ENVIRONMENTAL ASSESSMENT
FOR NON-CAPACITY RELATED AMENDMENT TO LICENSE

Terror Lake Hydroelectric Project—FERC Project No. 2743-079

Alaska

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Administration and Compliance
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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
Amendment Application	Final Application for Non-Capacity Amendment including the Preliminary Draft Environmental Assessment
ANC	Afognak Native Corporation
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
APDES	Alaska Pollutant Discharge Elimination System
AWC	Alaska Department of Fish and Game's Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes
BTU	British Thermal Unit
C	Celsius
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
cfs	Cubic feet per second
City	City of Kodiak
Commission	Federal Energy Regulatory Commission
Contract Terms and Conditions	Contract Terms and Conditions - Special Provisions Related to Safety and Environmental Protection
CUP	Conditional Use Permit
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D-East	Proposed eastern diversion dam of the Upper Hidden Basin Diversion
DHAC	Federal Energy Regulatory Commission's Division of Hydropower Administration and Compliance
DNR	Alaska Department of Natural Resources
D-West	Proposed western diversion dam of the Upper Hidden Basin Diversion
EA	Environmental Assessment
ECM	Environmental Compliance Monitor
EEA	Early Entry Authorization
EFH	Essential Fish Habitat
EL	Elevation above sea level, expressed in feet
ESA	Environmental Species Act
ESCP	Erosion and Sediment Control Plan
FERC	Federal Energy Regulatory Commission

FPA	Federal Power Act
FWCA	Fish and Wildlife Coordination Act
FWS	United States Fish and Wildlife Service
IPaC	United States Fish and Wildlife Service's automated Information for Planning and Conservation database
KEA	Kodiak Electric Association, Inc.
KIB	Kodiak Island Borough
KIBSD	Kodiak Island Borough School District
kWh	Kilowatt-hours
MOU	Memorandum of Understanding
mph	Miles per Hour
MSA	Magnuson – Stevens Fishery Conservation and Management Act
MW	Megawatts
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NLUR	Northern Land Use Research, Inc.
NPV	Net Present Value
NRHP	National Register of Historic Places
Original License	Order Issuing Major License and Approving Joint Offer of Settlement
PAD	Pre-Application Document
Participants	Resource Agencies, Indian tribes, Alaska Native Corporations, Non-Governmental Organizations, and other interested persons and organizations
PDEA	Preliminary Draft Environmental Assessment
PRO	Federal Energy Regulatory Commission's Division of Dam Safety and Inspections, Portland Regional Office
Project	Terror Lake Hydroelectric Project - FERC No. 2743
QCIP	Quality Control and Inspection Program
Refuge	Kodiak National Wildlife Refuge
RUS	Rural Utility Service
Scoping Meeting	Joint Public/Agency Scoping Meetings held in Kodiak, Alaska on July 21, 2015
SD1	Scoping Document No. 1
SHPO	State Historic Preservation Office
SPCC	Spill Prevention Control and Countermeasures
TBM	Tunnel Boring Machine
UHBD	Upper Hidden Basin Diversion

US	United States
USACE	United States Army Corps of Engineers
USGS	United States Geologic Survey
WQC	Clean Water Act Section 401 Water Quality Certification

EXECUTIVE SUMMARY

On May 26, 2016, Kodiak Electric Association, Inc. (KEA or licensee) filed an application with the Commission for a non-capacity license amendment to install two new diversions at the Terror Lake Hydroelectric Project, FERC Project No. 2743. The project is located on the Terror and Kizhuyak Rivers in Kodiak, Alaska. The project currently occupies a total of 4,282 acres of federal lands administered by the U.S. Coast Guard, the Bureau of Land Management, and the U.S. Fish and Wildlife Service (FWS) within the Kodiak National Wildlife Refuge (Refuge). The amount of federal land occupied by the project would increase by 2 acres under the proposed action to 4,284 acres for the inclusion of a subterranean tunnel on Refuge lands.

As part of the amendment application, KEA filed an Applicant Prepared Environmental Assessment (APEA), also referred to as a Preliminary Draft Environmental Assessment (PDEA). Separately, a Memorandum of Understanding was executed on March 8, 2017 between the Commission and the FWS regarding interagency cooperation in the development of an Environmental Assessment for the proposed amendment to the project license and for permitting requirements under Title XI of the Alaska National Interest Lands Conservation Act (ANILCA), for the FWS' purposes. Commission staff and FWS agreed to use the APEA as the basis of the Environmental Assessment to be issued for compliance with the National Environmental Policy Act for the license amendment and permitting proceedings. This Environmental Assessment substantially uses the APEA with editorial changes and additional analyses made by Commission and FWS staff.

Under the proposed action, the licensee would build two diversion dams to supplement the project's available water supply by capturing additional snow melt and rain in the upper mountain tributaries of the West Fork of Hidden Basin Creek and conveying it westward through a tunnel under a mountain ridge to the existing Terror Lake reservoir. The diversion components would be a basic, non-mechanical design intended for gravity-fed water conveyance. Once the additional water resources from the diversions flow into the Terror Lake reservoir, hydropower would be generated from the existing project powerhouse and fed directly into KEA's existing grid without any operational changes or any other capacity-related modifications. The proposal would not change the authorized installed capacity of the Project; however, the additional water resources added to Terror Lake from this diversion are expected to increase average annual generation by 33 gigawatt-hours.

The licensee proposes to implement a number of measures to limit the environmental effects of construction activities. It proposes to develop and implement the preliminary FWS 4(e) conditions and National Marine Fisheries Service (NMFS)

10(j) conditions as recommended by the agencies and intends to follow a number of best management practices during construction. These actions would help control erosion and sedimentation, help manage water resources, as well as prevent significant disturbances to wildlife.

The FWS 4(e) conditions and NMFS 10(j) conditions specify the preparation of a vegetation management plan, limit construction activities and project associated helicopter traffic to limit the disturbance to brown bears, require a plan to manage water levels in Terror Lake to meet instream flow requirements as specified in the existing Article 43 of the project license, require the licensee to develop a plan to monitor and mitigate any acid rock drainage associated with tunnel excavation activities, and require a new instream flow condition. Staff have reviewed these conditions and recommend that they be made part of the licensee's requirements in implementing the proposed action. The proposed action would involve the use of an additional 2 acres of land on Refuge lands that are outside the project boundary. This expansion would require that the licensee obtain a right-of-way authorization from the FWS under Title XI Section 1101 of ANILCA.

The proposed action is not likely to adversely affect any federally listed threatened or endangered species as there are no listed species or critical habitats within the vicinity of the proposed action area.

Prior to filing its application with the Commission, the licensee determined that no historic properties would be affected by the proposed action. The licensee sent a letter to the Alaska State Historic Preservation Officer (SHPO) on May 1, 2015, outlining the licensee's findings and asking the Alaska SHPO to concur with the no effect finding. The Alaska SHPO concurred in a communication dated May 28, 2015.

Based on our analysis, staff recommends approval of the license amendment as proposed by the licensee with staff's additional measures. Staff finds that approval of this amendment to the existing license for the Terror Lake Project would not constitute a major federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

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Cooperating Agency
U.S. Fish and Wildlife Service
Region 7
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Anchorage, AK 99503

Terror Lake Hydroelectric Project
FERC Project No. 2743—Alaska

1.0 INTRODUCTION

1.1 APPLICATION

Application Type:	Non-capacity related amendment of license
Date Filed:	May 26, 2016, supplemented October 6, 2016
Applicant's Name:	Kodiak Electric Association, Inc.
Waterbody:	Upper Hidden Basin Creek, the Terror and Kizhuyak Rivers, and Terror Lake
Borough and State:	Kodiak Island Borough, Alaska.
Federal Lands:	The project currently occupies a total of 4,282 acres of federal lands administered by the U.S. Coast Guard, Bureau of Land Management, and the U.S. Fish and Wildlife Service within the Kodiak National Wildlife Refuge; under the proposal, the amount of federal land occupied by the project would increase by 2 acres.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

On October 5, 1981, the Federal Energy Regulatory Commission (FERC or Commission) issued an Order Issuing Major License and Approving Joint Offer of Settlement (Original License) for the Terror Lake Hydroelectric Project – FERC Project No. 2743 (Project) to Kodiak Electric Association, Inc. (KEA) with an effective date of November 1, 1981. The Project commenced commercial operation in 1985, and it remains the primary source of KEA's energy supply.

The Terror Lake Hydroelectric Project is a trans-basin development, capturing water from the Terror River watershed and Kizhuyak River watershed and transporting it by means of tunnel to a powerhouse located on the west bank of the Kizhuyak River (refer to Figure A-3, Conceptual Project Layout in Appendix A of the amendment application). The powerhouse contains three 11.25 megawatt (MW) turbine-generator units; each unit comprises a vertical shaft 6-jet Pelton turbine and synchronous generator. Two units were authorized in the Original License issued on October 5, 1981, and the third unit was authorized in an order approving a capacity amendment of the license, issued on February 17, 2012.

The Project is the primary source of KEA's energy supply, and is the cornerstone to KEA's generation system. This Environmental Assessment (EA) addresses construction of the Upper Hidden Basin Diversion (UHBD). This new diversion would supplement the Project's currently available water supply to boost hydropower production at the existing facility so that KEA's growing load demand can continue to be powered with renewable energy. The proposal would not change the authorized installed capacity of the Project; however, the additional water resources added to Terror Lake from the UHBD are expected to increase average annual generation of the Project by an additional 33 gigawatt-hours (GWh).

Diverting water from the Hidden Basin watershed was considered during the original design and construction of the Project. The 1978 Terror Lake Hydroelectric Project's Definite Project Report stated:

"The Hidden Basin Creek diversion works are not included in the recommended development of the Terror Lake Project at this time [1978]. However, this scheme is the most economical means of increasing the output of the development above its presently projected level, and it can be built whenever the growth in power demand in Kodiak justifies it. Therefore, the scheme is included in the present report as a recommended future development."

KEA already operates and maintains three other diversions at the Project as part of the existing hydropower system. The proposed UHBD area is adjacent to existing Project lands, east of the Terror Lake reservoir and south of the Shotgun Creek Diversion. The proposed UHBD tunnel would run though the same stable granitic ridge as the Terror Lake power tunnel.

Adding more water to the existing Project would be the most cost-effective and minimally-invasive approach for increasing generation capacity on KEA's isolated grid given the alternatives presented in this EA. The UHBD is a step KEA could take to achieve its vision statement: "Endeavor to maintain 95 percent of energy sales with cost effective renewable power solutions for the future of our members and the community." Enhancing KEA's wind-hydro system with the additional water resources of Upper Hidden Basin makes it possible for KEA members to displace diesel fuel as an energy and heat source in their homes and businesses, and it supports Kodiak's economic growth in the global seafood industry. The energy independence provided by KEA's wind-hydro system is a significant benefit for the remote island community of Kodiak. With the UHBD, Kodiak would be able to continue to rely on affordable, locally-generated, energy.

1.2.2 Need for Power

KEA provides electricity to approximately 6,000 electric meters on Kodiak Island, Alaska in a service area that includes the region in and around the City of Kodiak, Bells Flats, Chiniak, Pasagshak, Port Lions, and the nation's largest U.S. Coast Guard base. KEA's system operates in a remote island environment with no interconnections to outside sources of power (refer to Figure A-2, KEA Service Area in Appendix A of the amendment application).

The Terror Lake Hydroelectric Project is the cornerstone to KEA's renewable wind-hydro energy system. On an annual average, KEA's electric grid is powered with 80 percent hydropower from the Project, and 20 percent wind energy from the Pillar Mountain Wind Project. KEA's renewable hydro-wind generation system is currently able to supply 161 GWh of electricity annually to its isolated grid. Annual energy production requirements for KEA's grid in 2015 were 159 GWh, and this energy demand was powered by KEA's 99.8 percent renewable energy portfolio. However by 2020, system-wide load growth demand is expected to exceed KEA's currently available hydropower and wind energy supply due to expansions of Kodiak's seafood processing sector, the repowering of the City's shipping port crane, numerous new building construction projects, and an overall community-wide shift of energy sourcing from diesel fuel to renewably-generated electricity. Without additional sources of

renewable energy to meet the growing load demand, KEA would revert to diesel generation.

The limited amount of water available within the Terror River watershed is insufficient to continue powering KEA's growing loads. KEA's grid cannot integrate additional wind energy at this time. KEA continues to examine the potential for other forms of renewable resource development such as solar, tidal, run-of-the-river, and wave energy; however, those forms of energy are also variable and intermittent like wind energy. Further, tidal and wave energy generation technology remains in the pilot testing phase, and is not yet ready for utility-scale deployment and operation. There are no local sources of natural gas, coal, or nuclear power on Kodiak Island. It would not be feasible to import natural gas, coal, or nuclear fuel to Kodiak due to transportation logistics, high cost, safety precautions, and pollution control requirements. Developing an entirely new hydropower facility separate and redundant to the existing Project is not practical. The only other alternative for obtaining an equivalent amount of power is diesel-generation. However, reverting back to a dependence on barged-in diesel fuel for local electric generation is not preferable, due to both economic and environmental costs.

According to KEA, enhancing existing hydropower assets with a new diversion that brings more water to the Project is the most practical, cost-effective and minimally-invasive option available for adding more energy to KEA's isolated electrical grid system. KEA states that the UHBD is the most viable option for supplying continuous renewable power to its remote electrical grid.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A license amendment for the Terror Lake Project is subject to numerous requirements under the Federal Power Act (FPA) and other applicable statutes described below.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the U.S. Department of the Interior (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 provides that any license issued by the Commission for a project within a federal reservation will 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. The FWS filed preliminary 4(e) terms and conditions on August 22, 2016, as modified on December 2, 2016. These conditions are detailed in Appendix A.

1.3.1.3 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. On August 23, 2016, as modified on September 28, 2016, NMFS filed section 10(j) recommendations.[1] These recommendations are detailed in Appendix B.

1.3.2 Clean Water Act

Under section 401 of the Clean Water Act, a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the Clean Water Act. The State of Alaska does not issue certification under section 401 of the Clean Water Act for hydroelectric projects.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. There are no federally listed threatened or endangered species or critical habitats within the vicinity of the proposed action area.

1.3.4 Coastal Zone Management Act

Section 307 (c)(3)(A) of the Coastal Zone Management Act requires that all federally licensed and permitted activities be consistent with approved state coastal zone

[1] These conditions are also NMFS's Essential Fish Habitat conservation recommendations pursuant to the Magnuson-Stevens Fishery Conservation and Management Act.

management programs. If the project is located within a coastal zone boundary, or if a project affects a resource located in the boundaries of the designated coastal zone, the applicant must certify that the project is consistent with the state coastal zone management program.

As of July 1, 2011, Alaska no longer has a federally approved coastal management program or defined coastal zone, so federal consistency does not apply to Alaska.

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act 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.

The licensee sent a letter to the Alaska State Historic Preservation Officer (SHPO) on May 1, 2015, requesting concurrence with the determination that the proposal would not affect historic properties. The Alaska SHPO concurred in a communication dated May 28, 2015 and the licensee included this letter of concurrence in the application for license amendment. The Alaska SHPO did not file any comments on KEA's application in response to the Commission's public notice issued on June 24, 2016.

1.3.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with NMFS on all actions that may adversely affect essential fish habitat (EFH). On August 23, 2016, as modified September 28, 2016, NMFS filed a letter with the Commission including conservation recommendations which are both EFH and 10(j) license recommendations. The 10(j)/EFH recommendations are detailed in Appendix B.

1.3.7 Alaska National Interest Lands Conservation Act of 1980

Section 810(a) of the Alaska National Interest Lands Conservation Act (ANILCA) requires completing an evaluation of uses and needs for any federal determination to "withdraw, reserve, lease, or otherwise permit the use, occupancy or disposition of public lands." It directs that a project shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other

lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. Therefore, an evaluation of potential impacts to public lands under this section is provided for the project in Section 3.3.11.

In Title XI of ANILCA, Congress addressed Alaska's largely undeveloped transportation and utility network. In response to Alaska's anticipated future requirements for transportation and utility systems and to minimize adverse impacts to conservation system units, such as National Wildlife Refuges, Congress provided an orderly, continuous decision making process involving Federal and State governments and the public.

Title XI rights-of-way are issued according to both ANILCA and the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997. These rights-of-way are specifically used for transportation and utility systems within conservation system units, including National Wildlife Refuge System lands administered by the FWS.

Transportation and utility systems include but are not limited to: canals, pipelines, tunnels, electrical transmission and distribution systems, radio and television systems, roads, landing strips, docks and other systems of general transportation.

1.4 PRE-FILING PUBLIC REVIEW AND CONSULTATION

The Commission's regulations require that licensees consult with appropriate resource agencies, tribes, and other entities before filing an application for amendment of license. Pre-filing consultation must be complete and documented in accordance with the Commission's regulations.

1.4.1 Consultation

The Final Amendment Application, including the PDEA, involves KEA's request to construct and operate two new diversions in a location where there is no existing dam or diversion as part of the existing FERC License No. 2743. When a licensee proposes to add a new diversion to an existing project, the Commission's regulations and terms of the license require that the licensee file an application for amendment for Commission approval. KEA is a not-for-profit 501(c)12 rural electric cooperative and is not claiming preference under section 7(a) FPA. KEA owns and operates the existing Project.

KEA filed the Final Amendment Application with FERC and provided copies to appropriate resource agencies, Indian tribes, Alaska native corporations, non-governmental organizations, and other interested persons and organizations (Participants) in May 2016.

At the outset of the preparation of the Draft Amendment Application, KEA met via teleconference on March 4, 2015 with FERC Division of Hydropower Administration and Compliance (DHAC) staff to discuss KEA's proposed Non-Capacity Amendment. KEA was directed by DHAC to use the three-stage consultation process as set forth in the regulations at 18 CFR 4.38.

The First Stage of Consultation commenced with KEA's initiation of consultation with Participants regarding the proposed Joint Public/Agency Scoping Meetings (Scoping Meetings) to discuss issues and develop the agenda for these meetings. On June 19, 2015, KEA filed its Preliminary Application Document (PAD) with the Commission and distributed copies to Participants. The distribution of the PAD also served as KEA's written notification of intent and invitation for all interested parties to participate in the consultation process. The PAD document contained the Draft Amendment Application and a comprehensive appendix with photos and maps of the proposed UHBD area and downstream Hidden Basin Creek watershed area.

