream flow requirements before the license is issued.

Once the minimum streamflow requirements are finalized, minimum streamflows shall commence within 90 days of license issuance, unless facility modifications are required. License Condition 16 (Modification of 4(e) Conditions After Biological Opinion or Water Quality Certification) provides the opportunity to adjust these minimum streamflow requirements to comply with the NOAA Biological Opinion and the SWRCB 401 Water Quality Certificate, if needed.

The Licensee shall schedule the timing of maintenance or other planned outages to avoid negative ecological effects from the resultant spills. The Licensee shall provide written notification to the Forest Service at least 90 days prior to any planned or scheduled maintenance outages that would affect streamflows in Pine Creek. Notification shall include a description of Project and coordinated measures the Licensee plans to take to minimize the magnitude and duration of spills into the Project reach. The Licensee shall not proceed with the planned maintenance outage without the formal written approval of the Forest Service and notification on Licensee's public Project website. The Forest Service will respond in a timely manner.

The Minimum Streamflow requirements are subject to temporary modification if required by equipment malfunction, as directed by law enforcement authorities, or in emergencies. An emergency is defined as an event that is reasonably out of the control of the Licensee and requires 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.

If the Licensee temporarily modifies the requirements of these conditions, then the Licensee shall make all reasonable efforts to promptly resume performance of such requirements and shall notify the Forest Service and other interested or affected governmental agencies within 48 hours of the modification.

Where facility modification is required to implement the efficient release of Minimum Streamflows, the Licensee shall submit applications for permits within one year after license issuance, and complete such modifications and initiate minimum streamflows as soon as reasonably practicable but no later than two years after receipt of all required permits and approvals. Prior to completion of such required facility modifications, the Licensee shall make a good faith effort to provide the specified Minimum Streamflows within the capabilities of the existing facilities.

Part 2. Streamflow Measurement.

For the purpose of determining the river stage and minimum streamflow on Pine Creek, the Licensee shall install, operate and maintain a gage at the plug and one in Pine Creek near Rovana, consistent with all requirements of FERC and under the supervision of the USGS. Licensee shall install an instream measuring device either within or adjacent to the plug to directly measure instream flow releases from the mine.

The Licensee shall measure and document all instream flow releases in publicly available and readily accessible formats. Flow data collected by Licensee from the stream gages will be reviewed by the Licensee's hydrographers as part of its quality assurance/quality control (QA/QC) protocol.

Condition No. 21 - Water Quality and Temperature Monitoring

Within one year of license issuance, and in consultation with applicable Federal and State agencies, the Licensee shall file with the Commission a Water Quality and Temperature Monitoring Plan that is approved by the Forest Service, as it relates to aquatic habitats managed by the Forest Service. Upon Commission approval, Licensee shall implement the Plan. This plan shall include:

In Pine Creek and Morgan Creek, both upstream and downstream of the mine outflow:

- To ensure water quality objectives of Pine Creek above US Tungsten Corp Mine, outlined on page 3-48 of the Lahontan Regional Water Quality Control Board Basin Plan (RWQCB, 1995), are met from the discharge of water from the Pine Creek Mine, test for the following water quality parameters: Total dissolved solids

(TDS), chloride, sulfate, fluoride, boron, nitrate as nitrogen, ammonia, and phosphorous (RWQCB, 1995).

- To ensure the Beneficial Uses of Pine Creek are not degraded, test for the following water quality parameters at all 3 locations: Dissolved Oxygen, pH, temperature, turbidity, color, sediment, total nitrogen (page 3-6 of the Basin Plan).
- Test General Mineral (Includes bicarbonate, carbonate, hydroxide, total alkalinity, calcium, chloride, copper, MBAS, iron, potassium, magnesium, manganese, pH, sodium, specific conductance, total hardness, zinc.
- Test metals for both freshwater aquatic species and human health risk: Antimony, arsenic, arsenic (V), barium, cadium, chromium (III), copper, cyanide, lead, manganese, mercury, molybedenum, nickel, selenium,silver, thallium, tungsten, and zinc.
- Test TPH (total petroleum hydrocarbons) and subtier. Test for PCB's as there are transformers in the facility. Test for asbestos.
- Conduct toxicity test for freshwater organisms four weeks into sampling.

Data Analysis and Reporting

The lab results will be summarized and reported to the Inyo National Forest monthly. If any of the constituents is found to not meet water quality standards, it will be reported to the USFS Inyo National Forest within 48 hours of result receipt.

Schedule

- Sample on a monthly basis as close to the plug as possible. Monthly sampling will occur for a period of 5 years, and then can be reduced every 6 months for constituents that met standards at all times during those 5 years.
- Coincide sampling with monthly sampling at location R-3, located on Pine Creek downstream of the confluence with Morgan Creek.

