# BRADLEY LAKE HYDROELECTRIC PROJECT

**FERC No. 8221**

## BRADLEY LAKE EXPANSION NON-CAPACITY LICENSE AMENDMENT

# EXHIBIT D
# STATEMENT OF COSTING AND FINANCING

https://www.ecfr.gov/current/title-18/part-4/subpart-F#p-4.51(b)

Prepared for:


**Alaska Energy Authority**
813 West Northern Lights Boulevard
Anchorage, Alaska 99503-2495

Prepared by:
**Kleinschmidt Associates**

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# ACRONYMS AND ABBREVIATIONS

***A***

| | |
|---|---|
| AEA | Alaska Energy Authority |

***B***

| | |
|---|---|
| Bradley Lake Pool Raise | 16-foot pool raise to Bradley Lake |
| Bradley Lake Project | Bradley Lake Hydroelectric Project (FERC No. 8221) |

***D***

| | |
|---|---|
| Dixon Diversion | new diversion dam and appurtenant features at the toe of the Dixon Glacier, diversion tunnel, and exit portal access road |

***F***

| | |
|---|---|
| FAA | Final Amendment Application |
| FERC | Federal Energy Regulatory Commission |

***M***

| | |
|---|---|
| MWh | megawatt-hour |

***O***

| | |
|---|---|
| O&M | operations and maintenance |

***P***

| | |
|---|---|
| Project | Bradley Lake Hydroelectric Project (FERC No. 8221) |

# 1.0 INTRODUCTION

The Alaska Energy Authority (AEA), Licensee and owner of the 120-megawatt Bradley Lake Hydroelectric Project (Bradley Lake Project or Project; Federal Energy Regulatory Commission [FERC] No. 8221), is pursuing a non-capacity amendment to its current FERC license. AEA proposes to build a new diversion dam (Dixon Diversion) to divert seasonal meltwater coming from the Dixon Glacier, located at the headwaters of the Martin River, to Bradley Lake via an underground tunnel. AEA also proposes to raise the normal maximum operating pool elevation of Bradley Lake by about 16 feet (Bradley Lake Pool Raise) through a combination of raising the concrete spillway crest elevation, adding spillway crest gates, and raising the dam embankment crest. Together, these two components make up the Bradley Lake Expansion Project, which would increase the Bradley Lake Project's average annual power generation by approximately 38 percent, providing more power to the Railbelt. This Exhibit D contains a statement of costs of financing specific to the proposed Dixon Diversion and Bradley Lake Pool Raise.

# 2.0 ESTIMATED COST OF NEW DEVELOPMENT

## 2.1 Land and Water Rights

New lands to be used by the Bradley Lake Project described in this amendment are owned by the State of Alaska and will not have an acquisition cost. AEA will amend its existing lease for use of project lands with the Alaska Department of Natural Resources (ADNR). The ADNR waives annual lease fees for the Bradley Lake Project.

Water rights are administered by the ADNR. The cost to apply for water rights was $50 and there is an annual fee of $50. There is also a one-time fee of $1,500 to adjudicate the water rights.

## 2.2 Cost of New Facilities

The total cost is estimated to be approximately $400 million.

*A cost breakdown will be provided with the Final Amendment Application (FAA).*

# 3.0 ORIGINAL COST OF EXISTING UNLICENSED FACILITIES

This section is not applicable.

# 4.0 ESTIMATED AMOUNT OF PAYABLE UPON TAKEOVER PURSUANT TO SECTION 14 OF THE FEDERAL POWER ACT

The applicant is the AEA, an agency of the State of Alaska and is therefore not required to provide estimated cost of Federal Government taking the Bradley Lake Project over at expiration of the license pursuant to section 14 of the Federal Power Act.

# 5.0 ESTIMATED AVERAGE ANNUAL COST OF THE PROJECT

## 5.1 Capital Costs

AEA is in the process of exploring different financial options.

*Additional information will be provided with the FAA.*

## 5.2 Taxes

AEA is structured as a public corporation and a component unit of the State of Alaska and is therefore exempt from local, state, and federal taxes.

## 5.3 Depreciation and Amortization

As described above, AEA is tax-exempt, and therefore, this section is not applicable.

## 5.4 Operation and Maintenance Expenses

AEA's budget for operation and maintenance (O&M) of the Bradley Lake Project is averages $8,000,000 annually. The total annual cost is anticipated to increase by approximately $500,000 for the operation and maintenance of the Dixon Diversion and tunnel.