On July 7, 2015, KEA filed Scoping Document No. 1 (SD1) to advise all Participants on the proposed scope of NEPA EA for KEA's UHBD proposal, and to seek additional information pertinent to this analysis. The SD1 document contained a description of the NEPA scoping process, the proposed schedule for the development of the EA, a description of the proposed action and alternatives, preliminary identification of the environmental issues and field study efforts, request for comments and information, a proposed EA outline, and a list of comprehensive plans applicable to the proposed action. No comments were received on the SD1 and no additional studies were requested.

On July 21, 2015, KEA hosted agency and public meetings in Kodiak with an aerial tour of the Hidden Basin watershed to explain the UHBD proposal and its potential environmental impact, to review the information provided in the PAD and SD1, and to discuss the proposed development, construction and operational plan. The agenda for the meetings was developed in consultation with the Participants. Written notices of the agency and public meetings were provided on June 19, 2015 and July 7, 2015, and were published in the Kodiak Daily Mirror and the Alaska Dispatch News on July 7, 2015. Proof of publication for these printed public notices was filed with the Commission on July 23, 2015. The agency and public meetings were well attended. Meeting participants included representatives of KEA and its environmental and

engineering advisors; US Fish and Wildlife Service, Kodiak National Wildlife Refuge, and Region 7 Division of Realty; US Army Corps of Engineers, Alaska Division; US Department of Agriculture, Rural Utility Service; Alaska Department of Natural Resources (ADNR); Alaska Department of Fish and Game (ADF&G); University of Alaska Fairbanks; Sun'aq Tribe of Kodiak; Kodiak Island Borough; Kodiak Historical Society; Senior Citizens of Kodiak; and the general public. Written transcripts of the two meetings were filed with the Commission on August 31, 2015.

A public review and comment period continued for 60 days after the joint public/agency meetings were held, and concluded on September 21, 2015. In addition to the verbal comments received during the joint agency/public meetings and the agency consultation letters included in the PAD, KEA received two written comments regarding the proposed action, which are provided in Appendix F of the amendment application – Public Comments and summarized below.

On June 23, 2015, the Alutiiq Museum and Archeological Repository provided written concurrence with the cultural resource protection measures recommended in the report, Review of Cultural Resources in Vicinity of Kodiak Electric Association Terror Lake Project – FERC No. 2743 Upper Hidden Basin Diversion Project, prepared by Northern Land Use Research, Inc. This report was filed with the Commission on June 9, 2015. The Alutiiq Museum and Archeological Repository comment letter was filed with the Commission on June 23, 2015. KEA filed a response to this comment with FERC on October 14, 2015, stating that KEA appreciates the Alutiiq Museum and Archeological Repository's review of this report, and their engagement in KEA's informal consultation pursuant to the regulations 36 CFR 800.2(c)(4), implementing section 106 of the National Historic Preservation Act.

On September 21, 2015, the US Department of Agriculture, Rural Utility Service (RUS) filed comments directly with the Commission requesting cooperating agency status in the preparation of the NEPA documents associated with KEA's UHBD proposal. On October 14, 2015, KEA filed with FERC a response to this comment stating that KEA appreciates the potential funding support of the RUS and its willingness to engage in the NEPA process. However, on October 5, 2016, KEA filed clarification with the Commission that KEA does not plan to pursue RUS financing for the UHBD. Therefore, there is no need for RUS to participate as a cooperating agency in the development of any NEPA documents for the non-capacity amendment.

There were no objections expressed on the UHBD proposal or the information provided in the PAD or SD1, and no additional studies were requested. Upon completion of the first stage of the pre-filing consultation process, KEA filed a letter with FERC on October 14, 2015, stating its finding that the proposed action to construct

and operate the UHBD as part of the existing FERC License No. 2743 qualifies for a Finding of No Significant Impact (FONSI) determination under NEPA. In this letter, KEA also concluded that without any additional issues identified in scoping or study requests, there was no Second Stage of pre-filing consultation to conduct, nor was there a need to issue Scoping Document 2. On December 1, 2015, KEA consulted via teleconference with FERC DHAC regarding the conclusions presented in the October 14, 2015 letter. Comments received from all Participants along with KEA's response were incorporated into the PDEA.

1.4.2 Public Notice

On June 24, 2016, the Commission issued a notice that the licensee's application for amendment of license had been accepted for filing and soliciting motions to intervene and comments, recommendations, terms and conditions, and fishway prescriptions. NMFS filed comments and 10(j) recommendations on August 23, 2016, as modified on September 28, 2016. The FWS filed comments and 4(e) terms and conditions on August 22, 2016, as modified December 2, 2016.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Commission would deny the licensee's proposal. The project would continue to operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures associated with the licensee's proposal would be implemented. We use this alternative as the baseline environmental conditions for comparison with the proposed alternative.

2.2 PROPOSED ACTION

The purpose of the proposal is to divert a portion of water resources from the upper reaches of the Hidden Basin watershed to the Terror River watershed for renewable energy production. The UHBD would be similar to existing diversion structures currently in operation at the Project.

The UHBD comprises 15 percent of the overall Hidden Basin watershed size, and is located above two large waterfalls in a mountainous tundra area where no fish have been observed. No threatened or endangered species are located within the vicinity of this area. There would be minimal change in the facility's aesthetic appearance, and there is little recreational or other public use at the site.

Constructing the new diversion dams and access road will require structures to be placed within tributary creeks and wetlands; however, during construction activities, KEA proposes to use best management practices to minimize potential impacts to the aquatic and terrestrial environments. Impacts from construction activities would be outweighed by the long-term benefits associated with minimizing the pollution associated with fossil fuel consumption achieved by enhancing renewable energy infrastructure with this hydropower diversion.

KEA initiated field studies of the proposed UHBD and the downstream Hidden Basin Creek area in 2013. The scope of studies completed include surface water stream gauging; watershed hydrology; fish presence, absence and distribution; wetland assessment; cultural resources; surveying and mapping; conceptual engineering design; and conceptual construction cost estimate. Surface water gauging of Hidden Basin Creek was also conducted by the U.S. Geologic Survey (USGS) from 1982 to 1984.

The following Table 2-1 provides an overview of the resource issues and provides clarifying statements regarding whether a particular resource would be affected. The table also provides proposed measures that KEA would implement to avoid any adverse environmental effects during the construction and operation of the UHBD.

Table 2-1 Overview of Resource Issues

Resource/Location	Project-Related Effect	Proposed Measures
Air Quality	Positive cumulative effect – reduction in diesel fuel combustion & emissions Temporary localized degradation of air quality. No long term effect on air quality classification	None required
Water Use & Quality: • Hidden Basin Creek	Proposal would divert approximately 30,000 acre-feet of water from Hidden Basin watershed; 15 percent of watershed drainage area No effect on downstream	Design and install a pipe that will provide a minimum of one (1) cubic foot per second (cfs) of instream flow downstream of the UHBD during the period of July 15 through September 30 when

Resource/Location	Project-Related Effect	Proposed Measures
Water Use & Quality, continued: • Hidden Basin Creek	water temperatures	water is available for discharge. Comply with terms and conditions of water rights appropriation, as required Protection of aquatic resources addressed in KEA's Contract Terms & Conditions Environmental Compliance Monitor (ECM) during construction
Water Use & Quality: • Terror Lake Dam & Terror River	Rock from tunnel construction not likely to generate acid drainage No effect on Instream Flow Release as per License Article 43	Test tunnel rock periodically during tunnel construction to monitor potential to generate acid drainage on Refuge land. A mitigation plan would be developed and implemented to respond, an adaptive management approach. Continue current Project operations ECM during construction
Wetland Habitat	Filling of wetlands for diversion dam and access road construction estimated at 1.4 acres.	Comply with terms and conditions of CWA 404 Permit & ADEC APDES Stormwater Permit, as required Erosion & sedimentation control addressed in KEA's Contract Terms & Conditions ECM during construction

Resource/Location	Project-Related Effect	Proposed Measures
Fish Species – Pink, Chum & Coho Salmon; Dolly Varden, Sculpin • Hidden Basin Creek	No fish present at UHBD sites Not likely to have cumulative adverse effect on downstream fish habitat	Protection of aquatic resources addressed in KEA's Contract Terms & Conditions ECM during construction
Fish Species – Pink, Chum & Coho Salmon; Dolly Varden • Tailrace & Kizhuyak River • Terror River	No effect on Tailrace, Kizhuyak or Terror River	Continue current Project operations Protection of aquatic resources addressed in KEA's Contract Terms & Conditions ECM during construction
Terrestrial Resources: • Kodiak Brown Bear • Bald Eagle	Wildlife will be displaced temporarily during construction. Minor cumulative adverse effect on wildlife would be mitigated.	Construction activities and Project-associated helicopter traffic at the portal site (south end of Terror Lake) is prohibited from January 1 to June 1 of each year to avoid disturbance of brown bears in, and emerging from, dens. Road closure and minimal official site use after construction Bear Safety Plan Wildlife interactions addressed in KEA's Contract Terms & Conditions ECM during construction

Resource/Location	Project-Related Effect	Proposed Measures
Terrestrial Resources: • Vegetative Cover • Invasive Weeds	Not likely to have cumulative adverse effect on vegetation	Revegetation Monitoring Plan for tunnel rock placement area on federal land Preventative measures to avoid introduction or spread of invasive weeds Landscape disturbance addressed in KEA's Contract Terms & Conditions ECM during construction
Threatened & Endangered Species	No listed species or critical habitat in vicinity of UHBD site	None required
Cultural Resources • KOD-190 Site	No adverse effect to cultural resources	Contractor personnel education Warning signs posted Contractor personnel access restricted Periodic monitoring of KOD-190 site ECM during construction
Land Use	Proposal would expand FERC-licensed Project boundary by approximately 160 acres Approximately 158 acres of the expanded boundary would extend into state land	Comply with terms and conditions of land use agreements, as required Land use activities addressed in KEA's Contract Terms & Conditions ECM during construction

Resource/Location	Project-Related Effect	Proposed Measures
Land Use, continued	Approximately 2 acres of the expanded boundary would extend into federal land for subterranean portion of tunnel	Application for a Right-of-way permit as appropriate given the outcome of proposed legislation in the U.S. Congress.
Recreation and Aesthetic Resources	No recreation facilities near UHBD area Public use near UHBD is low	Continue current Project operations
Socioeconomic Factors	Positive cumulative effect - enhanced renewable energy supply for benefit of KEA cooperative members	Continue current Project operations

KEA proposes to expand the Project with an additional diversion (UHBD) to convey water resources from the upper reaches of the Hidden Basin watershed to the Terror River watershed. The UHBD components would be a basic, non-mechanical design intended for gravity-fed water conveyance.

KEA proposes to construct two rockfill diversion dams approximately 30 feet high and 250 feet long within an eastern and western tributary branch in the upper reaches of the West Fork of Hidden Basin Creek, approximately six miles upstream of Hidden Basin Lagoon and Ugak Bay on the eastern side of Kodiak Island, Alaska. Surface water from the diversion dam on the eastern tributary (D-East) would flow through a 0.5-mile-long, 5-foot-diameter underground pipe to the diversion dam on the western tributary (D-West). From there, surface water from both diversion dams would flow by gravity through a 1.2-mile-long, 12-foot-diameter tunnel under a mountain ridge to Terror Lake, the main reservoir for the existing Project. During periods of heavy rain and snow melt, water flow that may exceed the capacity of the UHBD conveyance pipe and tunnel would be spilled into the West Fork of Hidden Basin Creek. The proposed UHBD would also include a 4-mile-long spur road off of an existing road to provide access for constructing and maintaining the new diversion (refer to Figure A-4, Conceptual UHBD Layout in Appendix A of the amendment application).

The proposal would not change the authorized installed capacity of the Project or any other feature of the existing Project; however, the additional water resources added to Terror Lake from this new diversion are expected to increase average annual generation by an additional 33 GWh.

2.2.1 Project Location

Kodiak Island, located in the Gulf of Alaska, is the largest island in Alaska and second largest island in the United States and is 252 air miles south of Anchorage, Alaska. Kodiak Island contains the Kodiak National Wildlife Refuge (Refuge) which encompasses nearly 1.9 million acres of land on Kodiak and Afognak Islands. The largest city on Kodiak Island is the City of Kodiak (City), located within the Kodiak Recording District and Kodiak Island Borough (KIB) near the northeastern tip of Kodiak Island. The Terror Lake Hydroelectric Project is located approximately 25 air miles southwest of the City (refer to Figure A-1, Site Location Map and Figure A-2, KEA Service Area in Appendix A of the amendment application).

The Final Amendment Application proposes a new diversion in the mountainous uplands of the Hidden Basin watershed, east of the existing Terror Lake reservoir on Kodiak Island. The proposed UHBD would be located on upper tributaries of the West Fork of Hidden Basin Creek, approximately six miles upstream of Hidden Basin Lagoon and Ugak Bay.

Most of the UHBD would occupy land owned by the State of Alaska. The proposed action's new road and conveyance structures would add approximately 160 acres to the existing FERC licensed boundary of the Project. Of these 160 acres, approximately 140 acres would encompass a new access road that would connect the existing Project access road to the proposed UHBD site for construction, and subsequent inspection and maintenance. Approximately 15 acres of the proposed Project boundary expansion would encompass the two diversion dam structures on State land, and the remaining 5 acres would encompass a subterranean tunnel that would connect the UHBD dams to the Terror River watershed. The downstream tunnel outlet portal on the Terror Lake side of the mountain ridge would be located in an area already encompassed by the existing FERC licensed Project boundary. A detailed map of the proposed revisions to the FERC-licensed Project boundary is provided in Exhibit G of the amendment application – Project Map.

2.2.2 Use of Existing Facilities

The electric energy derived from the additional water resources supplied by the UHBD to the Terror Lake reservoir would be generated by the Project's existing

infrastructure. KEA's current infrastructure is already able to utilize the water resources provided by the UHBD to generate the additional hydropower and deliver it to KEA's service area.

The Project is remote, and is not accessible by the Kodiak road system. Access to the Project site is only possible by floatplane, helicopter, or boat. KEA maintains the Project's existing dock/jetty area, located at the head of Kizhuyak Bay for transporting material and personnel to and from the Project. The dock/jetty area would be used to accommodate delivery of equipment and material for the construction of the UHBD. Material would be offloaded at the dock/jetty area and trucked to the UHBD site using the Project's existing access road. The length of road from the dock/jetty to the area where a new UHBD spur road would be constructed is approximately 10 miles. A new access road spur would connect this existing road to the new D-West and D-East diversion dams of UHBD.

Infrastructure support for temporary construction personnel already exists at the Project. A fully-functioning single-family home at the Project site and owned by KEA can house a small construction crew, up to eight people. For larger sized construction crews up to 30 people, an additional contractor camp is available onsite with hook-ups for electricity, potable water, and sewer. Once the UHBD is built, no additional KEA staff would be necessary to operate or maintain the UHBD.

As a requirement for all contractor work conducted at the Project site, KEA employs standard Contract Terms and Conditions - Special Provisions Related to Safety and Environmental Protection (Contract Terms and Conditions) to advise contractor personnel that they shall comply with all environmental protection requirements while on Project Lands. A copy of the Contract Terms and Conditions document is included in Appendix E of the amendment application – Measures and Plans, and a summary of these requirements is provided in Table 2-2 below.

Table 2-2 Existing Environmental Measures – Summary of KEA Contract Terms and Conditions

Section	Description
Contractor Use of Project Facilities	Project facilities are to be used only for activities directly associated with Project operations and maintenance. Contractor personnel are to confine activities to the Project area relevant to their work, including contractor staging area and lodging facilities provided by KEA. No travel is permitted on Project roads or trails not associated with assigned work. Contractor personnel are not allowed to use the Project Area for recreational purposes. Contractor personnel may not bring personal firearms to the Project site. All survey monuments are protected, they shall not be disturbed. Contractor personnel to notify KEA if any archaeological materials or sites are discovered during the course of work.
Equipment & Vehicle Operation	No motorized wheeled access to any road on Project lands other than official use vehicles. Speed limit in the Powerhouse/Housing area is 10 miles per hour (mph); speed limit on access roads is 35 mph. To prevent spread of non-native species, equipment and vehicles are to be cleaned prior to delivery on Project lands. No equipment or vehicles may be operated below a water body's ordinary high water mark without prior authorization. Refueling of equipment or storage of petroleum products may not occur within 100 feet of a water body's high-water line without prior authorization.

Section	Description
Fuel & Chemicals	Contractor is responsible for transport, hauling, and control of their petroleum based products, chemicals, and flammable liquid products on site in accordance with all applicable regulations. Contractor shall provide KEA with a copy of job-specific Spill Prevention, Control, and Countermeasures (SPCC) Plan that complies with 40 CFR 112 prior to bringing any fuel on site. Contractor to maintain accurate accounting and product information for fuels and hazardous materials delivered to, stored at, and used on the Project site.
Disposal of Wastes	All putrescible wastes and other burnable garbage shall be incinerated in accordance with KEA policies at the Project incinerator and stored in closed buildings or bear-proof containers prior to incineration. Non-burnable or other hazardous waste products are to be shipped off-site for disposal in an appropriately authorized waste disposal facility. Contractor personnel shall prevent entrance or accidental spillage of material or wastes into water bodies.
Erosion and Sedimentation Control	Work shall be conducted in a manner consistent with erosion and sediment control best management practices.
Wildlife & Landscape	Encounters with wildlife may occur on Project lands. Animals are not to be harmed in any way, and feeding of wildlife is not allowed. Contractor personnel shall adhere to KEA's Bear Safety Plan which includes participation in a Bear Safety Orientation and bear incident reporting.
Protection of Aquatic Resources	Notify KEA if it becomes necessary to enter a water body within the vicinity of the Project area. KEA will then instruct Contractor personnel on specific measures to minimize any potential adverse effects on resources resulting from work.

