

COMPATIBILITY DETERMINATION

Use: Construct a tunnel to divert water from Upper Hidden Basin Creek to Terror Lake to supplement the Terror Lake Hydroelectric Project

Primary Uses: Construction of a portion of a 1.7 mile diversion tunnel, an outflow portal and surface channel on Refuge lands to supplement an in-stream flow to the existing hydroelectric development downstream

Refuge Name: Kodiak National Wildlife Refuge (Refuge)

Establishing and Acquisition Authorities

Original authority was Executive Order 8857 (1941); modified by Public Land Order 1634 (1958), Alaska Native Claims Settlement Act (ANCSA: 1971), and Alaska National Interest Lands Conservation Act (ANILCA; 1980)

Refuge Purposes

Executive Order 8857 established Kodiak National Wildlife Refuge “. . . for the purpose of protecting the natural feeding and breeding ranges of the brown bears and other wildlife on Uganik and Kodiak Islands . . .”

Section 303(5)(B) of ANILCA states the following:

“The purposes for which the Kodiak National Wildlife Refuge is established and shall be managed include

- (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited, to Kodiak brown bears, salmonids, sea otters, sea lions, and other marine mammals and migratory birds;
- (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
- (iii) to provide, in a manner consistent with purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
- (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in subparagraph (i), water quality and necessary water quantity within the refuge.”

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System (NWRS) is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C.668dd-668ee]).

Description of Use

This determination evaluates the addition of 2 acres of federal lands (federal lands within project currently 4282 acres) as well as the construction of a portion of a 1.7 mile, 12-foot-diameter Upper Hidden Basin Diversion (UHBD) tunnel, on a 1% slope, to gravity supplement an in-stream flow to the existing hydroelectric project (map attached). This FERC permitted project moves water from Upper Hidden Basin Creek to Terror Lake. The determination also evaluates the construction of an outflow portal at the terminal end of the UHBD tunnel transitioning from subsurface to surface, as well as a channel on the surface from the portal to Terror Lake. Waste rock from the

tunnel boring will be moved and contoured adjacent to the tunnel portal. The intake of the UHBD tunnel and two diversion dams would be created on lands managed by the State of Alaska, which will not be discussed in this Compatibility Determination. The EA for this project went out for a 30-day public review on May 11, 2017 and the FONSI was signed on June 27, 2017.

This new project will add additional in-stream flow to the original Terror Lake Hydroelectric Project – FERC Project No. 2743 which is commercially operated by Kodiak Electric Association, Inc. (KEA), authorized on November 1, 1981. The original project occupies a FERC withdrawal 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. The plan would increase the amount of federal land occupied by the project by 2 acres. When the project is completed the diversion will supply enough water to generate an additional 33 gigawatt hours to KEA's current renewable hydro-wind generation capability of 161 gigawatt hours.

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.

When tunneling is complete, a concrete portal structure would be constructed to permanently stabilize the downstream tunnel portal face. After UHBD tunnel construction is complete the disturbed area will be revegetated and a metal grate positioned over the tunnel entry to prevent wildlife from entering. Regardless of the 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 waste rock, which equates to approximately 25 acre-feet in 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.

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. This rock would then be moved to a permanent location and contoured to the landscape using a bulldozer or loader bucket.

Availability of Resources

Oversight of this right-of-way would require moderate effort prior to and during the construction period and a limited amount of staff time annually for ongoing maintenance of the project. Staff time during the construction year would focus on execution of the right-of-way permit and field monitoring to assure compliance with provisions of the operations plan and permit, estimated 20 to 40 hours. Annual monitoring would be minimal and focus on compliance with the operations plan and adherence to mitigation measures, estimated 2 hours annually. It is expected that adequate resources are available for administration of this proposed right-of-way.

Anticipated Impacts of the Use

The proposed addition to the Terror Lake Hydroelectric Project is to divert a portion of water resources from the Upper Hidden Basin Watershed to the Terror River Watershed. The new UHBD would be similar to existing diversion structures currently within operation at the project site.

The diversion would encompass 15% of the Hidden Basin Watershed, and the intake would be 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 the proposed site. Lands in this Upper Hidden Basin Watershed are managed by the State of Alaska. Each end of the UHBD tunnel will have a grated portal to prevent wildlife from entering.

