ALASKA ENERGY AUTHORITY

DIXON DIVERSION PROJECT UPDATE

Curtis W. Thayer
Executive Director

Ryan McLaughlin, PE
Senior Infrastructure Engineer

Chugach Electric Association
Board of Directors Meeting
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ALASKA ENERGY AUTHORITY

Dixon Diversion Project

AEA is evaluating the Dixon Diversion Project to boost energy output from the Bradley Lake Hydroelectric Project. Like the West Fork Upper Battle Creek Diversion, it would redirect water from Dixon Glacier—increasing Bradley Lake's annual energy production by up to 50%.

Located five miles from Bradley Lake, the project would utilize the existing powerhouse.

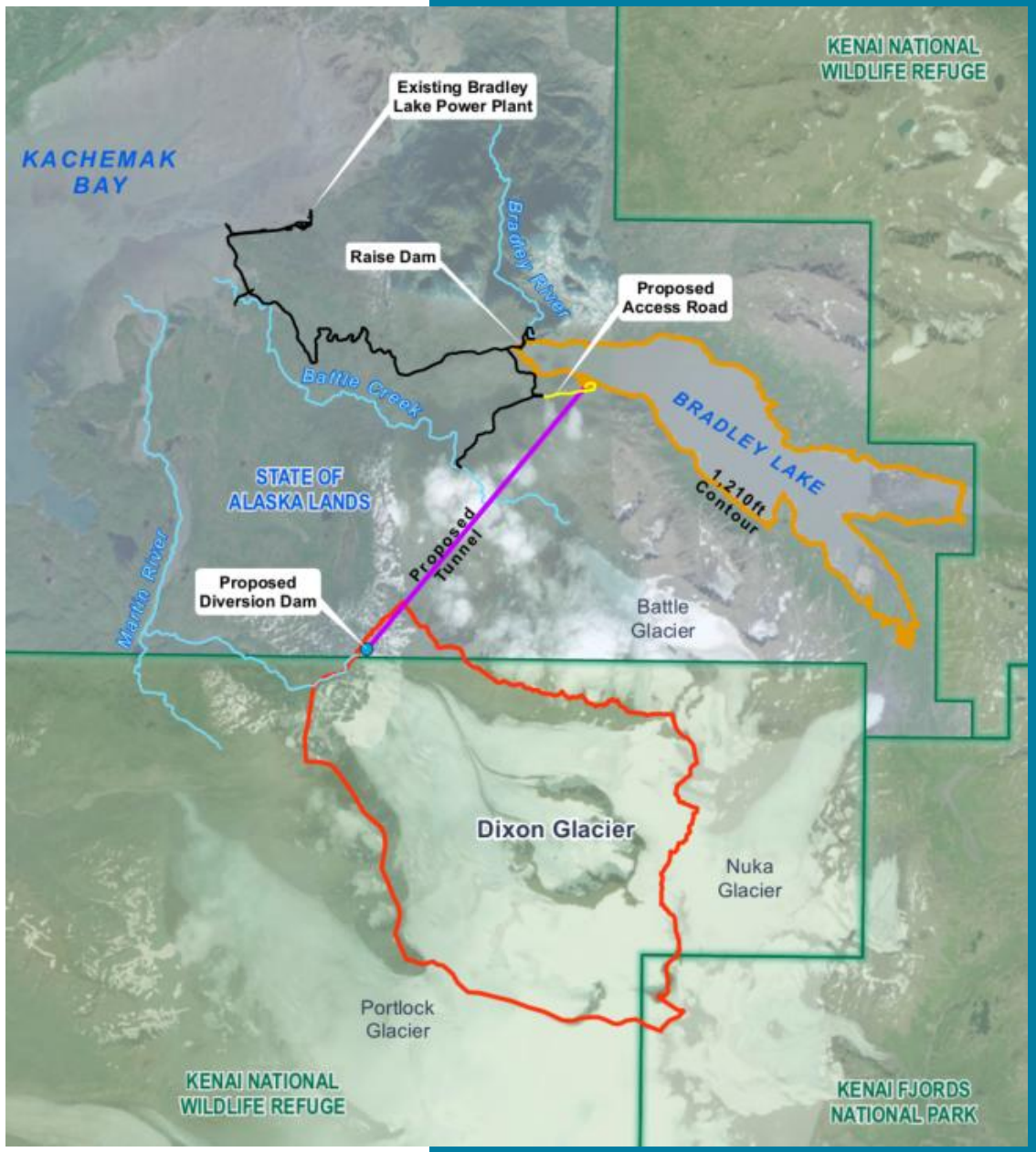
- **Annual Energy Output:** ~180,000 MWh (enough to power up to 30,000 homes)
- **Natural Gas Offset:** 1.5 billion cubic feet/year (7.5% of Alaska's projected unmet Railbelt demand in 2030)
- **Target Completion**: 2031
- **Estimated Cost:** $342 million cost to construct (Class 4)

