

ALASKA ENERGY AUTHORITY

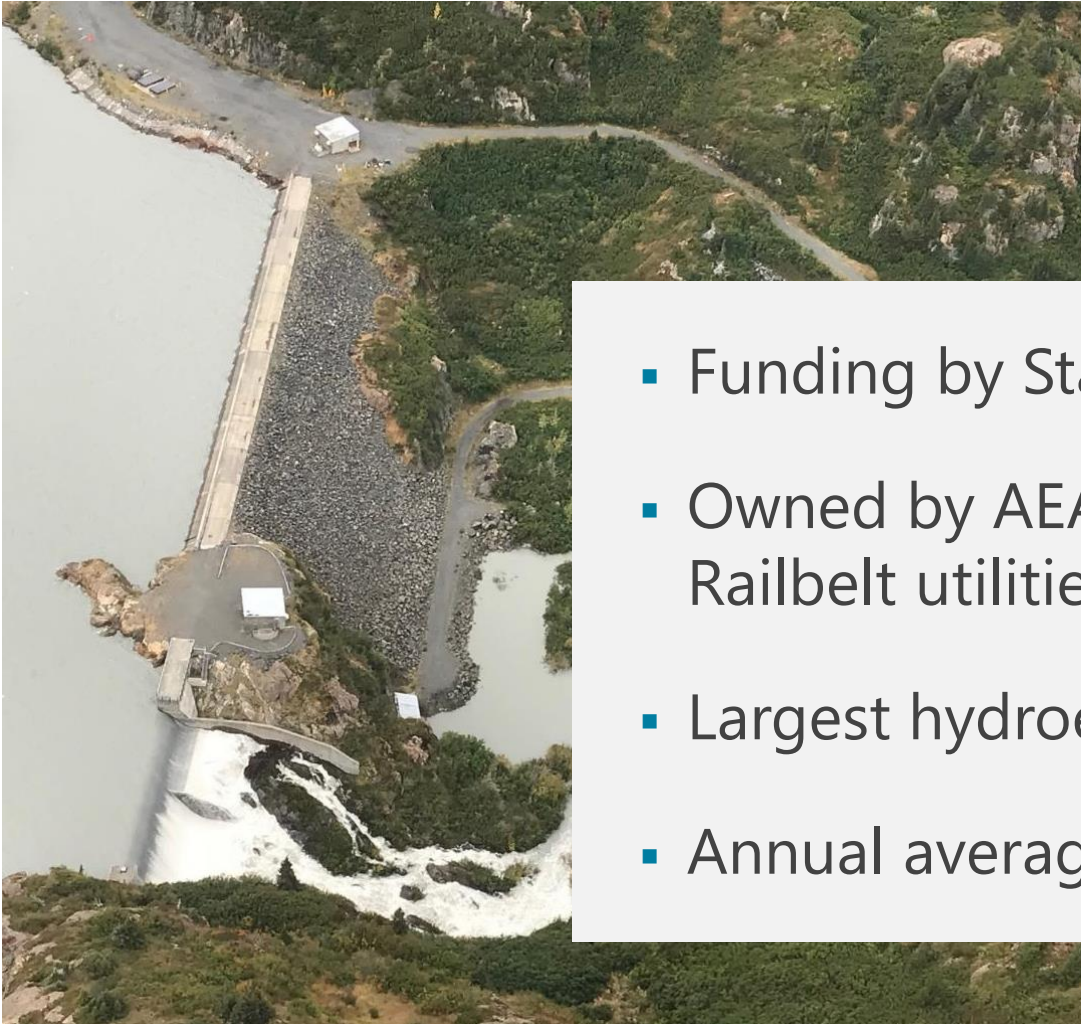
RAILBELT HYDROPOWER: CURRENT & UPCOMING PROJECTS

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Bradley Lake Hydroelectric Project



Alaska's largest source of renewable energy, the 120-megawatt facility generates about 10% of the total annual power used by Railbelt electric utilities at some of the lowest-cost to more than 550,000 Alaskans.

