Regional Community Liaison Committee Project Briefing

December 7, 2022

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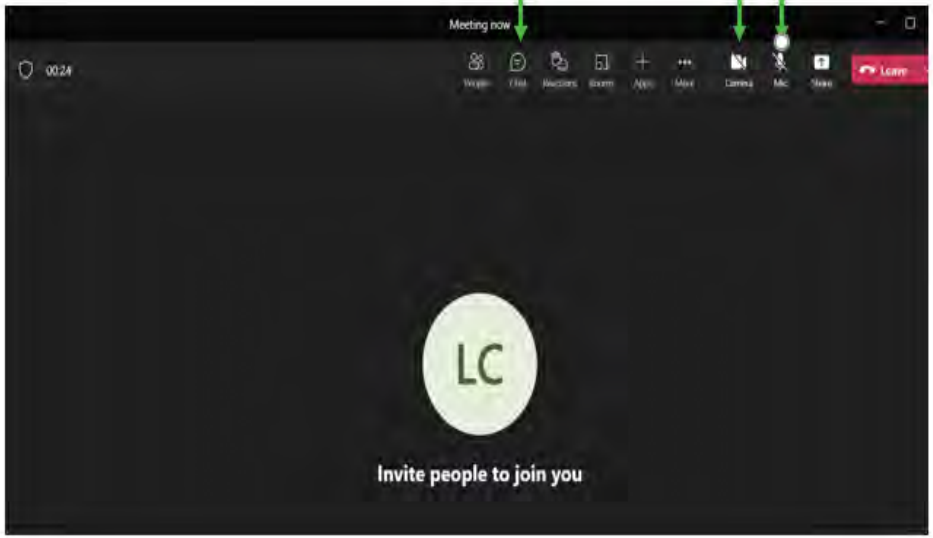
Microsoft Teams Reminders

We'll be using a few basic tools, which you can find on your screen

open chat box for q's & feedback

turn video on/off & mute/unmute mic



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AGENDA

Opening & Welcome (Bob Gammer)	1:30 PM
Review of Agenda & Action Items (Bob Gammer)	1:35 PM
Dam Off-site Construction Update (Katrina Kelly) o Highway 29 Realignment o Boat Launches o Berm Update o Reservoir Clearing Work	1:40 PM
Dam On-site Construction Update (Chris Waite) o Main Civil Works o Right Bank	1:55 PM
Reservoir Filling (Chris Hatton)	2:05 PM
BREAK (Optional)	2:30 PM
Regulatory Update (Karen Von Muehldorfer)	2:40 PM
Employment Forecast (Krista Drost)	2:50 PM
Jobs and Businesses Update (Kate O'Neil)	3:00 PM
Contractor Updates	3:05 PM
Roundtable (Committee members)	3:15 PM
Next Steps & Closing (Bob Gammer) o Next meeting – March 1 or March 8	3:25 PM

December 7, 2022

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Regional Community Liaison Committee

Action Items Tracking Log: January – December 2022

Item No.	Action Item	Responsibility	Meeting Date	Status / Outcome*
2022-001	Matt Drown to confirm the dates, details and public access to the trails around the berm and D.A. Thomas Road area with Mayor Heiberg.	Matt Drown	March 16, 2022	**Complete.** Matt Drown provided a verbal update, September 21. Matt confirmed that he and Ben Rauscher had met with Rahul from the District of Hudson's Hope and agreed on the areas of the berm that would be open and not open to public access. At the last CEC meeting (May 18, 2022) we committed to schedule a meeting with DoHH staff on site at the berm to discuss trail access following berm construction (summer 2022) and prior to recreational site construction (summer 2023).
2022-006	James Thomas to confirm how the land at Wilder Creek will be put back in to use after the fish habitat is created.	James Thomas	June 15, 2022	**Complete.** The land will be leased to a farmer to ensure it remains in agricultural production.
2022-009	Mayor Fraser asked what happens to the insulating panels used to cure the concrete on the Buttress	Chris Waite	June 15, 2022	**In Progress:** Chair Sperling reminded the committee this item had been brought up at the June meeting and wanted to know the status of it. He said it shouldn't end up in the regional landfill. An update on this is expected for the December meeting.
2022-010	Karen Goodings asked for an explanation of how a dam built at right angles is designed and how is it secure	Chris Waite		**In Progress:**