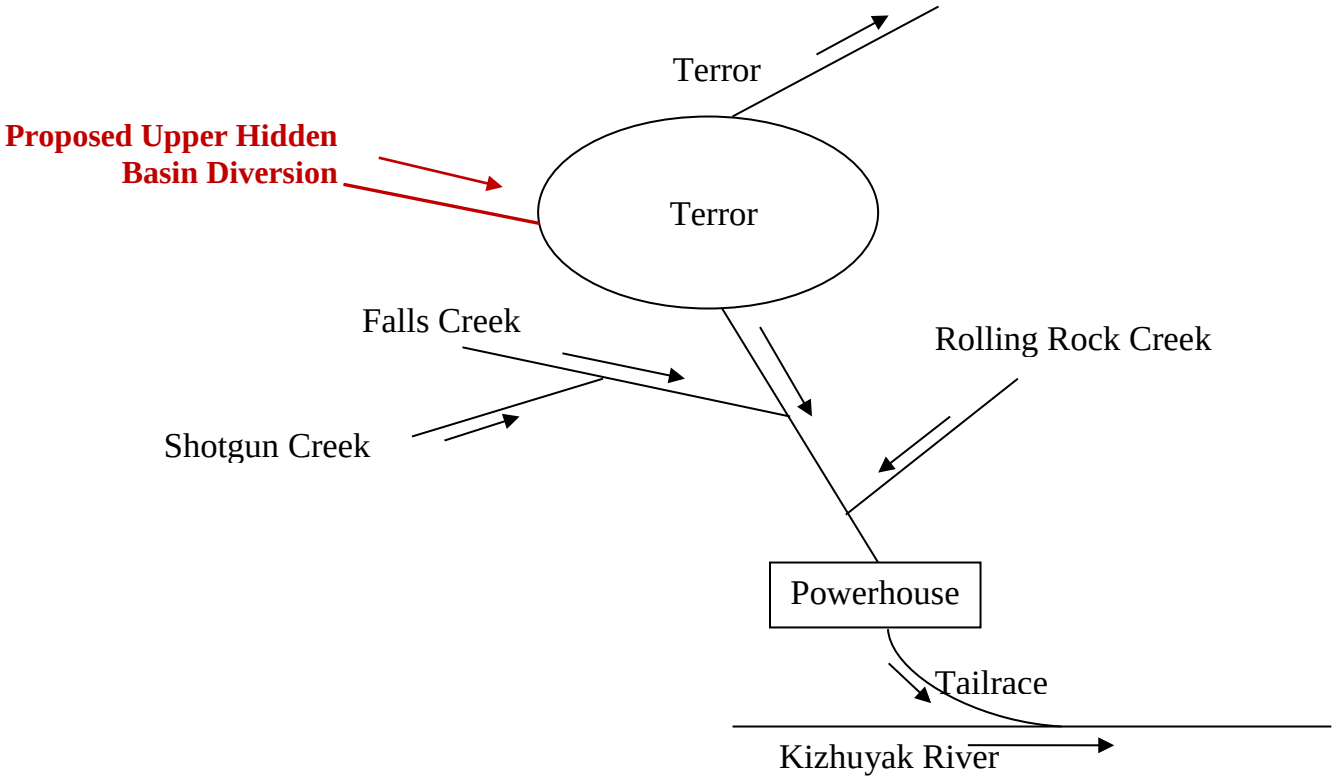
Section	Description
Safety	Contractor to ensure safe working practices are followed and machinery is maintained in good working order. Contractor personnel to adopt and accept KEA's safety plan as detailed in the American Public Power Association Safety Manual.
Prohibited Items & Uses	No alcohol. No personal firearms. No recreational activities.

2.2.3 Project Operation with Upper Hidden Basin Diversion

The UHBD components would be a basic, non-mechanical design intended for gravity-fed water conveyance with minimal storage capacity behind two minor diversion dam structures. KEA has been operating and maintaining three other similar diversions at the Project for 30 years. The Project has KEA staff onsite continuously and the plant is controlled by the system dispatchers in KEA's Dispatch Center located within the City. The Project will remain KEA's primary source of electric power during adverse, mean and high water years.

Figure 2-1 below is a simplified diagram (not to scale) of the inflow and outflow of water throughout the entire Project. A detailed analysis of how the additional inflows provided by the UHBD will be utilized by the Project is also presented in Exhibit B of the amendment application – Project Operation and Resource Utilization.

Figure 2-1 Diagram of Water Inflow and Outflow at Terror Lake Hydroelectric Project



The Project's total plant capacity would remain unchanged at 33.75 MW. The existing average annual generation is 135 GWh and the proposed UHBD would provide an additional 33 GWh of new energy production each year.

The proposed UHBD involves no change to the Terror Lake reservoir, dam or spillway design. With the Terror Lake dam and spillway unchanged, the Project's gross storage capacity and usable storage capacity provided by the Terror Lake reservoir remains unchanged. The proposed UHBD would supply additional water resources to the Terror Lake reservoir, but the normal maximum surface area, 1,020 acres, normal maximum surface elevation, 1,420 feet mean sea level (msl), and usable storage capacity, 108,000 acre-feet, of the Terror Lake reservoir would remain unchanged. The current volume of the Terror Lake reservoir is adequate to utilize the additional inflows provided by the proposed UHBD under future projections of electrical load demand. The Project has no license-mandated lake level elevation rule curve. Terror Lake's minimum lake level elevation is 1,250 feet msl. Maximum lake level elevation is 1,420 feet msl, which is the elevation of the Terror Lake dam spillway. The Project's lake

levels would continue to be managed to ensure compliance with its Terror River instream flow requirements as per FERC License Article 43.

Terror Lake's elevation is expected to be drawn down lower in the future than current lake levels due to growing load demand and the need for the Project to provide usable storage capacity for the UHBD inflow, but the minimum lake level would not be drawn down below 1,250 feet msl and the maximum lake level would remain 1,420 feet msl. During very wet years, there is the potential for lake spill if the Project's available water supply outpaces KEA's hydropower demand. In those wet year situations, the Terror Lake spillway has sufficient spillway capacity to pass excess water as needed, including the additional inflows provided by the proposed UHBD. The maximum inflow from the proposed UHBD to the Terror Lake reservoir would be limited by the hydraulic capacity of the UHBD tunnel size, which is estimated to be 950 cubic feet per second (cfs). Any future change to Terror Lake's annual lake level drawdown, recharge, or spill rates has no impact to any of the Project's license-mandated compliance obligations.

With the exception of station service and transmission losses, all power generated by the Project is sold to KEA's Cooperative members. The full contribution of the UHBD inflows is expected to be fully utilized by 2025. At this time, KEA has no plans for additional Project developments other than the UHBD.

2.3 ALTERNATIVES

There are only two sources of energy that can be added to KEA's grid at this time: diesel fuel and hydropower (the proposed action). The alternatives are discussed below along with those considered but eliminated from further analysis.

2.3.1 Modification to Licensee's Proposal – 10(j) Recommendations and 4(e) Mandatory Conditions

In response to our notice issued June 24, 2016, NMFS filed a recommendation with the Commission subject to section 10(j) on August 23, 2016, as modified on September 28, 2016. This recommendation included the requirement to provide a minimum instream flow of one cfs from the proposed diversion.

The FWS filed the following preliminary 4(e) conditions with the Commission on August 22, 2016, as modified on December 2, 2016:

- Condition No. 1 – Vegetation management plan

- Condition No. 2 – Construction activity limitations

- Condition No. 3 – Water level management plan

- Condition No. 4 – Waste rock leachate monitoring plan

2.4 STAFF ALTERNATIVE

Under the staff alternative, the project would include the licensee's proposed measures, FWS' 4(e) conditions, and NMFS' 10(j) recommendation, as modified to clarify a reporting requirement.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Other alternatives considered were: curtailing electric load demand, additional wind sources, new hydropower generation facilities, new renewable energy sources (solar, tidal, run-of-river, and wave), natural gas, coal, and nuclear power. These alternatives were not found to warrant further analysis for the following reasons:

- Curtailing electric load demand to below KEA's 161 million kWh of available renewable energy supply through conservation measures is not a reasonable solution to Kodiak's specific energy circumstances, as it disregards the community-wide shift away from diesel fuel consumption as well as the growth occurring in the community's industrial sector.

- KEA is already pushing the technologic edge for wind energy penetration on its isolated micro-grid with battery and flywheel energy storage system integration, and cannot practically engineer any more wind energy additions to its system.

- KEA has investigated other potential sites on Kodiak Island for hydropower development; however, it was determined not practical or cost-effective to license, build and operate an additional hydropower facility redundant to the existing generation and transmission infrastructure of the Project.

- There are no other viable diversion sites within the vicinity of the Project able to supply water resources to the Project powerhouse.

- The stable integration of variable energy forms such as solar, tidal, run-of-river hydroelectric, and wave energy on KEA's isolated micro-grid has reached its maximum under KEA's current conditions. Further, tidal and wave energy

generation technology remains in the testing phase, and is not yet ready for utility-scale deployment and operation.

- There are no local sources of natural gas, coal, or nuclear power on Kodiak Island. It would not be feasible to import natural gas, coal, or nuclear fuel to Kodiak due to transportation logistics, high cost, safety precautions, and pollution control requirements.

3.0 ENVIRONMENTAL ANALYSIS

Information presented in this Section addresses the requirements of the NEPA Environmental Assessment and the FERC regulation for the Environmental Exhibit E [18 CFR 4.51(f)]. Information provided in this Section is based largely on KEA's consultation with the federal and state resource agencies, Indian tribes, Alaska native corporations, non-governmental organizations, and other interested persons and organizations.

3.1 GENERAL SETTING

3.1.1 Climate

Kodiak Island is known for its maritime climate, which is mild by Alaska standards. The climate is dominated by a strong marine influence that produces frequent cloudy skies, moderately heavy precipitation, and relatively cool temperatures year round.

In general, temperature patterns are characterized by cool summers and, compared to the rest of south central Alaska, warm winters. The range between mean annual maximum and mean annual minimum temperatures is small throughout the region. The average summer maximum temperatures occur in July or August and range from 57 to 61 degrees Fahrenheit (F). The coldest average winter minimum temperatures drop to 19 to 23 degrees F in December. Average temperature differences between air and water are greatest during fall and winter when the air is as much as 7 degrees F colder than the water. This unstable condition results in air near the water surface being warmed, maintaining clouds at a higher level than during spring and summer months when the air is warmer than the water.

Average rainfall is 67.6 inches per year and average snowfall is 78.7 inches per year. Precipitation during periods of 24 hours or less can be heavy enough to cause flooding. February is the month with the highest storm frequency and the greatest intensity of the Aleutian Low (a persistent low pressure in the outer Aleutian Islands area), and July is the month with the lowest storm frequency and intensity. Due to its

elevation, steepness and terrain shading, snow can remain in the UHBD area well into June. There are no glaciers on the West Fork of Hidden Basin Creek where the UHBD is proposed.

The hydrology in Hidden Basin Creek is characterized by a spring snowmelt as well as flashy, short duration high flow events associated with heavy precipitation throughout the year. This is evident on the hydrographs as steep spikes with very little ascending or descending lag time prior to or after the peak flow. Persistent rain throughout the year saturates the soil and underdeveloped flood plains through much of the basin resulting in an abrupt increase in the surface water discharge shortly following precipitation events. During the early spring months, it is not uncommon to receive heavy rain on a deep snow pack, accelerating the rate of snow melt. Detailed hydrographs of the Hidden Basin watershed are presented in ERM's report, Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015 which is provided in Appendix C of the amendment application– Technical Reports.

3.1.2 Air Quality and Noise

Alaska is a State Implementation Plan-approved state with jurisdiction over the national air quality standards required by the Clean Air Act. The ADEC Air Permit Program has classified the air quality surrounding the Project area as in attainment or unclassified with respect to the National Ambient Air Quality Standards for particulate matter smaller than 10 micrometers, sulphur dioxide, nitrogen dioxide, and carbon monoxide. Federal Prevention of Significant Deterioration and Alaska air quality regulations designate the Project area as a Class II area. (ADEC, 2015).

There is no noise monitoring data available and no monitoring is currently being collected. Impacts to wildlife from noise can be expected during construction. Due to the remote site and the lack of development, there is no noise pollution within the Project area (FERC, 1981).

3.1.3 Topography

The landscape of northwest Kodiak Island is characteristic of glaciation as evidenced by long, narrow fjords, and u-shaped valleys. The Hidden Basin watershed in northcentral Kodiak Island originates in a mountainous area east of the Terror Lake reservoir. Hidden Basin Creek is short and steep, originating at an elevation of 2,500 feet msl and flowing south 6 miles into Hidden Basin, a natural saltwater lagoon, before discharging into Ugak Bay and the Gulf of Alaska.

The proposed UHBD area would be located in the headwaters of the West Fork of Hidden Basin Creek (refer to Figure A-8, Hidden Basin Watershed in Appendix A of the amendment application). The upper tributary geomorphology of Hidden Basin Creek is characterized by high gradient step-pool morphology, large boulder/bedrock substrate, rapids, and waterfalls interspersed with pools and undercut banks. The proposed UHBD dams would be located in this steep headwater area at approximately 1,520 and 1,800 feet msl where the tributaries are approximately 2,000 feet apart. There are no glaciers on the West Fork of Hidden Basin Creek where the UHBD is proposed.

Downstream and below the proposed UHBD, the gradient steepens and drops over a waterfall in a narrow canyon. Below this sharp drop, the gradient flattens and the valley broadens (refer to Photo B-16, Aerial View of Upper Meadow in Appendix B of the amendment application). The channel is braided in this area and is dominated by riffles over a small boulder/cobble substrate. Several tributaries that originate in the snowy mountains outside of the proposed UHBD sub-watershed converge in this area, each contributing to surface flows downstream of the UHBD.

Downstream of this shallower gradient area, the gradient steepens again through the lower canyon section of the West Fork of Hidden Basin Creek and drops again over an approximate 50 foot vertical waterfall where the surface waters are confined by steep bedrock cliff walls (refer to Photo B-17, Lower Waterfall Barrier in Appendix B of the amendment application). The gradient substantially flattens again before exiting the canyon, transitioning from a boulder/bedrock step-pool to boulder/cobble riffle morphology.

The Middle, East and West Forks of Hidden Basin Creek join at the canyon mouth, forming Hidden Basin Creek (refer to Photo B-18, Convergence of West, Middle and East Forks of Hidden Basin Creek in Appendix B of the amendment application). Several unnamed tributaries provide additional surface water inputs along the 3 mile length of Hidden Basin Creek. Two of these tributaries contain lakes in their headwaters which provide storage to help maintain base flows in the lower reaches of Hidden Basin Creek. The lower anadromous reach of Hidden Basin Creek has a relatively flat gradient characterized by a meandering channel with multiple channel braids (refer to Photo B-20, Aerial View of Hidden Basin Creek). The substrate is dominated by alluvial materials consisting primarily of large cobble boulders transported during peak flow events with small gravels interspersed (refer to Photo B-19, Porous Alluvial Substrate of Hidden Basin Creek). The outfall is an inter-tidal estuary where channel depth varies dramatically between high and low tide (refer to Photo B-21, Aerial View Hidden Basin Creek's Intertidal Reach).

3.1.4 Vegetative Cover

Treeless tundra occurs above 1,500 EL and consists primarily of two closely related vegetative community types. The more prevalent of these is a carex-forb meadow found on moist slopes. Characteristic species are carex sedges, artic bluegass (*Poa arctica*), lutkea (*Luetkea pectinata*), sweet coltsfoot (*Petasites hyperboreus*), lupine (*lupines sp*.), coastal fleabane (*Erigeron peregrinus*), and Indian paintbrush (*Castilleja sp*.). Ridgetops with well-drained soil and barren, rocky patches support the fell field community that has many of the same species as the carex-forb meadow, but can be distinguished by the presence of such plants as crowberry (*Empetrum nigrum*), alpine azalea (*Kalmia procumbens*), Kamchatka rhododendron (*Rhododendron camtschaticum*), Alaska moss heath (*Polytrichum sp*.), and blueberry (*Vaccinium sp*.). (FERC, 1981).

3.1.5 Land Development and Population Size

The Project is located in a remote area of northcentral Kodiak Island approximately 25 miles west of the City (refer to Figure A-1, Site Location Map and Figure A-2, KEA Service Area in Appendix A of the amendment application). According to the KIB GIS records (KIB GIS Website, 2016) there are seven privately owned lots equipped with tax-assessed buildings along the southwestern shores of Hidden Basin lagoon at the mouth of Ugak Bay (refer to Photo B-23 Aerial View of Southwestern Shore of Hidden Basin Lagoon in Appendix B of the amendment application). This area is over 6 miles south of the proposed UHBD area, on the shores of marine tidewaters to the west of the Hidden Basin Creek delta outlet.

The Alaska Community Database Community Information Summaries (DCED, 2015) lists the 2010 Certified Population for the Borough as 13,592; of which the City population is 6,130, the U.S. Coast Guard base is 1,301 and Port Lions is 194. The City is the eighth largest city in Alaska in terms of population.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

Pursuant to the Council on Environmental Quality regulations for implementing NEPA at 40 CFR 1508.7, cumulative effects are 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 which 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. Actions to be considered include both hydropower and other land and water development activities in the vicinity of the UHBD.

The UHBD area is remote and undeveloped. There are no developments in the Hidden Basin watershed and there are no towns located within 15 miles of the Project. The only activity in the vicinity of the Project are KEA staff who operate and maintain the Project equipment and facilities. The license order, issued in 1981, approved a "Joint Offer of Settlement" agreed to by KEA and intervening parties.[2] The settlement agreement and certain license conditions provide for the mitigation of "any and all adverse effects." Some mitigation was off site; for example Habitat Replacement via a Cooperative Management Agreement (dated June 16, 1981). Effects of the UHBD are also expected as discussed in Section 5.2 below and would be cumulative to those already addressed by the 1981 agreement and license.

3.3 PROPOSED ACTION

3.3.1 Geology and Soils

a. Affected Environment:

There are two general rock types in the UHBD area: the light-colored granitic rocks of the Kodiak Batholith, and the darker-colored metamorphic rocks of the Kodiak Formation (refer to Photo B-15, Geologic Contact in Appendix B of the amendment application).

