

Kleinschmidt

Tyee Lake Hydro Project

P-3015

Proposed Capacity-Related
License Amendment

Joint Agency and Public Meeting
November 14, 2024



Meeting Purpose

- **October 8, 2024 - SEAPA filed Draft Amendment Application**
- **Initiated Formal Consultation Process per FERC Regulations**
- **NEPA – Scoping & Public comment on the Application, PDEA, process**



Meeting Overview

- Introductions
- SEAPA Service Area and Generation System
- Overview of Existing Project & Proposed Installation of the Third Unit
- Questions
- Break (5 minutes)
- Draft Amendment Application
 - Engineering Exhibits
 - Preliminary Draft Environmental Assessment
- FERC Process
 - Proposed Request of Waiver of Second Stage
- Questions
- Next Steps



Meeting Protocol

- **Sign-in (Sheet or Teams Chat)**
 - Name, organization and contact information
- **Meeting is recorded**
 - Recording and/or transcript will be made available
- **When you speak, please state name and affiliation**
- **Please do not put phone line on hold**



Introductions



SEAPA Service Area and Generation System



Service Area and Generation System



- SEAPA is a Joint Action Agency (AS 42.45.310)
- Governance is through a Board of Directors appointed by member utilities
- **Tyee Lake Hydro Project – 20 MW**
 - 1984
 - Petersburg and Wrangell
- **Swan Lake Hydro Project – 22 MW**
 - 1984
 - Ketchikan
- **Swan-Tyee Intertie (STI) - 2009**
 - interconnected SEAPA projects and all three communities

A stylized map of Southeast Alaska is positioned on the left side of the slide. The landmasses are colored in a light green, while the surrounding water is a light blue. The map shows the coastline of the region, including the Gulf of Alaska and the Inside Passage.

Need for Additional Generation

Communities are experiencing load growth.

- Current energy demand is greater than SEAPA's total licensed capacity of 42-MW
- 2030 demand is projected to increase due to beneficial electrification
- >\$54 million federal and state grants for heat pump conversions and EV charging stations (2024 – 2027)
- Potential future shore power at cruise ship berths and for Alaska Marine Highway System ferries

A stylized map of Alaska is positioned on the left side of the slide. The landmass is colored in a light green, while the surrounding water is a light blue. The map shows the state's outline, including the Aleutian Islands.

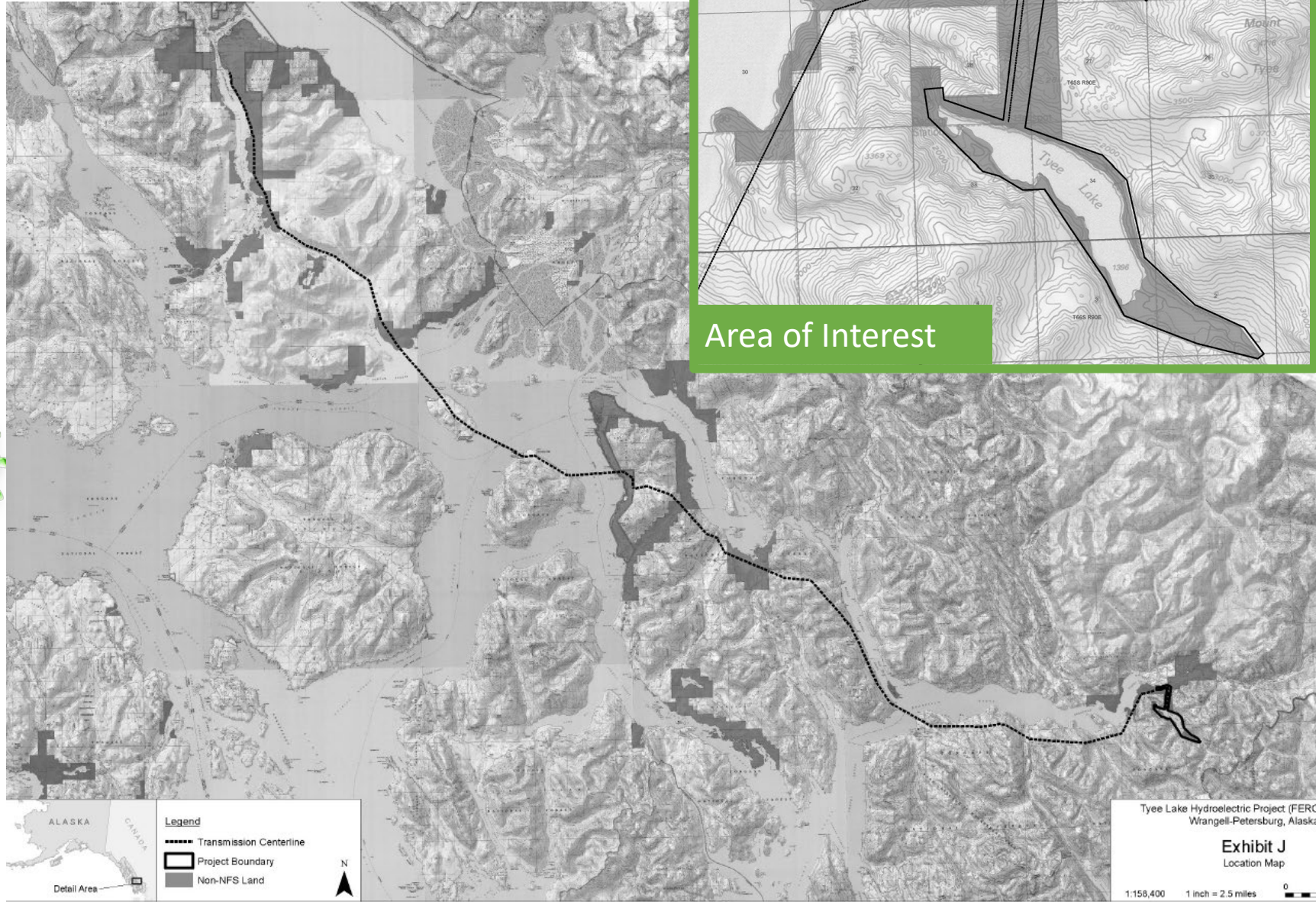
Value of Third Unit at Tyee

- Additional hydro generation to meet current and future demand
- Increased operational flexibility to optimize hydro resources
- Redundancy to existing units during maintenance
- Reduced dependence on diesel generation
 - Stabilized cost of energy
 - Reduced emissions
- Increased resiliency and system reliability
- Minimal potential environmental impact



Overview of Existing Project and Proposed Installation of the Third Unit

Existing Project



Area of Interest

Tyee Lake Tap
~1,225 ft el.

