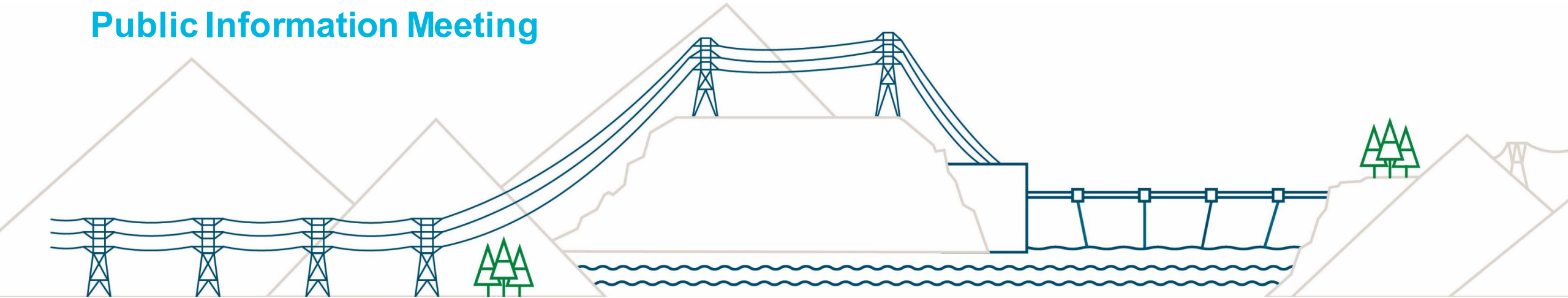


Cheakamus Water Use Plan Order Review

Public Information Meeting



June 1, 2021

Meeting Objectives

- Provide an overview of next steps in the WUPOR process
- Provide an overview of preliminary priority issues for the Cheakamus Water Use Plan Order Review (WUPOR)

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Agenda

- Welcome & Introductions
- WUPOR Overview
- Preliminary Priority Issues List
- Next Steps
- Q&A

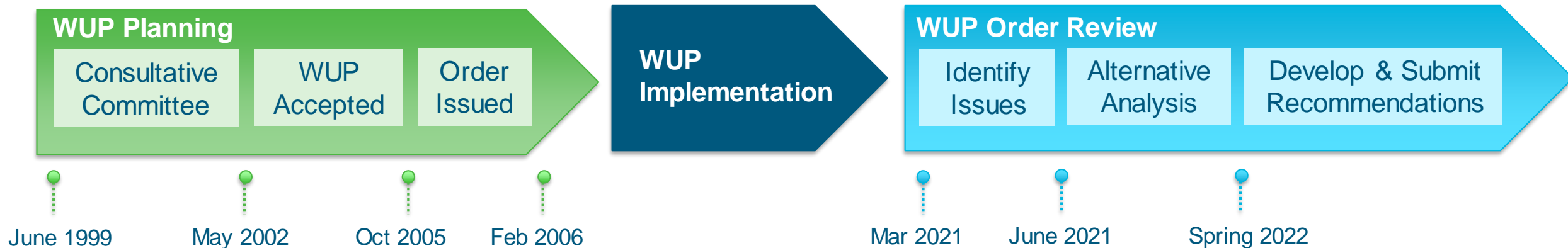
WUPOR Overview



What is the Process for the Review?

WUPOR has three phases

- 1. Issues Identification:** Identify priority issues to focus on in the WUP Order Review
- 2. Alternative Analysis:** Develop and evaluate alternative hydro operations along with other actions that could address those issues using Structured Decision Making (SDM) methods
- 3. Recommendations:** Informed by the analysis of alternatives, develop and submit recommendations to the Water Comptroller on proposed adjustments to the Cheakamus WUP Order



