ENVIRONMENTAL ASSESSMENT

FOR HYDROPOWER LICENSE

Fresno Dam Site Water Power Project

FERC Project No. 14751-002

Montana

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

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ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
applicant	Alpine Pacific Utilities Hydro, LLC
Alpine Pacific	Alpine Pacific Utilities Hydro, LLC
CFR	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DO	dissolved oxygen
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESCP	Erosion and Sedimentation Control Plan
ºF	degrees Fahrenheit
FPA	Federal Power Act
Fresno Power Project	Fresno Dam Site Water Power Project
FWS	United States Fish and Wildlife Service
Interior	United States Department of the Interior
IPaC	Information, Planning and Conservation System
J/kg	joule per kilogram
kV	kilovolt
kW	kilowatt
mm	millimeters
Montana DEQ	Montana Department of Environmental Quality
Montana FWP	Montana Department of Fish, Wildlife, and Parks
Montana SHPO	Montana State Historic Preservation Office
mg/l	milligrams per liter
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
NERC	North American Electric Reliability Corporation
NHPA	National Historic Preservation Act
Project	Fresno Dam Site Water Power Project
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
SWAP	State Wildlife Action Plan
TMDL	total maximum daily load
tailwater fishing site	Fresno tailwater fishing access site
USGS	U.S. Geological Survey
WECC	Western Electricity Coordinating Council
WMA	Wildlife Management Area

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1.0 INTRODUCTION

1.1 APPLICATION

On February 1, 2017, Alpine Pacific Utilities Hydro, LLC (Alpine Pacific) filed an application for a license to construct and operate its proposed 1.5-megawatt (MW) Fresno Dam Site Water Power Project (Fresno Power Project or project). The proposed project would generate an estimated 6,251 megawatt-hours (MWh) of energy annually.

The project would be located on the Milk River, at the existing U.S. Bureau of Reclamation's (Reclamation) Fresno Dam, near the town of Kremlin, in Hill County, Montana (figure 1). The project would occupy 0.07 acre of federal land managed by Reclamation.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the Fresno Power 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 Alpine Pacific for the Fresno Power 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.

Figure 1. Location of Fresno Dam Site Water Power Project Facilities (Source: staff).

Issuing a license for the Fresno Power Project would allow Alpine Pacific to generate electricity at the project for the term of the license, making electric power from a renewable resource available to the public.

This environmental assessment (EA) evaluates the effects associated with construction and operation of the proposed project, and makes recommendations to the Commission on whether to issue a license, and if so, recommends conditions that would become a part of any license issued.

In this EA, we assess the environmental and economic effects of constructing and operating the project: (1) as proposed by Alpine Pacific, and (2) as proposed with staff recommended measures and agency mandatory conditions. We also consider the effects of the no-action alternative. Important issues include the protection of soils, aquatic, terrestrial, recreation, and cultural resources during project construction and operation.

1.2.2 Need for Power

As noted, the project would have an installed capacity of 1.5 MW and generate approximately 6,251 MWh per year. To assess the need for project power, we looked at the needs in the operating region in which the project is located, which includes parts of Montana, South Dakota, and Nebraska.

The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The proposed project would be located in the Northwest Power Pool area of the Western Electricity Coordinating Council (WECC) region of NERC. For the 2018-2027 time period, NERC projects that net internal demand[1] within the region will increase by approximately 0.6 percent per year.

Therefore, power from the proposed project would help meet a need for power in the WECC region in both the short and long term. The project would provide power that would displace non-renewable, fossil-fired generation and contribute to a diversified generation mix. Displacing the operation of fossil-fueled facilities avoids some power plant emissions and creates and environmental benefit.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A license for the Fresno Power Project is subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described below.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA, 16 U.S.C. § 811, states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior. Neither the Secretary of Commerce nor the Secretary of the Interior filed Section 18 fishway prescriptions.

1.3.1.2 Section 4(e) Conditions

Section 4(e) of the FPA, 16 U.S.C. § 797(e), 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. Reclamation filed final conditions on March 7, 2018, pursuant to section 4(e) of the FPA. These conditions are described under section 2.2.7, *Modifications to Applicant's Proposal—Mandatory Conditions*.

[1] Net internal demand is the total internal demand less the available demand response resources in the region.

1.3.1.3 Section 10(j) Recommendations

Under section 10(j) of the FPA, 16 U.S.C. § 803(j), 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.

No 10(j) recommendations were filed for the Fresno Power Project.

1.3.2 Clean Water Act

Under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1), a license applicant must obtain either water quality certification (certification) from the appropriate state pollution control agency verifying that any discharge from a project would comply with applicable provisions of the Clean Water Act, or a waiver of certification by the appropriate state agency. The failure to act on a request for certification within a reasonable period of time, not to exceed one year, after receipt of such request constitutes a waiver.

On February 20, 2018, Alpine Pacific applied to the Montana Department of Environmental Quality (Montana DEQ) for 401 water quality certification or waiver for the Fresno Power Project. Montana DEQ received this request on February 20, 2018. Montana DEQ has not yet acted on the certification request. The certification is due February 20, 2019.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, 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.

On May 29, 2018, staff accessed the U.S. Fish and Wildlife Service's (FWS) Information, Planning, and Conservation (IPaC) System to determine which federally listed species might occur at or near the project. According to the IPaC database, there are no threatened, endangered, or candidate species, or critical habitats, in the project area. Therefore, construction and operation of the project would have no effect on federally listed species or critical habitats.

1.3.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, requires that every federal agency "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 of Historic Places (National Register).

On June 17, 2016, the Commission designated Alpine Pacific as its non-federal representative for the purposes of conducting section 106 consultation with the Montana State Historic Preservation Officer (Montana SHPO), under section 106 of the NHPA. As the Commission's designated non-federal representative, Alpine Pacific consulted with the Montana SHPO to identify historic properties, determine the National Register-eligibility of the project, and assess potential adverse effects on historic properties within the project's area of potential effects (APE).

Based on these consultations and other investigations, there are three historic sites located within or adjacent to the project boundary that are eligible for listing on the National Register: Fresno Dam (site 24HL860), the Hill County portions of Highway 2 (site 24HL1128), and the Hill County portions of the Great Northern Railroad (24HL869). However, construction, operation, and maintenance of the project would not adversely affect Fresno Dam because the footprint of the proposed powerhouse and substation would not diminish site integrity in any meaningful way. Further, the proposed transmission line would be buried beneath the highway and railroad using a jack and bore system to prevent any surface disturbance; thus, ensuring that the project would not involve removal of any critical site materials and design characteristics or cause a change in setting, feeling, or other aspects of integrity to these features. The Montana SHPO concurs with the finding that no historic properties would be adversely affected by the proposed project,[2] as does staff. Therefore, the section 106 process has been completed for this undertaking.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R. § 4.38) require that applicants consult with appropriate resource agencies, tribes, 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, the Endangered Species Act, the NHPA, and other federal statutes.

[2] Alpine Pacific filed the Montana SHPO's concurrence letter, dated December 22, 2017, on December 29, 2017.

Pre-filing consultation must be complete and documented according to the Commission's regulations.

Alpine Pacific filed a notice of intent to file an application for an original license and a pre-application document on January 21, 2016 and January 28, 2016, respectively. On February 2, 2016, Alpine Pacific filed a request for approval to use the traditional licensing process (TLP). The request to use the TLP was granted on March 9, 2016. As part of their pre-filing consultation, Alpine Pacific held a pre-filing meeting with the agencies and public on April 19, 2016. On June 30, 2016, Alpine Pacific distributed a draft license application and requested comments from stakeholders. In letter filed September 29, 2016, Reclamation filed comments on the draft license application. On February 1, 2017, Alpine Pacific filed its final license application.

Before preparing this EA, the Commission solicited additional study requests by public notice on February 14, 2017. No comments or requests for additional studies were filed. In its notice stating the application was accepted and ready for environmental analysis issued on December 21, 2017, the Commission stated its intent to waive scoping for this project based on the pre-filing consultation record. No objections were filed.

1.4.1 Interventions

On December 21, 2017, the Commission issued a notice stating that the license application was accepted and ready for environmental analysis. This notice set February 20, 2018 as the deadline for filing protests and motions to intervene. No protests or motions to intervene were filed.

1.4.2 Comments on the Application

The December 21, 2017, notice solicited comments, terms and conditions, recommendations, and prescriptions. In a letter filed March 7, 2018, Reclamation filed comments and terms and conditions.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

The no-action alternative is license denial. Under the no-action alternative, the project would not be built and environmental resources in the project area would not be affected.

2.2 APPLICANT'S PROPOSAL

2.2.1 Reclamation's Fresno Dam and Operation

Reclamation's Fresno Dam and Reservoir are existing irrigation storage facilities on the Milk River in north-central Montana, about 14 miles west of Havre, Montana. Fresno Dam was completed in 1939 as part of Reclamation's Milk River Project.

The compacted earthfill dam is about 2,070 feet long at the crest. The crest of the dam is at elevation 2,596.1 feet,[3] with a structural height of 110 feet and width of 22 feet. At a water surface elevation of 2,575 feet, the dam impounds 91,746 acre-feet and has a surface area of 5,163 acres. An uncontrolled overflow-type spillway is located at the northern end of the dam and discharges into a stilling basin. The spillway has a crest length of 210 feet and crest elevation of 2,575 feet, and can pass 51,360 cubic feet per second (cfs) at a reservoir elevation of 2,591 feet.

The outlet works consist of an intake structure with a trashrack; a 12-foot-diameter, 475-feet-long concrete-lined tunnel leading to a gate chamber; two, 6-foot-diameter, 290-foot-long welded steel outlet pipes within the tunnel; and a valve house. Flow from the intake passes through the concrete tunnel where it bifurcates at the gate chamber into the welded steel outlet pipes. Flow is controlled in the gate chamber using two, 5-foot-wide by 6-foot-high, high-pressure sluice gates. Flow through the outlet pipes is discharged into the stilling basin, and controlled by two, 5-foot-wide by 6-foot-high, high-pressure sluice gates contained in the valve house. The outlet works have a capacity of 2,180 cfs at a reservoir elevation of 2,575 feet. A road provides vehicle access to the valve house from Fresno Road North.

Reclamation operates the Fresno Dam and Reservoir primarily for irrigation storage and municipal water supply, with some storage used for limited flood control benefits. Each year irrigation allotments and release schedules are set by the Milk River Joint Board of Control. Regulation of the reservoir and corresponding water releases are made in accordance with annual operating plans developed based on forecasted and actual precipitation and weather information. Typically in April or May, during peak runoff in the basin, releases from Fresno Dam are set to minimize flooding downstream and maintain storage in Fresno Reservoir at or below the normal full pool elevation of 2,575 ft. Mean monthly discharges for this period generally range from about 350 cfs in

[3] Unless noted, all elevations based on the original project datum established during construction and confirmed to be 4.7 feet higher than National Geodetic Vertical Datum of 1929 (NGVD29) and 2.0 feet higher than North American Vertical Datum of 1988 (NAVD88)(Ferrari, 2013).

April to 775 cfs in May.[4] Once the peak runoff event has ended and reservoir elevations decrease below normal full pool, the dam is operated to release flows to meet the irrigation demands set by the Milk River Joint Board of Control. Mean monthly discharges to meet irrigation demands from June through September range from about 370 cfs to 1,170 cfs.[5] Typically in September, when the irrigation season ends, the available storage in Fresno Reservoir is evaluated and water in excess of 50,000 acre-feet may be transferred downstream to Nelson Reservoir.[6] During the non-irrigation season, a minimum release of 25 cfs from Fresno Reservoir is maintained to provide mixing flows for treated wastewater that is discharged into the Milk River; however, because of the gate configurations, the minimum flow typically ranges from 40 to 50 cfs.

2.2.2 Project Facilities

The proposed project would be constructed by modifying the outlet pipes near the valve house (figure 2). Each outlet pipe would be fitted with a pipe adapter consisting of a 72-inch diameter circular section transitioning to a 72-inch-high by 60-inch wide rectangular section. The pipe adapters would connect to a series of rectangular concrete adapter boxes that apportion flow using sluice gates into either the proposed turbines contained in a new underground powerhouse or to Reclamations' existing valve house. The powerhouse would be located adjacent to the valve house and contain one 875-kilowatt (kW) and one 625-kW Natel Energy single linear hydroengine turbine (figure 3) for a total rated capacity of 1.5 megawatts. Flow into each turbine would be passed through a 12-inch by 60-inch orifice and regulated by one side opening butterfly gate. Two new 5-foot-wide by 6-foot-high, 85-foot-long concrete tailraces would discharge powerhouse flows back into the existing stilling basin. Project power would be transmitted from the powerhouse to a new 400-square-foot switchyard containing a pad-mounted, three phase step-up transformer. An approximately 3.35-mile-long, 12.74-kilovolt (kV) underground transmission line would convey project power from the switchyard to a substation owned by Northwestern Energy.