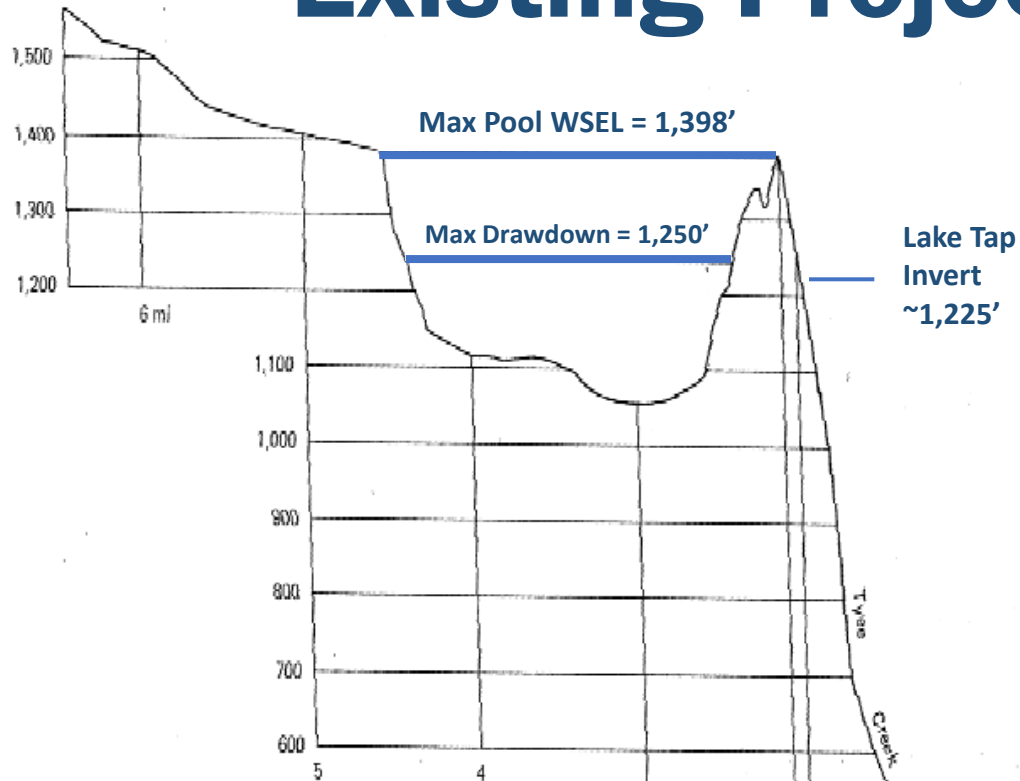
Power Tunnel
8,300 ft long
10 ft diameter

Penstock
1,350 ft long

**Powerhouse
Switchyard**

Transmission Line
~80 mi

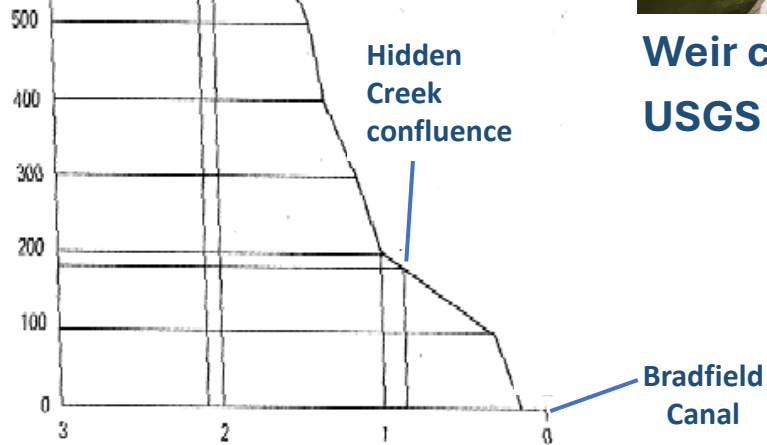
Existing Project



- Natural lake with a lake tap at ~1,225 ft EL.
- Normal pool elevation:
 - 1,250 – 1,398 ft (weir invert)
- Usable storage capacity: 52,400 ac-ft



Weir constructed in 2013 at lake outlet
USGS Gage 15019990 measures lake WSEL



Existing Project

- Lake tap intake structure directs water through an unlined 8,300-ft-long power tunnel to a 1,350-ft-long steel penstock to the powerhouse



Intake Structure

Gatehouse

Coarse Trashrack
at lake intake

Gate Shaft
Trashrack
60 spaces @ 1 3/8"

Power Tunnel and
Penstock

Existing Project

- Trifurcated penstock, powerhouse, switchyard, and tailrace designed and constructed with provisions for three generating units
- Two 10-MW Pelton-type (impulse) turbines currently installed and operated