- Funding by State of Alaska and Railbelt utilities
- Owned by AEA and managed to maximum extent by Railbelt utilities
- Largest hydroelectric Project in Alaska
- Annual average energy 400,000 MWh — and increasing

Battle Creek Project



- Located 2 miles southwest of Bradley Lake and serves Railbelt
- Completed in 2020
- Funding by State of Alaska and Railbelt utilities
- Diversion of upper Battle Creek to Bradley Lake by two-mile pipe
- Annual energy ~37,000 MWh
- Low-cost energy



Battle Creek Project Schedule

- 2010-2013: Studies
- 2015: Submit license amendment to Federal Energy Regulatory Commission (FERC)
- 2016: Environmental Assessment
- 2016: Receive license amendment
- 2017: Financing and bid project
- 2018-2020: Construction

Dixon Glacier



Dixon Diversion Project

- AEA is investigating generating energy from the outflow of Dixon Glacier five miles southwest of the Bradley Lake Hydroelectric Project.
- The Dixon Diversion Project would be largest renewable energy project in Alaska since Bradley Lake was completed in 1991.





Dixon Diversion Project

- Drainage area is ~20 square miles.
- Watershed receives more than 100 inches precipitation per year (106,000 ac-ft/yr).
- Ice melt average 94,500 ac-ft/yr.
- ~200,000 ac-ft/yr.

Diversion to Bradley Lake

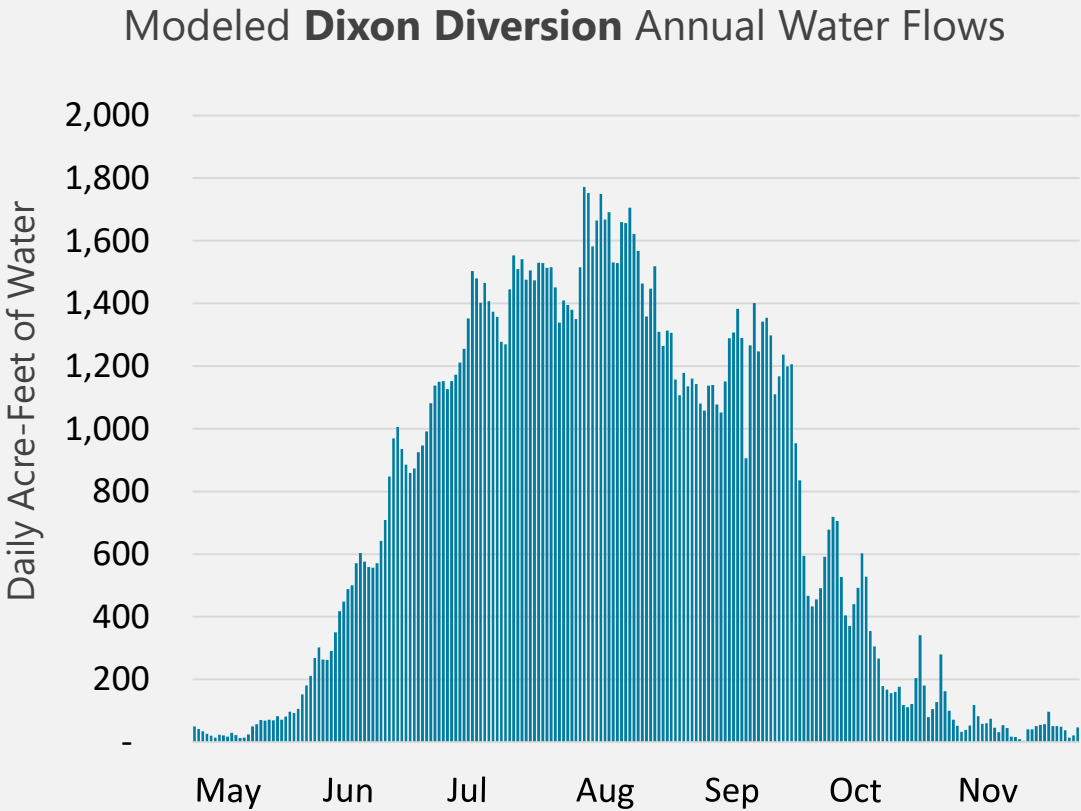
- 4.7 mile tunnel from intake to Bradley Lake
- Water goes through Bradley Lake powerhouse
- Raise Bradley spillway/dam to capture seasonal flow and allow for additional water storage for winter
- Entire project on State land



Energy Generation Comparison

<u>Project</u>	<u>MWh/yr</u>
Bradley Lake Hydro	~400,000 MWh/yr
<i>Dixon Diversion</i>	<i>~160,000 MWh/yr</i>
Fire Island Wind	~49,000 MWh/yr
Battle Creek Diversion	~37,000 MWh/yr
Net Metered Solar	~3,500 MWh/yr

Source: This comparison slide is courtesy of Chugach Electric Association.