2.2.3 Project Boundary

The proposed project boundary encompasses approximately 7.54 acres. Of the 7.54 acres, approximately 0.07 acres are land managed by Reclamation. The Exhibit G drawings filed by Alpine Pacific include the new project facilities listed in section 2.2.2,

[4] Mean monthly discharge was calculated using data collected from 2007 to 2017 from USGS gage number 06140500 located on the Milk River at Havre, Montana.

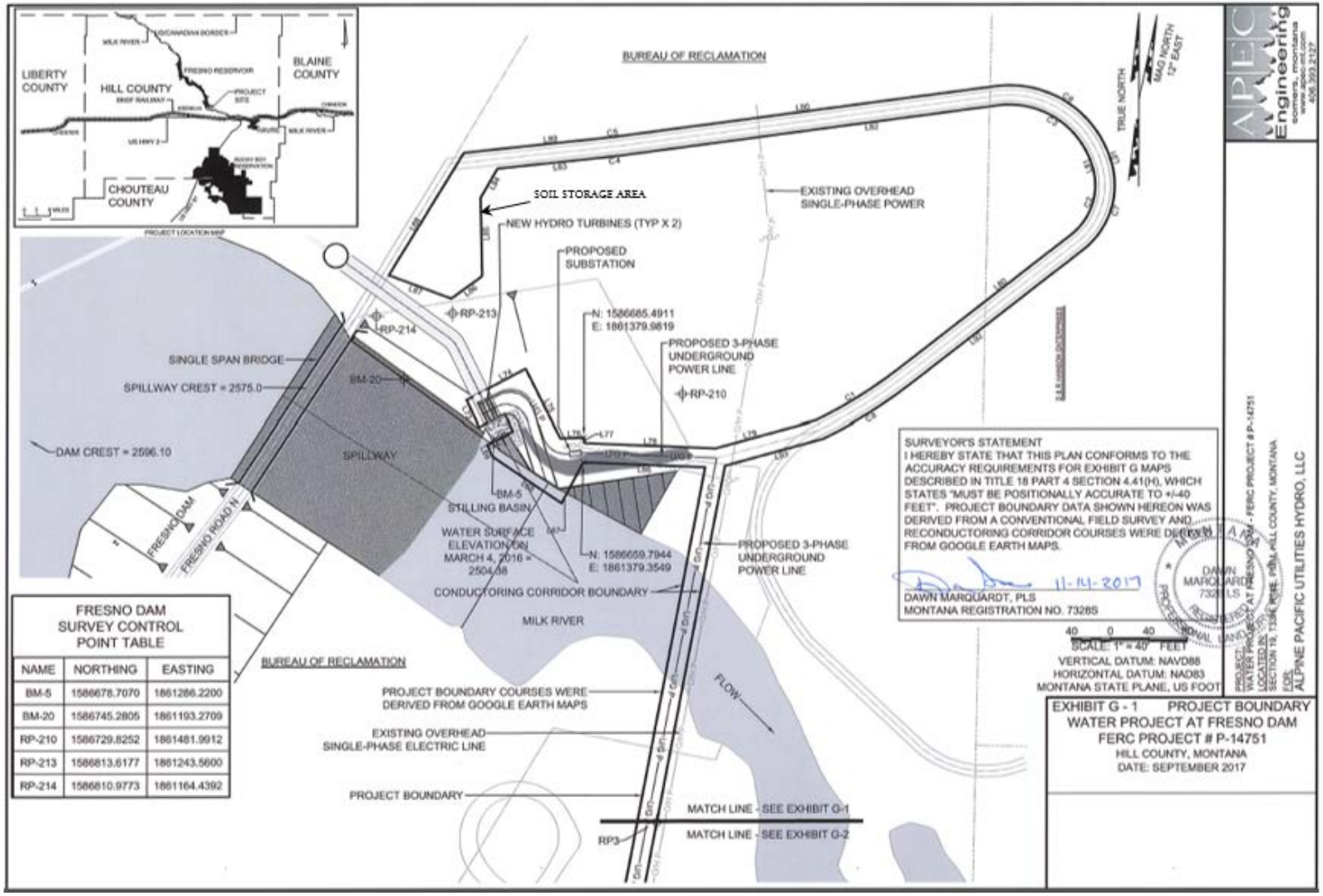
[5] *Id.*

[6] Nelson Reservoir is a Reclamation Project located 19 miles northeast of Malta, Montana. It receives Milk River water through the Dodson South Canal and provides off-stream storage for irrigation water.

the existing access road to the valve house, and an area along Fresno Road North that would be used for soil storage.

2.2.4 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-approved plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.



FRESNO DAM SURVEY CONTROL POINT TABLE

NAME	NORTHING	EASTING
BM-5	1586678.7070	1861286.2200
BM-20	1586745.2805	1861193.2709
RP-210	1586729.8252	1861481.9912
RP-213	1586813.6177	1861243.5600
RP-214	1586810.9773	1861164.4392

Figure 2. Fresno Dam Site Water Power Project proposed facilities (Source: Alpine Pacific, 2017d).

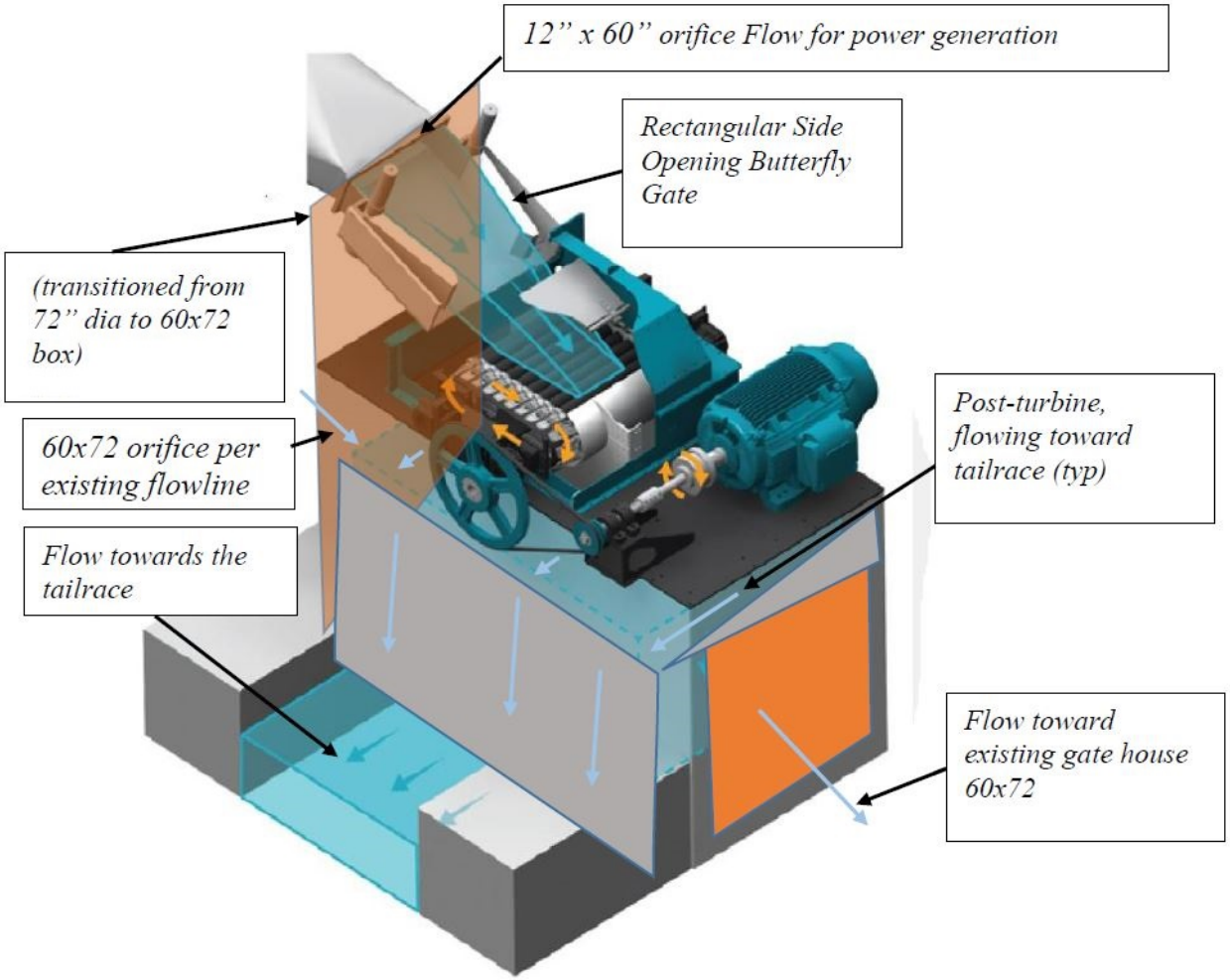


Figure 3. Proposed layout of the single linear hydroengine turbine unit installation (Source: Alpine Pacific, 2017e).

2.2.5 Project Operation

Project operation would not alter operation of Reclamation's Fresno dam and reservoir. The proposed Fresno Power Project would operate in a run-of-release mode, which means it would only use flows released to the project by Reclamation. More specifically, power generation would be seasonally dictated as reservoir levels and irrigation flow deliveries are set forth by Reclamation.

The hydropower project would be operated automatically, and monitored remotely by a local operator. The powerhouse would ordinarily be unmanned, except for brief daily periods of maintenance, inspection, and cleaning performed by one primary operator and additional part-time operators, as necessary.

Flows available for generation would be step controlled over two turbine units. As flow is made available, the 875-kW lead unit would start generating. Once that unit is generating at maximum hydraulic capacity, the 625-kW unit would be brought online. New sluice gates ahead of each turbine would be used to apportion flows.

The proposed project would operate using Reclamation's flow releases ranging from 36 to 670 cfs. One turbine unit would have a maximum hydraulic capacity of 375 cfs and the other would be throttled to limit the maximum hydraulic capacity to 295 cfs. Flows less than 36 cfs would bypass the powerhouse and flow through the existing Reclamation gates into the downstream river channel. Flows in excess of 670 cfs (the project's maximum hydraulic capacity) would be sent directly to the Milk River through the existing Reclamation gates, matching current operations.

2.2.6 Proposed Environmental Measures

Alpine Pacific proposes the following measures to protect environmental and cultural resources:

- Develop an erosion and sedimentation control plan (ESCP) with measures to reduce erosion and sedimentation.

- Schedule the majority of construction activities during winter months,[7] when flows are lowest and recreation activities are negligible to minimize the effects of project construction on Reclamation operation and recreation.

- During project construction, ensure at least one of the two existing outlet pipes is available to release flows into the Milk River to maintain Reclamation's existing minimum flow requirements.

- Revegetate all disturbed areas using native plants.

- Bury the transmission line parallel to the existing distribution line corridor to minimize adverse effects to terrestrial, aesthetic, and historic resources.

- Install flight diverters and perch deterrents at the substation's above-ground section of the transmission line to minimize avian collisions and electrocutions.

[7] Project construction would occur during the non-irrigation season, which typically includes September through April, with most construction activities occurring during the winter months (December through February).

2.2.7 Modifications to Applicant's Proposal – Mandatory Conditions

2.2.7.1 Section 4(e) Land Management Conditions

Reclamation filed nine conditions under FPA section 4(e). All of Reclamation's conditions would be included in any license issued for the project. We consider conditions 1 through 3 and conditions 5 through 9 to be administrative in nature and, as such, they are not addressed further in the EA.