Powerhouse
Provisions for 3 units

Powerhouse
Two 10-MW units
installed

**FERC Licensed
Capacity**
20 MW

Switchyard
Footprint anticipated
expansion for 3
turbines

Tailrace
1,100 ft-long
Intertidal

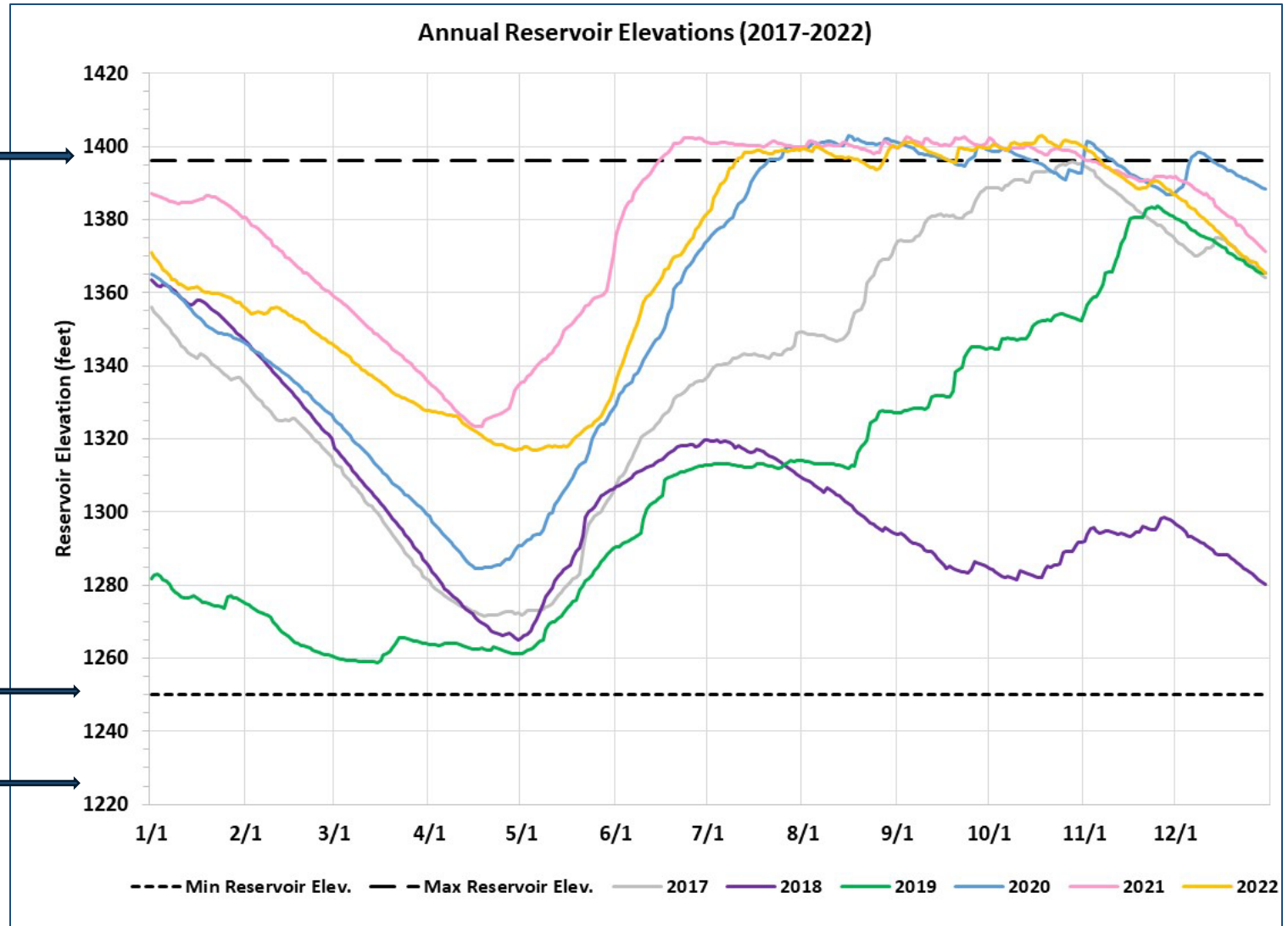
Existing Project

- **Water rights permit**
 - **135,000 ac-ft/yr**
- **No minimum flow requirement to Tyee Creek**
- **Spill to Tyee Creek occurs at lake WSEL 1,398 ft**
 - Typically occurs in response to precipitation events (2020-2022)
 - Does not occur every year (2017-2019)

1,398'
Weir
Invert

1,250'
Draft
Limit

1,225'
Intake



Proposed Action

- **Increase the Project's installed capacity by 50 percent**
 - Install third Pelton-style turbine-generating unit within existing powerhouse
 - Install third transformer within footprint of existing switchyard
 - Operate third unit within existing licensed lake levels and permitted water rights of 135,000 ac-ft annually

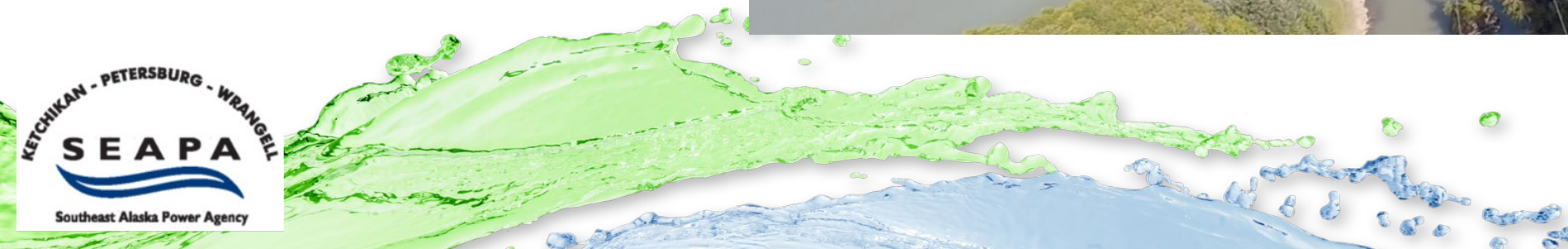
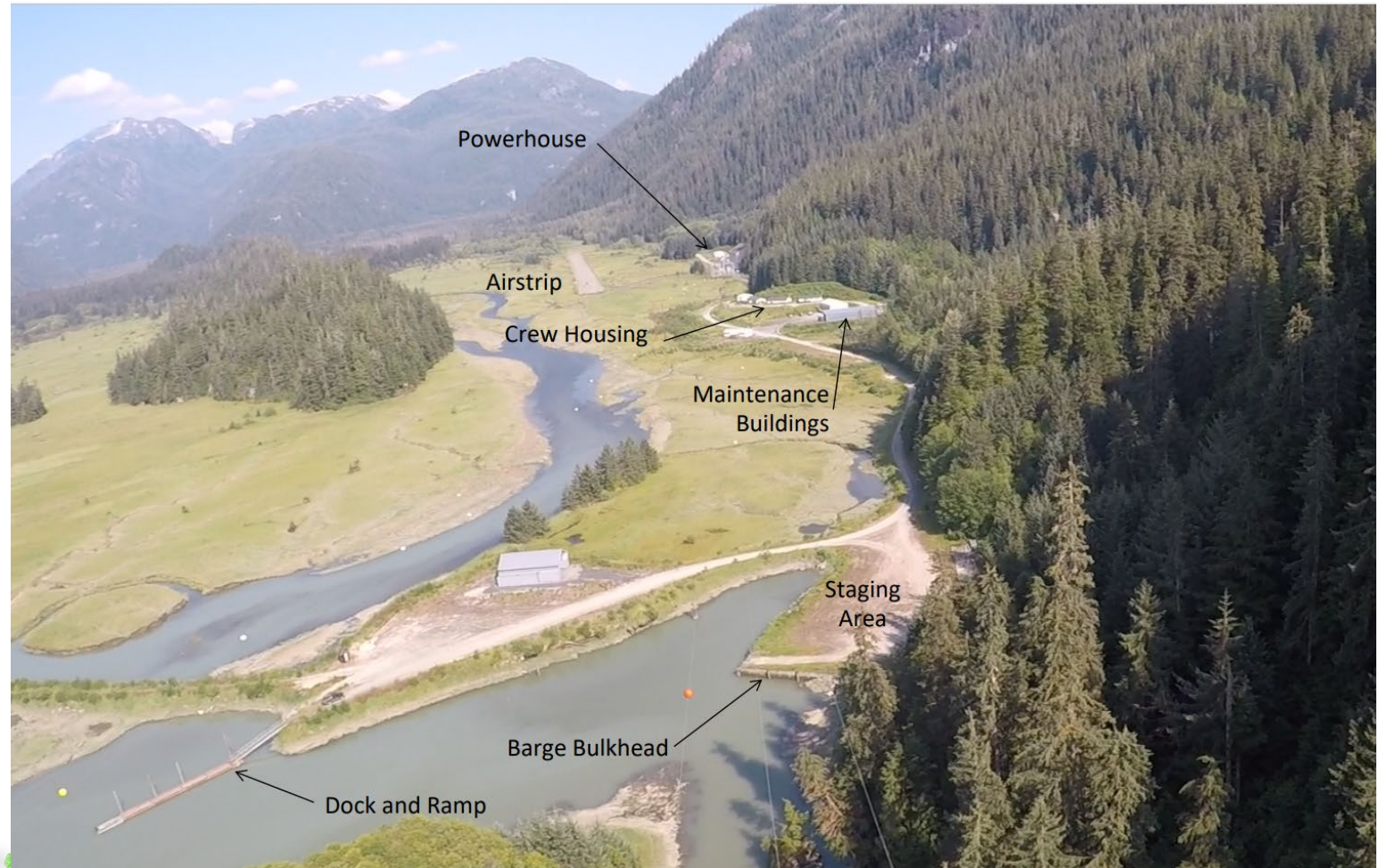