Project Components

The Dixon Diversion Project would be the largest renewable energy development in Alaska since the completion of the Bradley Lake Hydroelectric Project in 1991.

Key Project Components:

- Diversion dam at toe of Dixon Glacier
- 4.7 mile long, ~14′ diameter tunnel to convey water
- Bradley Pool Raise ~14′
- 1 mile of new access road



2025 In-Progress Activities

Licensing
- Prepare license articles for **Draft License Amendment Application** (early 2026)
- Develop **Protection, Mitigation, and Enhancement** measures

Environmental Studies
- Completion of fish, wildlife, and cultural studies

Geology
- Implement **Drilling Program Plan**
  - Boreholes and geophysical surveys at Bradley Dam
- Conduct
  - Reservoir rim stability analysis
  - Borrow source investigation

Hydrology
- Martin River stream gaging
- Refinement of energy estimates
- Complete:
  - Probable maximum precipitation study
  - Probable maximum flood study

Seismic
- Perform **site-specific seismic hazard analysis** using updated Alaska ground motion models

Engineering
- Advance design to **20% completion** for FERC license
- Progress design on dam raise, tunnel, intake/outlet portals, access road, and diversion dam

Project Milestones

The Dixon Diversion project is progressing through key phases—licensing, design, procurement, construction, and commissioning. At right is a snapshot of major milestones and expected deliverables for each stage.

LICENSING

- Draft and Final License Amendment Application 2026
- FERC issues FEA and license amendment order mid-2027