Condition No. 22 - Groundwater

The construction of a tunnel plug and the subsequent storage of water in the Pine Creek Mine will modify the existing groundwater aquifer within the Pine Creek sub-basin and potentially the Rock Creek sub-basin. The long-term impacts to the groundwater aquifer need to be identified. Groundwater impacts from periodically draining the underground reservoir should be identified. Impacts to groundwater quality from the long-term storage of water in the reservoir need to be addressed for heavy metals, radon, and other potential contaminants. These studies will also supplement the surface water studies that identify the minimum amount of discharge from the Easy-Go Adit necessary to meet all water rights and beneficial uses in the Pine Creek watershed.

Perform a groundwater study using published literature, underground and surface field studies, and all standard assessment procedures as applied by a California licensed Certified Hydrogeologist. Impacts to aquatic and terrestrial flora and fauna from modifying the groundwater aquifer must be assessed by qualified wildlife and fisheries biologists. This work shall be coordinated with, and reviewed and approved, by the Forest Service.

Condition No. 23 - Terrestrial Biological Management and Monitoring

Within one year of license issuance, the Licensee shall develop, in consultation with the Forest Service, CDF&G, potentially affected tribes, and other interested parties, and approved by the Forest Service, a Terrestrial Biological Management Plan, including Forest Service special status species (i.e. Forest Service sensitive, survey and manage, and management indicator species) potentially affected by the Project on NFS lands. Upon Commission approval, Licensee shall implement the plan.

The Plan shall include, but may not be limited to, the following components:

- Occupation and population monitoring at specific intervals for the species determined to be important once the Forest receives the special status wildlife assessment, and bat assessments from the applicant, as requested to Secretary Bose in 2011.
- Periodic surveys throughout the term of the license within the Project and Project-affected area to determine if additional populations develop, as specified below;
- Reporting of terrestrial survey and monitoring results including suitable habitat, populations, individuals, pairs, and nest locations every five years (or at Frequency specified below by species) with a Forest Service GIS compatible map that includes base data from study plan surveys, and updated data from periodic monitoring and surveys.

Mitigation measures to be implemented by the Licensee include:

- Licensee shall conduct pre-disturbance/pre-construction surveys for Forest Service special status species that follow standard protocols as reviewed and approved by the Forest Service, or protocols collaboratively developed and approved by the Forest Service if no protocols exist at the time;
- Licensee shall observe Limited Operating Periods (LOP's) where required (LOP's do not apply to emergency situations);

- Licensee shall utilize post-license monitoring and surveys for Forest Service special status species to determine if mitigation measures are necessary to protect Forest Service special status species.

Special Status Species Surveys

Beginning the first full calendar year after license issuance, the Licensee shall, in consultation with the Forest Service, annually review the current list of special status wildlife species (species that are Forest Service Sensitive (FSS), Survey and Manage (S&M), Management Indicator Species (MIS), or on the Inyo National Forest Watch List) that might occur on NFS lands in the Project or Project-affected area.

When a species is added to one or more of the lists, the Forest Service in consultation with the Licensee shall determine if the species or un-surveyed suitable habitat for the species is likely to occur on NFS lands within the Project or Project-affected areas. If the Forest Service determines that the species is likely to occur, the Licensee shall develop and implement a study plan in consultation with the Forest Service to reasonably assess the effects of the Project on the species. The Licensee shall prepare a report on the study including objectives, methods, results, recommended resource measures where appropriate, and a schedule of implementation, and shall provide a draft of the final report to the Forest Service for review and approval. The Licensee shall file the final report, including evidence of consultation, with the Commission. Upon approval by the Commission, Licensee shall implement those resource management measures.

Avian Collision and Electrocution Hazards

Within one year of license issuance, the Licensee shall file with the Commission, an Avian Collision and Electrocution Hazards Plan, approved by the Forest Service in consultation with appropriate Federal and State agencies that minimizes adverse interactions between Project transmission lines and avian species. All new or rebuilt power poles shall conform to, guidelines in "Suggested Practices for Raptor Protection—State of the Art in 1996" (APLIC 1996) or updated guidelines when they are issued. Any pole involved in a bird fatality shall be immediately repaired/replaced to meet these guidelines.

Condition No. 24 - Aquatic Biological Management and Monitoring

Within one year of license issuance, the Licensee shall develop, in consultation with the Forest Service, CDF&G, potentially affected tribes, and other interested parties, and approved by the Forest Service, an Aquatic Biological Management Plan, including Forest Service special status species (i.e. Forest Service sensitive, survey

and manage, and management indicator species) potentially affected by the Project on NFS lands. Upon Commission approval, Licensee shall implement the plan.