Dixon Diversion Value

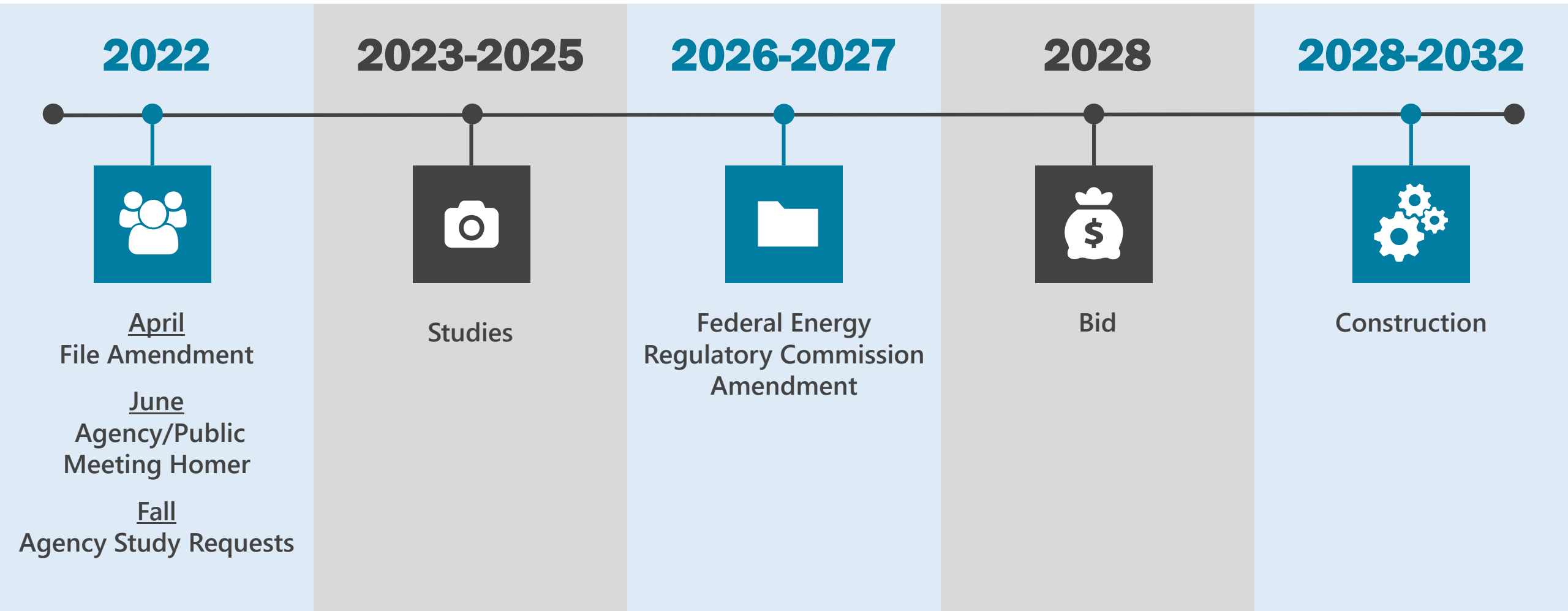
- Dixon Diversion provides:
 - Energy (more water)
 - Higher capacity factor (from 37% to 53%), but no increase of maximum capacity (no new turbine)
 - Increased long-duration energy storage (higher dam)
 - Low-cost, long-duration energy storage
- A new turbine/generator could be added at Bradley Lake power plant in the future