DESIGN

- 20% by Jan 2026, 100% by Q1 2027

PROCUREMENT

- Electrical 2026
- Bid tunnel and diversion/dam raise mid-2027

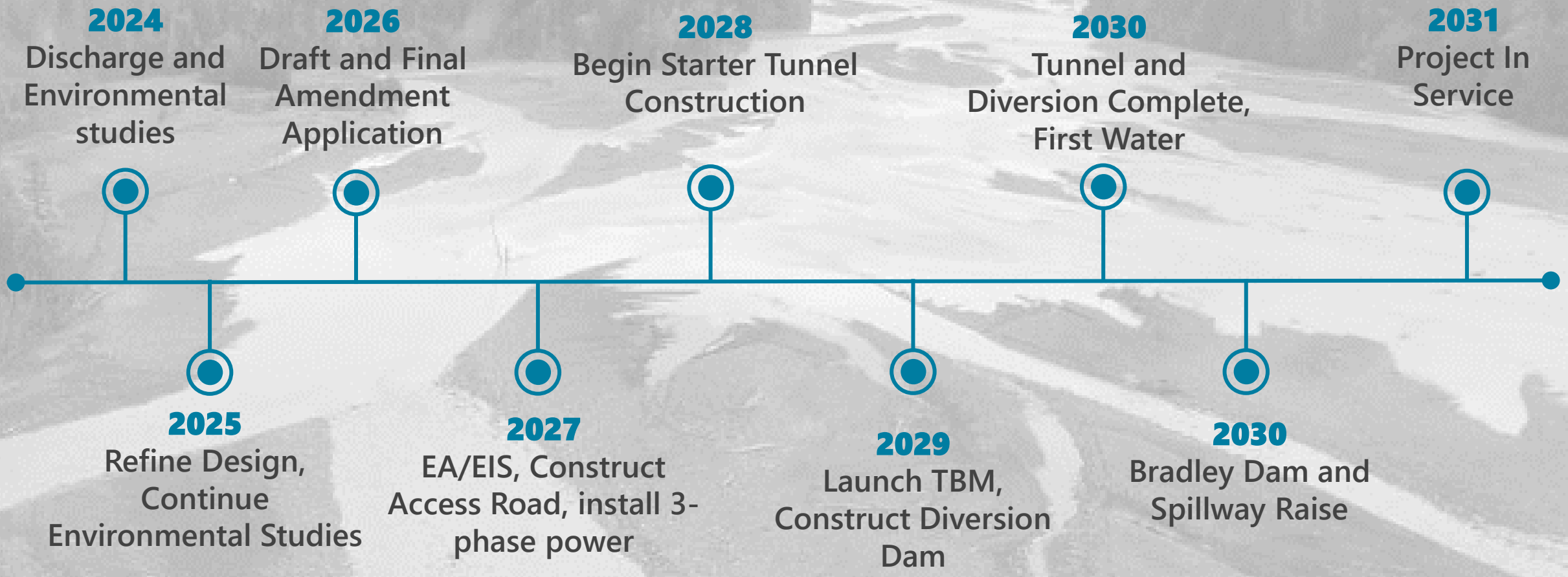
CONSTRUCTION

- Electrical 2026
- Bid tunnel and diversion/dam raise mid-2027

COMMISSIONING

- 2031

Licensing and Construction Schedule



Project Costs

- **CAPEX**
  - $342 million
  - Class 4 OPCC, 25% contingency (update in winter)
- **OPEX**
  - $500,000/year
  - Battle Creek O&M currently ~1% of CAPEX
- **Funding**
  - $19.7 million received
    - $6 million Bond Series 11
    - $1 million REF grant
    - $2.3 million Bradley R&C fund
    - $9.4 million SOA appropriation
  - $7.6 million spent
  - $12 million available to finish licensing and studies
- **Development Cost per Annual Energy Output**
  - $1900/MWh (original Bradley $2150/MWh)
- **Levelized Cost of Energy (LCOE)**
  - $106/MWh (4%, 30 years)