The Plan shall include, but may not be limited to, the following components. These will be refined once the Forest receives results of the aquatic study requested in 2011:

- Population trends, age-class structure, and fish condition factors in Pine Creek, and monitoring at specific intervals for the species listed below;
- List of fish species to be monitored, standardized sampling and data protocols consistent with pre-licensing studies, to the extent possible, to ensure comparability of survey results with pre-licensing data;
- Periodic survey once every three years (or as determined by the agencies, potentially affected tribes and other interested parties) for the first 9 years of the license period, and then once every five years for the term of the license;
- Report aquatic survey and monitoring results, including suitable habitat by age class (e.g. fry, juvenile, adult) and populations by age class and species, every five years (or at frequency specified below by species) with a Forest Service GIS compatible map that includes base data from study plan surveys, and updated data from periodic monitoring and surveys.

Benthic Macroinvertebrates

Monitor benthic macroinvertebrate population robustness and heterogeneity, composition of functional feeding groups, and pollution tolerance/intolerance trend in Morgan Creek and Pine Creek. Periodic sampling shall occur once every three years during the first nine years following license issuance, and thereafter, once every five years. The number of sites, site locations, and the frequency of monitoring may be modified with Forest Service approval after consultation with the Forest Service, potentially affected tribes, and other interested parties if needed based on initial sampling results.

Documentation and Reporting

A draft technical report of all Aquatic Biological Monitoring components shall be prepared following completion of each sampling effort for agency review, input and concurrence. The fish-based sampling report shall discuss implications regarding trends in fish abundance, changes in age-class structure, as well as any changes in fish condition factors. The benthic macroinvertebrate sampling report shall discuss any changes over time regarding the composition of functional feeding groups, overall population heterogeneity and robustness, and pollution tolerance/intolerance trends.

In addition to describing the results, the report is to compare results with those of previous surveys. All monitoring component reports shall discuss implications

regarding trends in parameters over time. Additionally, it shall address any monitoring results that may indicate biological concerns and an adaptive process to further assess and implement actions that may be necessary to address identified concerns related to Project effects. A final report incorporating input (or addressing why it was not incorporated) shall be prepared and filed with the Forest Service, applicable agencies, and the Commission.

Special Status Species

In consultation with the Forest Service, the Licensee shall, beginning the first full calendar year after license issuance, annually review the current list of special status aquatic wildlife species (species that are Forest Service Sensitive (FSS), Survey and Manage (S&M), Management Indicator Species (MIS), or on the Inyo National Forest Watch List) that might occur on NFS lands and waters in the Project and Project-affected area.

When a species is added to one or more of the lists, the Forest Service in consultation with the Licensee, shall determine if the species or un-surveyed suitable habitat for the species is likely to occur on such NFS lands and waters. For such newly added species, if the Forest Service determines that the species is likely to occur on such NFS lands and waters, the Licensee shall develop and implement a study plan in consultation with the Forest Service to reasonably assess the effects of the Project on the species. The Licensee shall prepare a report on the study including objectives, methods, results, recommended resource measures where appropriate, and a schedule of implementation, and shall provide a draft of the final report to the Forest Service for review and approval. The Licensee shall file the final report, including evidence of consultation with the Commission. Upon Commission approval, Licensee shall implement those resource management measures.

Condition No. 25 - Hazardous Substance Management

Within one year of license issuance, and at least 60 days before starting any activities the Forest Service determines to be of a land-disturbing nature on NFS lands, the Licensee shall file with the Commission, a plan approved by the Forest Service for oil and hazardous substances storage and spill prevention and cleanup.

At a minimum, the plan shall require the Licensee to:

- Maintain in the Project area, a cache of spill cleanup equipment suitable to contain any spill from the Project;
- Periodically inform the Forest Service of the location of the spill cleanup equipment on NFS lands and of the location, type, and quantity of oil and hazardous substances stored in the Project area;

- Inform the Forest Service immediately of the nature, time, date, location, and action taken for any spill on or affecting NFS lands.

Condition No. 26 - Road and Transportation Facility Management Plan

Within one year of license issuance, Licensee shall file with the Commission a Road and Transportation Facility Management Plan, approved by the Forest Service, for protection and maintenance of Project and Project-affected roads that are on or affect NFS lands. The Licensee shall consult with the Forest Service and other affected parties in the development of this Plan. The Licensee shall take appropriate measures to meet appropriate Forest Service Maintenance Level, Traffic Service Level, and Road Management Objectives (RMOs). Upon Commission approval, Licensee shall implement the Plan and actions specified therein. At a minimum, the Road and Transportation Facility Management Plan shall include the following components:

1. **Planning & Inventory** (Project and Project-affected roads)**:**

   - A map(s) compatible with Forest Service Travel Management Routes and GIS database showing all Project and Project-affected roads, culverts, bridges, drainages, watering sources, borrow and disposal sites for surplus rock and soil from road maintenance within and adjacent to the Project Boundary;
   - Identification of uses (e.g. recreation, facility access) of the roads and season of operation;
   - An inventory of road and road facility conditions including any construction or maintenance needs. Identify each Project and Project-affected road and identify how and when it will be addressed further. At a minimum, this inventory shall include the roads shown in Table 1-3, below;
   - A Traffic Safety component, including an inventory and condition for all existing and proposed traffic/road signs (excluding recreation and interpretive signs) and schedule for sign maintenance;
   - Any proposed changes to maintenance levels.