Proposed Action - Construction

Equipment and materials would be brought in by barge from Wrangell (~5 trips)

Workers (up to ~15 at one time) flown in by plane or transported via local ferry and housed onsite in bunkhouse or USFS cabins

No new ground-disturbing activity is anticipated



Proposed Action - Construction

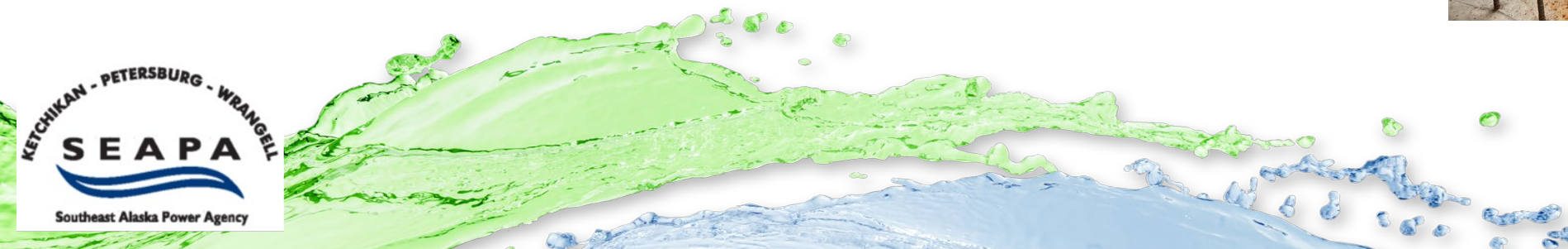
Project designed and constructed with provisions for third turbine.

Concrete work <2 weeks

Installation of third transformer within existing switchyard footprint

Most installation work would occur inside of powerhouse

No in-water work



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Proposed Action - Construction

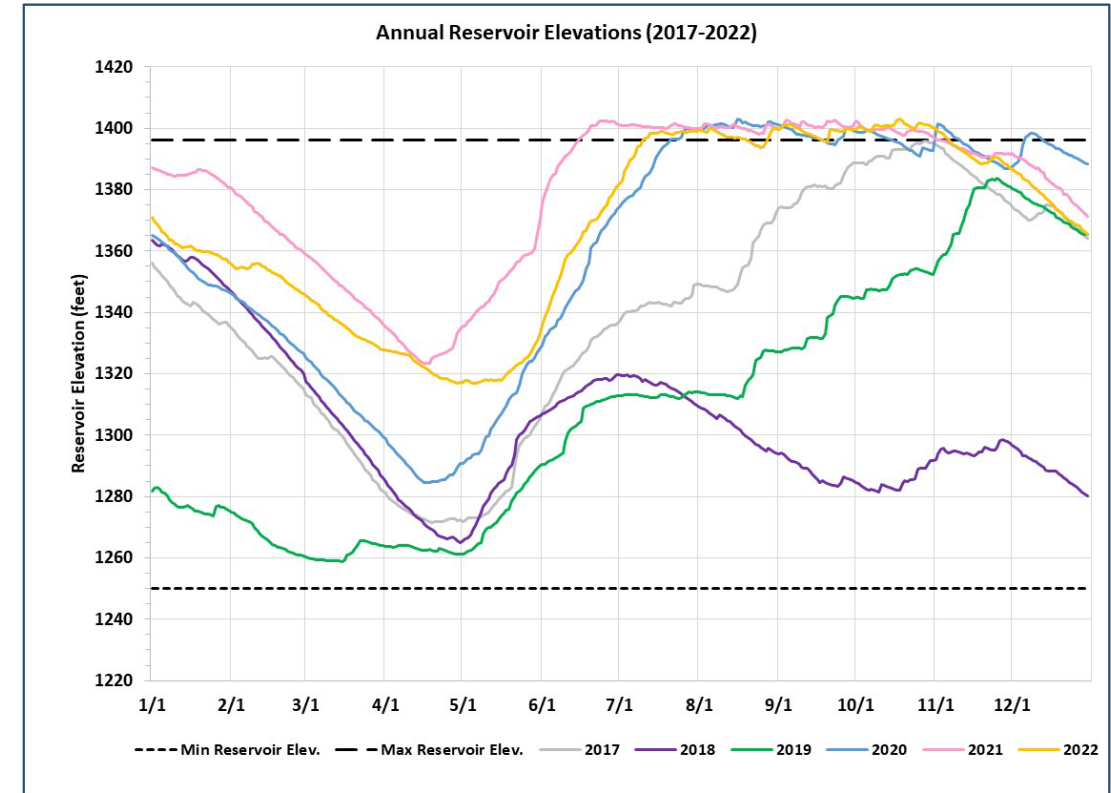
Implementation of Standard BMPs

- Contractor use of project facilities
- Equipment/vehicle operation on Project lands
- Fuel and chemicals
- Disposal of waste
- Erosion and sediment control
- Protection of aquatic resources



Proposed Action - Operations at Tyee Lake

- **No change to existing water rights**
 - 135,000 ac-ft annually
- **No change to min and maximum lake elevations**
 - 1,250 – 1,398 ft
- **No change to usable storage capacity**
- **Continue to optimize water resources**
 - Dedicated output to Wrangell & Petersburg
 - Additional output to Ketchikan as available
- **May increase rate of reservoir drawdown**
- **Continue to minimize spill; potentially less frequent spill to Tyee Creek in some years**



Proposed Action - Operations at Tailrace

Tailrace designed and constructed for operation of three turbines.