Affected Environment

Anticipated Impacts

Air Quality

Reduction in diesel fuel use on Kodiak Island

Temporary localized degradation of air quality

Water Use and Quality

Would divert 30,000 acre-feet of water from Upper Hidden Basin watershed, 15% of total

No effect on downstream water temperatures

Rock from tunnel construction not likely to generate acid drainage

Fish Species (Hidden Basin)

No fish present in UHB Watershed

No anticipated effects on downstream fish habitat

NMFS has required a 10(j) recommendation to require a minimum release of one cfs instream flow from July 15 through September 30 during the construction phase

Fish Species (Terror River)

No anticipated effects

Kodiak Brown Bear

Temporary displacement during construction

No helicopter use near portal site from January 1 through June 1.

Bald Eagle

Temporary displacement during construction

Native Vegetation

Replaced where feasible

Invasive weeds

Preventative measures will minimize impacts

Threatened and Endangered Species

No listed species or critical habitat near UHBD site

Cultural Resources

No adverse effects to any known cultural resources

Land Use

Proposal would expand the FERC-licensed boundary by approximately 160 acres

Approximately 2 acres of the expanded boundary would extend into federal lands

Recreation and Aesthetics

Public use is low

Cemented 12-foot portal and grate, and outlet portal

with rip-rap should be the only visible items

Socioeconomic

Positive cumulative effect with enhanced renewable energy for benefit of KEA cooperative members

Construction of the proposed UHBD would have relatively limited effects on upland habitats, with a relatively small visible footprint. The areas initially disturbed during construction would be revegetated, and gradually recover some of the habitat values.

Public Review and Comment

The Compatibility Determination can be found either on line at:

https://www.fws.gov/refuge/Kodiak/what_we_do/resource_management.html

or

a hard copy is located at the Kodiak Visitor Center, 402 Center Avenue, during hours of operation.

The public has an opportunity to review and comment from June 26, 2017 for 14 days.

Proposed Determination

Use is Not Compatible

Use is Compatible with the Following Stipulations

Justification

Stipulations Necessary to Ensure Compatibility

If found compatible the following stipulations would be included in the right-of-way permit:

KEA must comply with 50 CFR 29.21-4 terms and conditions of right-of-way.

Additional 4 (e) conditions as follows

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:

- 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.
- 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.
- A timeline for attainment of revegetation objectives.
- A monitoring plan, implemented by a qualified botanist, to document progress toward revegetation objectives.
- An adaptive management plan to address any failures in meeting revegetation objectives by the times specified in the Plan.
- 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 revegetate the site. Any proposed use of chemical control measures on Refuge lands will require specific review and, if deemed appropriate, authorization by the Service.
- 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.

Condition No. 5 –

Prior to completion of the outlet tunnel and portal, the licensee must file, for Commission approval, an engineered approved and stamped design for the outflow channel between the outlet portal and Terror Lake reviewed. The submission must be approved by the Kodiak NWR Refuge Manager. The design should provide the following outcomes:

- Minimize initial sediment transport and erosion
- Provide a channel that is stable both laterally and vertically
- Minimize erosion of the lake shore and lake bottom with flows anticipated to discharge from the tunnel
- Encourages vegetation within two feet of the water’s edge adjacent to the channel downstream of the excavated rock gully

After fully considering the impacts of this activity, it is my determination that this proposed use would not materially interfere with or detract from Kodiak NWR’s original refuge purposes. This use is also consistent with Title XI of ANILCA.

Signature Refuge Manager: _____
(Signature & Date)

Concurrence Regional Chief, NWRS, Alaska: _____
(Signature & Date)