The administrative conditions are as follows: (condition 1) enter into a construction, operation, and maintenance agreement with Reclamation; (condition 2) consult with and receive approval from Reclamation for those facilities that would be an integral part of, or could affect the structural integrity or operation of, the federal reservation; (condition 3) must neither impair the structural integrity or operation of the federal facilities, nor reduce or impair the capability to provide for the purposes and services of the Federal reservation, and further, must not negatively affect the Federal government's ability to fulfill its trust responsibilities to Indian tribes; (condition 5) have no claim against the United States arising from any change in operation of the federal facility; (condition 6) recognize the primary right of any Reclamation activity or the fulfillment of Indian water rights taking precedence over project hydropower activities; (condition 7) provide to the Commission's Regional Engineer copies of all correspondence between the licensee and Reclamation; (condition 8) provide Reclamation the opportunity to review and approve the design of contractor-designed cofferdams, blasting, and deep excavations; and (condition 9) acknowledge that the timing, quantity, and location of water releases and release changes from the facilities would be at the sole discretion of Reclamation.

Condition 4 is an environmental measure that is analyzed in this EA and requires the applicant to revegetate all newly disturbed land areas with plant species indigenous to the area within six months of the completion of the project's construction.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include Alpine Pacific's proposed measures and the section 4(e) conditions specified by Reclamation.

In addition, the staff alternative includes the following measures:

- Modify the Exhibit G drawings to remove the access road and soil disposal area from the project boundary and refile Exhibit G for Commission approval.

- Develop a revegetation and noxious weed control plan to limit the introduction and spread noxious weeds, and revegetate disturbed areas within six months after completion of construction.

- In the event that archaeological resources are discovered during project construction, include a provision in the license that requires Alpine Pacific to cease construction and notify Reclamation, Montana SHPO, and involved Indian tribes and develop a historic properties management plan (HPMP) if the resource is determined to be eligible for the National Register.

3.0 ENVIRONMENTAL ANALYSIS

In this section, we include: (1) a general description of the project vicinity, and (2) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area (aquatic, recreation, etc.). Under each resource area, historic and current conditions are first described. 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. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative*.[8]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The project would be located at Reclamation's Fresno Dam on the Milk River at river mile (RM) 437, in Hill County, Montana. Fresno Dam and Reservoir are Reclamation facilities used primarily for irrigation water storage and municipal water supply.

The Milk River is a 729-mile long tributary of the Missouri River, with a drainage basin that encompasses approximately 23,800 square miles. The Milk River flows predominately northeast from its headwaters in the foothills of the Rocky Mountains in northwestern Montana, east across Alberta, Canada, and then southeast through north-central Montana until it reaches its confluence with the Missouri River in Valley County,

[8] Unless noted otherwise, the sources of our information are the final license application filed on February 1, 2017 (Alpine Pacific Hydro Utilites, LLC, 2017a) and additional information filed on June 9, 2017 (Alpine Pacific Hydro Utilites, LLC, 2017b), September 19, 2017 (Alpine Pacific Hydro Utilites, LLC, 2017c), November 15, 2017 (Alpine Pacific Hydro Utilites, LLC, 2017d), and November 21, 2017 (Alpine Pacific Hydro Utilites, LLC, 2017e).

Montana, just downstream of the Fort Peck Dam. The Fresno Dam is located about 34-miles downstream from where the Milk River crosses back into Montana from Alberta. The drainage area above Fresno Dam encompasses about 3,776 square miles (Ferrari, 2000).

The climate in the basin is considered semi-arid with cold winters and warm to hot summers. In Havre, Montana average annual precipitation is 11 inches, and average annual snowfall is 42 inches (Western Reginal Climate Center, 2018). Average temperatures at Havre range from a minimum of 4.4°F in January to a maximum of 85.3°F in August (Western Regional Climate Center, 2018).

Fresno Dam and Reservoir are part of Reclamation's Milk River Project that also includes Lake Sherburne; Nelson Dam, the Dodson, Vandalia, St. Mary, Paradise, and Swift Current diversion dams; Dodson Pumping Plant; 200 miles of canals; 219 miles of laterals; and 295 miles of drains. Collectively, the features of the Milk River Project provides water for the irrigation of about 121,000 acres of land.

Land use around the Fresno Reservoir is primarily composed of federal lands maintained for recreation, livestock grazing, and wildlife habitat. Downstream of Fresno Dam, land use primarily includes crop production.

3.2 CUMULATIVE EFFECTS

According to the Council on Environmental Quality's regulations for implementing NEPA (40 C.F.R. § 1508.7), a cumulative effect is "the impact on the environment which results from the incremental impact of the 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.

Based on our review of the license application and agency and public comments, we have determined that no resources would be cumulatively affected by the construction, operation, and maintenance of the project. Although the project would be added to an existing water development, the proposed project would not cumulatively affect aquatic or other resources because it would not alter the timing, rate, volume, or origin of water withdrawals and discharges, would be consistent with the existing developed character of the project area, and would not add disrupt the visual setting because most features would be buried.

3.3 PROPOSED ACTION AND 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 analyze the site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. We have not identified any substantive issues related to socioeconomics associated with the proposed action, and therefore, this resource is not assessed in the EA. 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

Fresno Dam is located within the North Central Brown Glaciated Plains ecoregion designated by the U.S. Environmental Protection Agency (EPA). Terrain in this region is generally characterized by rolling hills and gentle plains that are mantled almost entirely by moraine[9], outwash[10], and glaciolacustrine[11] sediments (EPA, 2017). Soils within the project boundary are dominated by Telstad-Joplin loams at 0 to 4 percent slopes and Havre-Harlake clay loams at 0 to 2 percent slopes (USDA, 2017). Generally, these soils are well drained.

Seismic activity within and surrounding the project boundary is relatively insignificant. The U.S. Geological Survey (USGS) 2018 Short-Term Induced Seismicity Models put the region at a less than 1 percent chance of potentially minor-damage[12] ground shaking. The nearest faults documented by the USGS are located near Sweet Grass Hills, greater than 60 miles away from the project. Both faults run approximately southwest to northeast for approximately 3 miles. The most recent deformation of these faults is classified as undifferentiated Quaternary, or sometime within the last 1.6 million years. The slip rate for the faults is classified as less than 0.2 millimeters (mm) per year. The USGS has documented earthquakes that have occurred in 1978, 1979, 1991, 1994,

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[9] Moraine sediments are accumulations of till deposited by direct glacial action.

[10] Outwash sediments are transported and deposited by meltwater streams flowing away from a glacier as it recedes.

[11] Glaciolacustrine sediments are sediments from glaciers that are deposited into lakes.

[12] Minor-damage is defined as the equivalent to Modified Mercalli Intensity VI, which is defined as "Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight."

and 2013 within a 90 mile radius of the project site. All were measured at lower than 3.9 magnitude on the Richter Scale, classifying them as "Minor".

The areas where construction of the proposed project would occur, with the exception of the transmission line route, were disturbed during construction of the Fresno Dam, completed in 1939.

3.3.1.2 Environmental Effects

The outlet pipe modifications and installation of the powerhouse, tailrace, substation, transmission line, and appurtenant facilities would require ground-disturbing activities that could release sediment into the Milk River downstream of the dam.

The construction work would disturb approximately 7.5 acres of land located on the northern side of the riverbank and along the route of the transmission line. The transmission line would be buried beneath the Milk River using jack-and-bore tunneling and then would be buried along an existing transmission line corridor. The applicant proposes to utilize the existing access road and place a temporary soil stock pile area on the northern side of the riverbank near Fresno Road North.

To minimize soil erosion and dust, protect water quality, and minimize turbidity in the Milk River, the applicant proposes to develop an ESCP that includes include best management practices (BMPs) such as:

- scheduling construction to low rainfall periods to avoid discharge of sediment to the Milk River;
- seeding of soils stored for more than 30 days;
- surrounding stored soils with berms to contain runoff;
- disposing excess soil following project completion offsite;
- re-vegetating disturbed areas with native species; and
- developing a stormwater pollution prevention plan.

The applicant proposes to construct the powerhouse facilities in a manner to avoid any effects on dam stability and to monitor the stability of the embankment during and after project construction. The proposed hydroelectric facilities would also be designed to withstand seismic and hydrostatic forces.

Our Analysis

An ESCP that contains the type of measures proposed by the applicant would minimize project-related erosion and sedimentation at and downstream of the project and

would minimize any adverse effects to aquatic resources. Such a plan should be based on site-specific conditions and final project designs. With effective erosion control measures in place, sediment from construction activities would not likely enter the Milk River.

To ensure that the proposed facilities would not affect the stability of the dam and would be compatible with the applicable seismic and hydrostatic load standards, the applicant would need to finalize design plans and drawings in consultation with and need the approval of the Commission and Reclamation before construction could begin. The plans would include structural drawings, construction methods, and mitigation measures.

Once in operation, the project should have little or no effect on geology and soils.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Quantity

Fresno Dam impounds Fresno Reservoir on the Milk River at RM 437. Fresno Reservoir is the largest reservoir in the Milk River Project with a total storage capacity of 91,746 acre-feet, which comprises 57,747 acre-feet of active conservation storage, 33,841 acre-feet of joint use storage, and 158 acre-feet of inactive storage (Reclamation, 2016). At its normal maximum elevation of 2,575 feet, Fresno Reservoir has a surface area of 5,163 acres (Ferrari, 2013). The project is operated and maintained by Reclamation with irrigation allotments and schedule for irrigation season set by the Milk River Joint Board of Control. Typically the reservoir stores water from September to April (non-irrigation season) and releases water for irrigation from April to September (irrigation season); however, the irrigation season varies year to year based on hydrologic conditions.

Figure 4 provides the mean daily discharge from Fresno Dam to the Milk River for the 1988 to 2018 period (Reclamation, 2018). As discussed in section 2.2.1, mean monthly Milk River discharges recorded at USGS gage number 06140500 about 15 miles downstream from 2007 to 2017 ranged from about 350 cfs to 1,170 cfs during the typical irrigation season (April to September). During the non-irrigation season, the project releases enough water to meet a 25-cfs minimum flow intended to provide sufficient mixing flows for downstream wastewater treatment facilities. However, limitations of its existing gate configuration cause the releases to be between 40 to 50 cfs. The reservoir will typically reach its seasonal maximum elevation of between 2,570 to 2,575 feet in May and drop to its lowest elevation of about 2,560-feet in-September (Reclamation, 2018).

Water Quality

Water quality standards applicable to Fresno Reservoir and the Milk River downstream of Fresno Dam are shown in table 1. These waters are classified as B-3, which means they are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

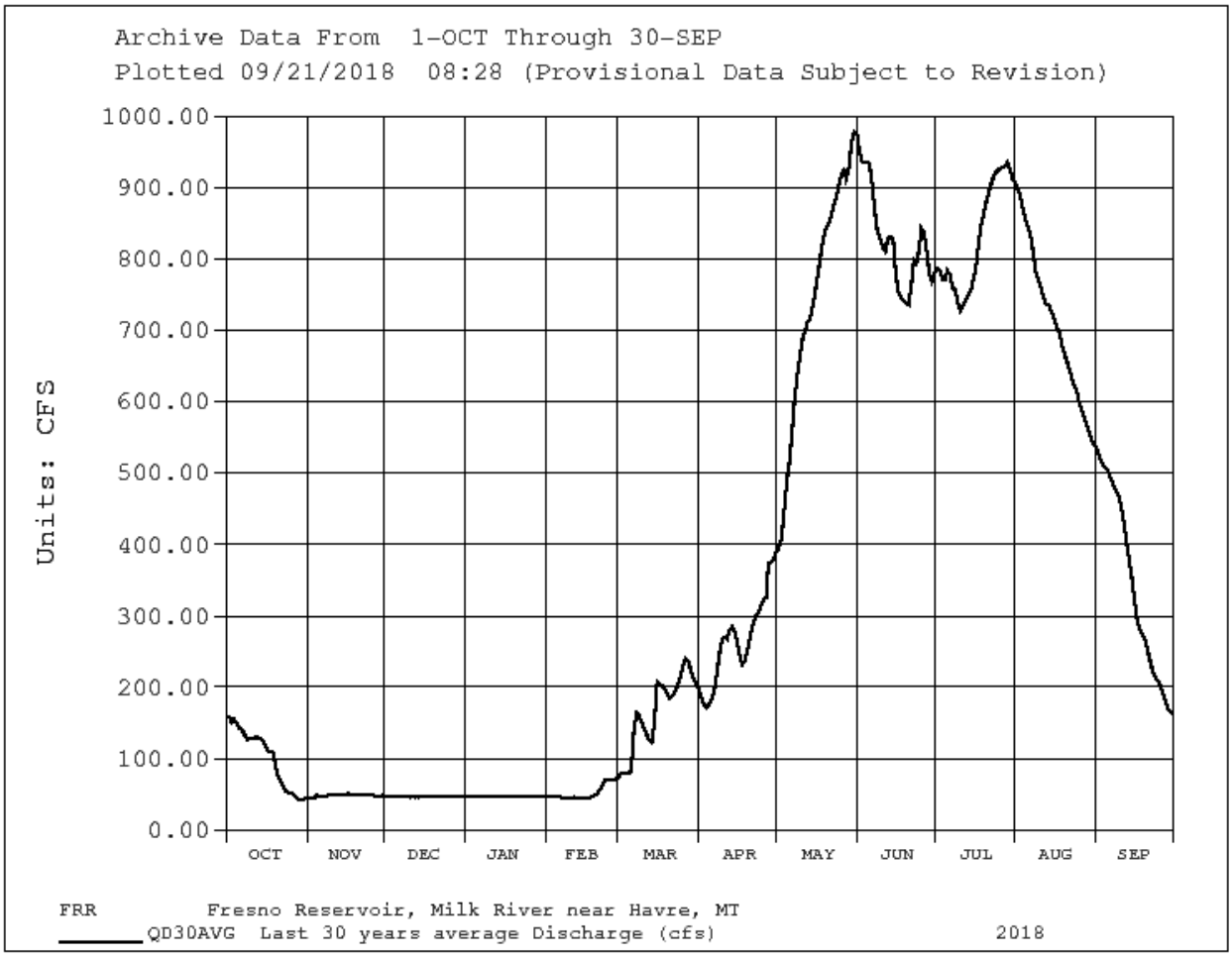

Figure 4. 30-year mean-daily discharge (cfs) from Fresno Reservoir (1988 to 2018) (Source: Reclamation, 2018).