At maximum output, each turbine would contribute up to 117 cfs of Tyee Lake water to the tidally-influenced tailrace and velocities would increase.



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Questions



Break



Draft Amendment Application



Engineering Exhibits

(Crosswalk to Historic Exhibit Labels)

- **Exhibit A – Project Description (Exhibit M)**
- **Exhibit B – Project Operations (Exhibit H)**
- **Exhibit C – Project Schedule (Exhibits O and Q)**
- **Exhibit D – Project Economics (Exhibit N)**
- **Exhibit F – General Design Drawings & Supporting Design Report (Exhibit L)**
 - To be filed separately under Critical Energy Infrastructure Information as part of the Final Application

Exhibit E – Environmental Report

- Preliminary Draft Environmental Assessment format (Historic Exhibits D, S, V, W)
 - Purpose and Need
 - Proposed Action and Alternatives
 - Consultation and Compliance
 - Environmental Analysis by Resource Area
 - Affected Environment
 - Potential Effects
 - Proposed Measures
 - Developmental Analysis
 - Conclusions and Recommendations
 - Finding of No Significant Impact (to completed in the Final Application)

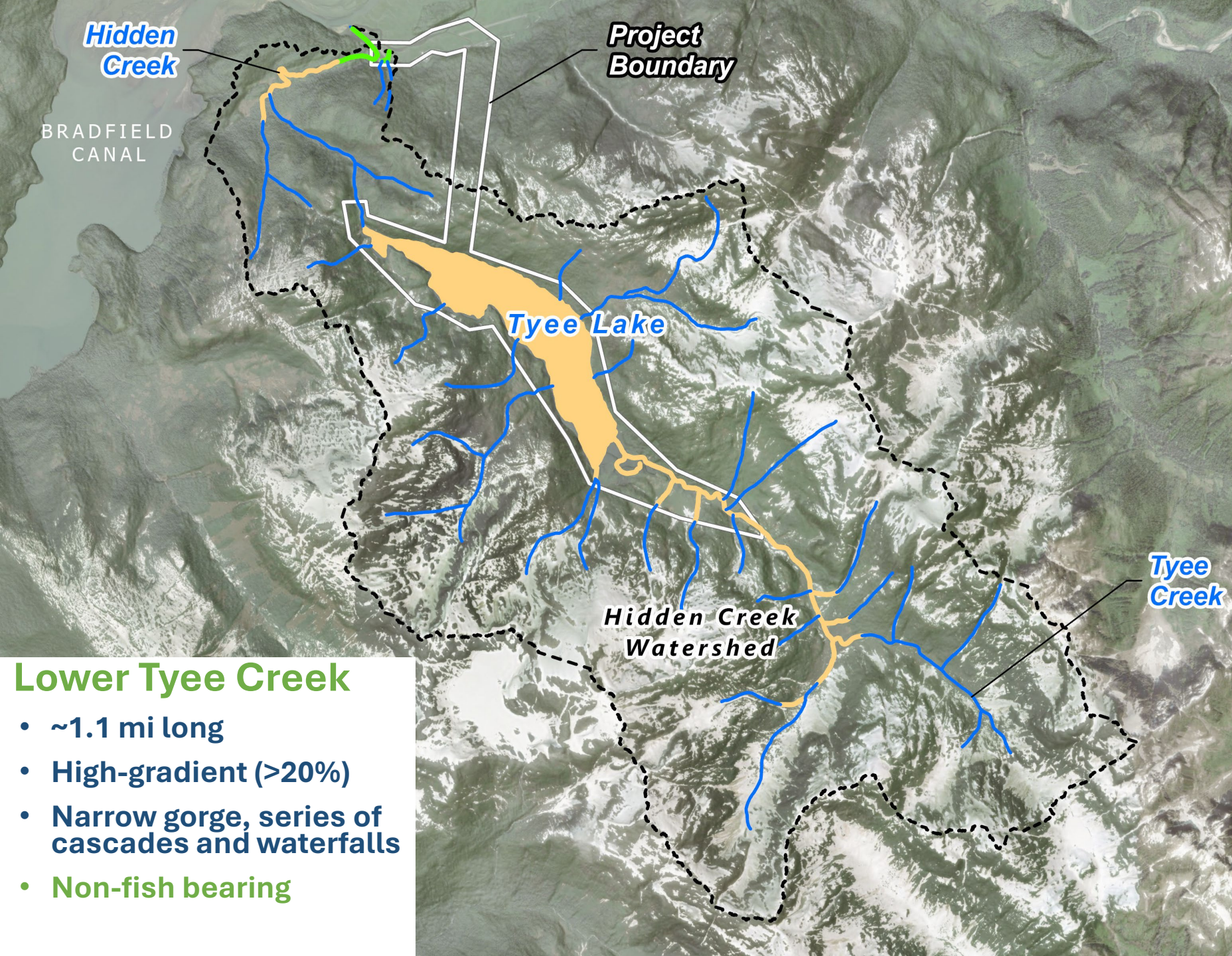


A map of the Ketchikan-Petersburg-Wrangell area in Southeast Alaska. The map shows the coastline with various islands and water bodies. Labels include Dry Island, Farm Island, Songlet Island, Umanak Island, Lincroft Island, Five Mile Island, Hat Island, Whangell Island, Turn Island, Eklia Island, Found Island, and Blanche Rock. The map is partially obscured by the text on the right.