## 5.5 Costs of Proposed Environmental Measures

*This information will be provided with the FAA.*

# 6.0 ESTIMATED ANNUAL VALUE OF PROJECT POWER

Power is sold through a Power Sales Agreement to the five utilities that are on the Alaska Railbelt. Each utility generates power from different sources depending on their access to fuels. Cost of generation on the system varies from a low of about $122 per megawatt-hour (MWh) (natural gas) to approximately $220/MWh (heavy atmospheric gas oil). Bradley Lake Project energy has a variable value depending on the fuel it is displacing and if the units are used for peaking. The draft AEA Alaska Railbelt Transmission Plan (2013) uses $125/MWh as a conservative value for Bradley Lake Project energy; this amendment uses $125/MWh. The value is less than diesel generation and greater than natural gas generation. The Bradley Lake Project's flexibility as a peaking plant reduces generator startups and should be increased as the Project will be less water limited during the year.

# 7.0 ENERGY SOURCE ALTERNATIVES

Load that is not met by Bradley Lake Project generation is provided by other generation sources on the Railbelt grid, including natural gas, coal, conventional hydropower, solar, wind, and battery energy storage systems. However, the Railbelt region is entering a period of acute energy vulnerability driven by a well-documented decline in Cook Inlet natural gas production. Natural gas currently supplies roughly 75 percent of Railbelt electricity, making the region heavily dependent on a fuel source that is now shrinking faster than utilities can replace it. Multiple regulatory agencies, utilities, and state officials warn that the Railbelt faces a natural gas shortfall as early as 2027, with no guaranteed long-term replacement fuel available. Declining output from existing Cook Inlet platforms has already rushed utilities toward high-cost natural gas imports – a stopgap measure that could significantly increase power costs for Alaskans. Hydropower is already one of the Railbelt's most important renewable resources, and studies show it remains a key option for long-term cost stability and energy security. Hydropower provides firm, dispatchable power, which is essential for balancing intermittent resources like wind and solar.

# 8.0 CONSEQUENCES OF DENIAL OF THE APPLICATION

A denial of the amendment application would result in higher energy costs for ratepayers. The Bradley Lake Project currently provides some of the lowest cost power to the entire Railbelt transmission system in Alaska. As discussed in Section 7.0, the Railbelt is powered primarily from natural gas generation sourced from Cook Inlet. The gas supply from Cook Inlet has long been in decline and in a few years will be unable to meet the demands of Southcentral Alaska. The energy generated from the Bradley Lake Expansion is expected to offset 1.5 billion cubic feet of natural gas per year, accounting for 7.5 percent of the unmet demand in 2030. Utilities are in the process of building natural gas import facilities to bridge this gap, which is expected to increase energy costs for ratepayers. Construction of the Bradley Lake Expansion Project will deploy additional affordable baseload power to the Railbelt and help utilities manage the dwindling Cook Inlet Gas supply issues. This project is a high priority for the State of Alaska.

# 9.0 SOURCES OF EXTENT OF FINANCING

Sources and extent of financing and annual revenues available to the applicant to meet the costs identified in paragraphs (e) (3) and (4) are as follows:

As a governmental entity, AEA's financing for major capital expenditures is secured by the issuance of long-term bonds. The utilities fund O&M of the Bradley Lake Project from revenues received from the sale of power produced.

The sale of power is the principal source of revenue for operation of the Bradley Lake Project. Funding for all capital improvements within the next five years is expected to come from Project revenues and bond proceeds.

# 10.0 COST OF DEVELOPMENT OF AMENDMENT APPLICATION

*The estimated total cost to develop the amendment application will be provided with the FAA.*

# 11.0 ON-PEAK AND OFF-PEAK VALUE OF PROJECT POWER

Energy generated will be used for peaking and base load. Because of the various fuel sources displaced by the Bradley Lake Project an estimate of $125/MWh based on the draft 2013 Alaska Railbelt Transmission Plan was used for the value of both on-peak and off-peak power since the fuel mixture cost of power by utilities varies significantly. The approximate value is determined by the reduction of generator start-up, expensive fuel oil, and peaking natural gas usage avoided.

# 12.0 CHANGES IN THE AMOUNT AND VALUE OF PROJECT POWER DUE TO PROPOSED CHANGES IN OPERATIONS

Estimated average annual increase due to a change in net operations at the Bradley Lake Project is as follows:

| Item | Net Average Annual Energy (MWh) | Value of Power ($125/MWh) |
|---|---|---|
| Existing Bradley Lake Project | 436,000 | $54,500,000 |
| Estimated net average annual increase with Dixon Diversion and pool raise (1 acre-foot ~ 1 MWh) | 165,000 | $20,625,000 |
| Estimated new Bradley Lake Project | 601,000 | $75,125,000 |