The Kodiak Batholith forms the high mountain ridge between the Terror Lake reservoir and the proposed UHBD area. The proposed UHBD tunnel would cross directly through the Kodiak Batholith ridge, and most of the tunnel excavation would be in the granitic rocks (refer to Figure A-5, Geologic Map of Project Area in Appendix A of the amendment application). The granitic rocks of the Kodiak Batholith are strong and resistant to erosion. The proposed UHBD tunnel would be inclined on a 1 percent slope from east to west, and is approximately 1.2 miles in length. The maximum rock cover above the tunnel would be approximately 1,060 feet. The upstream portal would be located immediately west of the D-West diversion dam with the invert at approximately 1,520 feet msl The downstream portal would be located adjacent to the southwest end of the Terror Lake reservoir with an invert at approximately 1,452 feet msl. The tunnel size would be 12 feet in diameter to convey up to 950 cfs of flow from the UHBD to the Terror Lake reservoir.

The area east of the mountain ridge is underlain by the somewhat weaker metamorphic rocks of the Kodiak Formation. The Kodiak Formation rocks were

[2] *Kodiak Electric Association, Inc.*, 17 FERC ¶ 61,026 (1981).

originally fine-grained sediments deposited underwater that have been buried, compressed, densified, folded, and faulted during regional tectonic deformation of Kodiak Island and intrusion of the Kodiak Batholith. Exposures of these rocks in the UHBD area vary from highly foliated and fractured shale and slate to more blocky, quartz and feldspar-rich meta-sandstones, greywackes, and argillites. In the highly fractured meta-sedimentary rocks, fracture spacing appears to be as little as inches apart, while the more blocky rocks have fracture spacing of about a foot or more.

Crown Mountain is a granite mountain ridge that forms the eastern edge of the Hidden Basin watershed. The contact between the granitic rocks of the Kodiak Batholith and Crown Mountain, and the adjacent meta-sediments of the Kodiak Formation can usually be identified by a change from light-colored to dark-colored rocks, a change from steep to more gentle topography, and generally less vegetative cover on the granitic rocks. The exact contact is often covered with soils and rocks which have slid down the mountainside (colluvium), obscured by stream sediments (alluvium) or buried beneath old glacial deposits (moraines). The intrusion of the viscous and hot granitic magma of the Kodiak Batholith and Crown Mountain severely heated and baked the adjacent Kodiak Formation meta-sedimentary rocks, making the rocks denser and harder, although the fracture density may also increase compared to the same materials outside of the baked zone. The width of the baked zone in the Kodiak Formation is reported to be from less than one mile wide to over 3 miles wide regionally. Both the D-West and D-East dams and the water conveyance between them would be either in or near this baked zone.

The proposed location for the D-East diversion dam is a stream invert of 1,800 feet msl and the proposed location for the D-West diversion dam is a stream invert of 1,520 feet msl. These stream channels consist mostly of gravel and cobbles with occasional large boulders. The channel banks consist of occasional bedrock outcrops, gravel, cobbles and boulders. Above the banks, the channel side slopes vary, some with tundra vegetation (Lachel, 2015). (Refer to Photos B-4 and B-5, D-East Area in Appendix B of the amendment application.)

Seven representative rock samples collected during a geotechnical investigation were tested for their potential to generate acid drainage. Two of these samples were of the granite and five samples were metamorphosed sediment. Samples were tested for total moisture, pH of the crushed rock paste, and total sulfur. From these tests, values were derived for parameters used in the evaluation of potential for acid rock drainage: neutralization potential (NP), acid potential (AP), and acid-nase accounting (ABA, also known as net neutralization potential). Negative ABA values are most likely to produce acidic conditions, and all project samples had positive ABA values of 6 to 11. Additionally, NP to AP ratios of 3:1 or higher have low risk for generating acid

drainage. Samples from the project had NP: AP ratios of 10:1 to 2.5:1, indicating a low risk for acid generating potential." The results of the laboratory testing therefore indicate that the rock generated from the tunnel construction has a low probability of developing acid drainage (Rogers, 2016).

b. Environmental Effects:

In order to construct the tunnel for the UHBD, KEA expects to use drilling, blasting, and a tunnel boring machine (TBM). The general number of blasting events to occur in the UHBD downstream tunnel portal area is expected to be in the range of 60 blasts, each typically lasting less than 20 seconds. Of these approximately 60 blasting events, ten would be for excavating the portal trench and the remaining 50 would be for constructing the starter tunnel for the TBM. If the entire tunnel were constructed by drilling and blasting instead of the TBM, there would be significantly more blasting events required.

Modern blasting involves the use of millisecond delays controlled by electronic systems resulting in a series of smaller amounts of explosives needing to be detonated at sequenced intervals, which results in reduced ground shock and noise compared to a single large blast. Blasting noise levels would be expected in the 100 to 110 decibel range, which is similar to a chainsaw, but less than the firing of a shotgun (130 decibels). After drilling a pattern of holes and loading the holes with explosives and detonators wired to a blasting control system, the area would be covered with blasting mats made of fragments of rubber tires held together with steel cables to contain the blast, prevent fly rock, and to suppress noise and dust. Following the blast and a safety check, the mats would be pulled aside and the blasted rock removed. Due the extremely short summer season, tunnel construction is expected to proceed around the clock, with two 12-hour shifts. For each shift, it can expected to have a crew of approximately 12 people.

When tunneling is complete, a concrete portal structure would be constructed to permanently stabilize the downstream tunnel portal face. After all UHBD construction is complete and Refuge land is revegetated as per the 4(e) condition filed by US Department of Interior, the only visible structures on Refuge land would be this concrete portal face of the tunnel outlet and a metal grate across the tunnel hole to prevent wildlife from entering the tunnel.

Regardless of tunnel construction method utilized, TBM or drilling and blasting, construction of a 12-foot diameter tunnel and its associated tunnel portal will generate up to 40,000 cubic yards of rock, which equates to approximately 25 acre-feet in rock volume. It is likely that drilling and blasting may result in greater volumes of rock than

the tunnel boring method due to the greater rock disturbance involved. Material removed from a drilled and blasted tunnel would likely be poorly graded with a particle size range of up to two feet on the longest axis. The size and shape of rock that typically comes out of tunnels constructed with tunnel boring method is approximately half that size with more uniform particle size range of less than one foot on the longest axis.

Equipment typically involved with moving tunnel rock from a drilled and blasted tunnel is a multi-purpose rubber-tired Load-Haul-Dump which enters the tunnel, uses a bucket to pick up and load the blasted rock and moves the rock out of the tunnel to a stockpile. In a bored tunnel, hauling waste rock out of the tunnel is accomplished with locomotive rail cars. In either case, once outside the tunnel, the rock is temporarily stockpiled near the tunnel portal outlet. If tunnel boring construction method is utilized with its faster daily tunnel advance of 60 feet per day ft/day, up to approximately 380 cubic yards of rock could be exiting the tunnel each day. As the construction schedule and mining cycle allow, the rock is then moved from the temporary stockpile over to the designated tunnel fill repository with loader or truck. This rock would then be contoured to the landscape using a bulldozer or loader bucket as per the 4(e) condition filed by US Department of Interior.

Site-specific permits, safety and quality control plans related to rock placement also include the Erosion and Sediment Control Plan (ESCP), Alaska Pollutant Discharge Elimination System (APDES) Stormwater Permit, Clean Water Act (CWA) Section 404 Wetland Permit, and acid drainage monitoring. Protection measures related to tunnel construction will be specifically addressed in KEA's Contract Terms and Conditions document to advise contractor personnel how they shall comply with all environmental protection requirements while on Refuge lands. KEA will also provide an Environmental Compliance Monitor (ECM) during construction to serve as the primary contact for communications among KEA and interested entities, including FWS as required.

To prepare the dam sites, the licensee intends to grade the streambed to facilitate construction of the concrete cradles and to more easily affix the dams to bedrock. Although the licensee would be excavating material within the creek, much of this material is gravel and cobble not prone to erosion while disturbed by construction activities during low to moderate flows, is regularly transported by natural high flow events, and the licensee would not be disturbing a large area. Therefore, construction of the diversion dams would have a negligible impact on geology and soil resources.

The proposed permanent access road alignment would extend approximately 4 miles through the Kodiak Formation, from the existing Project access road towards the

D-West and D-East diversion dam sites. Surface features range from rugged, mountainous terrain to wetlands (refer to photos in Appendix B of the amendment application). The road would be constructed using gravel, from off-project sources, and construction of the road would require the licensee to perform minor amounts of cut and fill as a result of the uneven terrain. Road construction would directly disturb roughly up to 10 acres of land, and may result in erosion and sedimentation, particularly where the licensee would move large amounts of material to achieve a gentle grade. However, the licensee's contract terms and conditions and its ESCP would help prevent any adverse impact to geology and soils from road construction or use.

3.3.1.1 Resource Protection Measures

KEA proposes to periodically test rock samples throughout the tunnel construction process to monitor for the potential to generate acid rock drainage during construction. If acid generation is detected during or after Project construction, KEA would implement a plan to manage the acid drainage. A preliminary 4(e) condition filed with the Commission by the Department of Interior on December 2, 2016 requires KEA to develop a plan to monitor waste rock leachate during construction in order to test for acid production from rock excavated from the tunnel. Monitoring would continue through the construction period each year until surface water at the waste rock disposal site freezes in the fall. If acid drainage is documented, KEA would be required to develop and implement measures to mitigate and manage the acid drainage from the waste rock. Any plan to manage acid conditions would need to be approved by the Refuge Manager.

KEA would develop site-specific quality control plans once the final engineering design is completed and a construction contractor is selected. KEA would be required to obtain all necessary site-specific permits and authorizations for all construction activities to include, but not necessarily limited to, a site-specific Quality Control and Inspection Program (QCIP), Erosion and Sediment Control Plan (ESCP), APDES Stormwater Permit, and CWA 404 Wetland Permit Authorizations.

Protection and avoidance measures relating to erosion and sedimentation control are also specifically addressed in KEA's Contract Terms and Conditions document provided in Appendix E of the amendment application.

As the sole owner and operator of the Project, KEA would be responsible for the overall management of the UHBD construction process. KEA would provide an ECM during construction to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be

available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is provided in Appendix E of the amendment application.

3.3.1.2 Record of Consultation

On February 13, 2016 KEA consulted with FERC PRO regarding the geotechnical investigation planned for 2016 and the proposed UHBD construction schedule. FERC PRO requested KEA file notification with their office prior to conducting the geotechnical investigation activities, which KEA filed on April 13, 2016. A copy of the notification is provide in Appendix D of the amendment application.

On November 9, 2015 KEA consulted with ADNR Division of Land, Mining, and Water, Land Section regarding geotechnical investigation activities on State land planned for 2016. The ADNR requested a Land Use Permit Application for the geotechnical investigation activities, which KEA filed on April 18, 2016. A copy of the Land Use Permit application is provided in Appendix D of the amendment application.

On April 22, 2015 and October 22, 2015, KEA consulted with the FWS Refuge regarding geotechnical investigation activities on Refuge land planned for 2016, and regarding the tunnel construction methods planned for 2018 and 2019 to connect the water resource to the existing Terror Lake reservoir. The FWS Refuge requested a Research Special Use Permit Application for the geotechnical investigation activities, which KEA filed on April 7, 2016. A copy of the Research Special Use Permit application is provided in Appendix D of the amendment application.

On August 22, 2016, FWS filed a letter with FERC recommending that rock from the tunnel be tested for its potential to generate acid drainage. KEA met with the FWS on September 14, 2016 to better understand this comment. The FWS stated that acid drainage is not currently a problem on Refuge lands, but FWS is looking for it in case potential problems arise. While the problem is unlikely to arise, FWS wants to ensure that the potential for the problem to arise is occasionally checked during construction. KEA agreed to monitor for signs of acid rock drainage as part of the construction plan.

On September 9, 2016 at meeting was held at KEA offices in Kodiak between FWS, State of Alaska, and KEA for the purposes of discussing minimum instream flow requirements.

A pre-application meeting was held with FWS on February 27, 2017 to discuss ROW terms and the application process for the ANILCA permit. At this meeting, the ROW application was submitted to FWS.

3.3.2 Water Use and Quality

a. Affected Environment:

The total drainage area of the entire Hidden Basin watershed is 24.86 square miles. The total drainage area of the West Fork portion of Hidden Basin Creek is 11.76 square miles, and the proposed UHBD area in the upper reaches of that West Fork is 3.88 square miles. The UHBD would divert 15 percent of the overall Hidden Basin watershed drainage area (refer to Figure A-7, UHBD Water Diversion and Figure A-8, Hidden Basin Watershed in Appendix A of the amendment application).

The upper catchment area of the Hidden Basin watershed is estimated to drain approximately 30,000 acre-feet of snow melt and rain. The UHBD proposal is to divert that surface water resource westward through a tunnel toward the Project's Terror Lake reservoir for hydropower generation. The D-West diversion dam catchment is estimated to provide approximately two-thirds of the total available water resources, and the D-East diversion dam catchment would provide the remaining one-third. The maximum capacity of the conveyance pipe connecting the D-East diversion dam to the D-West diversion would be approximately 250 cfs, and the combined total diversion capacity of the subterranean diversion tunnel connecting the D-West diversion dam to the Terror Lake reservoir would be approximately 950 cfs. Surface water flow that exceeds the maximum capacity of the UHBD conveyance pipe and tunnel would be spilled downstream into the West Fork of Hidden Basin Creek.

Despite the 2,500 foot elevation change in the watershed topography, diverting water from the upper reaches of the Hidden Basin Creek would have effects on surface water temperatures, similar to those observed on the Kizhuyak River, in the lower anadromous reach of Hidden Basin Creek. During daylight periods in the summer months, surface waters flowing in the lower Hidden Basin Creek are actually cooler than the surface waters flowing in the upper watershed area because the lower reach of Hidden Basin Creek is fed primarily by groundwater, except during peak snowmelt and large precipitation events. Groundwater upwelling occurs downstream of the canyon confluence where the West, Middle and East Forks join to form Hidden Basin Creek. Stream temperatures in the proximity of groundwater upwelling zones are typically cooler during periods of summer solar exposure than adjacent surface water and exhibit less fluctuation over a 24-hour period. Detailed information on water temperatures measured at gauging stations along Hidden Basin Creek is included in ERM's report,

Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015, which is provided in Appendix C of the amendment application.

The results of ERM's temperature analysis are consistent with the results of the Project's post-licensing study that examined the effects of the Project's operation on the surface and intragravel water temperature of the Kizhuyak River. A report assessing effects from construction and operation of the Project on the temperature and streamflow (Trihey and Associates, 1992) stated that:

- "For all practical purposes, project effects on intragravel water temperatures are the same as project effects on surface water temperatures.

- There are small seasonal differences between the pre- and post-project surface water temperature near the USGS gaging stations on both [Terror and Kizhuyak] rivers.

- In the Kizhuyak River, post-project water temperatures during summer are generally about 1.8 degrees F cooler than pre-project temperatures. There is a lesser difference between pre-and post-project stream temperatures during the winter months.

- Winter stream temperatures have changed little in the lower 1.5 miles of the Terror and Kizhuyak rivers where the greatest amount of spawning activity has traditionally occurred."

KEA operates three other diversion systems at the Project, and these three diversions have not resulted in adverse effects in water quality downstream. Post-licensing studies of the Project indicated that water quality parameters on the Terror and Kizhuyak Rivers are essentially unchanged from pre-project conditions. Nutrient and sediment levels remained low and dissolved oxygen remained at or above saturation. Water quality problems that arise are temporary and typically associated with natural events such as storm flooding (FERC, 2004).

b. Environmental Effects:

The proposed UHBD would not involve any changes to Terror Lake, the main reservoir for the Project. With the Terror Lake dam and spillway unchanged, the Project's gross storage capacity and usable storage capacity provided by the Terror Lake reservoir remains unchanged. Terror Lake's minimum lake level elevation is 1,250 feet msl. Maximum lake level elevation is 1,420 feet msl, which is the elevation of the Terror Lake dam spillway. The current volume of the Terror Lake reservoir is adequate

to utilize the additional inflows provided by the proposed UHBD under future projections of electrical load demand. The Project has no license-mandated lake level elevation rule curve. The Project's lake levels would continue to be managed to ensure compliance with its Terror River instream flow requirements as per FERC License Article 43.

Changes would occur to the lake shore, and potentially, to the lake bottom at the site of the outlet of subsurface tunnel potentially affecting water quality. An outlet channel would be created to accommodate up to 950 cfs of water exiting the tunnel and entering the lake. The potential for sediment transport will depend on the channel design and the currently unknown water velocity, but potentially increased sediment could occur initially from the channel and lake bottom. Therefore, proper design of the channel would be important to minimize effects and should be responsive to the geotechnical finding on site. At the outlet tunnel, the channel bed would be bedrock and the right of way permit would require the design to result in a stable channel with minimal erosion of the channel and lake bottom.

Detailed information on the hydrology of Hidden Basin Creek, including gauging data methodology, hydrographs and temperature analysis is provided in the ERM report, Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015, which is provided in Appendix C of the amendment application. A detailed analysis of how the additional inflows provided by the UHBD would be utilized by the Project is presented in Exhibit B of the amendment application – Project Operation and Resource Utilization.

Approximately 250 yards northeast of a gage on the mainstem of the Hidden Basin Creek, a separate Unnamed Stream originates with no apparent surface water connection to the Creek flowing approximately 1.5 miles to Hidden Basin Bay. The Unnamed Stream may be connected hydrologically from drainage from a ridge, but a direct surface water connection was not identified. The volume of water in the Unnamed Stream does increase at a point, suggesting upwelling of groundwater. According to KEA, field observations indicated that the Unnamed Stream does not rely on surface water flows from the Hidden Basin Creek because the channel flows even when the mainstem of the Creek is dry.

In a filing with the Commission on August 23, 2016, as modified on September 28, 2016, NMFS provided an EFH and FPA 10(j) recommendation to provide a minimum flow from the proposed diversions to the Unnamed Stream, as described in more detail in the Fishery Resources section below. The EFH and 10(j) recommendation requires KEA to design, install, and operate a pipe that would provide a minimum of one cfs of instream flow downstream of the UHBD during the period of

July 15 through September 30 provided water is available for discharge. The exact diversion point would be determined by KEA, however, the water would be returned to the west fork of the Upper Hidden Basin Creek below the western diversion. The pipe would have a spigot and KEA would be required to report the opening and closing date of that spigot each year in an annual report.