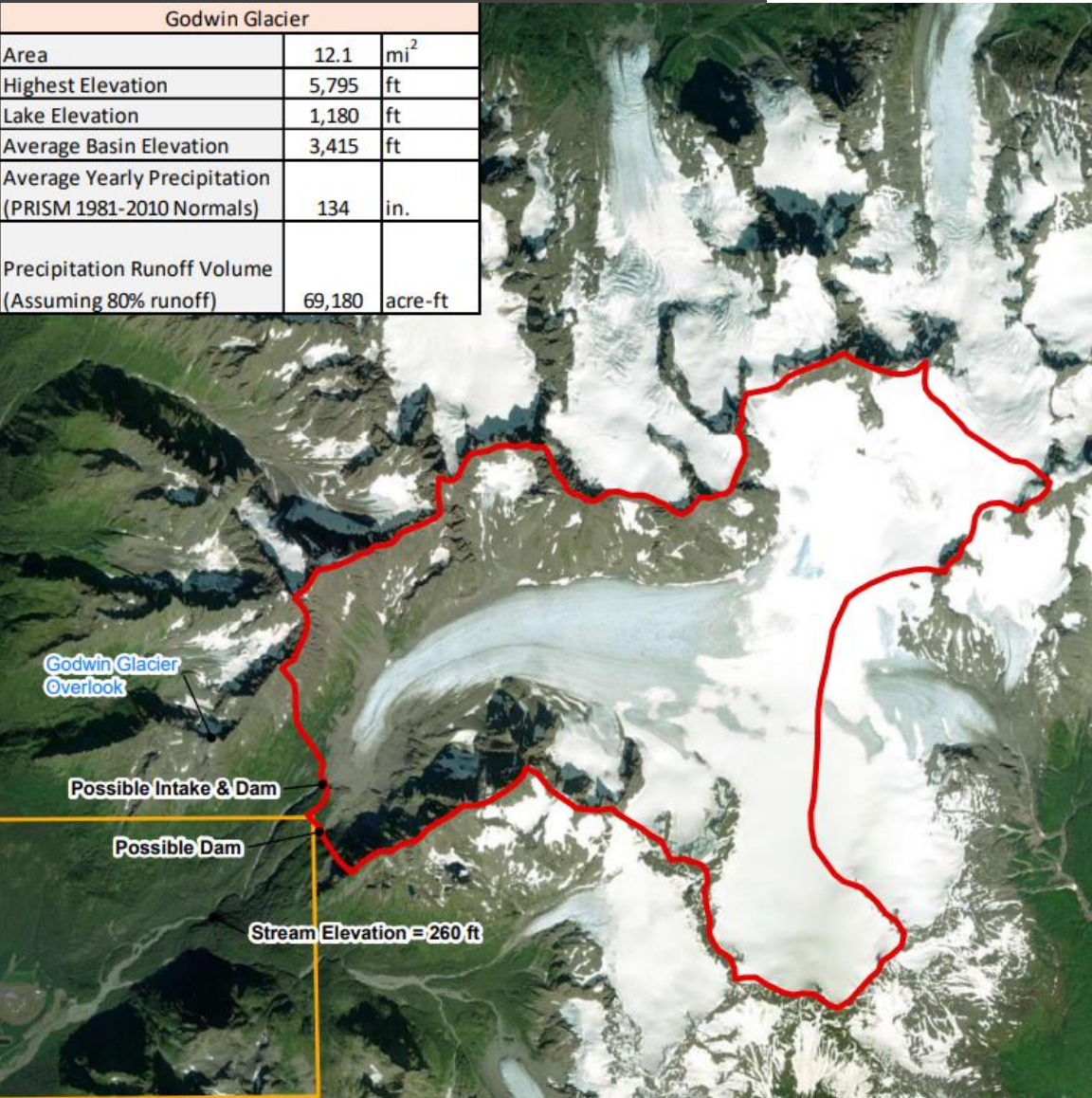
Dixon Diversion Next Steps

- Verify energy (2023)
 - Discharge measurements
 - Water Quality measures
- Optimism facilities and revise cost (2023)
 - Need for road
 - Geologic Site Review
- Consultation (2024)
- Studies (2024)