Finance Sources

Department of Energy Loan Program Office

Lenders / Bondholders

P3 Investment and Development Firm

Private Equity Investors

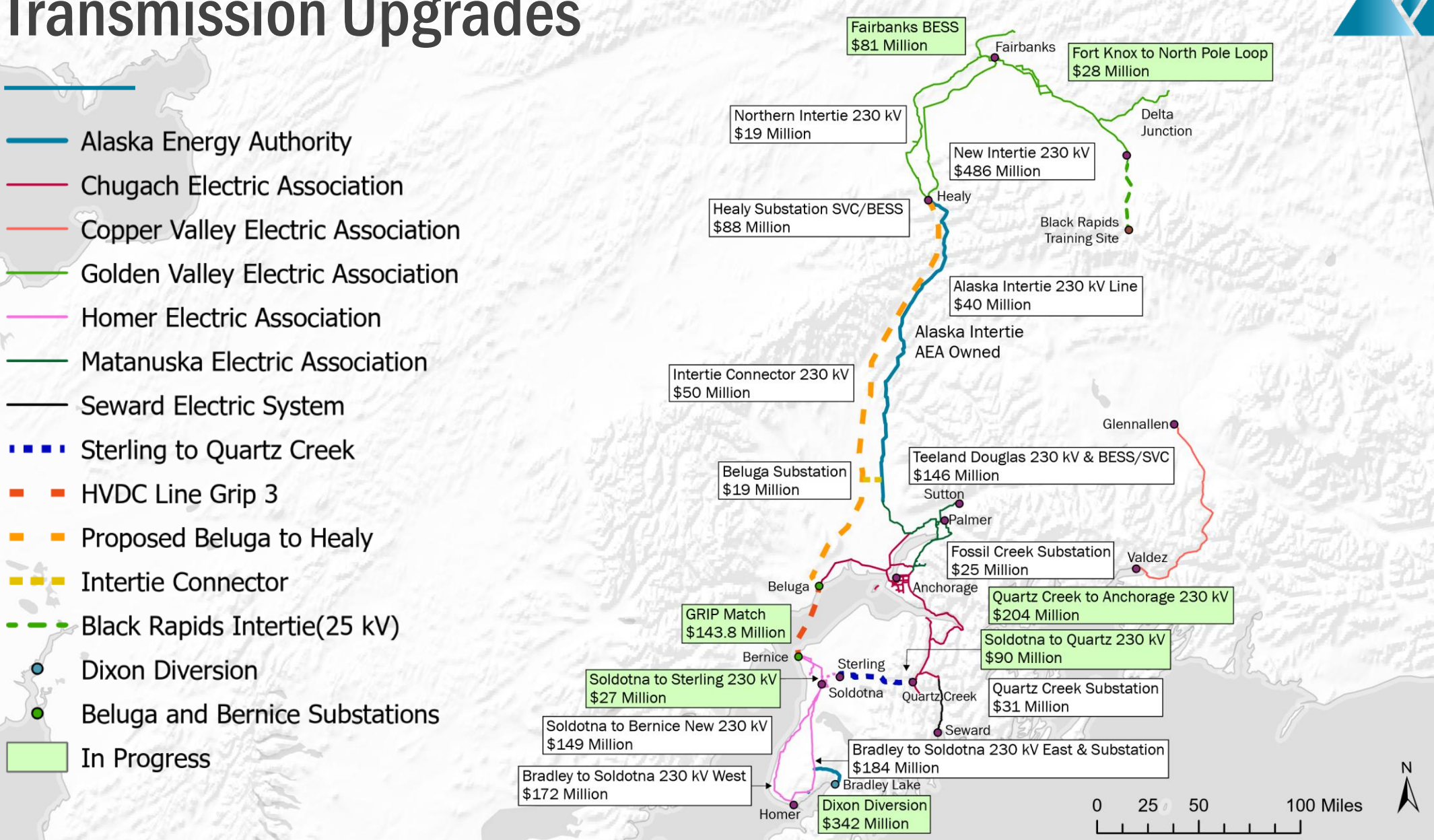
Permitting Requirements

- **FERC license amendment**
- **Additional Permits and Consultations**
  - USACE Section 404 Permit
  - ADF&G Fish Habitat Permit
  - DNR lease modification for change in project boundary
  - DEC Section 401 Water Quality certification or waiver
  - Consultation with NMFS for Essential Fish Habitat and endangered species
  - Consultation with USFWS for endangered species
  - Consultation with SHPO and affected tribal entities for NHPA Section 106 compliance

Environmental Impacts

- **Selected Alternative: Least Environmental Impact**
  - No road to diversion dam
  - Dixon powerhouse alternative removed
- **Project Benefits and Anticipated Impacts**
  - Minimal environmental footprint for a high-value project
  - ~1 mile of new access road
  - Pool raise causes inundation at Bradley Lake headwaters
  - Diversion dam site was ice-covered as recently as 10 years ago
- **Martin River Conditions**
  - Highly dynamic mainstem
  - Migration corridor for small coho/sockeye runs and juvenile
  - Fast, cold flow (2^{0}C) with high turbidity and bedload
  - Coordination with resource agencies underway to define Minimum Instream Flow and channel maintenance flows
- **Hydraulic Model of Modeling**
  - 2D model of Martin River
  - Snapshot: May 2024

Transmission Upgrades



Risks and Mitigations

- **Aim to de-risk project for all parties**
- **Geotech investigations**
  - Boreholes
  - Geophysical surveys
  - Borrow Source Investigations and Material Testing
- **Fully Lined Tunnel**
  - Lowers construction risk if unexpected lining is needed
  - Improved hydraulics
  - Increased worker safety
- **Early procurement of long lead items**
  - Transformers, Cable, Tunnel Boring Machine
- **Contingency built into cost estimates**
- **Early focus on construction sequencing and procurement strategies**
- **Supplying 3-phase power for TBM**
  - Avoids storing and hauling large diesel volumes up the mountain road in winter

Thank You!

Alaska Energy Authority
813 W Northern Lights Blvd.
Anchorage, AK 99503
Phone: (907) 771-3000
Fax: (907) 771-3044
akenergyauthority.org