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Off Dam Site Construction Update

Katrina Kelly

- Highway 29 Realignment
- Boat Launches
- Hudson's Hope Shoreline Protection
- Reservoir Clearing

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Construction Schedule Start to Finish

Lynx Creek – 8.1 km	**2019 to 2023**	**Halfway River – 3.7 km**	**2018 to 2023**
Dry Creek - 1.4 km	**2020 to 2022**	**Cache Creek West – 4.0 km**	**2018 to 2020**
Farrell Creek – 1.9 km	**2020 to 2022**	**Cache Creek East – 8.6 km**	**2019 to 2023**
Farrell Creek East – 3.0 km	**2021 to 2022**	**Highway decommissioning:**	**2022 to 2023**

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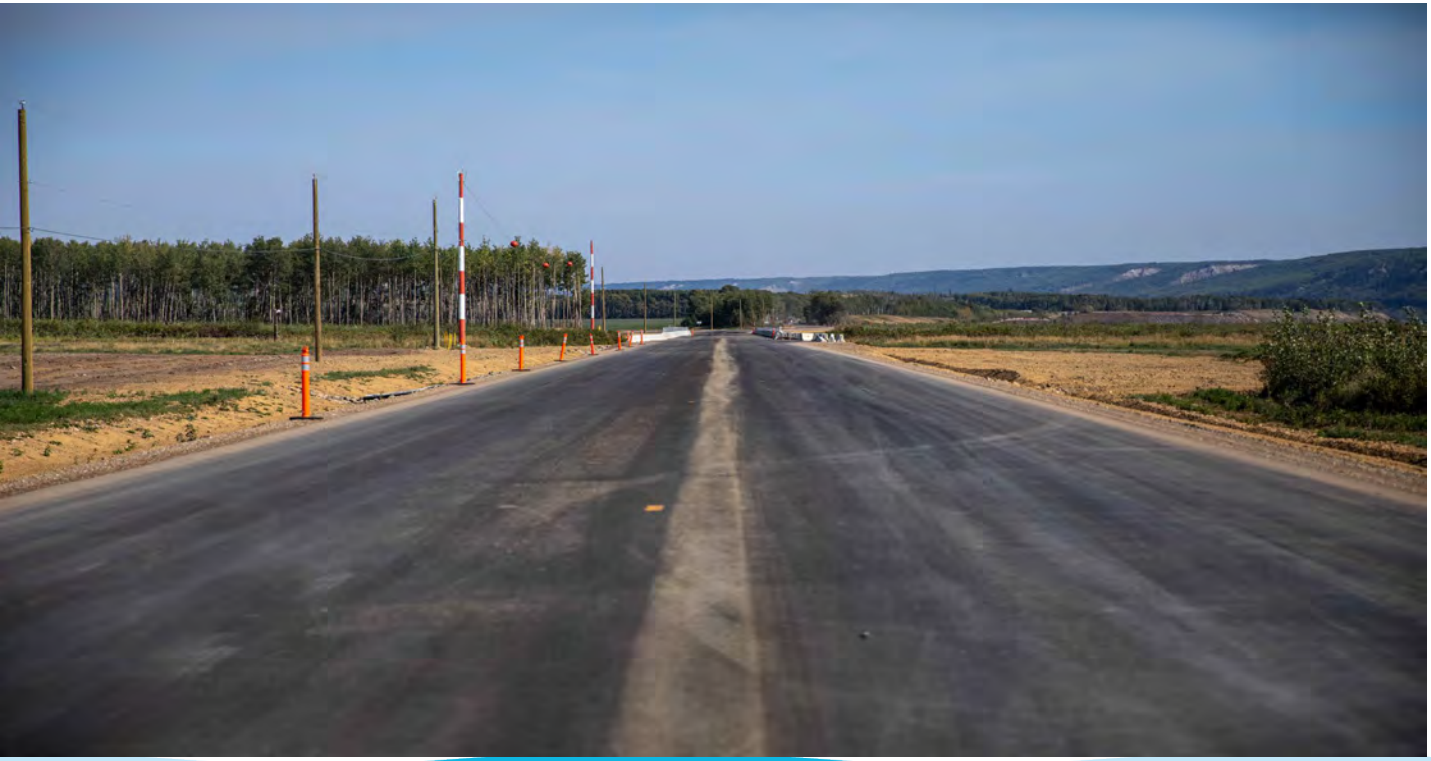
Highway 29 Cache Creek Realignment
Opened to Traffic