Cheakamus WUP Background

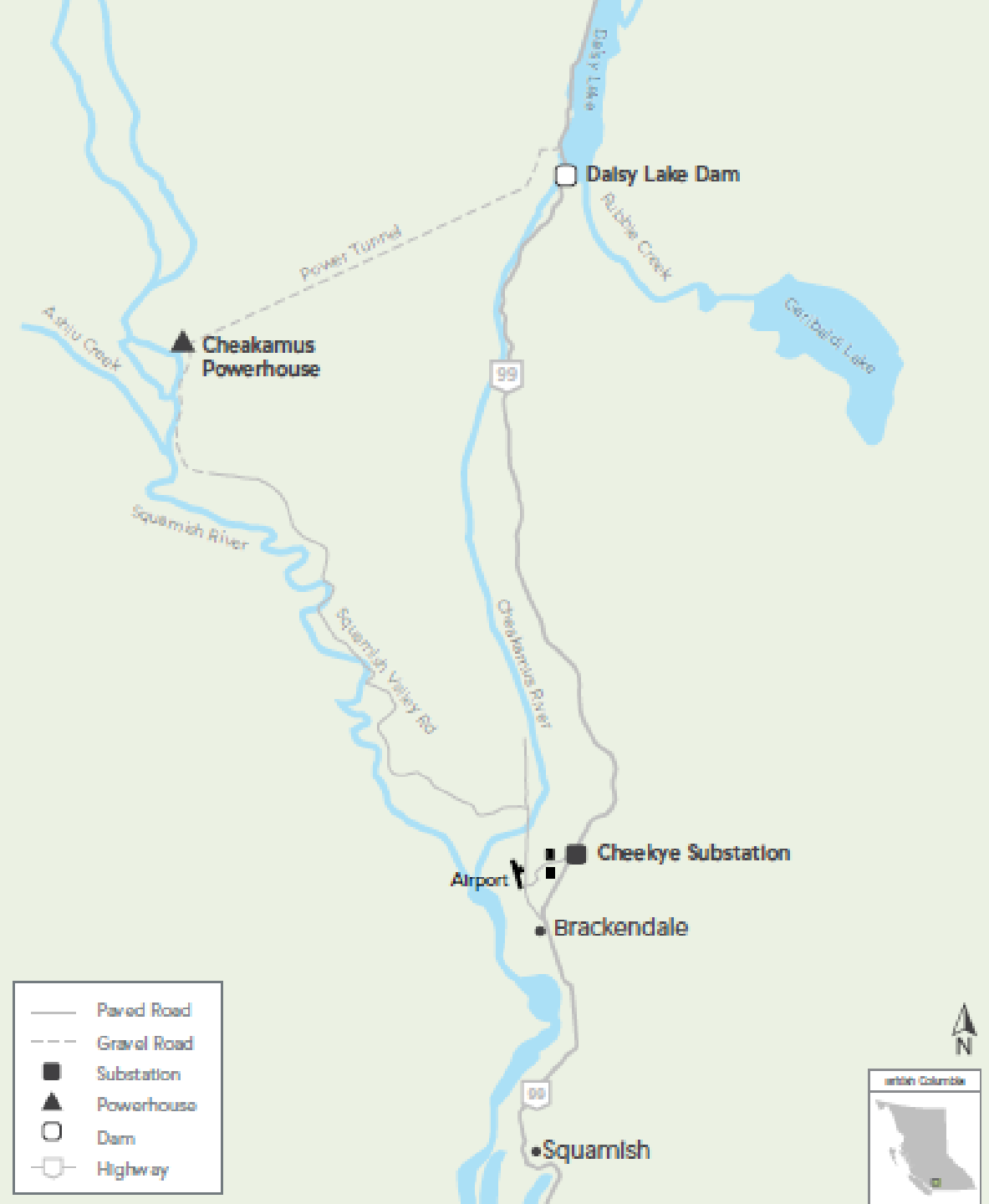
The Cheakamus WUP aimed to balance multiple interests

1. **Fish:** Maximize wild fish populations.
2. **Aquatic Ecosystem:** Maximize area and integrity of the aquatic and riparian ecosystem
3. **First Nations:** Protect integrity of Squamish Nation's heritage sites and cultural values
4. **Flooding:** Minimize adverse effects of flood events through operation of the Cheakamus Generating system.
5. **Recreation:** Maximize physical conditions for recreation.
6. **Power:** Maximize economic returns from power generated at Cheakamus Generating System.

Cheakamus WUP Order

WUP Order has regulated Cheakamus hydro operations since 2006

- Maximum reservoir levels in Daisy Lake
- Minimum releases from Daisy Lake Dam
- Minimum flows at Water Survey Canada gauge near Brackendale
- Maximum ramping rates



Identifying Issues

Multiple inputs

- Consultative Committee Report (2002) and Cheakamus Water Use Plan (2005)
- New information obtained since the Order was issued:
 - Results of ten WUP monitoring studies required in the Order
 - Results of the Cheakamus Adaptive Stranding Protocol
 - Operational Experience
- Input from Squamish Nation, regulators and stakeholders

WUPOR Issues Identification

Preliminary issues list

Issues have been organized according to WUP objectives

- Power Production
- Flooding
- Recreation
- Cultural Values & Resources
- Fish & Aquatic Ecosystem

Priority Issues

POWER PRODUCTION:

- Power generation revenue is a consideration that will be modeled in scenarios
- Ramping rates & operational flexibility are key considerations

FLOODING:

- Review and discussion of effectiveness of WUP order requirements for flooding.

RECREATION:

- Angling considerations – review of results of study conducted
- Review and discussion of recreational flows defined in the order for rafting, kayaking.