Mandatory 10-Year Re-Evaluation Date: _____

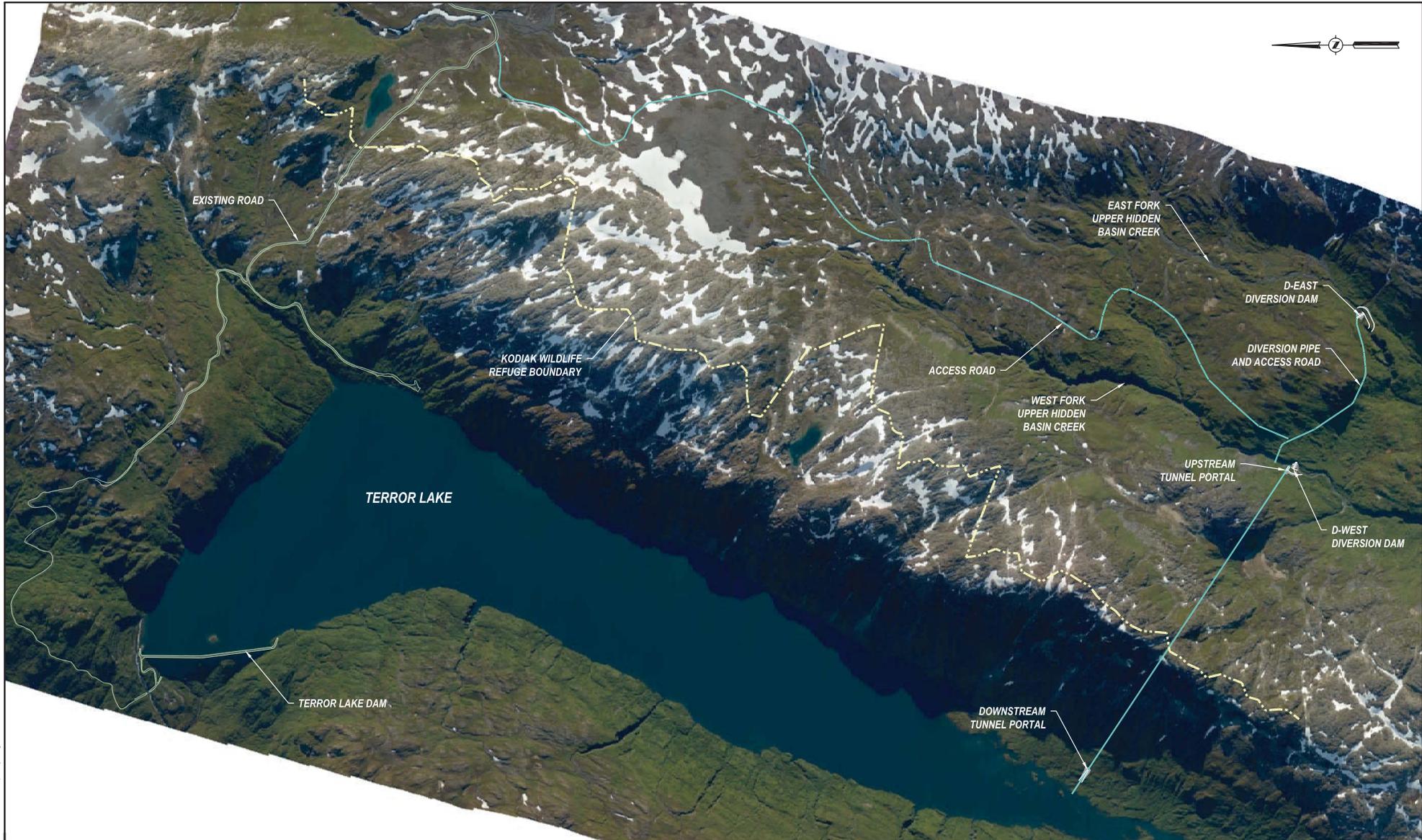
National Environmental Protection Act (NEPA) Compliance for Refuge Use Decision

_____ Categorical Exclusion without Environmental Action Memorandum

_____ Categorical Exclusions and Environmental Action Memorandum

 x Environmental Assessment and Finding of No Significant Impact

_____ Environmental Impact Statement and Record of Decision



Source: Orthophoto (RGB) by Kodiak Mapping Inc. (KMI) 0.50-foot pixel digital Imagery, dated July 15, 2014

Projection: NAD83 datum, Alaska State Planes: Zone 5, US Foot



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KODIAK ELECTRIC ASSOCIATION, INC
 UPPER HIDDEN BASIN DIVERSION PROJECT
 TERROR LAKE
 PROJECT NO. 1438609.00

CONCEPTUAL LAYOUT