Table 1. Numeric water quality criteria applicable to the Fresno Dam Site Water Power Project (Source: license application as modified by staff).

Parameter	Background Condition	Numeric Criteria
Temperature[a]	32°F to 77°F	3°F maximum increase above background
	77°F to 79°F	No thermal discharge allowed that will cause water temperature to exceed 80°F
	>79.5°F	The maximum allowable increase in water temperature is 0.5°F
Dissolved Oxygen (DO)	NA	For early life stages[a] of fish, the one day minimum DO is 5.0 mg/l and seven day mean DO is 6.0 mg/l. For all other life stages of fish, the one day minimum DO is 3.0 mg/l, the seven day mean minimum DO is 4.0 mg/l, and the 30 day mean is 5.5 mg/l.
pH	6.5 to 9.0	Induced variation of pH must be less than 0.5
	<6.5 or >9.5	No allowable change in pH
	>7.0	Natural pH be maintained above 7.0

[a] Montana does not have absolute standards for water temperature. Temperature regulation is relative and prohibits increases of various amounts above naturally occurring water temperature.
[b]Early life stages includes all embryonic and larval stages, and all juvenile forms of fish from 1 to 30 days following hatching.

Fresno Reservoir is included in Montana DEQ's 2016 Integrated Water Quality Report as impaired for alterations to flow regimes and physical substrate habitat resulting from hydrostructure flow regulation and modification. Because these impairments are not considered pollutants, no total maximum daily load (TMDL)[13] is established (Montana DEQ, 2017). The Milk River downstream of Fresno Dam is identified on the state of Montana's CWA section 303(d) list[14] as being water quality impaired (Montana

[13] A TMDL is a calculation of the maximum amount of a contaminant that a waterbody can receive and still meet water quality standards.

[14] A section 303(d) includes threatened or impaired waterbodies in a state that need a TMDL.

DEQ, 2017) because of mercury concentrations resulting from agriculture, dam or impoundment, and other natural sources. However, a required TMDL or other control program is not yet in place.

Water quality measurements were collected from Fresno Reservoir near the middle of the reservoir and near the dam in July, August, and September 2004 (National Water Quality Monitoring Council, 2018). Water temperature measured near mid-reservoir during this period ranged from 59.4 to 71.4°F with the highest temperatures occurring in August. During all months, water temperatures generally remained similar regardless of sample depth. Dissolved oxygen measured during this period and from depths ranging from 1.6 to 11.5 feet ranged from 7.8 to 9.6 mg/l and in all cases was higher than Montana's one day minimum criteria for aquatic life. The pH measured during this period ranged from 8.3 to 8.4.

Near the Fresno Dam, water temperatures ranged from 59 to 72.1°F, pH ranged from 7.7 to 8.6, and dissolved oxygen ranged from 3.6 to 9.3 mg/l. Dissolved oxygen measurements less than 5 mg/l occurred in July at a depth of 37.7 feet and in August at a depths of 24.6 feet and were, in some cases, lower than Montana's one day minimum dissolved oxygen criteria for aquatic life in Class B-3 waters (5.0 mg/l for early life stages of fish and 3.0 mg/l for all other life stages of fish). During September, dissolved oxygen ranged from 9 to 9.3 mg/l from the surface water to a depth of 27.9 feet.

Water temperature, pH, and dissolved oxygen were also collected in the surface waters of the Milk River, downstream of Fresno Dam in July and August 2010. During this period, water temperature ranged from 65.5 to 71.8°F, pH ranged from 8.2 to 8.5, and dissolved oxygen ranged from 7.8 to 8.3 mg/l. The measured dissolved oxygen concentrations were all higher than Montana's one day minimum criteria for aquatic life.

Aquatic Habitat

Fresno Reservoir

Fresno Reservoir is a relatively shallow, warmwater reservoir that spans 5,163 surface acres (Ferrari, 2013). As an irrigation storage facility, Fresno Reservoir experiences annual water fluctuations of more than 21 feet (Montana FWP, 2012). Vegetated shorelines along the reservoir provide important spawning and nursery habitat for fish when inundated by high reservoir water levels (Nagle, 2016). However, reservoir drawdowns can negatively affect spawning, rearing, and overwintering habitat, as well as cause an increase of fish entrainment through the intake (Montana FWP, 2012).

Milk River

Stash (2001) describes the Milk River reach from below Fresno Dam to Vandalia Diversion Dam as being confined to a single, deep, incised channel with vertical and highly erosive banks and moderately developed riparian areas. The substrate in the river predominately consists of sand and silt with a few areas consisting of gravel and cobble. The aquatic habitat generally lacks well-developed riffle habitat and instream structure (Stash, 2001).

Fisheries Resources

Fresno Reservoir

The Fresno Reservoir supports primarily a warmwater fishery that includes mostly introduced game and forage fish species. Currently, the reservoir is managed for walleye, sauger, burbot, northern pike, yellow perch, black crappie, and Lake Superior whitefish (Nagle, 2016). Non-native spottail shiners provide an important forage base. Native fish species known to occur in the reservoir include burbot, flathead chub, emerald shiner, and suckers. Over the years, Fresno Reservoir has also been stocked with kokanee, brown trout, and rainbow trout (Nagle, 2016). More recent stocking efforts conducted by Montana Department of Fish, Wildlife and Parks (Montana FWP) have included plantings of walleye and yellow perch. Walleye is the most targeted game fish in the reservoir (Nagle, 2016).

Milk River

The Milk River downstream of Fresno Dam also supports primarily a warm-water fishery composed of both introduced game species including yellow perch, walleye, northern pike, and lake whitefish and native species such as burbot, sauger, longnose sucker, longnose dace, emerald shiner, flathead chub, lake chub, and stonecat (Stash, 2001).

3.3.2.2 Environmental Effects

Water Quantity and Quality

Alpine Pacific proposes to operate the project as a run-of-release project, meaning that the project would use flows made available to it by Reclamation that would otherwise be released through Reclamation's outlet works. Thus, the flows below Fresno Dam would be identical to the flows that would be released by Reclamation in the absence of the project. This is consistent with Reclamation's 4(e) condition 9, which states that the timing, quantity, and location of water releases and release changes from the facilities would be at the sole discretion of Reclamation. Alpine Pacific also proposes to construct the project during the non-irrigation season and sequence construction of the powerhouse to ensure flow continuity during the construction period.

Our Analysis

Because the proposed project would not alter water volumes currently used for irrigation, municipal water supply, conservation use, or flood control, it would not affect the storage capacity or water levels of Fresno Reservoir or the amount and timing of water released from the reservoir into the Milk River. Water surface elevations in Fresno Reservoir would continue their seasonal fluctuations for purposes other than hydroelectric generation, rising in the winter and early spring and falling in the summer. The flow regime in the Milk River, the delivery of water to downstream users, and aquatic habitat in the Milk River would not change as a result of project operations. Project operation would not prevent Reclamation from changing its operations in the future.

Fresno Dam discharges flow through two 72-inch diameter outlet pipes. During the non-irrigation season, Reclamation uses one of these pipes to release a minimum flow of at least 25 cfs. To install the project turbines, a section of each of the two outlet pipes would need to be removed and replaced with an outlet pipe adapter that connects to each turbine unit. Installation would require flows through the affected outlet pipe to be shutoff temporarily. By installing the project turbines sequentially during the non-irrigation season, when low flow releases need only be accommodated by one of the outlet pipes, Alpine Pacific would avoid affecting Reclamation's normal operation and would ensure a continuous minimum flow release of at least 25 cfs during project construction.

Because the project would not change the timing, volume, or general location of Reclamation's releases at the dam, or the depth from which water is released, the proposed hydroelectric operations should have no impact on water quality in the Milk River, including water temperature and dissolved oxygen levels.

Fish Entrainment

Operation of the project has the potential to result in some fish injury or mortality from entrainment through the project's turbines. Alpine Pacific does not propose any measures to minimize fish passage through the turbines at the project, but proposes to use single linear hydroengine (SLH) type turbines that has been reported to have high fish passage survival rates (figure 3).

Our Analysis

Project operation would not affect the rate of fish entrained from Fresno Reservoir because the project would not alter the timing, rate, volume, or origin of water withdrawals.

There is little information on fish entrainment and mortality through Reclamation's existing intake and outlet works. Under existing conditions, fish passage from the reservoir to the Milk River downstream of the dam is either over the spillway, or through the intake, outlet pipes, and sluice gates. Nagle (2016) reported high angler catches of walleye in the Milk River below the dam following passage of fish over the spillway during a high flow event. Alpine Pacific's application includes a report of a fish kill below dam that occurred between March and April when Reclamation was releasing about 600 to700 cfs to provide flood storage due to heavy rainfall upstream. While it is unclear as to the cause of the mortality, the lower reservoir levels and high flows through the outlet works suggest that some fish mortality is occurring as result of passage through these project structures.

According to Natel Energy (2014), the probability of fish striking the blades of an SLH-type turbine ranges from 9 to 18 percent and the specific energy of the strike ranges from 8 to11 J/kg, both of which are similar to that of a Francis turbine (table 2).[15] Because the probability and specific energy of fish strike for an SLH turbine is similar to that of a Francis turbine, we expect that percent mortality through the project's SLH turbines would likewise be similar to that of a Francis turbine. The Electric Power Research Institute (EPRI) (1992) found that mortality through Francis turbines is usually 10 percent or less for naturally-entrained resident fish. Although operation of the project would likely cause some loss of smaller resident fish, the expected 10 percent or less mortality through the project's SLH-type turbines would be small and unlikely to adversely affect fish populations in the Milk River below the dam. We expect some entrainment mortality already occurs under existing conditions and downstream recruitment of fish during spill events would not be affected by project operation.

Table 2. Blade strike probabilities and specific energy of collision for fish encountering Francis and SLH turbines (Source: Natel Energy, 2014).

Turbine Type	Turbine Blade Strike Probability (%)	Specific Energy of Collision (J/kg)
Francis	8-30	10-26
SLH	9-18	8-11

Note: J/kg - joule per kilogram

[15] To develop the quantitative analysis of blade encounter characteristics of the SLH turbine, Natel Energy modeled pressure and fluid shear effects using advanced computerized fluid dynamic (CFD) modeling.

3.3.3 Terrestrial Resources

3.3.3.1 Affected Environment

The project is located in the Northwestern Glaciated Plains ecoregion (Montana FWP, 2015). This ecoregion covers northern Montana, as well parts of Nebraska and the Dakotas to the east, and Canada's Saskatchewan and Alberta provinces to the north (Wiken et al., 2011). The climate is mostly dry, with warm-to-hot summers and cold winters. The ecoregion contains mostly intermittent streams and a few large rivers, and in some areas, a high concentration of semi-permanent and seasonal wetlands ("prairie potholes"). A variety of native grasses, shrubs, herbs, and sagebrush can be found throughout the ecoregion, but large tracts of land have been converted into rangeland for cattle grazing or agricultural cropland (Wiken et al., 2011).