2. **Operation, Maintenance, and Road-Associated Debris** (Project and applicable Project-affected roads)**:**

   - Develop an annual road operation and maintenance (O&M) schedule for Project roads and applicable Project-affected roads on NFS lands to comply with Forest Service standards, RMOs, BMPs, and Travel Management guidelines.
   - Complete normal maintenance activities on an annual basis including: road surface maintenance, repair and replacement of damaged culverts, cleaning debris and rockfall from drainage channels, vegetation removal to allow

adequate sight distances, vegetation removal to maintain an open traveled way consistent with Forest Service standards, etc.

- Describe types of road-associated debris (e.g. native materials such as dirt, rocks, trees, etc.), any acceptable locations on NFS lands where this material can be stored (identify if temporary only or permanent), and measures to control erosion, weed infestation, etc. on these piles. Remove all road spoil piles not currently located at approved sites on NFS lands to a location either off the Forest, or to a Forest Service approved disposal site.
- Include any required limited operating periods (LOP's) for wildlife species and noxious weed prevention provisions in planning and performing maintenance activities.
- Comply with the following O&M guidelines:
    - Slope: Outslope roads where feasible; utilize long, gradual rolling dips to disperse runoff. For insloped roads, use sufficient drainage structures to minimize runoff in inside ditches.
    - Erosion/Sediment: Disconnect road sediment sources to watercourses and incorporate erosion control measures by/through the use of rolling dips, waterbars, filter strips, cross-drains, etc. Treat potential erosion or mass wasting sites.
    - Drainage: Assess cross-drain frequency, waterbars, rolling dips, and lead outs that minimize flow concentration.
    - Timing: Address timing use restrictions (winter period, wet weather, or other).
    - Design: Address need to upgrade surfacing to comply with RMO's. For Bridges: meet current AASHTO Standard specifications for Highway Bridges (latest edition) including guardrails, and pave 50 feet either side of approaches. For Gates: comply with Forest Service standards for construction and signing.
    - Decommissioning/closures: Address need and schedule for any road closures and decommissioning.
    - Snowplowing: Conduct plowing according to Forest Service procedures.
    - For road and stream crossings, implement the following:
        - Sidecast: Remove or minimize with particular care near streams.
        - Realign existing routes that pose risks to water quality.
        - Culverts: Replace "shotgunned" cross drains, armor inlets/outlets with rip-rap, utilize culvert diameters equal to or greater than the average active channel width, utilize extra cross drains, critical dips and road aggregate surfacing at connected crossings to decrease chronic and potential catastrophic delivery of sediment, upgrade crossings to reduce diversion potential.
        - Drainage: Treat roads to minimize erosion and sediment delivery to the watercourse. Include overflow dips/critical dips or other

feature to minimize watercourse diversion potential at culvert crossings. Inslope roads at crossings, where feasible and safe, to prevent road runoff from discharging onto the downstream fill face. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

- Fish Passage: Provide for fish passage and proper stream function for all stream crossings that are identified as fish habitat areas.

- Intermittent and perennial stream crossings shall accommodate a 100-year storm event and associated bedload and debris unless an exception is allowed by the Forest Service. Provide hydrologic information to verify calculations where requested by Forest Service.

3. **Construction and Reconstruction** (Project and applicable Project-affected roads)**:**

- Develop a road construction and reconstruction implementation schedule to bring existing roads and associated facilities (i.e. culverts, gates, bridges, crossings, crib-walls, etc.) into compliance with Forest Service standards that achieve Forest Service RMOs and Travel Management Guidelines for applicable roads in Table 1-3, below. The schedule shall bring existing roads into compliance within five years of Plan approval, with health and safety items as well as water passage/resource objectives within the second year of implementation, road surfacing items within the third year of implementation, and all lower priority projects in years four and five after implementation;
- During construction and reconstruction activities, comply with O&M guidelines provided in Item 2. Operation, Maintenance, and Road-Associated Debris, above.

Specific Construction & Reconstruction Items:

- Within two years following Plan approval, repair those road sites identified in Table 1-4 listed below, with greater than 75% erosion hazard.
- Implement any remaining or new Forest Service approved reconstruction mitigations resulting from McCloud Dam spillway flows undercutting Forest Service road 38N11 that were not completed under the existing license.
- Identify and close, after Forest Service review and approval, those user created roads accessing Iron Canyon Reservoir that generate water quality impacts or impacts to other resources. Closure methods may

include: natural materials (i.e. boulders & fallen trees), barriers, gates, or signing.