Highway 29 Realignment:
Cache Creek Bridge Complete

Highway 29 Realignment:
Halfway River Bridge

Highway 29 Realignment:
Farrell Creek Bridge – Open to Traffic

Highway 29 Realignment:
Dry Creek Bridge - Complete



Highway 29 Realignment:

Lynx Creek East Embankment – Opened to Traffic

Highway 29 Realignment:

Lynx Creek Bridge West-Facing - Complete

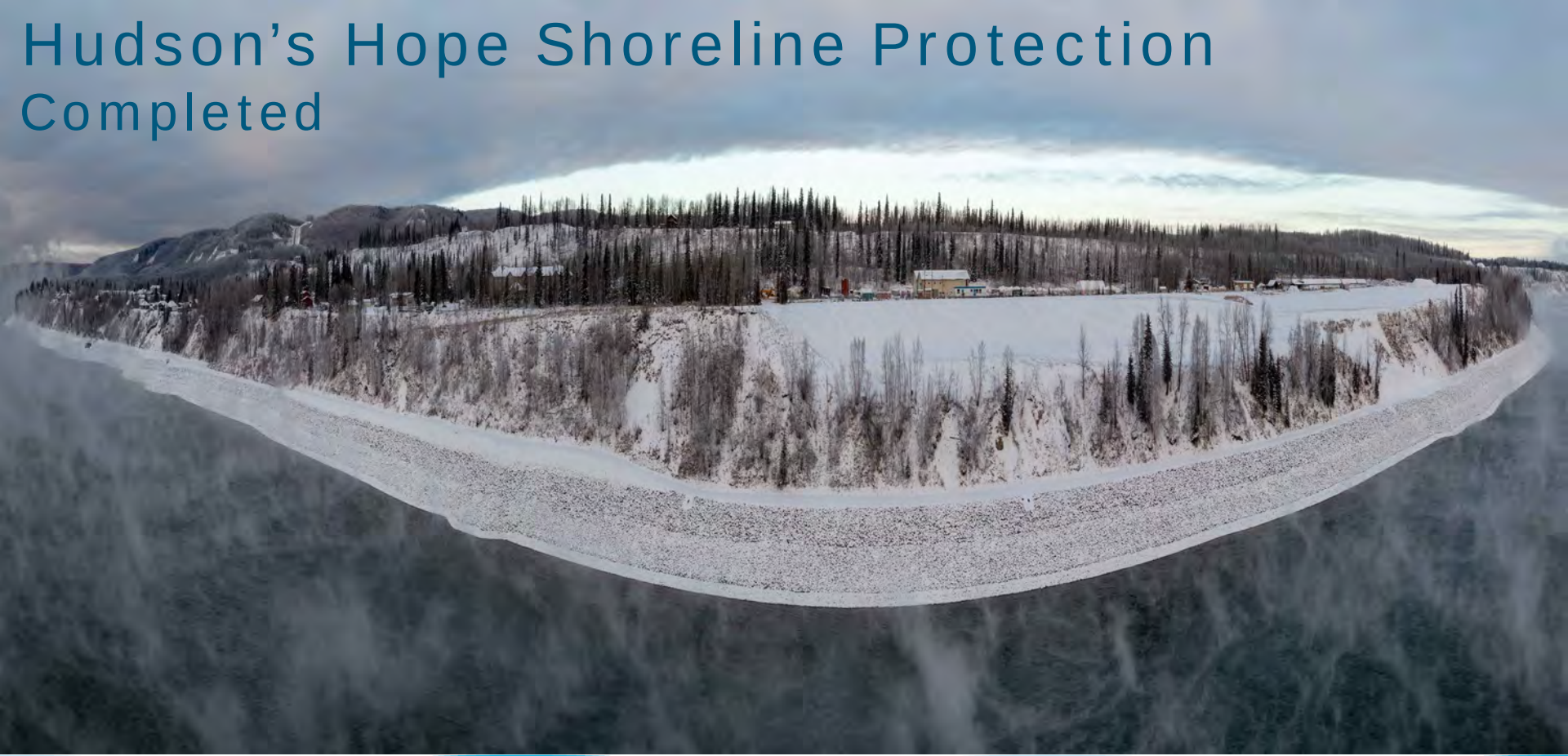
Highway 29 Realignment:
Lynx Creek Bridge East-Facing