Vegetation

General habitat types occurring in the project vicinity include agricultural lands, prairie grassland, and altered/disturbed areas with introduced annual and biennial forbs. The main land cover type immediately surrounding Fresno Dam and proposed project structures (e.g., underground powerhouse, substation) is classified as Great Plains Mixed Grass Prairie (Montana NHP, 2018). Grasses typically comprise the greatest canopy cover, and western wheatgrass is usually dominant. Other species include thickspike wheatgrass, green needlegrass, and blue grama.

The proposed route for the underground transmission line crosses through different land cover types, most (two-thirds of the length) is cultivated cropland located along the southern end of the route. The northern end of the transmission line route crosses under the Milk River and passes through small sections of Great Plains Mixed Grass Prairie, Great Plains Badlands, Great Plains Shrubland, and altered/disturbed soils invaded by noxious weeds (Montana NHP, 2018). Great Plains Badlands occurs on rugged and eroded upland, and is characterized by having sparse vegetation of many dryland shrubs or herbaceous taxa, including curlycup gumweed, threadleaf snakeweed, and sagebrush. Great Plains Shrubland is often found on the upper terraces of rivers and streams, and has a similar grass component as that of Great Plains Mixed Grass Prairie but with a higher shrub cover percentage, generally 10 to 50 percent. It is typically dominated by shrub and dwarf-shrub species such as serviceberry, skunkbush sumac, snowberry, shrubby cinquefoil, silverberry, and horizontal juniper.

Wetlands

The proposed transmission line route crosses beneath the Milk River and two streams that are classified as intermittent, seasonally flooded riverine systems according

to FWS's National Wetlands Inventory system (FWS, 2018a). One of those intermittent streams is just north of Highway 2, and runs eastward before eventually draining into the Milk River. The other is a small drainage just north of the intersection of Fresno Road North and Tailwater Road near the Milk River floodplain.

The Montana State Wildlife Action Plan (SWAP) identifies the Milk River as a Tier 1 aquatic and terrestrial Focal Area (Montana FWP, 2015). Focal Areas are regional areas that are in greatest need of conservation, and Tier 1 areas are ranked as having the highest conservation priority. Threats to the Milk River include irrigation withdrawals, incompatible grazing practices, fish barriers, and development along the riparian corridor (Montana FWP, 2015).

Noxious Weed Species and Regulated Plants

Commission staff searched two online databases, Montana's Field Guide (Montana NHP, 2018) and the Early Detection and Distribution Mapping System West (UGA, 2018), for information regarding noxious weeds or regulated plants in the project vicinity. Sixteen noxious weeds and one regulated plant from Montana's Department of Agriculture Noxious Weed List (Montana DA, 2017) have been documented in Hill County (table 3). It is likely that noxious weeds occur in the vicinity of the project, as nearby habitat types are suitable for many of these species to thrive (e.g., roadsides, fields, meadows, areas with disturbed soils, riparian zones). At the Fresno Reservoir Wildlife Management Area (WMA), located approximately 11 miles northwest of the Fresno Dam, Canada thistle is the primary noxious weed in need of control (Montana FWP, 2017).

Table 3. Noxious weeds or regulated plants in Hill County, MT (Source: staff).

Common Name	Scientific Name	Priority Status*
Common reed	*Phragmites australis ssp. australis*	1A
Common buckthorn	*Rhamnus cathartica L.*	2A
Canada thistle	*Cirsium arvense*	2B
Field bindweed	*Convolvulus arvensis*	2B
Leafy spurge	*Euphorbia esula*	2B
Whitetop	*Cardaria draba*	2B
Russian knapweed	*Acroptilon repens*	2B
Spotted knapweed	*Centaurea stoebe*	2B

Diffuse knapweed	*Centaurea diffusa*	2B
Dalmation toadflax	*Linaria dalmatica*	2B
Sulphur cinquefoil	*Potentilla recta*	2B
Common tansy	*Tanacetum vulgare*	2B
Oxeye daisy	*Leucanthemum vulgare*	2B
Houndstongue	*Cynoglossum officinale*	2B
Yellow toadflax	*Linaria vulgaris*	2B
Saltcedar	*Tamarix spp.*	2B
Russian olive	*Elaeagnus angustifolia*	3
* Priority 1A – Limited, or no presence in MT; requires eradication, education, and prevention. Priority 2A – Common in isolated areas of MT; requires eradication or containment. Priority 2B – Abundant in MT; requires eradication or containment. Priority 3 – Regulated Plant and may not be intentionally spread or sold; research, education, and prevention is recommended to minimize spread.		

Wildlife

Several wildlife species are present near the Milk River or its adjacent shoreline and floodplain areas. Bird species such as eastern kingbirds, killdeer, osprey, tree swallows, red-winged blackbirds, ring-billed gulls, spotted sandpipers, and various waterfowl species (e.g., common merganser, blue-winged teal, Canada goose, mallard and eared grebe) are likely to be seen near the Fresno Reservoir and Dam. Painted turtles, beavers, deer mice, and plain spadefoot toads have been observed foraging in and around Fresno Dam's tailwaters.

In upland areas of the proposed project, bird species that could be present include horned lark, western meadow lark, northern harrier, and American kestrel. Snakes, such as North American racer and plains gartersnake, and various small mammals could be found foraging in the project's grassland or shrubland habitats.

Wildlife Species of Conservation Concern

Commission staff searched Montana's Natural Heritage Program online database for wildlife species of concern near the proposed project and found 26 species that have

been documented in Hill County (table 4) (MT NHP, 2018). Several of these could potentially inhabit or temporarily utilize habitats found within the project area.

Table 4. Species of Concern in Hill County, MT (Source: staff).

Common Name	Scientific Name	State Rank*	Project Vicinity **	Habitat
Mammals				
Black-tailed Prairie Dog	*Cynomys ludovicianus*	S3	B	Grasslands
Hoary Bat	*Lasiurus cinereus*	S3	A, B	Riparian and forest
Little Brown Myotis	*Myotis lucifugus*	S3	A, B	Generalist
Pygmy Shrew	*Sorex hoyi*	S3		Grasslands, shrublands
Merriam's Shrew	*Sorex merriami*	S3		Sagebrush grassland
Dwarf Shrew	*Sorex nanus*	S2S3		Rocky habitat
Swift Fox	*Vulpes velox*	S3	B	Grasslands
Birds				
Baird's Sparrow	*Ammodramus bairdii*	S3B	B	Grasslands
Sprague's Pipit	*Anthus spragueii*	S3B	B	Grasslands
Golden Eagle	*Aquila chrysaetos*	S3	B	Grasslands
Great Blue Heron	*Ardea herodias*	S3	A, B	Riparian forest
Burrowing Owl	*Athene cunicularia*	S3B	B	Grasslands
Ferruginous Hawk	*Buteo regalis*	S3B	B	Sagebrush grassland
Chestnut-collared Longspur	*Calcarius ornatus*	S2B	B	Grasslands
Greater Sage-Grouse	*Centrocercus urophasianus*	S2		Sagebrush
Bobolink	*Dolichonyx oryzivorus*	S3B		Moist grassland
Loggerhead Shrike	*Lanius ludovicianus*	S3B	A, B	Shubland
Long-billed Curlew	*Numenius americanus*	S3B	B	Grasslands
McCown's Longspur	*Rhynchophanes mccownii*	S3B	B	Grasslands
Brewer's Sparrow	*Spizella breweri*	S3	B	Sagebrush
Forster's Tern	*Sterna forsteri*	S3B	A, B	Wetlands
Common Tern	*Sterna hirundo*	S3B	A, B	Large rivers, lakes
Reptiles				
Plains Hog-nosed Snake	*Heterodon nasicus*	S2		Friable soils

Greater Short-horned Lizard	*Phrynosoma hernandesi*	S3	A	Sandy / gravelly soils
Amphibians				
Great Plains Toad	*Anaxyrus cognatus*	S2		Wetlands, floodplain pools
Plains Spadefoot	*Spea bombifrons*	S3	A, B	Wetlands, floodplain pools

* S2 - At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state. S3 - Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas. S2S3 - Uncertainty of species status ranges between S2 and S3. S2B or S3B - Rank refers to only the breeding population of the species in Montana.
** A - Documented in Montana's Natural Heritage Program online database within approximately five miles of the project area, B - Sighted at or near the Fresno Reservoir Wildlife Management Area (Montana FWP, 2017)(website source: http://fwp.mt.gov/fishAndWildlife/wma/siteDetail.html?id=39754295)

The Montana's SWAP addresses those species with a state ranking of S2 or higher (Montana FWP, 2015). This was done to ensure that limited resources used for conservation actions focused primarily on the species most at-risk. The only species likely within the proposed project area with an S2 ranking is the chestnut-collared longspur, although habitat for the greater sage-grouse surrounds the Fresno Dam and Reservoir.

Chestnut-Collared Longspur

The chestnut-collared longspur is a medium-sized terrestrial passerine that feeds on grass seeds, insects, and spiders. It migrates from its breeding grounds in the northern Great Plains to its wintering grounds in the southwestern United States and northern Mexico. Conversion of native prairie to agriculture and urban development has eliminated the chestnut-collared longspur from much of its historical breeding range. Past and more recent (less than ten years) observations of this species shows that it uses the habitat surrounding Fresno Reservoir (Montana FWP, 2015). Montana's SWAP includes conservation actions to benefit the chestnut-collared longspur including protecting grasslands and implementing grazing management that creates heterogeneous structured habitat, with an emphasis on the short-medium vegetation height preferred by this species.

Greater Sage-Grouse

The greater sage-grouse is a large upland game bird that has undergone steady population declines and loss of its sagebrush and open lands habitat across its western range. In 2010, FWS listed the sage-grouse as a candidate species under the ESA, but in 2015, FWS determined that it did not warrant ESA protection because current conservation efforts were adequate to protect this species and its habitat (FWS, 2015). In 2005, Montana created its first greater sage-grouse conservation plan, which was updated in 2014. The 2014 plan designates three types of habitat conservation areas: Core Areas, Connectivity Areas, and General Habitat.[16] Within Hill County, there are no designated Connectivity or Core Areas, but certain riparian or floodplain areas as well as tracts of large mixed prairie habitat are classified as General Habitat. General Habitat in the project area includes the Fresno Reservoir and nearby surrounding lands, with most of the proposed project features (i.e., powerhouse, switchyard, northern portion of the transmission line) located within this designated General Habitat.[17] Montana's SWAP recommends certain conservation actions to benefit the greater sage-grouse include promoting the conservation of intact sagebrush grasslands and using existing corridors for new infrastructure (e.g., power lines, roads) to minimize fragmentation (Montana FWP, 2015).

3.3.3.2 Environmental Effects

Vegetation and Wetlands

Construction of the project would result in approximately 0.08 acre of permanent habitat loss and approximately 7.42 acres of temporary habitat disturbance.[18] The temporary habitat disturbance would be primarily from excavation and boring associated with construction of the 3.35-mile-long transmission line. The 0.08 acre of permanent habitat loss would result from the construction of permanent project features (e.g., the powerhouse, the tailrace, the switchyard, and appurtenant facilities).

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[16] As defined in the 2015 Montana Greater Sage-Grouse Stewardship Act, a Core Area is "an area that has the highest conservation value for sage grouse and has the greatest number of displaying male sage grouse and associated sage grouse habitat". A Connectivity Area is "an area that provides an important linkage among populations of sage grouse, particularly between core areas or priority populations in adjacent states and across international borders". General Habitat is "an area providing habitat for sage grouse but not identified as a Core or Connectivity Area".

[17] https://sagegrouse.mt.gov/ProgramMap

[18] Our estimate of permanent and temporary land disturbance (7.50 acres total) differs from the final license application, which states that project's land disturbance is 1.7 acres, including 3.35 miles of underground power lines.

Alpine Pacific proposes to bury the transmission line beneath the Milk River using a jack-and-bore system. The power bore pits would be located outside the riparian zones; therefore, there would be no fill or alteration of wetlands other than vegetation clearing for equipment and maintenance of the right-of-way.

As discussed previously, Alpine Hydro proposes several measures to minimize adverse effects of soil erosion on surrounding vegetation including developing an ESCP that includes establishing a berm around 0.18-acre soil storage area and seeding the soils if stored for more than 30 days. The soil storage area would be located northwest of the existing valve house and adjacent to Fresno Road North and the valve house access road.