As indicated above under section 3.3.1- Geology and Soils, the creek beds at the sites of the proposed diversion dams mainly consist of gravel, cobbles, and large boulders. During dam construction, this material is unlikely to be suspended within the water column for a meaningful period and would not contribute to turbidity or total suspended solids, or alter water chemistry. Furthermore, the licensee intends to install temporary cofferdams during construction of the diversion dams, which would help dewater the work area and prevent impacts to water quality, particularly from uncured concrete which the licensee plans to use for some diversion dam features.

3.3.2.1 Resource Protection Measures

In a response to NMFS's September 28, 2016 letter regarding the EFH and 10(j) recommendations, KEA filed a letter with the Commission on October 5, 2016 accepting the revised conservation recommendation.

KEA states that it would acquire water rights for the operation of the proposed UHBD, and would comply with the terms and conditions of the water rights appropriation LAS 30459. KEA would acquire the temporary water use permits for the construction of the proposed UHBD, and would comply with the terms and conditions of the temporary water use permit TWUA J2016-01. Copies of the applications for the operational water rights, and for the temporary use of water during geotechnical investigation and construction activities are provided in Appendix D of the amendment application.

KEA would develop site-specific quality control plans once the final engineering design is completed and a construction contractor is selected. KEA would be required to obtain all necessary site-specific permits and authorizations for all construction activities to include, but not necessarily limited to, a site-specific Quality Control and Inspection Program (QCIP), Erosion and Sediment Control Plan (ESCP), APDES Stormwater Permit, and CWA 404 Wetland Permit Authorizations.

KEA is required to comply with CWA regulations 40 CFR 112 related to oil pollution prevention with KEA's SPCC Plan for the Project. A copy of the Project's current SPCC Plan is provided in Appendix E of the amendment application. Separate SPCC Plans specific to any additional oil containers temporarily brought on-site for

UHBD construction would be required to be prepared by the contractor, as is specified in the Contract Terms and Conditions document. An example of a contractor-provided SPCC Plan is provided in Appendix D of the amendment application as a component of the applications and notification related to the geotechnical investigation activities scheduled for August 2016.

As a requirement for all contractor work conducted at the Project site, KEA would employ standard Contract Terms and Conditions. Protection and avoidance measures relating to erosion and sedimentation control and protection of aquatic resources are included in this document. A copy of the KEA Contract Terms and Conditions document is provided in Appendix E of the amendment application.

KEA would provide an ECM during installation to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the proposed duties and authority of the ECM is provided in Appendix E of the amendment application.

3.3.2.2 Record of Consultation

On April 10, 2015, KEA consulted with the ADNR Division of Land, Mining, and Water, Land Section and Water Sections regarding the process and application for water rights needed for the proposed UHBD. KEA received guidance from ADNR staff regarding the process and the application, and on May 5, 2015, filed an Application for Water Rights as per AS 46.15 for approximately 45,000 acre-feet of surface water to be diverted by the UHBD to the existing Terror Lake reservoir. The ADNR advised KEA to request rights for an amount of water greater than the amount of water estimated to be diverted because the quantity of water can be easily adjusted down during the final water rights appropriations process, but it cannot be easily adjusted up. Therefore, KEA requested 45,000 acre-feet of water as a conservative buffer to the 30,000 acre-feet of water estimated to be available at the proposed UHBD. On January 22, 2016, ADNR issued a letter stating:

"The Department of Natural Resources received your application for water rights on September 24, 2015 and initiated a case file. This date is the provisional priority date of any eventual water right resulting from this application for water rights if it is adjudicated and a permit to appropriate water or a certificate of appropriation is granted. While this letter indicates that your application is substantially complete, DNR may request further information if needed to adjudicate the permit."

A copy of KEA's water rights application and ADNR's response letter is provided in Appendix D of the amendment application.

The ADNR attended the Agency Scoping Meeting on July 21, 2015 and the aerial site tour, and expressed no objection to the UHBD proposal.

On January 25, 2016, KEA consulted with ADNR regarding the next steps in the water rights appropriation process. KEA agreed to collect surface water discharge data at the gage D-West and gage D-East sites until October 2016 and provide ADNR with an updated hydrology report with this additional year of surface water discharge data included in the analyses. After the UHBD is constructed and operational, KEA would monitor and report the beneficial use of the water appropriation to ADNR.

Certification pursuant to CWA Section 401 is required as per FERC regulation 18 CFR 4.38(a)(1). Alaska DEC is the lead agency for purposes of 401 Water Quality Certifications (WQC) for hydro projects pursuant to the CWA; however, Alaska DEC typically waives the requirement for the WQC for the type of action KEA is proposing with the UHBD. On May 20, 2015, KEA submitted a request to Alaska DEC Division of Water, Stormwater and Wetlands Program to provide a statement regarding the WQC. On June 3, 2015, Alaska DEC issued a letter stating:

"In accordance with Section 401 of the Federal Clean Water Act of 1977 and provisions of the Alaska Water Quality Standards, the Department of Environmental Conservation (DEC) is waiving its right to issue a Certificate of Reasonable Assurance for licensing Federal Energy Regulatory Commission (FERC) Project No. 2743 – Alaska; Terror Lake Hydroelectric Project. DEC reserves the right to review future construction projects, as they may arise, in accordance with Section 401 of the Clean Water Act of 1977, and the provisions of the Alaska Water Quality Standards (18 AAC 70)."

A copy of this correspondence is provided in Appendix D of the amendment application.

The ERM report, Hidden Basin Creek Hydrology and Fisheries Report, Technical Report February 2015 was provided to ADF&G on February 27, 2015; to NMFS on March 12, 2015; to ADNR on May 5, 2015; and to USGS on May 18, 2015. It was also provided to all Participants on June 19, 2015 as an appendix to the PDEA. Since then an additional year of data collection was completed, and the updated version of the ERM report, Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015 was provided to ADF&G on December 22, 2015; to NMFS on December 18, 2015 and on January 11,

2016; and ADNR on December 28, 2015. It is included in Appendix C of the amendment application.

On August 23, 2016, NMFS filed a letter with FERC recommending, pursuant to Section 10(j) of the Federal Power Act, KEA provide a combined 1 cfs of instream flow year-round downstream of either of the two diversion structures to mitigate the effects caused by the stream diversions and minimize lowering the water table beneath an unnamed stream adjacent to the lower reaches of Hidden Basin Creek during dry periods. KEA met with NMFS on September 15, 2016, to better understand this 10(j) recommendation and to discuss the infrastructure proposed for the UBHD and the seasonality of water availability in the UHBD area. NMFS agreed to revise the 10(j) recommendation to designing and installing a pipe that would provide a minimum of one (1) cfs of instream flow downstream of the UHBD during the period of July 15 through September 30 when water is available for discharge. NMFS filed a letter with FERC on September 28, 2016, with the revised 10(j) recommendation.

3.3.3 Wetlands

a. Affected Environment:

Wetlands in the vicinity of the proposed UHBD consist of palustrine emergent or scrub shrub wetlands characterized by herbaceous vegetation and low or dwarf shrubs; depression bogs and marshes along creek areas and riverine intermittent stream bottom; riverine upper perennial unconsolidated bottom; and ponds. The riverine water channel types are either deep incised canyon channels, alpine rivulets, or braided gravel bed streams. Ponds are typically very fine sand or silt substrate, many of which are periodically dry (ERM, 2014).

The wetland mapping effort consisted of GIS-based desktop pre-mapping, visual observations by wetland specialists in the field during the summer season when vegetation was identifiable, and GIS-based post-field editing of the desktop pre-mapping. In 2014, a certified professional wetland scientist completed the desktop pre-mapping within the study area by manually digitizing all potential wetlands or waters features as polygons in ArcGIS. On July 17, 2014, a biologist and engineer with extensive experience in wetland assessment in Alaska walked the length of Upper Hidden Basin valley from the Project's existing access road to the proposed UHBD diversion dam areas. This field team documented representative wetlands and waters and upland areas using photographs and GPS points. Corrections to the pre-mapped wetlands and waters polygons were drawn on the field maps for post-field desktop editing. The results of the 2014 preliminary assessment were presented in a wetland report (ERM, 2014). In March 2016, higher resolution mapping data became available

for more refined desktop mapping. The results of the refined assessment were presented in a second wetland report (ERM, 2016), which is included in Appendix C of the amendment application.

The wetland mapping effort focused on the proposed UHBD access road corridor, which does not include the downstream tunnel portal area adjacent to the Terror Lake reservoir on the western side of the mountain ridge. A field team returned to the UHBD area to conduct visual observations on the western side of the mountain ridge so that all wetland areas throughout the entire UHBD area were located and documented.

Wetland areas near the site of the access road generally existed year round and were mostly flowing slope or riverine wetlands, followed by wetlands located within depressions or on flat ground. Vegetation within the wetlands generally consisted of low shrubs or a mix of low shrubs and herbaceous vegetation.

b. Environmental Effects:

The construction of the proposed UHBD would involve the filling of wetlands located in the vicinity of the proposed UHBD. KEA gathered information to determine the exact location and size of affected wetlands, and the total potential volume of fill per wetland unit.

During its mapping efforts, the licensee evaluated a 2,000-foot-wide corridor in which the access road may be located. Of the 892 acres within this area, 123.6 acres, or approximately 14 percent, were identified as wetlands. Hence, road construction may fill approximately 1.4 acres of wetland habitat. During construction, the licensee's proposal to follow the requirements of its permits and plans would limit wetland impacts to those immediately within or adjacent to the road right-of-way. In this way, the adverse effects to wetlands would be reduced, although the impacts on the affected wetland would be permanent. The permanent removal of 1.4 acres of wetland would be a minor impact since much of the surrounding area includes similar habitat, and the licensee would allow water within the riverine wetland areas to flow under the road through culverts or other drainage devices, maintaining interconnectivity.

3.3.3.1 Resource Protection Measures

KEA would comply with all terms and conditions of the CWA 404 Permit and ADEC APDES Stormwater Permit, as required. Applications for those permits would be filed after more detailed information is obtained.

Protection and avoidance measures relating to aquatic resources, and erosion and sedimentation control are specifically addressed in KEA's Contract Terms and Conditions document included in Appendix E of the amendment application.

KEA would provide an ECM during installation to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is provided in Appendix E of the amendment application.

3.3.3.2 Record of Consultation

On April 29, 2015, KEA consulted with USACE Alaska Division, Kenai Field Office regarding the applicable CWA 404 permitting requirements and application process for the proposed UHBD. USACE attended the Agency Scoping Meeting on July 21, 2015, and expressed no objection to the UHBD proposal. On April 19, 2016, USACE provided additional guidance verifying that KEA's approach to wetland mapping was appropriate for the purpose of preparing a CWA 404 permit application for the UHBD, and clarifying that that all components of the proposed UHBD must be included as a single CWA 404 permit application. KEA would file a CWA 404 permit application with the USACE.

The ERM report, Upper Hidden Basin Creek Access Road, Preliminary Wetlands and Waters Assessment, August 2014 was provided by KEA to USACE on March 5, 2015. It was also provided to all Participants on June 19, 2015 as an appendix to the Draft PDEA. The updated version of the ERM report, Upper Hidden Basin Diversion Access Road Corridor Wetland and Waters Assessment, April 2016 was provided by KEA to USACE on April 15, 2016. It is included in Appendix C of the amendment application.

3.3.4 Fishery Resources

a. Affected Environment:

No fish have been observed in the proposed UHBD area. The diversion dams, tunnel, and access road would be sited in the upland area above two major waterfalls that serve as fish passage barriers. There are no fish in the Terror Lake reservoir. Both the UHBD and Terror Lake reservoir are located in upland mountainous areas above major waterfalls that serves as a natural fish passage barriers.

The 3-mile-long section of lower Hidden Basin Creek is listed as Stream No 259-41-10077 in the ADF&G Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes (AWC). This lower reach of the Hidden Basin Creek was known to support chum salmon (*Oncorhynchus keta*), pink salmon (*Oncorhynchus gorbuscha*), and Dolly Varden (*Salvelinus malma*). In 2014, minnow trapping associated with KEA's recent research efforts confirmed coho salmon (*Oncorhynchus kisutch*) was another anadromous fish species inhabiting the drainage seasonally. Coho were not previously documented in the AWC for Hidden Basin Creek, but have since been added to the AWC as a result of KEA's nomination.

The upper limit of the anadromous reach is approximately 3 miles downstream of the proposed UHBD area, below the two major waterfalls that separate the UHBD area from the lower reaches. Hidden Basin Creek forms at a canyon mouth where the West Fork joins with the Middle Fork and East Fork. This convergence area of the three major forks remains dry the majority of the time due to downwelling of surface waters to subsurface flow underneath the porous alluvial substrate (refer to Photo B-19, Porous Alluvial Substrate of Hidden Basin Creek in Appendix B). Fish distribution is limited spatially and temporally to intermittent, disconnected pools located on Hidden Basin Creek, approximately 1 mile downstream from the confluence of the West, Middle, and East Forks.

While renowned for their homing ability, salmon are also highly opportunistic and capable of exploiting marginal or newly available habitat for their various life stages. The fact that portions of Hidden Basin Creek experience discontinuous flow during late summer in some years suggests adult pink and chum salmon (and potentially coho salmon) make use of the system opportunistically for spawning under suitable flow conditions. Based on the prevailing gradient and substrate, most, if not all, of this opportunistic spawning likely occurs within the last 1 mile section of Hidden Basin Creek measured from the interface with the marine environment. Although the West, Middle, and East Forks have continuous flow, it is unlikely salmon spawn in them due to the fragmented surface flow in Hidden Basin Creek, combined with the steep gradient, large boulder substrate and presence of waterfalls a short distance upstream from the confluence of the respective forks.

The anadromous and resident fish found in Hidden Basin Creek have likely adapted to the stochastic nature of the surface water flows. Fish habitat in the dry stream channel of the lower reach is limited spatially and temporally. During storm events or periods of high run-off, fish may access the otherwise dry reaches of Hidden Basin Creek opportunistically but are likely to be trapped in pools with limited resources such as dissolved oxygen or food, making them more vulnerable to disease, competition, and predation. Fish occupying pools in Hidden Basin Creek that are

seasonally dewatered are not likely to survive the winter unless the pool has sufficient depth and food resources.

The longitudinal movement of anadromous and resident fish in Hidden Basin Creek is largely restricted to the stream reaches with available surface water. The lowest 2 miles of Hidden Basin Creek appear to maintain surface water connectivity to the marine tidewaters of Hidden Basin Lagoon. Water diversions at the UHBD are not likely to impact available fish habitat in this lower reach of the watershed. The UHBD comprises 15 percent of the overall Hidden Basin watershed area, which is a small portion of the surface water reaching the last 2 miles of the creek.

A small, isolated population of resident Dolly Varden was observed in in the meadow area located between the two large waterfalls on the West Fork of Hidden Basin Creek. Adults collected at this location in 2014 and 2015 were relatively small in size (150 millimeters). Resident Dolly Varden are well known to persist in waters above barriers similar to the large waterfall in the West Fork of Hidden Basin Creek. Throughout their range, Dolly Varden are often the only species present above fish migration barriers and likely benefit from the absence of competition for resources.

b. Environmental Effects:

Flows in an adjacent Unnamed Stream may be reduced by the project's diversion of flows from Hidden Basin Creek. EFH for Coho Salmon, Pink Salmon, and Chum Salmon spawning and rearing exists in the Unnamed Stream. The Unnamed Stream shares the same narrow alluvial valley as Hidden Basin Creek, however the two streams are separated by a small longitudinal berm. KEA proposes that the flow in Unnamed Stream remains stable and is unconnected to flow in Hidden Basin Creek and that the two streams are not hydrologically connected, due to an "aquitard," or semi permeable barrier. In comments filed on August 23, 2016, NMFS states that there is no soil profile or other field data supporting it, and from observing the landscape and geomorphology, it seems likely that the two streams are hydrologically connected. NMFS further states that due to the fact that the permeable coarse alluvial substrate appears to underlie both streams, it does not concur that the lower water table caused by the diversion during dry spells will only affect the water table on the western side of the valley. NMFS believes the water table underlying Unnamed Stream will also be lowered due to the diversion of flow from the project, adversely affecting spawning and rearing of Coho Salmon, Pink Salmon, and Chum Salmon.

3.3.4.1 Resource Protection Measures

As a result of meetings between KEA and NMFS staff, a consensus was reached regarding the fact that there is little risk from late fall through early summer of flow in Unnamed Stream going subsurface. From mid-July through September, Coho Salmon spawn in the Unnamed Stream and NMFS states that providing a modest, short-duration, instream flow to mitigate the risk of the stream flow going subsurface is acceptable. KEA would design and install a pipe that would provide a minimum of one (1) cfs of instream flow downstream of the Upper Hidden Basin Diversion during the period of July 15 through September 30 when water is available for discharge.

KEA states that it employs standard Contract Terms and Conditions to advise contractor staff on specific environmental protection requirements, including fishery resource protection measures, while on Project lands. According to KEA, contractor personnel are not allowed to use the Project area for recreational purposes, such as hiking, hunting, or fishing. Contractor personnel would confine their activities to the Project area relevant to the construction of the UHBD. Protection and avoidance measures relating to aquatic resources would also be addressed by KEA with contractor staff.

KEA would provide an ECM during installation to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is provided in Appendix E of the amendment application.

3.3.4.2 Record of Consultation

ERM engaged in a surface water stream gaging study in the Hidden Basin watershed. This stream gaging activity is authorized under ADNR Land Use Permit No. LAS 29042 and ADF&G Fish Habitat Permit FH 13-II-0038. KEA would continue to comply with the terms and conditions of these permits.