Dixon Diversion Schedule

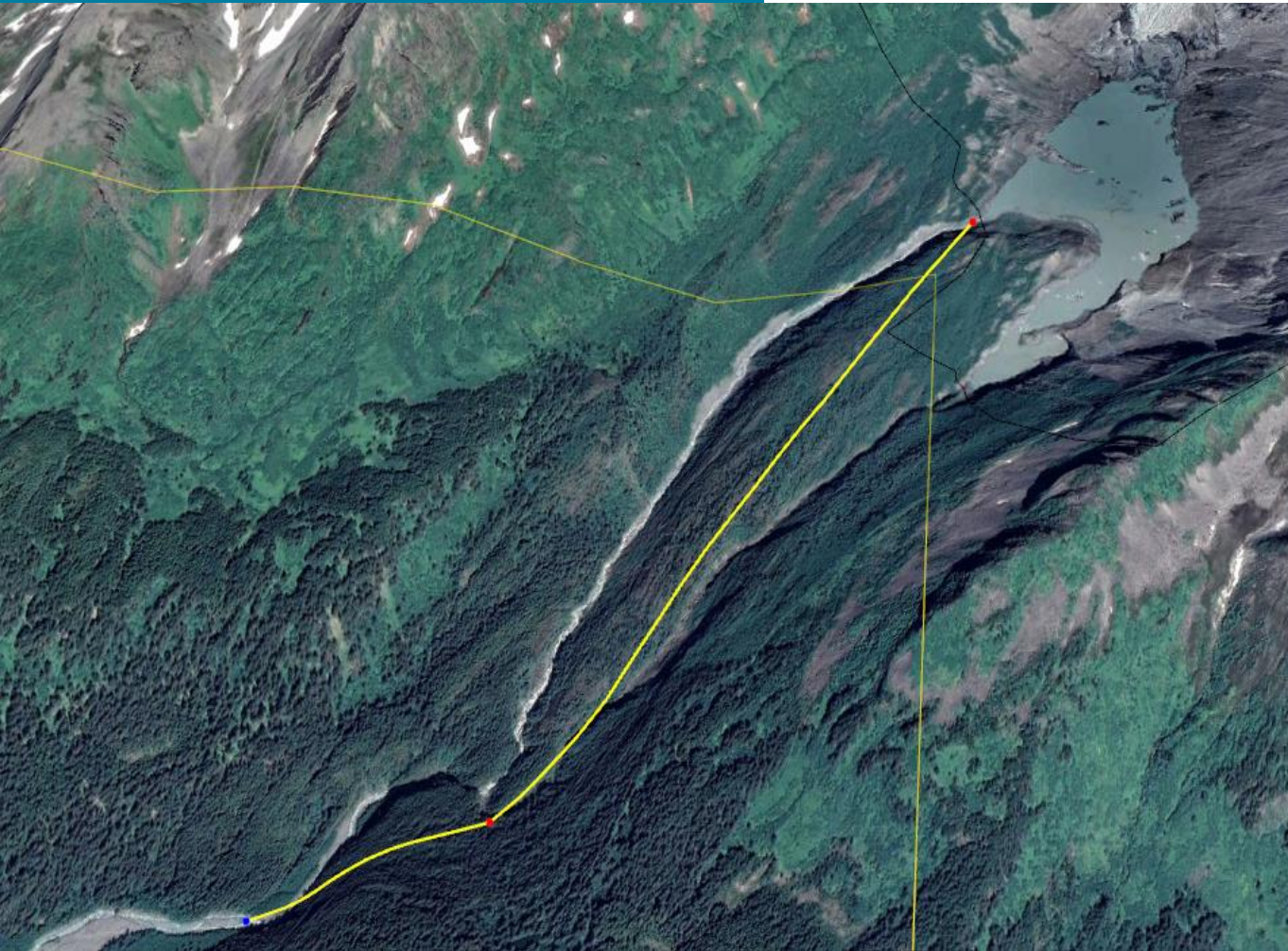




Godwin Hydropower Project

- If average ice melt 10 feet/year then an additional 77,000 ac-ft above annual precipitation for coming decades
- Power plant less than 2 miles from roads and 115 kVA lines
- Port to bring in equipment and materials

Godwin Hydropower Project



- River drop ~920 feet over 1.5 miles.
- Intake downstream of lake has entire project on State land (likely non-FERC). Intake at lake provides regulating ability.
- Chugach Electric Association performing feasibility work.
- Could be online ~ 10 years.



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