The applicant also proposes to revegetate all disturbed areas with native vegetation. Reclamation's 4(e) condition 4 would require that all newly disturbed land areas be revegetated with plant species indigenous to the area within six months of completion of project construction.

Our Analysis

As discussed previously, a well-developed ESCP would limit adverse effects of erosion on adjacent vegetation. Revegetating disturbed areas within six months of completing project construction using native plant species would minimize possible erosion and colonization of weeds that can out-compete native vegetation and reduce habitat quality for wildlife. However, no details on how revegetation efforts would be implemented have been provided. Further, much of the area has been disturbed and likely contains invasive species. Developing a revegetation and noxious weed control plan, in consultation with Reclamation, would assist in clarifying the specific actions and timing of proposed revegetation efforts, and would help to ensure that best management practices for controlling the introduction and spread of noxious and invasive weeds are being considered. Given that part of the proposed project area is within designated General Habitat for the greater sage-grouse, implementing specific best management practices to reduce the possible introduction and colonization of noxious weeds would help to maintain the existing habitat quality for the greater sage grouse.

The construction work would not directly affect the Milk River as all work would be done outside of the river bank or floodplain area. The transmission line route would, however, cross two intermittent streams, where trenching and back-filling would be required to bury the transmission line. These actions could cause possible filling or sedimentation of these streams. Adverse effects are expected to be minor, however, as the applicant proposes to conduct construction during the non-irrigation season when these streams are likely to be dry (i.e., less rainfall during the winter and early spring, no irrigation water drainage from surrounding cropland). In addition, the applicant's proposed ESCP would contain best management practices to minimize soil erosion and protect water quality.

Wildlife

Construction activities would result in noise and increased human presence that would temporarily disturb and displace wildlife. Excavation of soils could collapse dens and burrows, and increased vehicle traffic could cause mortality to less mobile species. Above-ground transmission lines could cause avian injuries/mortalities due to collisions or electrocutions. Waterfowl, wading birds, and piscivorous raptors, such as bald eagles, are particularly vulnerable to collisions with transmission lines near or across water features.

To prevent avian collision/electrocution issues, the applicant proposes to bury the 3.35-mile-long transmission. A small section of the transmission line at the substation would be above-ground; however, the applicant proposes to install flight diverters and perch deterrents on this segment.

Our Analysis

Since construction is expected to last only six months, disturbance and displacement of wildlife would be temporary and localized. Additionally, since construction would take place over the non-irrigation season (e.g., fall to early spring), it would be less likely to disrupt nesting activity occurring in late spring and summer.

Burying the transmission line would prevent avian collisions and electrocutions. For the short, above-ground section of the transmission line at the substation, the applicant's proposal to install flight diverters and perch deterrents would minimize the likelihood of avian injuries or mortalities.

3.3.4 Threatened and Endangered Species

On May 29, 2018, staff accessed the FWS's IPaC System to determine which federally listed species might occur at or near the project. According to the IPaC database, there are no threatened, endangered, or candidate species, or critical habitats, in the project area (FWS, 2018b). Therefore, construction and operation of the project would have no effect on federally listed species or critical habitats.

3.3.5 Recreation, Land Use, and Aesthetic Resources

3.3.5.1 Affected Environment

Fresno Reservoir Recreation Resources

Boating and fishing are popular activities on Fresno Reservoir. During the summer, anglers target walleye, northern pike, and perch, while other recreation opportunities include boating, swimming, waterskiing, birding, picnicking, hiking, and camping. In the winter, ice-fishing remains a pastime. Hunting opportunities for waterfowl, antelope, whitetail deer, mule deer, upland game birds, moose, and elk also exist on Reclamation-owned lands surrounding the project.

Reclamation owns and maintains six recreation sites along the 65 miles of shoreline on the Fresno Reservoir (figure 5): (1) Kremlin Bay Campground, located 3.5 miles east and 4 miles north of Kremlin, Montana, and includes designated campsites, restrooms, a day use area, and a concrete boat ramp; (2) Fresno Beach day use area, which features designated campsites, including Walleye's Unlimited Campground and Pavilion, two restroom facilities, a day use area, gravel road access, and parking area; (3) Jaycee's Beach, which includes cabin sites, a concrete and dirt boat ramp, day use area, gravel road access, and a parking area; (4) Kiehn's Bay, which includes a day use area, camping, restroom facilities, gravel road access, and a parking area; (5) Fresno tailwater fishing access site (tailwater fishing site), managed by Montana FWP, located immediately downstream of the dam, and which offers restroom facilities; and (6) Overlook and Boat Ramp day use area, which includes a concrete boat ramp, paved parking area, restroom facilities, and a group use shelter (Reclamation, 2013).

Figure 5. Project recreation in the vicinity of the project (Source: license application).

Land Use and Aesthetic Resources

Land use within the Milk River watershed is primarily agricultural, with cropland and pastures surrounding the project. There are also large patches of mixed and evergreen forest, with small areas of recreational and residential use concentrated along the Fresno reservoir. The Milk River is not designated as a National Wild and Scenic River, nor are there any areas within the proposed project boundary that are designated within the National Trails System or National Wilderness Preservation System.

The main aesthetic features of the proposed project is the existing historic dam. The reservoir offers an array of recreational opportunities for local residents and visitors.

3.3.5.2 Environmental Effects

Recreation

Construction-related noise associated with the proposed powerhouse and substation would temporarily disturb recreation at the tailwater fishing site. Further, burial of the transmission line would temporarily prevent recreation access to the tailwater fishing site. To minimize the effects of project construction on recreation in the vicinity of the project, Alpine Pacific proposes to schedule the majority of construction activities during winter months (December through February), when flows are lowest and recreation activities are negligible.

Reclamation's 4(e) condition 1 states that Alpine Pacific shall seek its review and approval of the design, construction, operation, and maintenance activities of the proposed project and schedule. No entity has recommended measures specifically to mitigate or enhance recreation resources.

Our Analysis

Installation of the buried transmission line would impede road access to the tailwater fishing site for no longer than one day for public safety. However, noise from construction activities for the remainder of the project facilities are expected to intermittently disrupt recreation at the site for about six months during the non-irrigation season. These effects would be unavoidable; however, recreation access would continue to be provided at the Fresno Beach day use area, Kremlin Bay Campground, Jaycee's Beach, Kiehn's Bay, and the Overlook and Boat Ramp day use area during the temporary closure and would provide a reasonable alternative during winter months if noise levels preclude recreationists from enjoying their experience at the tailwater fishing site. Because construction activities would be scheduled to occur intermittently during off-peak winter months, the brief loss of access to the tailwater fishing site and construction-related noise are expected to have a negligible effect on recreation use.

Once the project is operating, there would be no changes to the operation, maintenance, or use of any of the recreation areas.

Land Use and Aesthetics

The proposed project would require the construction of a powerhouse, tailrace, substation, and transmission line, which would all be located adjacent to and slightly downstream of the dam. Alpine Pacific proposes to bury the transmission line parallel to the existing distribution line corridor to avoid areas of new surface disturbance, and to re-vegetate any disturbed areas with native species to mitigate any visual effects.

Our Analysis

Land uses in the vicinity of the project would remain unchanged. The project footprint would be small (approximately 7.5 acres of land) and consistent with existing uses, including water conveyance/irrigation, and transmission of energy.

Project construction activities would be visible from Fresno Road North, Supenau Road, the Fresno tailwater fishing access site, and other sites near the dam and along the transmission line corridor, and temporarily affect visual resources at the project during their construction. Once construction is complete, the permanent presence of above-ground facilities, including the powerhouse and substation, would alter the existing visual environment. While the proposed hydroelectric facility would be generally out of view from areas above the dam, they would be conspicuous below the dam. However, given the developed character of the site, the effect of adding these structures on the viewshed would be minor.

As previously discussed in section 3.3.3, *Terrestrial Resources*, Reclamation's 4(e) condition 4 would require Alpine Pacific to revegetate any disturbed areas with indigenous plant species within six months of project construction. Doing so would minimize any long-term adverse effects on the aesthetic character of the project site.

3.3.6 Cultural Resources

3.3.6.1 Affected Environment

Under section 106 of the NHPA of 1966, as amended, the Commission must take into account whether any historic property within the project's APE could be affected by the project. The Advisory Council on Historic Preservation defines an APE (36 C.F.R. § 800.16) as "the geographic area or areas within which 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 Fresno Power Project includes all lands that would be involved in constructing the project, including a new underground powerhouse adjacent to the existing dam valve house, a new substation, and placement of a three-phase underground electric line from the substation south to a connection with an existing 69-kV line owned by NorthWestern Energy (figure 6). The project involves lands owned by the Bureau of Reclamation, Hill County, BNSF Railway, Montana Department of Transportation, and a private party.

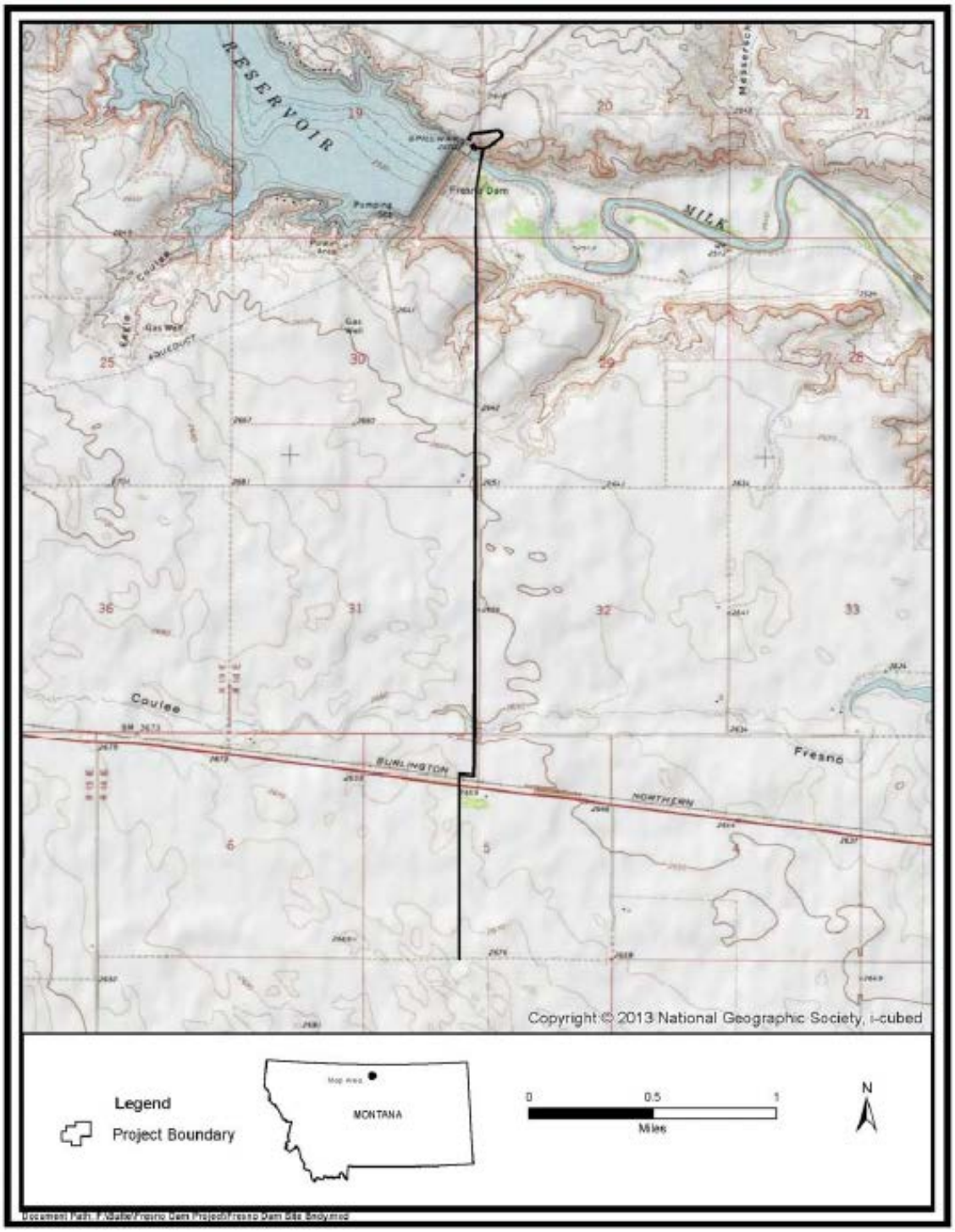

Figure 6. APE for the Fresno Power Project (Source: Alpine Pacific, 2017f).