ERM conducted fish presence, absence and distribution surveys along the West Fork and Hidden Basin Creek from the alpine headwaters to the lower reach. The 2014 and 2015 fish collection activities were authorized under ADF&G Fish Resource Permit Nos. SF2014-153 and SF2015-145, respectively (copies provided in Appendix D). KEA and ERM fulfilled all terms and conditions of this permit, including providing ERM's report, Hidden Basin Creek Hydrology and Fisheries Report, Technical Report February 2015 to ADF&G on February 27, 2015 and an updated version of the ERM

report, Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015 on December 22, 2015 which detailed the results of the fish presence, absence and distribution surveys. KEA nominated the addition of juvenile coho salmon to Stream No. 259-41-10077 (Nomination Number 15-051), Hidden Basin Creek on Kodiak Island due to observations of its presence in the lower reaches of Hidden Basin Creek during the 2014 study. No additional fish collection activities are needed to determine the lack of potential impact of UHBD on fishery resources.

On April 1, 2015, KEA met with ADF&G in a pre-filing meeting to discuss KEA's intention to develop the UHBD, and to discuss the three-stage consultation process involved with the Application for Non-Capacity Amendment to FERC License No. 2743. ADF&G attended the Agency Scoping Meeting on July 21, 2015, and expressed no objection to the UHBD proposal.

KEA provided NMFS with the ERM report, Hidden Basin Creek Hydrology and Fisheries Report, Technical Report February 2015 on March 12, 2015. After the additional year of data collection was acquired, KEA provided NMFS with the updated ERM report, Hidden Basin Creek Hydrology and Fisheries Report, Three-Year Summary Report: 2013-2015, Technical Report December 2015 on December 18, 2015 and again on January 11, 2016. Upon their review of these reports, NMFS raised questions and concerns regarding the potential impact of the UHBD on surface water hydrology in the Unnamed Stream adjacent to Hidden Basin Creek that also drains into the Hidden Basin Bay. In response, KEA provided NMFS with a supplemental report that clarified ERM's 2016 report conclusion that the diversion of water from the upper reaches of the West Fork of Hidden Basin Creek would not be measurable in this Unnamed Stream.

A copy of the ERM supplemental report, Lack of Measurable Nexus among Upper Hidden Basin Diversion and the Unnamed Stream, Supplement to the Hydrology and Fisheries Technical Report, March 2016 is provided in Appendix C of the amendment application. A copy of KEA's report transmittal letter to NMFS dated March 11, 2016, along with NMFS's e-mail correspondence dated April 18, 2016 regarding MSA consultation without study requests, is provided in Appendix D of the amendment application.

On August 23, 2016, NMFS filed a letter with FERC recommending, pursuant to Section 10(j) of the Federal Power Act, KEA provide a combined 1 cfs of instream flow year-round downstream of either of the two diversion structures to mitigate the effects caused by the stream diversions and minimize lowering the water table beneath an unnamed stream adjacent to the lower reaches of Hidden Basin Creek during dry

periods. KEA met with NMFS on September 15, 2016 to better understand this 10(j) recommendation and to discuss the infrastructure proposed for the UBHD and the seasonality of water availability in the UHBD area. NMFS agreed to revise the 10(j) recommendation to designing and installing a pipe that would provide a minimum of one (1) cfs of instream flow downstream of the UHBD during the period of July 15 through September 30 when water is available for discharge. NMFS filed letter with FERC on September 28, 2016 with the revised 10(j) recommendation.

3.3.5 Terrestrial Resources

a. Affected Environment:

Six terrestrial mammal species are native to Kodiak Island They are the Kodiak brown bear (*Ursus arctos middendorfi*), ermine (*Mustela erminea*), river otter (*Lutra canadensis*), red fox (*Vulpes vulpes*), tundra vole (*Mifrotus oeconomus*), and little brown bat (*Myotis lucifugus*). All of these species occur in the Terror Lake Hydroelectric Project area (FERC, 1981).

The primary mammal species of concern is the Kodiak brown bear. This species appears to be distributed throughout the Island; most emerge from dens between April and June. Breeding occurs in the period following emergence and generally ends by late July. Between mid-July and early August, bears move to river valleys to feed on salmon. Denning occurs in late-October and December, and the mid-mountain slope to alpine region of mountains adjacent to the Project areas includes suitable denning habitat.

ADF&G initiated a bear research program in 1982 concurrent with the construction of the Project. The primary objective was to document bear activities in the Terror, Kizhuyak, and Elbow Creek drainages during and immediately after construction. Results of surveys conducted in 1987 and 1997 yielded density estimates of 234 independent bears (adults or subadults) per 1,000 square kilometer (or 0.6 bears per square mile), and 276 independent bears per 1,000 square kilometer (or 0.7 bears per square mile), respectively. The ADF&G investigation concluded that KEA's Project construction had little adverse impact on the local bear population. It also noted that as long as salmon resources were conserved, standard bear safety practices were followed, and access along the Project access roads were carefully managed, operation of the Project was not anticipated to harm bears (Van Daele, 2010).

Over the past 100 years, many other species of mammals have been introduced to the Kodiak Island area. Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) were first introduced to Kodiak Island in 1934 and are abundant throughout the Project area.

The deer make vertical migration from sea level to alpine areas in response to climatic conditions and the availability of food. As fall arrives, the deer generally migrate from the high elevations to feed on remaining succulent vegetation at lower elevations. Deer winter in the lower river drainages, generally below 500 feet msl (FERC, 1981). Mountain goat (*Oreamnus americanus*) were introduced to Kodiak Island in the 1950s. Since introduction near the project area, the population has increased, numbered about 3000 animals in 2016, and is distributed throughout the Island cordillera wherever extensive cliffs and sheer slopes are available as escape cover. Mountain goat seasonally aggregate in alpine areas including the Project area between May and November. During winter, mountain goat move to lower elevation canyons and coastal mountains.

Between the period 1929 to 1931, 23 beavers (*Castor canadensis*) were introduced to the Island and released to lakes and streams. Beaver can be found in habitat throughout the Island, including the Terror and Kizhuyak river drainages. Watchout Creek, in the lower Kizhuyak drainage, contains the most significant sign of beaver habitation (FERC, 1981).

Kodiak Island supports a diversity of landbirds, waterfowl and seabirds. Although no major waterfowl production areas occur in the Project area, Kodiak Island's river deltas provide suitable habitat for numerous bird species. Project personnel report that bald eagles (*Haliaeetus leucocephalus*) are observed year-round in the Terror Lake Hydroelectric Project area, primarily below alpine regions, including foraging on salmon in Kizhuyak River in late July through September. Eagles frequently nest in cottonwoods in lower reaches of river valleys including the Terror River.

b. Environmental Effects:

Female Kodiak brown bears with cubs appear to be particularly sensitive to disturbance while at their dens. A preliminary 4(e) condition provided by FWS in an August 22, 2016 letter filed with the Commission, would have limited construction equipment and helicopter traffic to the period of July 1 through October 31, primarily to avoid disturbance of denning adult female brown bears with cubs. KEA consulted with the FWS, the ADF&G, and the authors of a previous study on bears in the Terror Lake Basin to discuss timing of bear denning because the project start date is an important element for the KEA's project. The biologists agreed that most bears emerge from their dens by June 1, with the exception of sows with new cubs which may emerge as late as July 1. In balancing KEA's needs with bear conservation needs in the area, the FWS and the ADF&G agreed to prohibit construction activities at the tunnel portal site before June 1 each year to avoid disturbance to bears in, and emerging from, their dens. This

would also include prohibiting, for the same reason, helicopter flights to the portal construction site before June 1. KEA expressed that they would be accessing the site primarily by boat. The FWS agreed with the ADF&G that construction of a barge along the lakeshore (and transportation to and from that location) could occur at the north end of the lake along the road system prior to June 1.

The FWS recognizes impacts added to the original Terror Lake project. While the impacts for the original project were mitigated through agreement in 1981, they were still recognized as adverse. The addition of the upper hidden basin adds impacts to the same and adjacent drainage. KEA has agreed to take substantial measures to minimize impacts during the construction period. Nevertheless, as cited in Section 5.2, the proposed developments and activities associated with the UHBD would produce additional cumulative impacts lasting well beyond the construction period. These impacts would be associated primarily with maintenance, repairs, access to, and monitoring of the tunnel and the road to the tunnel. Impacts to bears and bear habitat are unavoidable given new development in previously undeveloped areas. These effects are expected to be minor if resource protection measures are adhered to as outlined (Section 3.3.5.1).

3.3.5.1 Resource Protection Measures

KEA would not conduct heavy construction at the tunnel portals during the period of January 1 to June 1 to avoid disturbance of brown bears in, and emerging from, dens.

Contractor personnel would be required to participate in a Bear Safety Orientation provided by KEA to mitigate the possibility of conflict between personnel and a bear. In accordance with KEA's Bear Safety Plan (included in Appendix E of the amendment application), no food shall be left outside unattended, garbage handling will be done by incineration, and there is no feeding of wildlife. A bear incident reporting form is to be completed upon any significant and abnormal encounter with a bear in the Project area, which is then forwarded to the ECM for ADF&G notification.

KEA states that it employs standard Contract Terms and Conditions to advise contractor personnel on specific environmental protection requirements, including terrestrial resource protection measures, while on Project lands. Contractor personnel would not be allowed to use the Project area for recreational purposes, such as hiking, hunting, or fishing. Contractor personnel would be required to confine their activities to the Project area relevant to the construction of the UHBD. Contactors may not bring personal firearms to the Project site, and there is no motorized wheeled access authorized on Project lands other than official use vehicles.

Encounters with wildlife may occur in the Project area; however, KEA's Terms and Conditions clearly stipulate that animals are not to be harmed in any way. All eagles, their eggs, and nests are protected from disturbance. No vehicles or equipment may interfere with beaver dams.

KEA would implement measures to prevent introduction or spread of invasive species, including the cleaning and inspection of all equipment prior to entry on Project lands.

A qualified botanist would conduct vegetation surveys of the UHBD downstream tunnel portal site on Refuge lands before, during, and after construction to monitor for potential introduction of non-native plants. If non-native plants are present, KEA would develop a plan in consultation with the Refuge to treat or control any such species identified during or after construction.

KEA would provide an ECM during installation to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is provided in Appendix E of the amendment application.

See section 3.3.8 – Land Use for the discussion on KEA's Revegetation Monitoring Plan for tunnel construction activities on FWS Refuge land.

3.3.5.2 Record of Consultation

The UHBD proposal was presented to the Kodiak Brown Bear Trust on September 4, 2016. Members of the Brown Bear Trust, FWS Refuge, Koniag, Inc., Old Harbor Native Corporation, Kodiak Unified Bear Subcommittee, and local big game guides attended the presentation and expressed no objection to the UHBD proposal.

On August 22, 2016, FWS filed a letter with FERC recommending, pursuant to Section 4(e) of the Federal Power Act, that construction equipment and helicopter use on Refuge land be limited to the period of July 1 – October 31. KEA met with FWS on September 14, 2016 and again with FWS and ADF&G on September 22, 2016 to better understand this proposed 4(e) recommendation. KEA, FWS, and ADF&G examined the proposed UHBD construction sequence and schedule and discussed bear denning behavior and their seasonal establishment and emergency form dens. In consideration of the proposed UHBD construction sequence and schedule, and the mutual interest to avoid additional years of construction activity on Refuge lands, FWS and ADF&G

discussed allowing mobilization to the UHBD area and barge construction at the Terror Lake reservoir earlier in the year, and revise the prohibition period for heavy construction activities at the tunnel portals to January 1 to June 1.

On August 22, 2016, FWS filed a letter with FERC recommending, pursuant to Section 4(e) of the Federal Power Act, best management practices to avoid invasive species introduction. KEA met with FWS on September 14, 2016 and agreed to adopt these proposed measures as part of the construction plan.

3.3.6 Threatened and Endangered Species

Based on consultation with the FWS, there are no listed, proposed, or candidate species under the ESA or their designated critical habitat identified to occur within the vicinity of the proposed UHBD. Likewise, based on consultation with the NMFS, there are no species under NMFS jurisdiction and listed as endangered or threatened under the ESA that are known or suspected to occur in the proposed UHBD area, nor is there designated critical habitat for any such species in the proposed UHBD area.

3.3.6.1 Resource Protection Measures

Due to the lack of use of the UHBD area by ESA-listed, proposed, or candidate species, there are no proposed measures specific to ESA. Refer to discussion of other resources for protection and avoidance measures associated with wildlife protection.

3.3.6.2 Record of Consultation

On March 12, 2015, KEA submitted Requests to be Designated Non-Federal Representative pursuant to Section 7 of the ESA to consult with the FWS and NMFS regarding any listed and candidate species. On April 17, 2015, FERC issued a letter to FWS and NMFS informing the agencies of KEA's designation as their non-federal representative for the purpose of conducting informal consultation pursuant to regulation 50 CFR 402.08 implementing Section 7 of the ESA. On April 28, 2015, KEA requested species lists from the FWS and NMFS.

On June 1, 2015, FWS directed KEA to utilize its automated Information for Planning and Conservation (IPaC) online system (http://ecos.fws.gov/ipac/) for obtaining information on federally endangered or threatened plant and animal species, as well as plant and animal species of concern that are known or suspected to occur in the UHBD area. The automated IPaC system provided KEA with a report that there are no listed species or designated critical habitat in the proposed UHBD planning area. Appendix D of the amendment application includes a copy of KEA's species request

letter to FWS, dated April 28, 2015, along with the FWS IPaC automated response report dated June 1, 2015.

On June 1, 2015, KEA also received an e-mail from the NMFS stating that none of the listed species under the NMFS' jurisdiction would be found in the proposed UHBD area. The e-mail also stated that the lack of ESA listed species in the area precludes the need to consult informally with NMFS under Section 7 of the ESA for development of KEA's proposed UHBD as part of the FERC-licensed Project. Appendix D of the amendment application includes a copy of KEA's species request letter to NMFS, dated April 28, 2015 along with NMFS's e-mail response dated June 1, 2015.

Copies of the findings and correspondence related to Section 7 ESA consultation were filed with FERC on June 9, 2015.

3.3.7 Cultural Resources

During the Project's original FERC licensing proceeding, KEA conducted reconnaissance archeological surveys and test excavations within the proposed Project area of potential effect. The reconnaissance surveys at the then-planned location of the dock/jetty and access road from Kizhuyak Bay to the powerhouse resulted in discovery of two prehistoric sites (Righter, 1979). Further test excavations at KOD-138 showed it to be a severely eroded, small site covering less than 100 square meters, and with shallow cultural deposits. Test excavations at KOD-190 showed it to be a larger site spread over a 675 square meter area on an outcrop 6 meters above sea level. Surface indications of ten housepits were present, as well as indications of a late Kachemak Period occupation, 100 BC to AD 1100, and a later Koniag occupation, AD 1100 to ca. 1760. Both sites were interpreted as seasonally occupied fish camps (Righter and Jordan, 1980). Test excavations and analysis recommended that site KOD-138 was not eligible for listing on the National Register of Historic Places (NRHP). Site KOD-190, a stratified, multi-component prehistoric site, was recommended by investigators as eligible for the NRHP.

KEA, Alaska SHPO, Western Region of the Advisory Council on Historic Preservation (ACHP), and FERC concurred with the recommendations and a mitigation plan for the sites located along Kizhuyak Bay. KEA implemented mitigation measures, including moving the planned access road further away from the sites, relocating the dock/jetty, posting notices to contractor personnel regarding cultural resources, and periodic monitoring of the site conditions. The archeological sites are located outside of the Project boundary on lands owned by the Afognak Native Corporation (ANC).

The cultural resource surveys conducted during the Project's original licensing studies did not locate any cultural resources in the vicinity of Terror Lake or Hidden Basin. The UHBD would be constructed in an interior location on Kodiak Island at a high elevation, which was difficult to access from the coast prior to the Project's road construction. There are few resources to attract human use of this remote area, and salmon cannot reach the area.

Northern Land Use Research, Inc. (NLUR) prepared the report, Review of Cultural Resources in Vicinity of Kodiak Electric Association Terror Lake Project – FERC No. 2743 Upper Hidden Basin Diversion Project at the request of KEA. The report describes the locations of the protected sites, presents an overview of the proposed UHBD, and makes recommendations for measures appropriate to the proposed action. The report was provided to the Alaska SHPO on May 1, 2015 for their review and comment. The Alaska SHPO reviewed NLUR's report and issued a letter dated May 28, 2015 with concurrence that a finding of no historic properties affected is appropriate for the proposed license amendment for the UHBD.

3.3.7.1 Resource Protection Measures

As recommended in the NLUR report and reiterated by the Alaska SHPO in a letter dated May 28, 2015, KEA determined that (1) no cultural resource survey is required for the UHBD area due to the low probability of encountering cultural resources based on the Project location and the negative findings from previous research; (2) the existing mitigation measures would remain in place and be updated as necessary in FERC licensing for the UHBD; (3) KEA would continue using the existing contract language and procedures regarding the inadvertent discovery of human remains or cultural resources during construction; (4) KEA would continue to provide contractor personnel training on cultural resources and human remains and the protections given under state and federal laws; (5) KEA, Alutiiq Museum and Archaeological Repository, and ANC continue the successful archaeological stewardship monitoring of cultural resource sites; and (6) KEA initiate Section 106 consultation with the Alaska SHPO by providing this report and a summary of measures to be taken during the construction of the UHBD.

KEA would continue its contractor personnel education and cultural resource awareness program. A copy of the KEA Contract Terms and Conditions document is provided in Appendix E of the amendment application.

KEA executed a Memorandum of Understanding (MOU) with ANC and the Alutiiq Museum and Archaeological Repository to conduct the required periodic monitoring of site KOD-190. The MOU provides for periodic monitoring and reporting

on the status of KOD-190 by a qualified archaeologist, consultation with ANC, and annual reporting on the monitoring program. The MOU is a collaborative approach to cultural resource stewardship. A copy of the MOU is included in Appendix E of the amendment application.

These mitigation measures provide adequate protection to KOD-190. Construction and operation activities associated with the proposed UHBD would not take place anywhere near the KOD-190 site. KEA policy, procedures, and training prevent contractor personnel from approaching anywhere near the site. Additionally, ongoing periodic monitoring of the site condition would verify that these measures are working to protect site KOD-190. Implementation of these measures would assure that no historic properties would be adversely affected by UHBD.