Exhibit E – Environmental Report

- **Resource Areas**

- **Geology and Soils**
- **Water Quantity and Quality***
- **Fish and Aquatic Resources***
- **Wildlife, Botanical and Wetlands**
- **Rare, Threatened, and Endangered Species***
- **Recreation, Land Use, and Aesthetics**
- **Cultural and Tribal Resources**
- **Socioeconomics**
- **Environmental Justice**



Aquatic Resources

Tyee Lake

- 14.4 sq mi drainage
- 2.5 mi x 0.5 mi
- 300 – 480 ac
- Steep-sided
- Deep: ~300 ft at full pool
- Temp: 0 - 13 °C
- DO: 100%
- pH: 6.2 - 7.0
- Low specific conductance, dissolved solids, and suspended solids
- **Arctic Grayling (adfluvial)**
 - ADFG stocked in 1960s
 - 1980s found infected with BKD and ERM
 - 2018 presence

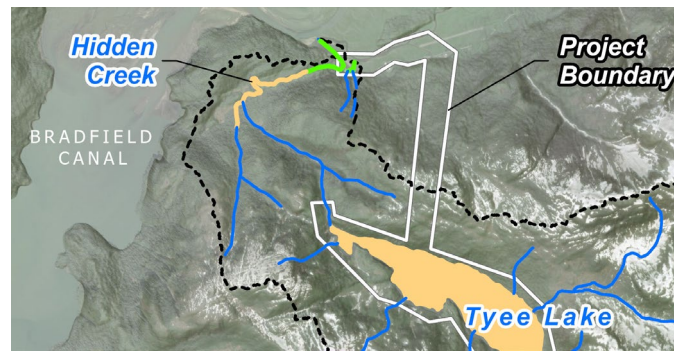
Lower Tyee Creek

- ~1.1 mi long
- High-gradient (>20%)
- Narrow gorge, series of cascades and waterfalls
- **Non-fish bearing**

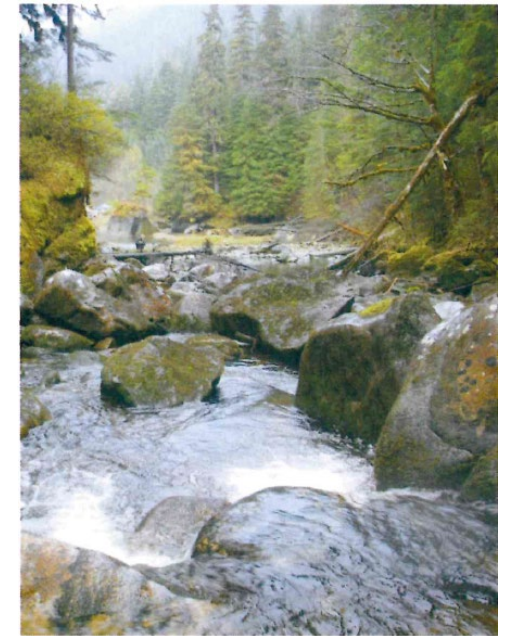
Aquatic Resources

Hidden Creek (~0.6 mi)

- Flows year-round
- Anadromous fish barrier ~RM 0.1
 - Hidden Creek 30-ft waterfall



- **Above barrier (RM 0.1-0.6)**
 - Moderate gradient (~4% average)
 - Cascades over boulders with pockets of pools and gravel substrate
 - Temperature: 0 – 12.5 °C
 - **Rainbow trout**
- **Below barrier (RM 0-0.1)**
 - Low gradient, intertidal
 - Cobble, gravel, sand and mud
 - Provides low quality spawning habitat for anadromous fish
 - **Pink, chum, and coho salmon; Dolly Varden, cutthroat trout, rainbow trout; sculpin**



Upper Hidden Creek looking downstream



Lower Hidden Creek at low tide

Aquatic Resources – Tailrace Creek

~1,100 ft long

Bed width = ~40 ft

Bankfull width = ~68 ft

Mean channel slope = 0.5%

Intertidal

Depth, velocity influenced by tidal stage and operations

e.g., at low tide:

Water depth = 0.5 – 2.5 ft

Velocity = 1.4 – 4.4 ft/s

Discharge = 79 (@11.4 MW) – 146 cfs (@19.8 MW)

Water quality heavily influenced by tidal stage, season

e.g., April 2016 low to higher tide:

Temperature = 3.5 to 8.3 °C

DO = 17.0 to 8.8 mg/L

pH = 6.0 to 7.6

Salinity = 0 to 17 ppt

Conductivity = 1 to 19,000 µs/cm

Substrate

Dominated by gravels > 0.75 in;

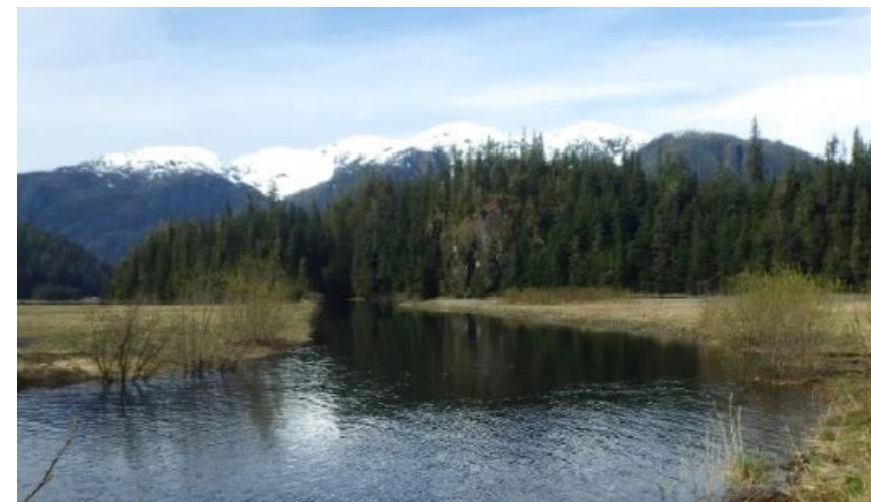
Sand < 10% at PH to 17% near Airstrip Slough