Regional History

The earliest evidence of Native American occupation in Montana dates back 11,900 years. Prehistoric native populations inhabited the region during distinct cultural

periods defined by advancement in available tools, including the use of darts, atlatls, and arrow points. Predominantly Blackfoot and Crow cultures migrated from one temporary settlement to the next based on the climate and availability of food resources on the Plains.

Cultural shifts continued upon European contact, when native populations adopted the use of horses and various trade goods; however, epidemics such as smallpox and the overtaking of native lands and language have had lasting effects on indigenous Plains cultures.

The region's resources attracted fur trappers to the area many years leading up to the Lewis and Clark Expedition, and a string of trading posts and forts were established along the Missouri River during the fur trapping period. In 1855, the Federal government designated the region as common hunting grounds for native Tribes, and then established forts for distribution of annuities and other goods to the tribes. Fort Belknap, for instance, was first built in 1871, abandoned in 1876, and then reestablished in 1878. In 1888, 17,500,000 acres of the common hunting grounds were ceded back to the Federal government, reducing Indian settlements to the boundaries of the Blackfeet, Fort Belknap, and Fort Peck reservations. The Rocky Boy's Indian Reservation was created September 7, 1916 by Executive Order.

The discovery of gold in the 1860s drew people to Montana, and wagon and steamboat traffic established trails, such as the Fisk Trail, to Fort Benton on the Missouri River. The Federal government began issuing grazing permits to the region in 1883, followed by the authorization of the Great Northern Railroad in 1887, which attracted further attention and homesteading as lands were made available for settlement. A few private irrigation systems were developed along the Milk River; however, water supplies were unreliable until the Federal government constructed the Milk River Project facilities.

On March 14, 1903, the Secretary of Interior authorized construction of Reclamation's first five projects, including the Milk River Project. On March 25, 1905, $1,000,000 was allocated for construction of storage works on the St. Mary River and facilities to divert water from the St. Mary River to the head of the Milk River. This authorization was limited by the condition that prior to the start of construction, a suitable agreement between the United States and Canada would have to be negotiated that would allow the stored waters of the St. Mary River to be transported through Canadian territory without interference.

By early 1906, even though the governments of the United States and Canada had been unable to reach an agreement, the Reclamation Service[19] was authorized to draw up

[19] Bureau of Reclamation was previously known as the U.S. Reclamation Service.

specifications and advertise for bids to construct the St. Mary Canal from the St. Mary River to the Milk River. Construction of the canal was anticipated to solidify the United States' claims to the waters of the St. Mary River, but if no agreement was reached, the canal would be used to irrigate some 100,000 acres in the eastern part of the Blackfeet Indian Reservation and surrounding areas.

Authorization for construction of the Dodson Diversion Dam on the Lower Milk River near Dodson, Montana, was given in early August, 1906. The Fresno dam and reservoir were given subsequent authorization in 1935, followed by the Dodson pumping unit in 1944.

Archaeological and Historic Resources

Over 400 prehistoric archaeological and historic sites were discovered during a cultural resources survey in 1985 and 1986. Seven of the archaeological and historic sites are within 0.25-mile of the APE, including sites 24HL859, 24HL860, 24HL869, 24HL935, 24HL1017, 24HL1128, and 24HL1254.

A field inventory of the APE was conducted on October 18 and 19, 2017 to locate and evaluate effects of the project on archaeological and historical resources. During the survey, no archaeological sites were observed, but three previously recorded historic sites were identified: the Hill County portion of the great Northern Railroad (site 24HL869), the Hill County portions of Highway 2 (site 24HL1128), and a small section of the Fresno dam (site 24HL860); all were previously found to eligible for listing on the National Register. Two isolated finds were also discovered during the survey, a scatter of about 40 artifacts and a cast iron object of unknown purpose, but are considered not historically important or National Register-eligible.

Hill County Portion of the Great Northern Railroad (site 24HL869)

The Great Northern Railroad historic site in Hill County is a linear property that is significant for being the farthest north transcontinental route in the United States. This site was previously found to be eligible for listing on the National Register under Criterion A: *Event* for the role it played during the settlement and development of this area in Montana by transporting passengers, livestock, timber, and agricultural products across the country, while employing thousands of people and serving as a freight, mail, and express line.

It was also found eligible because of its association with James Jerome Hill (National Register under Criterion B: *Person*). It is significant because of his engineering role in one of the leading transportation companies over the course of nearly 40 years, and for transforming the railroad's purpose as an agricultural hauler.

The distinctive characteristics of the period and method of construction qualify this historic site for National Register-eligibility under Criterion C: *Design/Construction*, and today most of the line lays in its historic position, as it does within the APE for the project.

Hill County Portions of Highway 2 (site 24HL1128)

U.S. Highway 2 runs adjacent to what is known as the Montana Hi-Line, which refers to the historic road across the northern part of Montana stretching from North Dakota to the Idaho border for more than 650 miles and is more than 150 years old. The Hill County portion of Highway 2 was the first asphalt-surfaced road on the Hi-Line, originally constructed in 1921 and rebuilt in 1946 to its present alignment. The Hill County portions of Highway 2 are significant and eligible for listing on the National Register under Criteria A, B, and C for its role as the main automobile and truck traffic route that links neighboring communities of common and diverse economic and ethnic backgrounds.

Fresno Dam (site 24HL860)

The Fresno dam historic site is eligible for listing on the National Register under Criterion A and C for its role in storing water for irrigation and residential purposes to mitigate water loss during the drought and Great Depression of the 1930s. During its associated historic period, the dam serviced over 120,000 acres across 700 farms within the larger Milk River irrigation system.

3.3.6.2 Environmental Effects

Effects on Historic Properties

Alpine Pacific's cultural resource inventory report determined that while construction of the new powerhouse and substation adjacent to the existing spillway and control house would affect the historic property, the effect of the proposed project will not be adverse because the site integrity will not be diminished in any meaningful way.

The report similarly concluded that the proposed project would have no adverse effect on the other two National Register-eligible properties. While the proposed transmission line would cross the Hill County portion of the Great Northern Railroad and Hill County portions of Highway 2, the line would be buried following Montana Department of Transportation's and Great Northern Railroad's standards and using a jack and bore system to ensure that the project would not involve removal of any critical site materials and design characteristics or cause a change in setting, feeling, or other aspects of integrity. Use of the jack and bore system would prevent any surface disturbance,

making the line burial virtually undetectable within the railroad and highway rights-of-way.

The Montana SHPO concurred on December 22, 2017 that the proposed project will have no adverse effect on historic properties and that a HPMP is not necessary at this time.[20]

Our Analysis

The proposed project would have no adverse effects on historic properties. Nevertheless, there is always a possibility that unknown archaeological resources could be discovered during the course of the project's construction, operation, or project-related activities. Including a condition in the license that would require Alpine Pacific to discontinue all exploratory or construction-related activities and consult with the Montana SHPO, Reclamation, and involved Indian tribes if a site is discovered would ensure that any adverse effects to cultural resources can be avoided, reduced, or mitigated. Such a condition would allow time to establish the proper treatment of any potential cultural resource, in the event that a cultural resource is inadvertently discovered during project-related activities.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative (denial of the application), the project would not be constructed and would not generate an estimated average annual generation of 6,251 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.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Fresno Power Project's use of the Milk River 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 Corp.*,[21] the Commission compares the current project cost to an estimate of the cost of obtaining the

[20] Alpine Pacific filed the Montana SHPO's letter, dated December 22, 2017, on December 29, 2017.

[21] *See Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (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.

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 Corp*, 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.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

Table 5 summarizes the assumptions and economic information we use in our analysis. This information was provided by Alpine Pacific in its license application. We found the Alpine Pacific values to be reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs, net investment, licensing cost, normal operation and maintenance cost, and Commission fees.

Table 5. Parameters for economic analysis of the Fresno Dam Hydroelectric Project (Source: license application, as modified by staff).

Parameter	Value	Source
Period of analysis (years)	30	Staff
Cost to develop license application, $ [a]	50,860	Alpine Pacific
Construction cost, $ [a]	4,373,870	Alpine Pacific
Operation and maintenance, $/year [b]	98,670	Alpine Pacific
Annual Power Value ($/MWh)	40.60	Alpine Pacific
Interest rate, %	5	Staff
Interest rate, %	5	Staff

[a] Costs provided in 2017 dollars and shown in 2018 dollars.
[b] Operation and maintenance costs include yearly depreciation, taxes, administrative and labor costs.

4.2 COMPARISON OF ALTERNATIVES

Table 6 summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project cost for each of the alternatives considered in this EA: no-action, Alpine Pacific's proposal, and staff alternative.

Table 6. Summary of the annual cost of alternative power and annual project cost for the four alternatives for the Fresno Dam Site Water Power Project (Source: staff).

	Alpine Pacific's Proposal	**Staff Alternative**
Installed Capacity (MW)	1.5	1.5
Average Annual Generation (MWh)	6,251	6,251
Annual cost of alternative power ($/MWh)	$480,700 79.90	$480,700 79.90
Annual project cost ($/MWh)	$535,200 85.61	$535,400 85.65
Difference between the cost of alternative power and project cost ($/MWh)	$(54,500) (8.71)	$(54,700) (8.75)

4.2.1 No-action Alternative

Under the no-action alternative, the project would not be constructed and would not produce any electricity. No costs for construction, operation and maintenance, or proposed environmental protection, mitigation, or enhancement measures would be incurred by the applicant.

4.2.2 Alpine Pacific's Proposal

Alpine Pacific's proposed environmental measures are presented in table 7. Under Alpine Pacific's proposal, the project would require construction of a new hydroelectric facility at the existing Fresno Dam. The proposed project would have a total capacity of

1.5 MW, an average annual generation of 6,251 MWh, and an average annual power value of $487,700, or $79.90/MWh. With an average annual project cost of $535,200 or $85.61/MWh, the project would produce power at a cost that is $54,500, or $8.71/MWh, more than the cost of alternative power.

4.2.3 Staff Alternative

The staff alternative includes the same developmental proposal as Alpine Pacific and, therefore, would have the same capacity and energy attributes. Table 7 shows the staff recommended additions and modifications to Alpine Pacific's proposed environmental protection and enhancement measures, and the estimated cost of each.

Based on a total installed capacity of 1.5 MW and an average annual generation of 6,251 MWh of electricity annually, the average annual cost of alternative power would be $487,700, or $79.90/MWh. The average annual project cost would be $535,400, or $85.65/MWh. Overall, the project would produce power at a cost that is $54,700, or $8.75/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 mitigation and enhancement measures considered in assessing the environmental effects of the continued operation of the Fresno Dam Site Water Power Project (Source: staff).

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
Geology and Soils				
1. Develop and implement an Erosion and Sedimentation Control Plan (ESCP).	Alpine Pacific, staff	$50,860	$0	$3,950
Aquatics				
2. During project construction, ensure at least one of the two existing outlet pipes is available to release flows into the Milk River to maintain Reclamation's existing minimum flow requirements	Alpine Pacific, staff	$0[a]	$0[a]	$0[a]
Terrestrial Resources				
3. Bury the transmission line parallel to the existing distribution line corridor to minimize land disturbance.	Alpine Pacific, staff	$0	$0	$0

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
4. Install bird flight diverters and perch deterrents at the above-ground section of the transmission line at the substation.	Alpine Pacific, staff	$10,170	$2,030	$2,400
5. Revegetate all disturbed areas with native plant species.	Alpine Pacific, Reclamation (condition 4), staff	$0[b]	$0[b]	$0[b]
6. Develop a revegetation and noxious weed control plan.	staff	$3,000[c]	$0	$230
Recreation Resources				
7. Schedule construction activities during winter months.	Alpine Pacific, staff	$0	$0	$0

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
Cultural Resources				
8. In the event that archaeological resources are discovered if a license if issued for the project, cease construction and notify Reclamation, Montana SHPO, and involved Indian tribes and develop a HPMP if the resource is determined to be eligible for the National Register.	staff	$0	$0	$0

[a] Costs to implement the measure included in the construction cost estimate.

[b] Costs to implement the measure included in the capital cost estimate for the ESCP.