3.3.7.2 Record of Consultation

On March 12, 2015, KEA submitted Requests to be Designated Non-Federal Representative pursuant to Section 106 of the NHPA to consult with the Alaska SHPO regarding historical properties potentially affected by the proposed UHBD. On April 17, 2015, FERC issued a letter to the Alaska SHPO informing the agency of KEA's designation as their non-federal representative for the purpose of conducting informal consultation pursuant to the regulation 36 CFR 800.2(c)(4) implementing section 106 of the NHPA.

On May 1, 2015, the NLUR report, Review of Cultural Resources in Vicinity of Kodiak Electric Association Terror Lake Project – FERC No. 2743 Upper Hidden Basin Diversion Project was transmitted to the Alaska SHPO pursuant to Section 106 of the NHPA as privileged Information. The Alaska SHPO responded in a letter dated May 28, 2015, with agreement that a finding of no historic properties affected is appropriate for the proposed license amendment for the UHBD. A copy of this letter is provided in Appendix D of the amendment application. Copies of the NLUR report and SHPO letter were filed with FERC under separate cover as privileged Information on June 9, 2015.

On June 23, 2015, the Alutiiq Museum and Archeological Repository provided written concurrence with the cultural resource protection measures recommended in the NLUR report. On October 14, 2015, KEA filed with FERC a response to this comment stating that KEA appreciates the Alutiiq Museum and Archeological Repository's review of this report, and their engagement in KEA's informal consultation pursuant to the regulations 36 CFR 800.2(c)(4) implementing section 106 of the National Historic Preservation Act. A copy of this comment letter is provided in Appendix F of the amendment application.

3.3.8 Land Use

a. Affected Environment:

The UHBD area is located 30 miles west of the City. There are no towns located within 15 miles of the Project, or any other developments in the Terror or Kizhuyak watersheds. The only activity in the vicinity of the Project are KEA staff who operate and maintain the Project equipment and facilities. According to the KIB GIS records, there are seven privately owned lots equipped with tax-assessed buildings along the southwestern shores of Hidden Basin Lagoon located at the mouth of Ugak Bay. This area is over 6 miles south of the proposed UHBD area, on the shores of marine tidewaters to the west of the Hidden Basin Creek delta outlet (refer to Photo B-23, Aerial View of Southwestern Shore of Hidden Basin Lagoon in Appendix B of the amendment application).

The Project occupies land owned by ANC, KEA, KIB, State of Alaska, and FWS Refuge (refer to Figure A-6, Land Ownership Map in Appendix A of the amendment application). ANC owns lands occupied by the Project's existing dock/jetty and portions of the Project's existing access road. KEA is authorized to access these areas with an easement lease granted by ANC for a term of 50 years (April 2, 1982 – April 2, 2032), extending beyond the November 1, 2031, expiration date of the FERC license. This easement lease was filed with FERC on April 24, 1986. KEA and KIB own lands occupied by the Project's powerhouse facilities. KEA is authorized to access KIB lands in accordance with the agreement, Authorization to Enter on Kodiak Island Borough Land to Design, Construct and Maintain the Terror Lake Hydroelectric Project signed on March 26, 1982. The State of Alaska owns the submerged lands at the Project's existing dock/jetty, and KEA is authorized to use those submerged lands with the ADNR lease agreement ADL No. 206462. The remaining portion of the Project east of the Terror River watershed (with exception of 136 acres for the portion of the transmission line corridor near the City of Kodiak), is owned by the State of Alaska. KEA is authorized to occupy these State lands with the ADNR lease agreement ADL No. 204024.

b. Environmental Effects:

The majority of the proposed UHBD area is located on lands owned by the State of Alaska, managed by the ADNR. Approximately 140 acres would encompass a new access road that would connect the existing Project access road to the proposed UHBD site for construction, and subsequent inspection and maintenance. Approximately 15 acres would encompass the two diversion dam structures, and approximately five acres would encompass a subterranean tunnel that would connect the UHBD dams to the

federal land boundary. The access road, conveyance pipe, and tunnel would be authorized under ADNR easement ADL 232213, and the two diversion dam structures would be authorized under a separate ADNR land lease. As the easement and land lease agreements are processed and finalized, KEA would acquire authorization to initiate construction activities in 2017 under an Early Entry Authorization.

The Project's currently licensed boundary occupies 4,282 acres of federal lands. Of that total amount, 136 acres of the Project boundary encompass lands occupied by the Project's transmission line connecting Project power to the City of Kodiak. The other 4,146 acres of the federal land within the Project boundary encompass the Terror Lake reservoir and western portions of the Project access road and tunnel. This federal land is administered by the FWS Refuge. By necessity of connecting the UHBD water resources to the existing Terror Lake reservoir, a portion of the UHBD construction and operation activities will occur on federal land. The majority of these activities would occur within the existing Project boundary on land already occupied by the Project. The downstream tunnel portal structure would be located within the existing FERC licensed Project boundary. A subterranean portion of the tunnel that connects the UHBD to the Terror Lake reservoir would occupy approximately 2 acres of federal lands outside the Project's currently licensed boundary, mostly or completely underneath a mountain ridge depending on the final location of the lower portal outlet.

A detailed map of the proposed revisions to the FERC-licensed Project boundary, including the location the State, federal, and existing Project boundaries are provided in Exhibit G of the amendment application – Project Map.

The proposed UHBD tunnel would be 12 feet in diameter, and approximately 1.2 miles in length through the granite ridgeline that separates the Upper Hidden Basin drainage area from the Terror Lake reservoir. This size tunnel and its associated tunnel portal areas could generate up to 40,000 cubic yards of rock, which equates to approximately 25 acre-feet in rock volume. At a depth of one yard, the stacked tunnel rock could occupy up to eight acres. Following construction, stockpiled topsoil would be placed on top of the stacked rock and the area naturally revegetated by native successional plant species present in area. This eight-acre area where rock would be placed during UHBD tunnel construction is not considered a project facility, and is therefore not included in the revised Project boundary.

3.3.8.1 Resource Protection Measures

KEA would be required to acquire all necessary land use authorizations for the proposed UHBD activities, including both for construction and operation. All construction activities would be conducted in accordance to site-specific QCIP, ESCP,

APDES Stormwater Permit and/or CWA Section 404 Wetland Permit Authorizations. KEA would comply with the terms and conditions of these land use and construction permit authorizations.

To monitor and document the revegetating of the tunnel rock placement area on Refuge lands, KEA would conduct a baseline vegetation survey of the downstream tunnel portal area. Upon completion of the baseline survey, a revegetation plan would be developed in consultation with the FWS Refuge to specify construction best management practices and revegetation monitoring metrics.

As a requirement for all contractor work conducted at the Project site, KEA employs standard Contract Terms and Conditions to advise them that they shall comply with all environmental protection requirements while on Project Lands. A copy of the KEA Contract Terms and Conditions document is provided in Appendix E of the amendment application.

KEA would provide an ECM during installation to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is included in Appendix E of the amendment application.

3.3.8.2 Record of Consultation

On October 15, 2015, a resident of a privately owned lot located along the southwestern shores of Hidden Basin lagoon met with KEA to discuss the UHBD proposal, specifically regarding water use and construction access. KEA explained that the UHBD would divert 15 percent of the total watershed area, and that access would occur from the existing Project north of Hidden Basin bay. The resident provided an e-mail to his neighbors summarizing this discussion; a copy of the e-mail is provided in Appendix F of the amendment application.

On April 10, 2015, KEA consulted with the ADNR Division of Land, Mining, and Water, Land Section and Water Section staff regarding the process and application for land access needed for the proposed UHBD. KEA received guidance from the ADNR regarding the process and the application, and on April 14, 2015, filed an Application for Easement as per AS 38.05.850 for the portions of the proposed Upper Hidden Basin Diversion located on State land. A copy of the Application for Easement is provided in Appendix D of the amendment application. The ADNR attended the Agency Scoping Meeting on July 21, 2015, and expressed no objection to the UHBD

proposal. On March 29, 2016, the ADNR provided additional guidance verifying that the review decision for easement ADL 232213 is underway for authorizing the access road and underground components of UHBD on State land, and clarifying that a separate land lease application was required for authorizing the diversion dam components of the UHBD on State land. KEA states that it would file the land lease application accordingly.

On April 22, 2015, KEA consulted with the FWS Refuge regarding the process for land access needed for constructing the UHBD tunnel that would connect the water resource of the UHBD to the existing Terror Lake reservoir. The FWS Refuge and FWS Region 7 Division of Realty attended the Agency Scoping Meeting on July 21, 2015 and raised questions regarding the regulatory process for authorizing the FERC boundary expansion, the need for a right-of-way (ROW) permit via ANILCA Title XI Section 1101, and the tunnel construction methods. On February 2, 2016, KEA and the FWS Refuge discussed the placement of tunnel rock on FWS Refuge land during UHBD construction. On February 25, 2016, KEA met with the FWS Refuge to discuss tunnel construction methods. KEA provided a letter with proposed measures for tunnel rock placement; a copy of this letter dated February 25, 2016, is provided in Appendix D of the amendment application. KEA and FWS Refuge met again on April 27, 2016, and reached consensus on tunnel rock placement measures. The FWS Refuge agreed to allow the placement of tunnel rock on Refuge lands as part of the UHBD construction process under the condition that KEA conduct a baseline vegetation survey and develop a revegetation plan. A copy of the May 2, 2016 FWS Refuge letter, documenting this agreement is provided in Appendix D of the amendment application. Kodiak Refuge Staff met with KEA on September 14, 2016 and KEA expressed their desire to delay the ROW application pending the outcome of the U.S. Congress consideration of proposed Terror Lake expansion legislation (which subsequently died in December 2016 in a Conference Committee prior to passage). FWS and KEA met February 27, 2017 in a pre-application ROW permit meeting where application for the tunnel and portal site were submitted.

On February 26, 2016, KEA consulted with KIB Community Development Department regarding land use zoning compliance required for construction and operation of the UHBD. KEA received guidance from KIB regarding the zoning designation for the UHBD area and the Conditional Use Permit (CUP) application and review process required for the UHBD structures. KIB recommended that KEA apply for the CUP after the FERC application is filed, and clarified that a CUP is not required for constructing the access road in 2017.

3.3.9 Recreation and Aesthetic Resources

Recreational demand in the Project area is low. Occasionally, backpackers use the area when crossing the island on foot or via air charter. Existing project roads are not open to public vehicle use (refer to Figures A-9, Recreation Sites near Project; and Figure A-10, Existing Recreation on Kodiak Public Road System in Appendix A of the amendment application).

FERC exempted the Project from filing the Hydropower Development Recreation Report, FERC Form 80, because of the lack of recreational use at the Project. Due to its low hazard potential and remote location, KEA has also remained exempt from Emergency Action Plan requirements since its original construction.

3.3.9.1 Resource Protection Measures

For the rare instances that the public approaches the Project area, an informational kiosk and sign-in book are located at the entrance of the access road from the Kizhuyak Bay dock/jetty on lands owned by the ANC. The information presented at the kiosk was developed in consultation with the ANC.

Public Safety devices utilized in the Project area consist of gates, signs, and fences. These devices are not specifically relevant to the UHBD area, but to the overall Project area. A copy of the Project's Public Safety Plan, written in accordance with 18 CFR 12.4 and 18 CFR 12.42 is provided in Appendix E of the amendment application.

Due to the remote location of the Project and lack of public use, no aesthetic resource measures are proposed.

3.3.9.2 Record of Consultation

In correspondence dated June 17, 1997, FERC acknowledged that available information indicates there is little or no potential for recreational use at the project. Therefore, in accordance with 18 CFR 8.11(c), FERC has exempted KEA from further filing of the Form 80 for the above-cited project, until further order of the Commission.

3.3.10 Socioeconomic Resources

a. Affected Environment:

The City of Kodiak is the economic, transportation, and governmental center of the island archipelago area. It is a Home Rule City with an elected Mayor and City Council, and employs a City Manager. The City ranks eighth in terms of population, in

comparison to other boroughs and unified municipalities of Alaska. The KIB is a second-class borough incorporated September 24, 1963, and operates under a Manager form of government with an elected Borough Assembly.

Access to Kodiak Island is by air or water. Alaska Airlines and Ravn Air provide regular scheduled service. Andrew Air, Island Air and Servant Air also provide scheduled air taxi flights to outlying communities, and charter services are available. Float plane facilities are also prevalent in Kodiak, as airport facilities or landing strips throughout the archipelago are not widely available. The road system on the Island follows the coastlines from Cape Chiniak and Narrow Cape north through the City of Kodiak to Monashka Bay. There is no rail service. The Alaska Marine Highway System provides passenger, vehicle and cargo ferry service connecting Kodiak to Alaska's mainland road system. Ferry transit from the City to the nearest mainland ferry terminal in Homer, Alaska is typically eight hours in duration during calm weather and smooth seas.

Marine terminals in Women's Bay provide service to several freight carriers, freight forwarders and consolidators, construction contractors, and the fishing fleet. The terminal has warehousing, yard storage, and crane services. The cost of shipping to Kodiak is a significant factor in the overall cost of living for the region, and improving the affordability and reliability of shipping in Kodiak is essential to the region's economy. Pier III is the primary cargo freight port facility for the Kodiak Island region with nearly every commodity imported or exported from Kodiak Island's communities' passing across Pier III. KEA partnered with the City to repower Pier III's inefficient diesel-powered crane with a new electric crane. The older diesel-powered crane was restricting the loading capabilities of Pier III to smaller specialized vessels, and kept the region vulnerable to limited transportation options and inflated shipping costs. KEA's efforts to help modernize Kodiak's regional port hub with a bigger, faster, more energy-efficient electric crane allows more local seafood products to be exported to the global market, and better food and building materials to be brought into Kodiak's remote island communities.

The majority of the KIB population resides in the area directly within or adjacent to the City. KEA provides electricity to approximately 6,000 electric meters on Kodiak Island (refer to Figure A-2, KEA Service Area in Appendix A of the amendment application). The availability of electric power generated primarily by KEA's integrated hydro-wind generation system provides electric service at a cost that is buffered against the extreme swings in diesel fuel cost. KEA's load demand is growing because the community is developing new infrastructure based on KEA's renewably-generated electricity as the local energy solution. The direct benefit to the membership

is not only in fuel-free, emission-free renewable power, it is in the stable, predictable cost of electric energy.

The Port of Kodiak is home to Alaska's largest and most diversified fishing fleet and is constantly ranked in the top three largest fishing ports in the US in terms of value landed. It has more than 650 boat slips and three commercial piers that can handle vessels up to 1,000 feet. More than one-third of the jobs in Kodiak are directly related to the fishing industry, in either the harvesting or processing sectors. There are 789 active permit holders in the local commercial fisheries. Landings to the Port of Kodiak in 2012 were 382 million pounds, with a wholesale value of $178.6 million. Groundfish, primarily pollock and cod, is the largest segment of Kodiak's fisheries in terms of volume and wholesale value, accounting for approximately 75 percent of the region's commercial catch and 49 percent of the region's total wholesale value. Salmon is the next largest with about 29 percent; halibut at 17 percent; crab at 3 percent; and herring at 2 percent. Kodiak's seafood processing plants employ approximately 3,226 people with a combined payroll of over $47 million. The largest shoreside seafood processors include Trident, International Seafoods of Alaska, Ocean Beauty, and North Pacific Seafoods. Subsistence and sport fishing are also prevalent in the region (Kodiak Chamber of Commerce, 2013).The electricity required to process and freeze seafood products drives KEA's electrical load demand.

Kodiak's role as a major commercial fishing port and one of the nation's largest producers of seafood is complemented by it being a regional center for transportation, governmental offices, timber, and tourism. The local hospital ranks among the top employers, and the City, KIB, state, and federal agencies also provide local employment. Kodiak Island is also home to the nation's largest U.S. Coast Guard base equipped with both aviation and maritime fleets. KEA assists the U.S. Coast Guard in its efforts to meet its federal facility renewable energy requirements. KEA allocates Renewable Energy Credits to the membership, including the U.S. Coast Guard base without additional costs. As a Cooperative, KEA's membership already owns the renewably-powered electric grid and KEA shares all of the value-added benefits and renewable energy credits with the member owners it serves.

KEA states that its success with implementing sustainable, renewable energy solutions has drawn the attention of numerous media outlets that travel to Kodiak to learn how a small rural electric cooperative could make such a huge difference in renewable energy and micro-grid technology development. Numerous news articles have been written about KEA's leadership and success in laying out a strategy to move the local community away from fossil fuels and toward cost effective renewable energy solutions. KEA has been awarded the 2014 State Leadership in Clean Energy Award by the Clean Energy States Alliance; the 2014 Clean Energy Innovator of the Year Award

by the Renewable Energy Alaska Project; the 2009 Wind Cooperative of the Year Award by the National Rural Electric Cooperative Association and US Department of Energy; the 2009 Cornerstone Award by the Kodiak Chamber of Commerce; and was a nominee for the Utility Scale Innovation 2013 Award from the Energy Storage North America.

b. Environmental Effects:

The proposed action would have no direct impact on local government revenues. KEA is a rural electric cooperative, and as a 501(c)12 not-for-profit organization, KEA is exempt from local, state, and federal taxes. Boosting the Project's power production with additional water resources provided by the proposed UHBD would, however, indirectly benefit the local governments by enhancing the Kodiak economy as a whole with stable cost of renewable power and continuation of marketing opportunities associated with renewable energy. When the cost of power is more stable and predictable with renewable sources of energy, KEA's cooperative members, including the City and KIB, remain in a better position to plan and budget for their power costs. KEA's renewable energy portfolio provides marketing opportunities for Kodiak businesses that use KEA's electricity to manufacture their products, and if these new marketing campaigns result in increased business, then the proposed action could boost Kodiak's local government tax revenue. Enhancing the existing Project with the UHBD would have a direct positive effect on the community and future sustainability of Kodiak Island.