Greatest amount of sand found closest to

Airstrip Slough in most tidally-influenced areas



-1.5 ft tide view from powerhouse



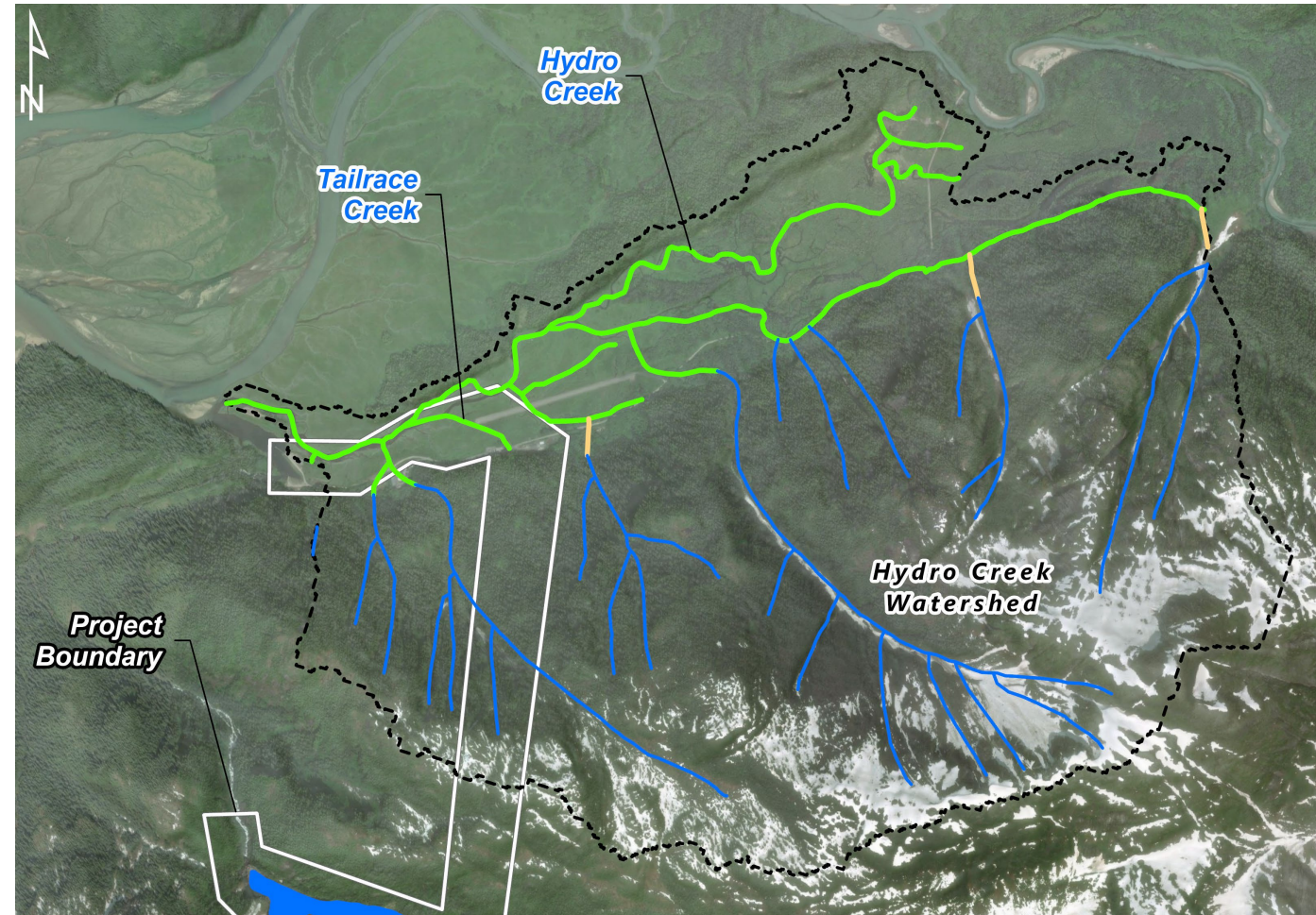
+18.5 ft tide view from powerhouse

Aquatic Resources – Tailrace, Airstrip Slough, Hydro Creek

Tailrace designed as experimental pink salmon spawning channel for mitigation for Hidden Creek anadromous habitat

ADFG monitoring concluded:

- Provides low-quality intertidal spawning habitat for a few pink salmon, mostly in the upper half of the channel less influenced by salt water.
- Channel will not continue to provide spawning habitat because no source of gravel.
- **Mitigation was not necessary because Hidden Creek has continued to flow year-round regardless of Tyee Lake discharges**

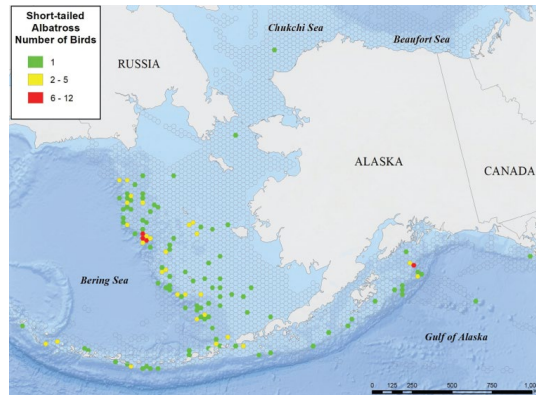


Tailrace and Hydro Creek: chum (p), pink (p), and coho (r)
Other species: Dolly Varden, sculpin, 3-spine stickleback, shrimp

Rare, Threatened and Endangered Species

- **ESA-listed species**

- Short-tailed Albatross (*Phoebastria albatrus*) – Endangered

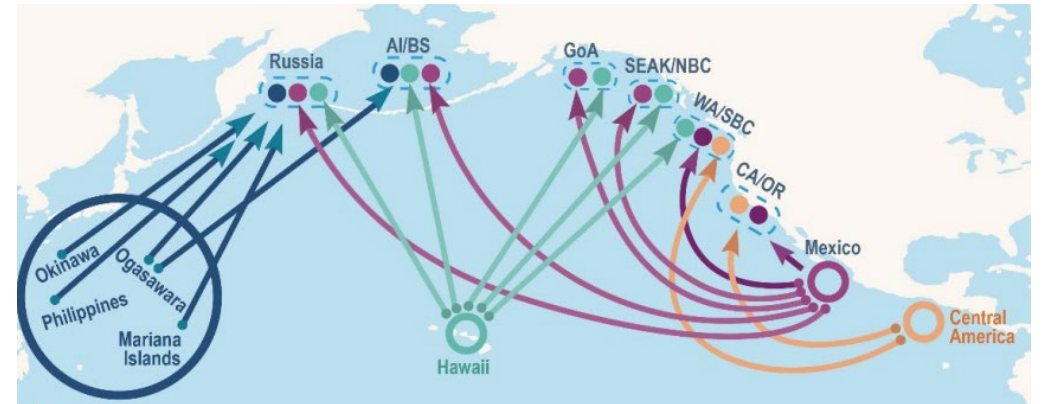


- **USFS Sensitive**

- Queen Charlotte Goshawk (*Accipiter gentiles laingi*)
- Black Oystercatcher (*Haematopus bachmani*)
- Stellar Sea Lion Eastern DPS (*Eumetopias jubatus*)

- **Marine mammals occur between Wrangell and Bradfield Canal**

- Humpback Whale Mexico DPS (*Megaptera novaeangliae*) - Threatened



Mexico-North Pacific Stock (light purple) feed in Southeast AK in summer. Annual human-caused mortality or serious injury to stock in SE AK is 0.101 whales from: fishing gear entanglement (0.04), marine debris entanglement (0.02), and vessel strikes (0.041).