4. **Monitoring** (Project and Project-affected roads)**:**

- Conduct traffic use surveys scheduled on a six-year basis (coinciding with the Commission's recreation Form 80 schedule) at Forest Service specified locations, to determine the number and type of vehicles per day, describe study periods and reporting requirements, and determine use trends. Conduct a minimum of 60 survey days during survey years;
- Conduct a road capacity and use review every six years following completion of use surveys, to determine if the roads continue to meet current road management objectives. If the Forest Service determines roads no longer comply, define actions and timelines to correct deficiencies;
- Following annual or periodic monitoring, any roads or bridges found to not meet Forest Service standards and guidelines requiring work beyond normal O&M shall be identified. This list, along with proposed measures to bring the roads or bridges into compliance, shall be submitted to the Forest Service at least 30 days prior to the Annual Consultation Meeting required under License Condition 1, or as needed.

5. **Licensee Road Memorandum of Understanding** (Project-affected roads)**:**

For applicable Project-affected roads develop a Memorandum of Understanding (MOU) with the Forest Service and other affected parties to address shared road management responsibilities. The goal of the MOU shall be to define proportionate road share costs, address specific public safety needs, resource protection, and erosion control mitigations to be performed by the Licensee. Implement plan when agreement is reached between parties and upon Forest Service and Commission approval.

6. **Road Use by Government**

The United States shall have unrestricted use of any road over which the Licensee has control within the Project area for all purposes deemed necessary and desirable in connection with the protection, administration, management, and utilization of NFS lands or resources. When needed for the protection, administration, and management of NFS lands or resources the United States shall have the right to extend rights and privileges for use of the right of way and road thereon to States and local subdivisions thereof, as well as to other users. The United States shall control such use so as not to unreasonably interfere with the safety or security uses, or cause the Licensee to bear a share of the costs disproportionate to the Licensee's use in comparison to the use of the road by others.

7. Road Use

The Licensee shall confine all vehicles being used for Project purposes, including but not limited to administrative and transportation vehicles and construction and inspection equipment, to roads or specifically designed access routes, as identified in the Road and Transportation Facility Management Plan. The Forest Service reserves the right to close any and all such routes where damage is occurring to the soil or vegetation, or, if requested by Licensee, to require reconstruction/ construction by the Licensee to the extent needed to accommodate the Licensee's use. The Forest Service agrees to provide notice to the Licensee and the Commission prior to road closures, except in an emergency, in which case notice will be provided as soon as practicable.

Condition No. 27 - Fire and Fuels Management

Within one year of license issuance, the Licensee shall file with the Commission a Fire and Fuels Management Plan that is approved by the Forest Service, and developed in consultation with appropriate State and local fire agencies. The plan shall set forth in detail the Licensee's responsibility for the prevention, reporting, and emergency response to fires in the vicinity of the Project resulting from Project operations. At a minimum, the plan shall address the following categories.

Fuels Treatment

- Consistent with Visual Quality Objectives for recreation sites, reduce fuels in and around developed and dispersed recreation sites identified in the Recreation Management Plan. Treatment may include shaded fuel breaks, limbing, brush trimming, and selective clearing around the perimeter of the site. Select vegetation treatments within recreation sites to maintain screening between sites where possible. Size fuel treatment according to the size and capacity of the facility. The Licensee shall implement and maintain fuel treatments;
- Maintain vegetation clearing around all Project infrastructure (dams, gages, valve houses, etc.) to comply with CalFire requirements;
- Fuel treatment disposal methods may include chipping, off-site disposal, or lopping and scattering (only with Forest Service approval, in limited amounts and locations). These fuels treatment methods are applicable to the Licensee's annual, routine vegetation management within the Project area. Larger fuel treatment projects that include merchantable Forest Service timber shall be handled separately under Timber Sale Contract with specific provisions for fire and fuels;
- During annual coordination meetings with the Forest Service, provide the proposed annual vegetation treatment schedule (with a map) for all areas where

fuel treatment is planned (including Project powerlines). Include known Limited Operating Periods or survey data for any areas with known sensitive resources;
- Standard protocols for Licensee compliance with the Forest Service Project Activity Level (PAL) during Project construction, reconstruction or maintenance.

Prevention and Response

- Access and Safety:
    - Identify Project sites potentially available for equipment staging, helispots, water drafting, Incident Command, safe zones, or other fire suppression strategies;
    - Include status of access roads, community road escape routes, helispots to allow aerial firefighting assistance, and water drafting sites;
    - Address fire danger and public safety associated with Project induced recreation, including fire danger associated with dispersed camping, existing and proposed developed recreation sites, trails, and vehicle access.

- Emergency Response Preparedness:
    - Include emergency contact list (updated annually) for Licensee Project operations, including operations personnel for power and dam operation, road maintenance contacts, transmission and distribution line staff, timber operations, and public affairs/website management.

- Reporting and Response:
    - Licensee shall report any Project related fires on National Forest System lands to Forest Service dispatch immediately but no later than 24 hours. Report shall include location, approximate size, fire activity, and nearest vehicle access routes;
    - Licensee shall, where possible, make equipment (including communications) and personnel available on-site during initial emergency response until relieved by State or Federal resources and shall take action as appropriate to suppress fires within or adjacent to Project, when possible.