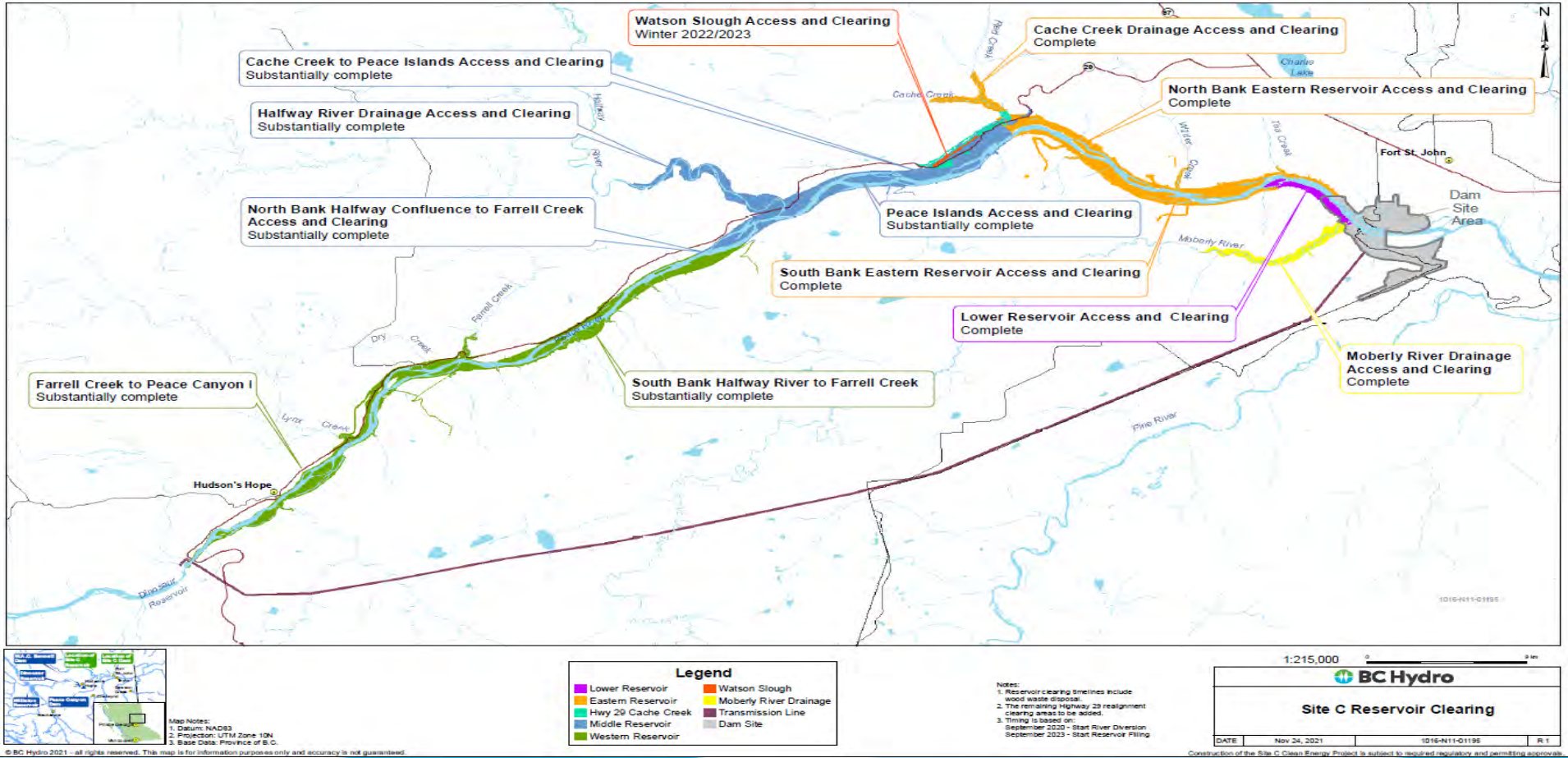
Halfway River Boat Launch

Lynx Creek Boat Launch

Hudson’s Hope Shoreline Protection

Completed




Watson Slough Access and Clearing
Winter 2022/2023
Cache Creek Drainage Access and Clearing
Complete
Cache Creek to Peace Islands Access and Clearing
Substantially complete
North Bank Eastern Reservoir Access and Clearing
Complete
Halfway River Drainage Access and Clearing
Substantially complete
Fort St. John
Dam Site Area
North Bank Halfway Confluence to Farrell Creek Access and Clearing
Substantially complete
Peace Islands Access and Clearing
Substantially complete
South Bank Eastern Reservoir Access and Clearing
Complete
Lower Reservoir Access and Clearing
Complete
Moberly River Drainage Access and Clearing
Complete
Farrell Creek to Peace Canyon I
Substantially complete
South Bank Halfway River to Farrell Creek
Substantially complete
Hudson's Hope
Peace River
Dinosaur Reservoir
Legend
Lower Reservoir
Eastern Reservoir
Hwy 29 Cache Creek
Middle Reservoir
Western Reservoir
Watson Slough
Moberly River Drainage
Transmission Line
Dam Site
Notes:
1. Reservoir clearing timelines include wood waste disposal.
2. The remaining Highway 29 realignment clearing areas to be added.
3. Timing is based on:
September 2020 - Start River Diversion
September 2023 - Start Reservoir Filling
Map Notes:
1. Datum: NAD83
2. Projection: UTM Zone 10N
3. Base Data: Province of B.C.
1:215,000
BC Hydro
Site C Reservoir Clearing
DATE
Nov 24, 2021
1016-N11-01195
R1
© BC Hydro 2021 - all rights reserved. This map is for information purposes only and accuracy is not guaranteed.
Construction of the Site C Clean Energy Project is subject to required regulatory and permitting approvals.

Questions?

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Dam Site Construction Update

Chris Waite

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Dam Site Construction Update

- Dam Construction
- Approach Channel
- Foundation Enhancement Pile Installation
- Spillway, Intakes and Penstocks
- Powerhouse
- Transmission Towers

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Dam Construction

Dam Construction:
85th Avenue Glacial Till Extraction

Approach Channel

Foundation Enhancement - Tailrace

Permanent Upstream Fish Passage

Spillways, Intakes, Penstocks

Intakes

Penstocks

Unit 1 Turbine Runner

The First of Six Runners is Installed

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Unit 1 Turbine Shaft

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Isophase Bus Installation

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38kv Disconnects

Between Generator Circuit Breaker and Generator Step-up Transformers

Transmission Towers

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Site C - Reservoir Filling

Chris Hatton

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Objective:

Safe tunnel conversion and filling of the Site C reservoir to meet the project schedule while minimizing risks to the project, the environment, upstream facilities, and the greater BC Hydro System

Steps:

Complete the work required for reservoir filling:

- Sufficiently complete required construction activities
- Prepare the Peace River system (Peace Canyon and GMS facilities)

Convert the Tunnel:

- Safely convert Tunnel #2 over 2 months

Fill the Reservoir:

- Upon completion of tunnel conversion, and within the reservoir filling window, complete the controlled filling of the reservoir over approximately 4 months

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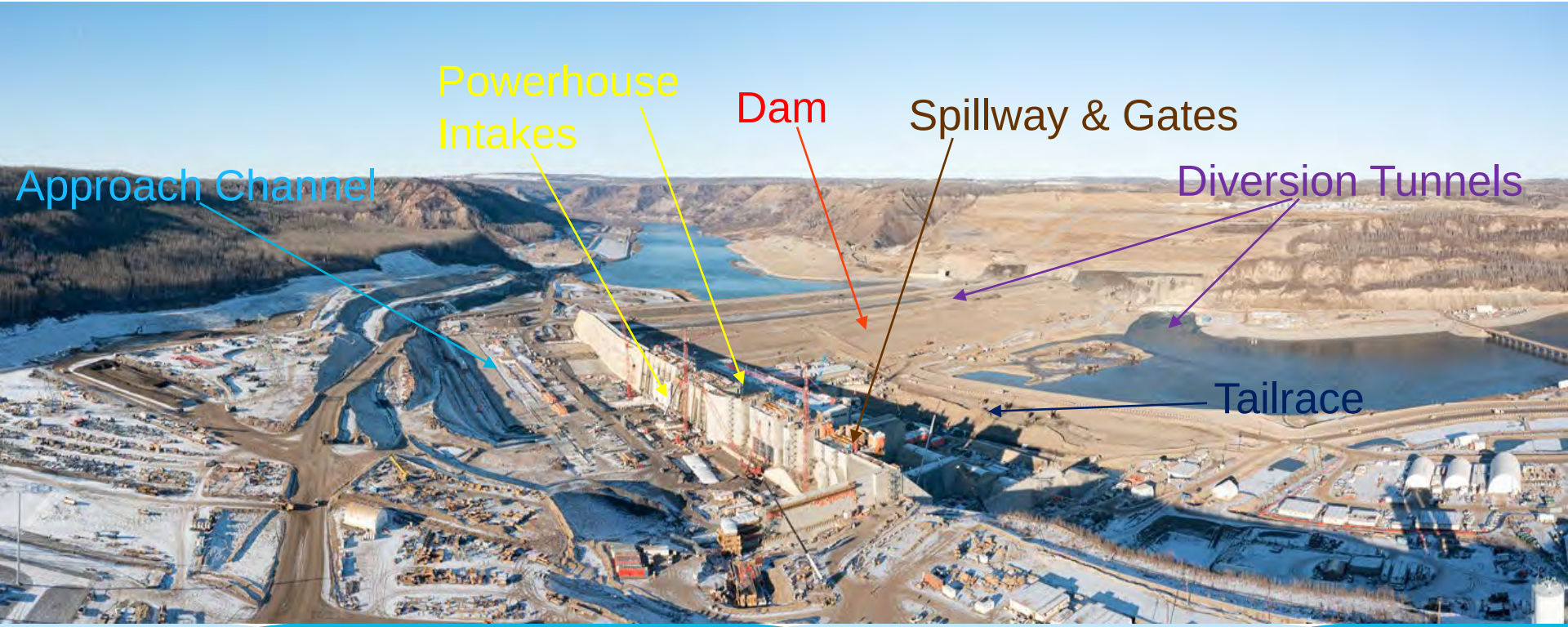
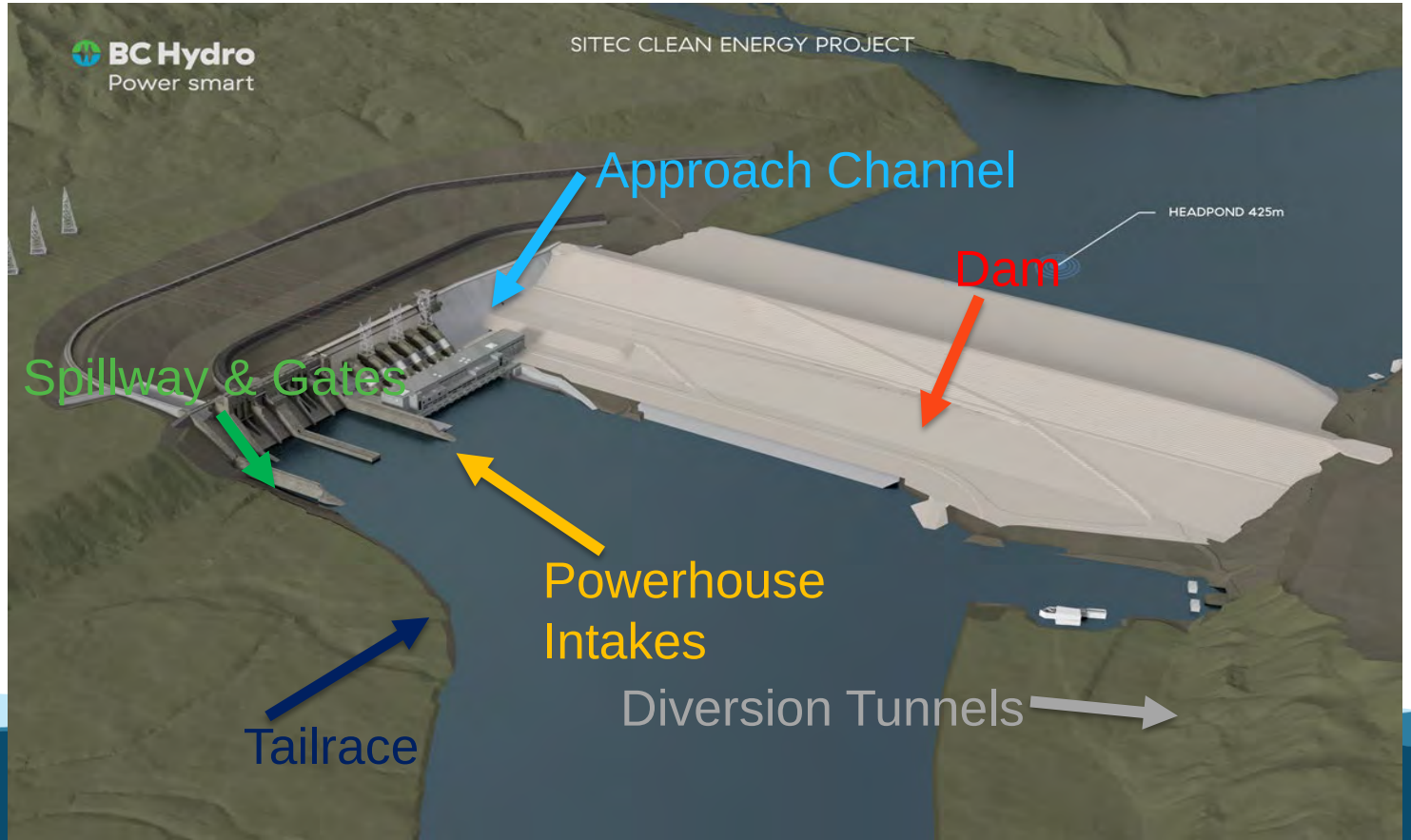
Conversion Plan – Complete the work