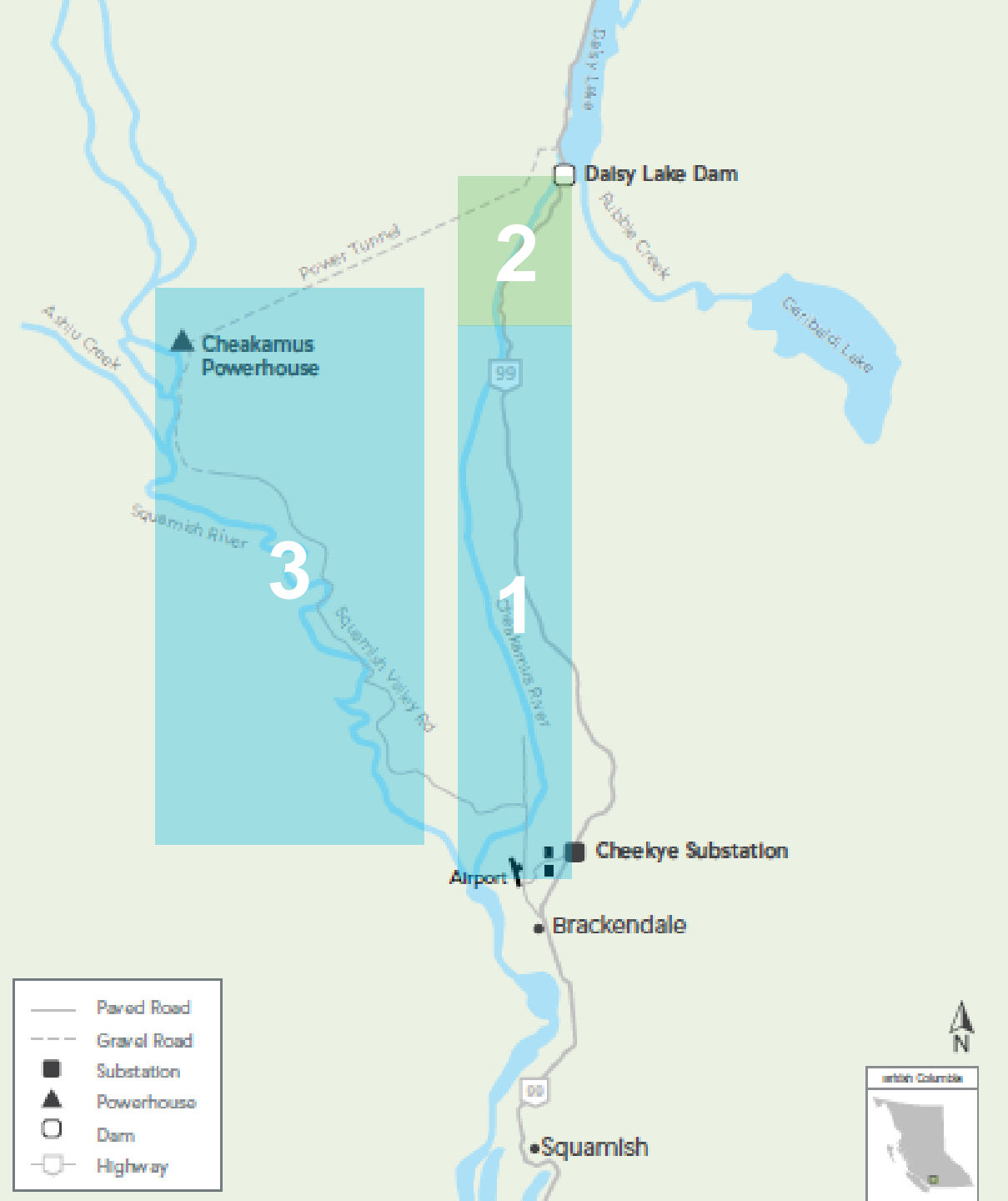
CULTURAL VALUES:

- Collaboration with Indigenous groups is planned in order to define and develop this set of priority issues.

Priority Issues

FISH & AQUATIC ECOSYSTEM

1. Anadromous reaches of Cheakamus River
2. Resident reaches of Cheakamus River
3. Squamish River (Generating Station to Brackendale gauge)



Monitoring Studies

Fish & Aquatic Ecosystem

10 WUP Monitoring studies (2007-2019)

- Conducted to provide insight into uncertainties regarding the potential effects of WUP flows on:
 - Juvenile salmon productivity
 - Fish habitat availability
 - Recreational angling

Cheakamus Adaptive Stranding Protocol (2018-Ongoing)

- better understand the conditions resulting in fish stranding
- test the effectiveness of operational mitigation measures
- identify mitigation options for consideration for long-term implementation.

Monitoring Studies

Examined Fish Populations, their Habitat and Stranding

- Chinook, Coho & Pink Salmon adult and juvenile abundance
- Steelhead escapement & egg to juvenile survival

Fish Productivity

- Side channel groundwater
- Channel morphology
- Benthic community/productivity

Fish Habitat

- Stranding monitoring (CASP)
- Stranding potential (Squamish River)

Fish Stranding

- Recreational Angling Surveys & Assessment

Priority Issues

FISH & AQUATIC ECOSYSTEM

Fish Stranding

- Ramping rate and timing influence stranding risk on Cheakamus River
- Squamish River discharge is influenced by powerhouse ramping in winter

Fish Productivity

- WUP minimum flows may influence abundance of salmon (e.g. spawn timing, available habitat, stranding)
- Large variation in flow influences steelhead juvenile abundance
- Weather driven storm events influences juvenile salmon abundance

Fish Habitat

- WUP minimum flows influence the amount and quality of habitat
- Food availability (e.g. benthic productivity) and WUP flow
- Groundwater fed side channels and WUP flows

Next Steps

Next Steps

- Setup the Order Review Advisory Committee
- Finalize engagement process with Squamish Nation
- Ongoing public engagement



BC Hydro

Power smart