Investigation of Project Related Fires

The Licensee agrees to fully cooperate with the Forest Service on all fire investigations. The Licensee shall produce upon request all materials and witnesses not subject to the attorney-client or attorney work product privileges, over which the Licensee has control, related to the fire and its investigation including:

- All investigation reports;
- All witness statements;
- All photographs;
- All drawings;
- All analysis of cause and origin;
- All other similar materials and documents regardless of how collected or maintained.

The Licensee shall preserve all physical evidence, and give custody to the Forest Service of all physical evidence requested. The Forest Service shall provide the Licensee with reasonable access to the physical evidence and documents the Licensee requires in order to defend any and all claims, which may arise from a fire resulting from Project operations, to the extent such access is not precluded by ongoing criminal or civil litigation.

Condition No. 28 - Heritage Resources Management and Monitoring

Within one year of license issuance, Licensee shall file with the Commission a Historic Properties Management Plan (HPMP) that is approved by the Forest Service. The HPMP is tiered to a Programmatic Agreement, to which the Forest Service will be a signatory, as defined by 36 CFR 800, and implements regulations of the National Historic Preservation Act. The Licensee shall consult with the State Historic Preservation Officer, applicable Native American Tribes, Forest Service, and other applicable agencies during the preparation of the Plan. Collaborative meetings for the development of the Final HPMP with the Licensee, Forest Service and potentially affected Tribes shall be facilitated.

If, prior to, or during ground-disturbing activities, or as a result of Project operations, items of potential cultural, historical, archeological, or paleontological value are reported or discovered, or a known deposit of such items is disturbed on NFS lands or on Licensee’s adjoining fee title property when heritage properties extend onto NFS lands, the Licensee shall immediately cease work in the area so affected. The Licensee shall then notify the Forest Service and shall not resume work on ground-disturbing activity until it receives written approval from the Forest Service. If it deems it necessary, the Forest Service may require the Licensee to perform recovery, excavation, and preservation of the site and its artifacts at the Licensee's expense

through provisions of an Archaeological Resources Protection Act permit issued by the Forest Service. The Licensee shall implement the Plan upon approval by the Commission.

APPENDIX C – CALIFORNIA STATE WATER RESOURCES CONTROL BOARD PRELIMINARY CLEAN WATER ACT § 401 CERTIFICATION CONDITIONS
September 26, 2016

Pine Creek Mine Project
FERC Project No. 12532

1. To prevent potentially adverse effects of rapid changes in regulated streamflow that are inconsistent with the natural rate of change in streamflow, Project operations will likely be subject to ramping rates to be specified at a later date. A ramping rate is defined as the rate of change in stream stage height, up or down, over a given time period.

2. Pine Creek Mine, LLC shall obtain all of the necessary state and federal permits and any other regulatory approvals prior to construction, potentially including, but not limited to: Construction General Permit[18]; National Pollutant Discharge Elimination System permits for applicable activities, such as dewatering; and California Department of Fish and Wildlife (California DFW) streambed alteration agreement. Adequate water quality monitoring should be required during construction activities as part of permits to ensure protection of beneficial uses and compliance with water quality standards. No construction shall commence until all necessary federal, state, and local approvals are obtained.

3. Pine Creek Mine, LLC shall consult annually with relevant resource agencies for the term of the license and any annual extensions. The date of the annual consultation meeting shall be mutually agreed on by Pine Creek Mine, LLC and relevant resource agencies. Meeting notes including recommendations made by attendees shall be developed by Pine Creek Mine, LLC and distributed to meeting participants. At the annual meeting, participants will review current lists of rare, threatened and endangered species and special-status plant and wildlife species to identify species that have the potential to be adversely impacted by the Project. Species-specific study plans shall be developed or updated, in consultation with relevant resource agencies, whenever new potential impacts or newly-listed species are identified. Pine Creek Mine, LLC shall conduct studies for species identified as vulnerable to impacts from Project construction or operations.

[18] Water Quality Order 2009-0009-DWQ and National Pollutant Discharge Elimination System No. CAS000002, or as amended.

4. Pine Creek Mine, LLC shall submit an Initial Fill of the Easy-Go Tunnel Plan (Initial Fill Plan) to the Deputy Director for review and approval. The Initial Fill Plan shall contain, at a minimum: 1) the proposed minimum outflow during the Easy-Go Tunnel fill; 2) coordination efforts with downstream water right holders; and 3) consultation activities with relevant resource agencies. Initial fill of the Easy-Go Tunnel shall not commence until the Initial Fill Plan is approved by the Deputy Director.