Expected Potential Effects

Installation

- ~5 barges from Wrangell, potential water taxi to transport workers to site
 - Low potential for pollution to marine waters
 - Very low potential for vessel strike of humpback whales
- Use of existing facilities for transportation
- No major construction, no new ground-disturbing activities
- Implementation of BMPs
- No significant environmental impacts from installation

Tye Lake Water Surface Elevation

- Increase in drawdown rate but no change to minimum and maximum normal pool elevations
- Use of water within existing permitted water rights of 135,000 ac-ft/yr
- No impacts expected to water quality or Tye Lake Arctic grayling population

Expected Potential Effects

Downstream Flows to Tyee Creek and Upper Hidden Creek

- Use of water within existing permitted water rights of 135,000 ac-ft/yr
- Potential reduced occurrence of spill to Tyee Creek in wet years (spill currently does not occur annually)
- No significant impacts expected to Tyee Creek water quality
- Upper Hidden Creek anticipated to continue to flow year-round; no significant impacts expected to water quality or resident fish population

Downstream Flows to Lower Hidden Creek

- Lower Hidden Creek will continue to flow year-round and is intertidal; no significant impacts expected to water quality or resident or anadromous fish populations



Expected Potential Effects

Downstream Flows to Tailrace and Airstrip Slough

- Temporary increase of flow to Tailrace, Airstrip Slough and Hydro Creek by up to 117 cfs with operation of all three units at peak capacity
- Potential for local and temporary changes in water quality in areas least influenced by semi-diurnal tides during peak operations of all three units during low tides
- Potential improvement of available spawning gravel in Tailrace
- No significant impacts expected to water quality or salmon populations using the Tailrace, Airstrip Slough or Hydro Creek



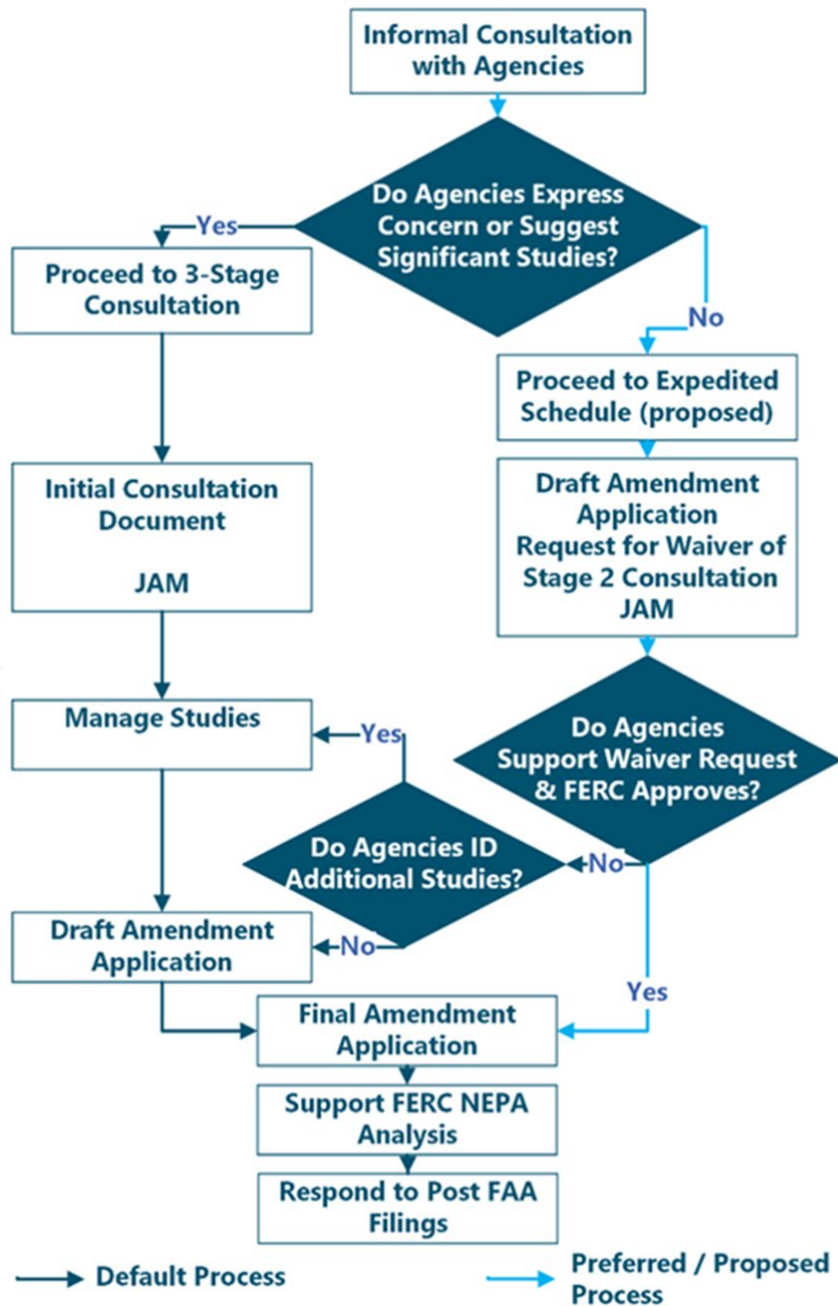


Questions



FERC Process

Proposed Regulatory Path



Early Consultation

- Address agency questions and concerns
- Discuss proposed schedule and process

Draft Amendment Application (in lieu of ICD)

- Continue Informal Consultation
- Propose Expedited Schedule and Process
- Request for Waiver of Stage 2 Consultation
- Joint Agency Meeting

Final Amendment Application

Request for Waiver of Stage 2 Consultation

Seeking agency/stakeholder support and concurrence that:

- 1) Studies are not needed to assess resource impacts from installation and operation of a third unit
- 2) Agency/stakeholder supports a waiver of the second stage of consultation so that SEAPA can proceed directly to a Final Amendment Application. This would expedite installation of the third unit.
- 3) Agency/stakeholder supports use of the PDEA in lieu of the Exhibit E in the Final Amendment Application. This may also expedite approval of the amendment.

Proposed Amendment Schedule

- **Early Consultation – Aug/Sept 2024**
- **Draft Amendment Application – Oct 8, 2024**
 - Propose Expedited Schedule and Waiver of Stage 2 Consultation
- **Joint Agency & Public Meeting – Nov 14, 2024**
- **Continue Informal Consultation – Oct - Dec 2024**
- **Agencies comments/letters of support – Dec 9, 2024** (60 days from DAA)
- **Request to FERC for Waiver of Stage 2 Consultation**
- **Final Amendment Application – Jan 2025** (if Stage 2 waived)





Questions

Thank you