[c] Cost estimated by staff.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreation, cultural, and other non-developmental values of the involved waterway equally with its electric energy and other developmental values. In deciding whether, and under what conditions a hydropower project should be licensed, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing the waterway. We weigh the costs and benefits of our recommended alternative against other proposed measures. This section contains the basis for, and a summary of, our recommendations for relicensing the Alpine Pacific Project.

Based on our independent review and evaluation of the environmental and economic effects of the proposed action, the proposed action with additional staff-recommended measures, and no action, we recommend the proposed action with the additional staff-recommended measures as the preferred alternative. This alternative includes the applicant's proposed measures, Reclamation's mandatory conditions, and staff's additional measures.

We recommend the staff alternative because: (1) issuing an original license would allow Alpine Pacific to operate the project as a beneficial and dependable source of electric energy; (2) the 1.5 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; and (3) the recommended environmental measures would protect aquatic, terrestrial, recreation, and cultural resources.

5.1.1 Measures Proposed by Alpine Pacific

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

- Develop an Erosion and Sedimentation Control Plan (ESCP) with measures to reduce erosion and sedimentation.

- Schedule the majority of construction activities during winter months,[22] when flows are lowest and recreation activities are negligible to minimize the effects of project construction on Reclamation operation and recreation.

- During project construction, ensure at least one of the two existing outlet pipes is available to release flows into the Milk River to maintain Reclamation's existing minimum flow requirements.

- Revegetate all disturbed areas using native plants.

- Bury the transmission line parallel to the existing distribution line corridor to minimize adverse effects to terrestrial, aesthetic, and historic resources.

- Install flight diverters and perch deterrents at the substation's above-ground section of the transmission line to minimize avian collisions and electrocutions.

5.1.2 Additional Staff-Recommended Measures

We recommend the measures described above, and the following staff-recommended measures:

- Modify the Exhibit G drawings to remove the access road and soil disposal area from the project boundary and refile Exhibit G for Commission approval.

- Develop a revegetation and noxious weed control plan to limit the introduction and spread of noxious weeds, and revegetate disturbed areas within six months after the completion of construction.

- In the event that archaeological resources are discovered during project construction, include a provision in the license that requires Alpine Pacific to cease construction and notify Reclamation, Montana SHPO, and involved Indian tribes and develop a HPMP if the resource is determined to be eligible for the National Register

Below, we discuss the rationale for modifying Alpine Pacific's proposal and the basis for our additional staff recommended measures.

[22] Project construction would occur during the non-irrigation season, which typically includes September through April, with most construction activities occurring during the winter months (December through February).

Project Boundary

The proposed project boundary depicted in the Exhibit G drawings filed with the license application included an existing access road and the proposed soil storage area that would be used during project construction. Although the access road would be used during project construction and operation, it would not be used primarily by the project as it would continue to be used by Reclamation to access and maintain its facilities within Reclamation's valve house and would continue to be maintained by Reclamation. Therefore, the access road does not need to be included in the project boundary. Once the soil storage area is revegetated, the lands would not serve a project purposes. Therefore, the soil storage area need not be included in the project boundary. Thus the project boundary should only include the project turbines, power house, tailrace, substation, and transmission line.

Revegetation and Noxious Weed Control Plan

The applicant proposes, and Reclamation stipulates, that all disturbed areas are to be revegetated using native plants. Reclamation's also requires that revegetation occur within six months after the completion of construction.

As we discussed in section 3.3.3.2, revegetating disturbed areas with native plants within six months after completion of construction would help to reduce erosion and colonization of weeds. Using native plants would also benefit local wildlife species that use these plants for forage or cover. However, Alpine Pacific does not describe how it would revegetate disturbed areas or control noxious weed infestation, which if they become established could reduce the quality of wildlife habitat. Invasive species are likely present, particularly along the proposed route for the transmission line which crosses through areas of altered/disturbed soils.

We recommend that the applicant develop a revegetation and noxious weed control plan in consultation with Reclamation that includes: (1) a description of techniques and best management practices to be followed for controlling the introduction and spread of noxious and invasive weeds; (2) a plant species list for revegetation efforts; (3) criteria for measuring success of revegetation efforts, and a description of procedures to be followed if revegetation is not successful; and (5) an implementation schedule that provides for completing for revegetation within six months after the completion of construction. The cost for developing a plan with these measures would be minimal and the benefits worth the levelized annual cost of $230.

Unanticipated Cultural Resource Discoveries

As discussed in section 3.3.6, *Cultural Resources*, 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. 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 Montana SHPO, Reclamation, and involved Indian tribes in the event that a significant cultural resource is inadvertently discovered during project construction, operation, or maintenance activities would result in a nominal cost.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Sediment would likely enter the Milk River during project construction, but this short-term effect would be minimized by implementing an erosion and sediment control plan. Construction activities associated with the powerhouse, tailrace, and transmission line could also temporally disturb local wildlife populations. Construction of the project would result in approximately 0.08 acre of permanent habitat loss; however, this affect would be minor as habitat loss would occur primarily in previously disturbed areas. Temporary disturbance of about 7.42 acres of wildlife habitat would occur during construction; however, adverse effects to wildlife would short-term, and any wildlife displaced from the construction area could return within a relatively short period of time. Construction-related noise associated with the proposed powerhouse and substation would temporarily disturb recreation at the tailwater fishing site; however, because construction activities would be scheduled to occur intermittently during off-peak winter months, the effect on recreation is expected to be negligible. Project construction activities would temporarily affect visual resources at the project during their construction. Once construction is complete, some of the project facilities would alter the existing visual environment, however, given the developed character of the site, the effect on the viewshed would be minor.

5.3 SUMMARY OF SECTION 10(J) RECOMMENDATIONS AND 4(e) CONDITIONS

5.3.1 Fish and Wildlife Agency 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, or 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.

The Commission received no recommendations.

5.3.2 Land Management Agency's Section 4(e) Conditions

Of Reclamation's 9 final 4(e) conditions, we consider 8 (conditions 1 through 3 and conditions 5 through 9) to be administrative or legal in nature and not specific environmental measures. We therefore do not analyze these conditions in this EA. Condition 4 requires the applicant to revegetate all newly disturbed land areas with plant species indigenous to the area within 6 months of the completion of the project's construction. All of Reclamation's section 4(e) conditions are included in the staff alternative.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) 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 the following nine comprehensive plans that are applicable to the Fresno Power Project, located in Montana. No inconsistencies were found.

Montana Board of Natural Resources and Conservation. 1992. Final order establishing water reservations above Fort Peck Dam. Helena, Montana. July 1992.

Montana Department of Environmental Quality. 2001. Montana non-point source management plan. Helena, Montana. November 19, 2001.

Montana Department of Environmental Quality. 2004. Montana water quality integrated report for Montana (305(b)/303(d)). Helena, Montana. November 24, 2004.

Montana Department of Fish, Wildlife and Parks. 1993. Water rights filings under S.B.76. Helena, Montana. February 8, 1993.

Montana Department of Fish, Wildlife and Parks. 1997. Montana warm water fisheries management. Helena, Montana. March 1997.

Montana Department of Fish, Wildlife and Parks. Montana Statewide Comprehensive Outdoor Recreation Plan: 2003-2007. Helena, Montana. March 2003.

Montana State Legislature. 1997. House Bill Number 546. Total Maximum Daily Load. Helena, Montana.

U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

U.S. Fish and Wildlife Service. 1995. U.S. Prairie Pothole joint venture implementation plan - update. Department of the Interior, Denver, Colorado. January 1995.

6.0 FINDING OF NO SIGNIFICANT IMPACT

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

7.0 LITERATURE CITED

Alpine Pacific Utilities Hydro, LLC (Alpine Pacific). 2017a. Fresno Dam Site Water Power Project, FERC No. 14751, final license application. February, 2017.

_____. 2017b. Fresno Dam Site Water Power Project, FERC No. 14751, response to resolve the deficiencies and request for extension of time to provide additional information. June 2017.

_____. 2017c. Fresno Dam Site Water Power Project, FERC No. 14751, response to the deficiency of application and request for additional information including revised exhibits F and G. September, 2017.

_____. 2017d. Fresno Dam Site Water Power Project, FERC No. 14751, response to the request for additional information including revised exhibits F and G. November 2017.

_____. 2017e. Fresno Dam Site Water Power Project, FERC No. 14751, response to the request for additional information including revised exhibits A and G. November 2017.

_____. 2017f. Fresno Dam Site Water Power Project, FERC No. 14751, A Cultural Resource Inventory and Determination of Effect. December 2017.

Bureau of Reclamation. 2013. Fresno Reservoir Recreation Area. Accessed on March 9, 2018 at: https://www.usbr.gov/gp/multimedia/publications/fresno_brochure.pdf.

_____. 2016. Fresno Reservoir Allocations. Revised June 28, 2016. Accessed on September 20, 2018 at: https://www.usbr.gov/gp/aop/resaloc/fresno.pdf

_____. 2018. Great Plains Region Hydromet System for Fresno Reservoir near Havre, Montana. Accessed on September 21, 2018 at: https://www.usbr.gov/gp/hydromet/frr.html

Electric Power Research Institute (EPRI). 1992. Fish entrainment and turbine mortality review and guidelines. Prepared by Stone and Webster Environmental Services, Boston, Massachusetts. EPRI Report No. TR-101231, Project 2694-01. September 1992.

Ferrari, R.L. 2000. Fresno Reservoir: 1999 Reservoir Survey. U.S. Bureau of Reclamation, Denver, CO. September.

_____. 2013. Fresno Reservoir 2010 Sedimentation Survey. Technical Report No. SRH-2013-01. U.S. Bureau of Reclamation, Denver, CO. April 2013.

Montana Department of Agriculture (Montana DA). 2017. Montana Noxious Weed List. February 2017.

Montana Department of Fish, Wildlife and Parks (Montana FWP). 2012. Montana Statewide Fisheries Management Plan: 2013-2018. 478 pp.

_____. 2015. Montana's State Wildlife Action Plan. 2015. Helena, MT. 441 pp.

_____. 2017. Fresno Reservoir Wildlife Management Area Final Management Plan. December 2017.

Montana Natural Heritage Program (Montana NHP). 2018. Montana Natural Heritage Map Viewer. Accessed on September 25, 2018 at: http://mtnhp.org/MapViewer/.

Montana Office of Tourism. 2018. Milk River. Accessed on March 9, 2018 at http://www.visitmt.com/listings/general/river/milk-river.html.

Nagle, C. 2016. Havre Area Warmwater Fisheries Management. Fisheries Division Federal Aid Job Progress Report. Montana Department of Fish, Wildlife, and Parks.

Natel Energy. 2014. Hydroengine and Fish Interactions Summary. Alameda, CA. December 2014.

National Water Quality Monitoring Council. 2018. Fresno Reservoir site data in the Water Quality Portal. Accessed on September 19, 2018 at: https://acwi.gov/monitoring/

NERC (North American Electric Reliability Corporation). 2018. 2017 Long-Term Reliability Assessment.

Stash, S.W. 2001. Distribution, relative abundance, and habitat associations of Milk River fishes related to irrigation diversion dams. M.S. Thesis. Montana State University.

U.S. Department of Agriculture (USDA). 2017. PLANRS Database. Accessed on September 25, 2018 at: https://plants.usda.gov/java/.

U.S. Department of Agriculture (USDA). 2017. Web Soil Survey. Accessed on April 12, 2018 at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

U.S. Environmental Protection Agency (EPA). 2017. Ecoregion Download Files by State- Region 8. Accessed on April 12, 2018 at: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-8#pane-24.

U.S. Fish and Wildlife Service (FWS). 2015. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List Greater Sage-Grouse (*Centrocercus urophasianus*) as an Endangered or Threatened Species. Federal Register 80(191): 59858–59942. October 2, 2015.

_____. 2018a. National wetlands inventory, wetlands mapper. Accessed on September 25, 2018 at: https://www.fws.gov/wetlands/data/mapper.HTML.

_____. 2018b. Official List of Threatened and Endangered Species for the Fresno Dam Site Water Power Project. Filed on May 29, 2018.

U.S. Geological Survey (USGS). 2018. Short-term Induced Seismicity Models: 2018 One-Year Model. Accessed on April 17, 2018 at: https://earthquake.usgs.gov/hazards/induced/index.php#2018.

Western Regional Climate Center. 2018. Cooperative Climatological Data Summaries: Eastern Montana. Accessed September 19, 2018 at https://wrcc.dri.edu/summary/Climsmemt.html

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