5. Pine Creek Mine, LLC shall develop and implement a Water Quality Monitoring Plan. Pine Creek Mine, LLC shall develop the Water Quality Monitoring Plan in consultation with the State Water Board and other relevant resource agencies. The Water Quality Monitoring Plan should include monitoring for dissolved metals, and associated mitigation plan to remove metals, and other pollutants from the Project discharge water, to meet Basin Plan water quality objectives. Pine Creek Mine, LLC shall install and operate equipment at multiple water quality monitoring locations per conditions of the water quality certification and Water Quality Monitoring Plan. The monitoring locations shall be developed in consultation with Pine Creek Mine, LLC, State Water Board staff, and relevant resource agencies. Monitoring data shall be made publically available as defined in the Water Quality Monitoring Plan. All monitoring data must be submitted electronically, as required by the State Water Board but annually at minimum, and in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with California Water Code section 13167. The Water Quality Monitoring Plan shall include, but not limited to require:

    a. Water quality monitoring for turbidity, dissolved oxygen, pH, and temperature: 1) when performing any in-water work; 2) once per day during the initial fill of the Easy-Go Tunnel; and 3) once per month for the duration of the license, or until receiving approval by the Deputy Director to cease monitoring. Increases in turbidity, dissolved oxygen, pH, and temperature attributable to Project-controllable water quality factors shall not exceed the limits defined in the *Water Quality Control Plan for the Lahontan Region* (Basin Plan).

    b. Water quality monitoring shall be conducted at the Project's powerhouse discharge, for all the constituents presented in Table 7.2.1 of the Final License Application, within one month after completing the initial fill of the Easy-Go Tunnel, and once per year thereafter for the duration of the License, or until receiving approval by the Deputy Director to cease monitoring.

6. All proposed plans and associated updates would be subject to review and approval by the State Water Board. If plans are developed and approved in advance of license issuance, any related conditions would be modified accordingly.

7. In the event pesticide to control vegetation is used and has the potential to impact water quality, Pine Creek Mine, LLC shall develop and implement a Pesticide Use Plan. Pine Creek Mine, LLC shall create the Pesticide Use Plan in consultation with relevant resource agencies, which shall include a plan for emergency action in case of spill or discharge to surface waters. The Pesticide Use Plan shall include provisions that restrict application of pesticides (as defined by the Basin Plan) in order to protect federal Endangered Species Act (ESA) or California Endangered Species Act (CESA)-listed species, and/or associated habitat in or downstream of an application area. Pesticides shall only be applied by an individual with a current and valid Qualified Applicator License issued by the California Department of Pesticide Regulation or under the direct visual supervision of such an individual. In case of spill, Pine Creek Mine, LLC shall notify the Deputy Director and other relevant resource agencies as soon as practical and suspend all pesticide-related activities.

8. Pine Creek Mine, LLC shall develop and implement a Fish Habitat Assessment Plan. The Fish Habitat Assessment Plan shall be developed in consultation with State Water Board staff and other relevant resource agencies. The Fish Habitat Assessment Plan shall include monitoring of habitat features (such as water temperature, stream depth, flow velocities, water quality, sediment transport, etc.) associated with resident fish populations and ESA and CESA-listed fish species potentially found within the Project area.

9. Pine Creek Mine, LLC shall develop and implement an Amphibian Monitoring Plan in consultation with relevant resource agencies. The Amphibian Monitoring Plan shall include monitoring for California red-legged frog, Foothill yellow-legged frogs, and Cascade frogs, specifically: egg masses, tadpoles, and adult amphibians on Pine Creek. Annual reports that present monitoring data and analyze and evaluate frog populations and recommends actions based on population changes shall be submitted to the relevant resource agencies.

10. Pine Creek Mine, LLC shall develop and implement a Vegetation and Invasive Weed Management Plan in consultation with relevant resource agencies. The California Food and Agriculture code defines non-native, invasive weeds. The Vegetation and Invasive Weed Management Plan shall address both aquatic and terrestrial non-native, invasive weeds and species of special concern, within and adjacent to the Project boundary. Project features related to the spread of non-native invasive weeds include, but are not limited to, roads and transmission lines. This Plan must include provisions for special status plant species to be protected and an adaptive management component to reduce existing occurrences and prevent the spread of non-native invasive aquatic weeds.

11. This condition applies to all plans or changes to plans required by the water quality certification or related to water quality. All plans shall be developed in consultation with relevant local, state, and federal agencies. Pine Creek Mine, LLC shall provide relevant local, state, and federal agencies with a minimum of 30 days to comment on draft plans and reports. The final plans and final reports shall include documentation of consultation with relevant local, state, and federal agencies. All comments made by relevant local, state, and federal agencies, and a description of how the final plan and/or final report incorporates or addresses the comments made by relevant agencies shall be included in the documentation provided to the State Water Board by Pine Creek Mine, LLC. Pine Creek Mine, LLC shall submit the final report or plan to the State Water Board for review and approval. The State Water Board may require modifications as part of the approval. Any subsequent modifications made to plans must be approved by the State Water Board prior to implementation. Upon State Water Board approval, Pine Creek Mine, LLC shall fill the approved final plan or report with FERC. Pine Creek Mine, LLC shall implement the plans upon approval from agencies.