The proposed action would have no direct impact on local government expenditures. There are no municipal services, such as road, police, fire, or medical services at the remotely located Project site. Infrastructure support for temporary construction personnel already exists at the Project. As the sole owner and operator of the Project, KEA is responsible for maintaining and repairing the Project's infrastructure including the dock/jetty, access roads, buildings, utilities, and fire protection systems. A fully-functioning single-family home can house a small construction crew of up to eight people. For larger sized construction crews up to 30 people, an additional contractor camp is available onsite with hook-ups for electricity, potable water, and sewer. KEA staff and hired contractor personnel at the Project site are responsible for conducting themselves in a safe and professional manner. If a medical emergency were to arise at the Project, flight evacuation to a hospital or other treatment facility would be provided at KEA's expense. Construction of the UHBD is a temporary process that would not result in a significant change to Kodiak's population. Once built, the UHBD would not require additional KEA staff to operate the Project.

3.3.10.1 Resource Protection Measures

Construction personnel are required to conduct themselves in a professional workman-like manner, as specified in the Contract Terms and Conditions. If a medical emergency were to arise at the Project, flight evacuation to a hospital or other treatment facility would be provided at KEA or the contractors' expense.

KEA would provide an ECM during construction to serve as the primary contact for communications among KEA and interested entities, including the federal and state resource agencies and other entities as required. The ECM would be periodically onsite during construction, and be available as needed to communicate with KEA staff and contractor personnel regarding any identified issues. A description of the duties and authority of the ECM is provided in Appendix E of the amendment application.

3.3.10.2 Record of Consultation

In addition to local news coverage on public radio and in newspapers, the UHBD proposal was presented to the Kodiak community at KEA's Annual Membership Meeting on April 20, 2015 with 291 people in attendance and on April 25, 2016 with 255 people in attendance. Members of the community also attended the Joint Agency/Public Scoping Meetings on July 21, 2015.

3.3.11 Subsistence, 810 Evaluation

The ANILCA section 810 requires an evaluation of the effects on subsistence uses for any action to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands.

This evaluation consists of:

- A finding of whether or not a proposed action would have a significant restriction on subsistence uses

- A notice and hearing if an action is found to have a significant restriction on subsistence uses

- A three-part determination prior to authorization of any action if there is a significant restriction on subsistence uses

The proposed project has minimal impacts on the environment and all impacts are of short duration.

The proposed project does not contain actions that would significantly reduce subsistence uses due to direct effects on wildlife or habitat resources or that would significantly increase competition for resources.

Similarly, the proposed project would not significantly change the availability of resources by altering their distribution or location.

Finally, the proposed project would not significantly reduce subsistence uses because of limitations on access—by physical or legal barriers—to harvestable resources. This evaluation concludes that the action would not result in significant restrictions of subsistence uses.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Commission would deny the licensee's proposal and the licensee would not construct the diversion dams and power tunnel. The project would continue to produce approximately the same amount of annual generation and would operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures associated with the licensee's proposal would be implemented.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at KEA's proposed action and alternatives to the proposed action to compare differences in the project's costs and power generation. In keeping with Commission policy as described in *Mead Corporation, Publishing Paper Division*,[3] our economic analysis is based on current costs with no consideration for potential future inflation or escalation.[4]

Our economic analysis helps to support an informed decision concerning what is in the public interest with respect to a proposed license amendment. However, our economic analysis is not a determination that any action is reasonable or prudent. Our analysis shows that the proposed amended facilities, with additional staff recommendations, would cost more to construct and operate than would be derived by the increased generation benefits, based upon our estimated cost of alternative power.

[3] 72 FERC ¶ 61,027 (1995).

[4] We assumed a 14-year financing period with an interest rate of 6 percent for all capital expenses.

However, it is the licensee who must decide whether to accept this amendment and any financial risk that entails.

4.1 PROPOSED ACTION

The UHBD would divert water from the upper reaches of the Hidden Basin watershed to the existing Terror Lake reservoir for additional hydropower production at the existing Project powerhouse. The UHBD boosts KEA's renewable energy supply by utilizing existing infrastructure and enhancing its potential for annual energy generation. The proposal would not change the authorized installed capacity of the Project; however, the additional water resources added to Terror Lake from this diversion are expected to increase average annual generation by an additional 33 GWh. The licensee's electrical system is located on an isolated island and all electricity consumed on the island must be generated on the island. The generating facilities on the island include the Project, the Pillar Mountain wind facility, and diesel generation. The licensee states that wind penetration within the grid has reached the maximum potential and the best currently reasonable alternative source for electricity is diesel generation. The licensee estimates the cost of diesel fuel to be $2.36 per gallon in 2020, when the diversion goes online. We use this value for our analysis, along with the licensee's stated efficiency of 14.2 kWh of electricity generated per gallon of diesel. Based on these values, the licensee would need to purchase an additional $5.5 million worth of diesel fuel each year to equal the 33 GWh of annual generation provided by the proposed diversion.

As stated in the amendment application, the total cost of the proposed action, including environmental measures, is estimated to be $77 million. Over the remaining term of the license, this equals a levelized annual cost of approximately $8.3 million ($252/MWh). Therefore, we estimate the cost of the proposed action would exceed the cost of the alternative fuel source by approximately $2.8 million ($85/MWh).

4.2 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Commission would deny the proposed construction and operation of the UHBD. The Project would continue to operate under the conditions of the existing license.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND STAFF RECOMMENDED MEASURES

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

Based on our independent review of agency and public comments filed on this project and our review of the environmental and economic effects of the proposed project and economic effects of the project and its alternatives, we selected the proposed project with staff-recommended modifications as the preferred alternative. We recommend this alternative because: (1) issuing an amendment of license for the project would allow KEA to continue to operate their project and provide a beneficial and dependable source of electric energy from a renewable resource that does not contribute to atmospheric pollution; and (2) the public benefits of this alternative would exceed those of the no-action alternative; and (3) the recommended measures would protect and enhance terrestrial and fishery resources.

In the following section, we make recommendations as to which environmental measures proposed by KEA or recommended by agencies or other entities should be included in any license amendment issued for the project. In addition to KEA's proposed environmental measures, we recommend an additional staff-recommended measure be included in any license amendment issued for the project.

5.1.1 Measures Proposed by the Licensee

Based on our environmental analysis of KEA's proposal, and the costs presented, we conclude that the following environmental measures proposed by KEA would protect and enhance environmental resources. Therefore, we recommend including these measures in any license amendment issued for the project. These measures are the same 10(j) recommendations and 4(e) terms and conditions provided by NMFS and FWS, respectively.

Aquatic Resources

Minimum Flows

Design, install, and operate a pipe that would provide a minimum of one cfs of instream flow downstream of the Upper Hidden Basin Diversion during the period of July 15 through September 30 provided the water is available for discharge. The exact diversion point would be determined by KEA engineers; however, the water would be returned to the west fork of Upper Hidden Basin Creek below the western diversion. The pipe will have a spigot and KEA would report the opening and closing date of that spigot each year in one of its existing required annual reports.

Reservoir Water Levels

The licensee should develop and manage water levels in Terror Lake to ensure availability of sufficient water to meet the instream flow requirements specified in Article 43 during periods of low reservoir inflows (e.g. during periods of low precipitation, unusually cold spring weather, etc.).

Terrestrial Resources

Vegetation Management Plan

At least six months before the start of any land-disturbing or land-clearing activities associated with Project construction, the licensee should file, for Commission approval, a vegetation management plan (Plan) approved by the Kodiak National Wildlife Refuge Manager, which provides the elements specified below. The purposes of this Plan are to: (1) establish a diversity of native vegetation on all tunnel rock placement areas and associated paths and storage areas disturbed by Project construction and (2) prevent introduction and spread of invasive species and noxious weeds during Project construction and operation.

The Plan should be developed after consultation with the Service and the Plant Materials Center, Alaska Division of Agriculture. The licensee should include with the plan: documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the Plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on Project-specific information.

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

The Plan should include, at a minimum, provisions for:

1. A pre-disturbance vegetation survey by a qualified botanist documenting baseline conditions, including lists of native and non-native plant species, percent of vegetated and non-vegetated areas, and relative abundance of species (by canopy cover) present on the proposed disposal site and associated disturbed areas.

2. A plan to establish at least 60 percent of the baseline canopy cover by dominant, native species on areas to be revegetated. Objectives for species diversity must also be included.

3. A timeline for attainment of revegetation objectives.

4. A monitoring plan, implemented by a qualified botanist, to document progress toward revegetation objectives.

5. An adaptive management plan to address any failures in meeting revegetation objectives by the times specified in the Plan.

6. A plan for identifying and controlling invasive species, including a description of best management practices to be followed to prevent introduction and spread of invasive plants during Project construction and operation. Measures shall include provisions to clean (e.g., power wash) and inspect all construction-related equipment and materials off-site prior to entry into the Project area, as well as use of certified weed-free seed if seeding is used to re-vegetate the site. Any proposed use of chemical control measures on Refuge lands will require specific review and, if deemed appropriate, authorization by the Service.

7. Monitoring for and treatment of invasive species during and after construction. The licensee should be responsible for treatment and at least two years of post-treatment monitoring if new invasive species are present post-construction (i.e., not in pre-construction survey).

Construction Activities and Bears

Construction activities and project associated helicopter traffic at the portal site (south end of Terror Lake) should be prohibited from January 1 to June 1 of each year to avoid disturbance of brown bears in, and emerging from, dens.

Waste Rock Leachate Monitoring

The licensee should develop a plan to monitor waste rock leachate during construction, in order to test for acid production from rock excavated from the tunnel. Monitoring would continue through the construction period each year until surface water at the waste rock disposal site freezes in the fall. If acid drainage is documented, the licensee should develop and implement measures to mitigate and manage the acid drainage from the waste rock. An adaptive management approach may be needed.

5.1.2 Additional Measures Recommended by Staff

We recommend the measures described above with one modification. We propose changing NMFS' 10(j) recommendation to require a plan and to clarify that KEA would be required to release a one-cfs minimum flow, *or available inflow,* rather than . . . *provided water is available for discharge*. We also recommend requiring the licensee to report spigot operations (openings and closings) in its Article 43 report that must be filed with the Commission by March 1 annually. These proposed changes clarify the minimum flow requirement and would allow the Commission to track compliance with this condition. In summary, we propose modifying NMFS' 10(j) recommendation as follows:

> The licensee must file a plan, for Commission approval, with the proposed design, location, and operation of a minimum flow pipe that would provide a one-cfs minimum flow, or available inflow, below the western diversion dam from July 15 through September 30 each year. The pipe must have a spigot and the licensee must report the opening and closing date of that spigot each year in its Article 43 report that must be filed with the Commission by March 1 annually.
>
> The licensee must develop the draft plan in consultation with NMFS and must allow a minimum of 30 days for NMFS to comment and to make recommendations before filing the final plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information. The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan including any changes required by the Commission.

5.2 UNAVOIDABLE ADVERSE EFFECTS

The licensee's proposal involves constructing two new dams, an access road, and a tunnel, including on Refuge lands, permanently altering the habitat within these areas. Modifying the habitat, including the loss of approximately 1.4 acres of wetlands, would alter the presence of some plant species within those areas, and thereby reduce their use by wildlife. However, the area affected by the project is relatively small when compared to the available habitat in the surrounding area, erosion and sedimentation controls would be used, and affected areas would be revegetated. Additionally, diverting water in approximately 15 percent of the overall Hidden Basin watershed drainage area would permanently alter drainage patterns, however, a minimum flow would provide water to Upper Hidden Basin Creek. Construction activities would also

create short-term noise disturbance, however, such activities would be limited to less sensitive periods of time.

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.

In response to our notice issued June 24, 2016, NMFS filed recommendations with the Commission subject to section 10(j) on August 23, 2016, as modified on September 28, 2016. We recommend adopting the recommendation, as modified under the Staff Alternative. The 10(j) recommendation is included in Appendix B.

5.3.2 Land Management Agency Section 4(e) Conditions

Under the provisions of section 4(e) of the FPA, any license issued by the Commission "for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation." Thus, any 4(e) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative. The U. S. Fish and Wildlife Service filed preliminary 4(e) conditions with the Commission on August 22, 2016, as modified on December 2, 2016. We include in the Staff Alternative four conditions as specified by the agency, without modification. The 4(e) conditions are included in Appendix A.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. § 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed five comprehensive plans that are applicable to the Terror Lake Project, listed below. No inconsistencies were found.

Federal

- U.S. Fish and Wildlife Service. 2008. Revised Comprehensive Conservation Plan, Kodiak National Wildlife Refuge. Anchorage, Alaska.

Alaska

- Alaska Department of Fish and Game. 2002. Kodiak Archipelago Bear Conservation and Management Plan. Anchorage, Alaska.

- Alaska Department of Fish and Game. 1998. Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes. Anchorage, Alaska.

- Alaska Department of Natural Resources. 2009. Alaska's Outdoor Legacy: Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2009-2014. Anchorage, Alaska.

- Alaska Department of Natural Resources. 2004. Kodiak Area Plan for State Lands. Anchorage, Alaska.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the non-capacity related amendment to the Terror Lake Project is approved with the additional mandatory conditions and recommendations, the project would continue to operate and provide increased hydroelectric power generation, while providing protection and enhancements to water quality, aquatic, terrestrial, recreation, and cultural resources.

Based on our independent analysis, approval of the amendment with the additional mandatory conditions and recommendations would not constitute a major federal action significantly affecting the quality of the human environment.

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ERM. Hidden Basin Creek Hydrology and Fisheries Report – Technical Report. February 2015.

ERM. Hidden Basin Creek Supplement to the Hydrology and Fisheries Technical Report – April 2013 – October 2014 Temperature Analysis Report. June 2015.

ERM. Lack of Measurable Nexus among Upper Hidden Basin Diversion and the Unnamed Stream - Supplement to the Hydrology and Fisheries Technical Report. March 2016.

ERM. Upper Hidden Basin Creek Access Road – Preliminary Wetlands and Waters Assessment. August 2014.

ERM. Upper Hidden Basin Diversion Access Road Corridor – Wetlands and Waters Assessment. April 2016.

Federal Energy Regulatory Commission. 2016 Request for Exemption from Emergency Acton Plan (EAP) Requirements for the Terror Lake Project, FERC No. 2743. 18 February 2016.

Federal Energy Regulatory Commission. Order Amending License and Approving Revised Exhibits, Project No. 2743-045. 07 October 2004.

Federal Energy Regulatory Commission. Order Amending License and Revising Annual Charges, Project No. 2743-071. 17 February 2012.

Federal Energy Regulatory Commission. Order Issuing Major License and Approving Joint Offer of Settlement, Project No. 2743. 05 October 1981.

Federal Energy Regulatory Commission, Office of Electric Power Regulation. FERC/EIS – Terror Lake Hydroelectric Project, FERC No. 2743 – Alaska, Final Environmental Impact Statement. August 1981.

Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Administration and Compliance. FERC Project No, 2743-045, Environmental Assessment – Non-Capacity Related License Amendment Application. 07 October 2004.

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APPENDIX A

U.S. Department of Interior, U.S. Fish and Wildlife Service
Preliminary 4(e) Terms and Conditions

Dated December 2, 2016

Condition No. 1 – Vegetation Management Plan

At least six months before the start of any land-disturbing or land-clearing activities associated with Project construction, the licensee must file, for Commission approval, a vegetation management plan (Plan) approved by the Kodiak National Wildlife Refuge Manager, which provides the elements specified below. The purposes of this Plan are to: (1) establish a diversity of native vegetation on all tunnel rock placement areas and associated paths and storage areas disturbed by Project construction and (2) prevent introduction and spread of invasive species and noxious weeds during Project construction and operation.

The Plan must be developed after consultation with the Service and the Plant Materials Center, Alaska Division of Agriculture. The licensee must include with the plan: documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the Plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on Project-specific information.

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

The Plan should include, at a minimum, provisions for:

1. A pre-disturbance vegetation survey by a qualified botanist documenting baseline conditions, including lists of native and non-native plant species, percent of vegetated

and non-vegetated areas, and relative abundance of species (by canopy cover) present on the proposed disposal site and associated disturbed areas.

2. A plan to establish at least 60 percent of the baseline canopy cover by dominant, native species on areas to be revegetated. Objectives for species diversity must also be included.

3. A timeline for attainment of revegetation objectives.

4. A monitoring plan, implemented by a qualified botanist, to document progress toward revegetation objectives.

5. An adaptive management plan to address any failures in meeting revegetation objectives by the times specified in the Plan.

6. A plan for identifying and controlling invasive species, including a description of best management practices to be followed to prevent introduction and spread of invasive plants during Project construction and operation. Measures shall include provisions to clean (e.g., power wash) and inspect all construction-related equipment and materials off-site prior to entry into the Project area, as well as use of certified weed-free seed if seeding is used to re-vegetate the site. Any proposed use of chemical control measures on Refuge lands will require specific review and, if deemed appropriate, authorization by the Service.

7. Monitoring for and treatment of invasive species during and after construction. The licensee shall be responsible for treatment and at least two years of post-treatment monitoring if new invasive species are present post-construction (i.e., not in pre-construction survey).

Condition No. 2 –

Construction activities and Project-associated helicopter traffic at the portal site (south end of Terror Lake) is prohibited from January 1 to June 1 of each year to avoid disturbance of brown bears in, and emerging from, dens.

Condition No. 3 -

The licensee shall develop and submit a written plan to manage water levels in Terror Lake to ensure availability of sufficient water to meet the instream flow requirements

specified in Article 43 during periods of low reservoir inflows (e.g. during periods of low precipitation, unusually cold spring weather, etc.).

Condition No. 4 –

The licensee will develop a plan to monitor waste rock leachate during construction, in order to test for acid production from rock excavated from the tunnel. Monitoring will continue through the construction period each year until surface water at the waste rock disposal site freezes in the fall. If acid drainage is documented, the licensee will develop and implement measures to mitigate and manage the acid drainage from the waste rock. An adaptive management approach may be needed.

APPENDIX B

U.S. Department of Commerce, National Marine Fisheries Service

10(j) Recommendations

Dated September 28, 2016

1. 1. KEA shall design, install, and operate a pipe that would provide a minimum of one cfs of instream flow downstream of the Upper Hidden Basin Diversion during the period of July 15 through September 30 provided the water is available for discharge. The exact diversion point will be determined by KEA engineers; however, the water would be returned to the west fork of Upper Hidden Basin Creek below the western diversion. The pipe will have a spigot and KEA will report the opening and closing date of that spigot each year in one of its existing required annual reports.