12. Activities associated with operation and maintenance of the Project that potentially impact water quality shall be subject to review by the State Water Board.

13. The State Water Board shall be notified at least one week prior to the commencement of ground-disturbing activities. Upon request, a construction schedule shall be provided to relevant agency staff. Pine Creek Mine, LLC must provide State Water Board staff reasonable access to Project sites to document compliance with a water quality certification.

14. 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 discharges to surface waters. Erosion control measures shall be used for any stockpile of material to control runoff, and prevent material from contacting or entering surface waters.

15. 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 and local laws, ordinances, and regulations.

16. 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, 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 and local laws, ordinances, and regulations.

17. 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 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 at an authorized landfill, in compliance with state and local laws, ordinances and regulations.

18. 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 steam 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, generator, 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.

19. On-site 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.

The following standard conditions may also apply to this Project in order to protect water quality and beneficial uses over the term of the Project's license and any annual extensions.

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

21. 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 Pine Creek Mine, LLC fails to provide or implement a required plan in a timely manner.

22. The State Water Board reserves the authority to add to or modify the conditions of a water quality certification to incorporate changes in technology, sampling, or methodologies and/or load allocations developed in a total maximum daily load developed by the State Water Board or the Lahontan Regional Water Quality Control Board.

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

24. The State Water Board may add to or modify the conditions of a water quality certification as appropriate 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 standards or protect beneficial uses of water.

25. The State Water Board reserves authority to modify a water quality certification if monitoring results indicate that continued operation of the Project could violate water quality objectives or impair the beneficial uses of Pine Creek.

26. Future changes in climate projected to occur during the license term may significantly alter the baseline assumptions used to develop the conditions in a water quality certification. The State Water Board reserves authority to modify or add conditions in a 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.

27. A water quality certification requires compliance with all applicable requirements of the Basin Plan. The Applicant must notify the State Water Board and the Lahontan Regional Water Quality Control Board within 24 hours of any unauthorized discharge to surface waters.

28. Notwithstanding any more specific conditions in a 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 the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act. The Applicant must take all reasonable measures to protect the beneficial uses of Pine Creek.

29. A 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 CESA (Fish & G. Code §§ 2050-2097) or the ESA (16 U.S.C. §§ 1531 - 1544). If a "take" will result from any act authorized under a water quality certification or water rights held by the Pine Creek Mine, LLC, Pine Creek Mine, LLC must obtain authorization for the take prior to any construction or operation of the portion of the Project that may result in a take. Pine Creek Mine, LLC is responsible for meeting all requirements of the applicable ESAs for the Project authorized under a water quality certification.

30. In the event of any violation or threatened violation of the conditions of a water quality certification, the violation or threatened violation is subject to any 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 assure compliance with the water quality standards and other pertinent requirements incorporated into a water quality certification.

31. In response to a suspected violation of any condition of a water quality certification, the State Water Board may require the holder of any federal permit or license subject to a water quality certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. The State Water Board may add to or modify the conditions of a water quality certification as appropriate to ensure compliance.

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

33. A 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).

34. A 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.

35. Nothing in a 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.

36. Water quality certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, chapter 28.

APPENDIX D – LIST OF COMPREHENSIVE PLANS

California

California Department of Fish and Game. U. S. Fish and Wildlife Service. 2010. Final hatchery and stocking program environmental impact report/environmental impact statement. Sacramento, California. January 2007.

California Department of Fish and Game. California wildlife: Conservation challenges, California's wildlife action plan. Sacramento, California. 2007.

California Department of Parks and Recreation. Public opinions and attitudes on outdoor recreation in California. March 1998.

California Department of Parks and Recreation. California Outdoor Recreation Plan (SCORP) Sacramento California.

California Department of Water Resources. The California water plan: projected use and available water supplies to 2010. Bulletin 160-83. Sacramento California. December 1983.

California Department of Water Resources. California water plan update. Bulletin 160-93. Sacramento, California. 1994.

State Water Resources Control Board. Water quality control plans and policies adopted as part of the State comprehensive plan. April 1999.

United States

Bureau of Land Management. Final environmental impact statement for 19 wilderness study areas within the Benton-Owens Valley and the Bodie-Coleville study areas. Department of the Interior, Bakersfield, California. 1987.

Bureau of Land Management. Bishop Resource Management Plan. Department of Interior, Bishop, California. April 1993.

Forest Service. Inyo National Forest land and resources management plan. Department of Agriculture, Bishop, California. August 1988.

National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington D.C. January 1982.

U.S. Fish and Wildlife Service. Fisheries USA: the recreational fisheries policy of the U.S. fish and Wildlife Service. Washington, D.C. undated.

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