Conversion Plan – Complete the work



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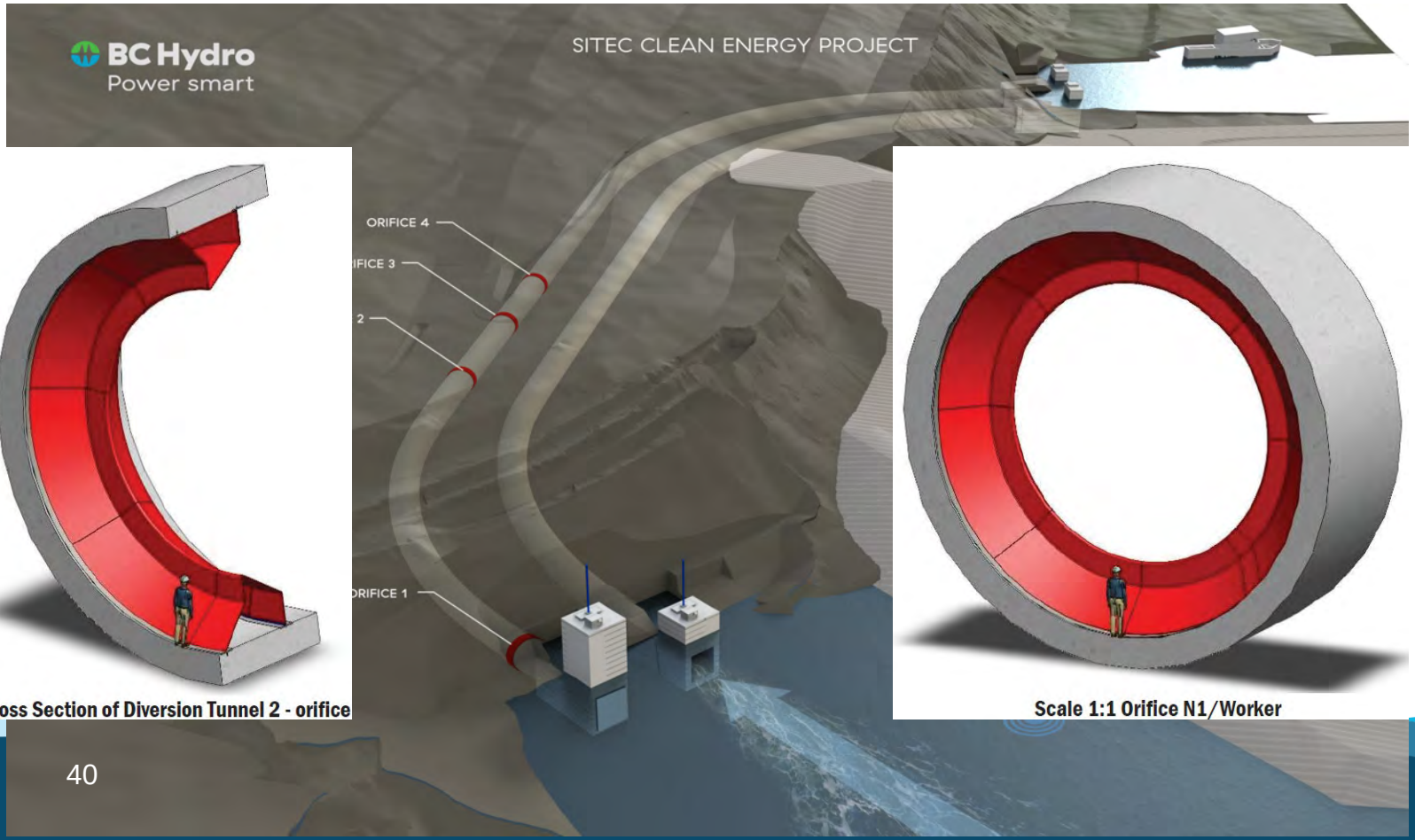
Tunnel Conversion

Cross Section of Diversion Tunnel 2 - orifice



Scale 1:1 Orifice N1/Worker

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What impacts reservoir filling?

- **Environmental constraints**
- **Weather**
- **Operation Constraints**
- **Construction progress**

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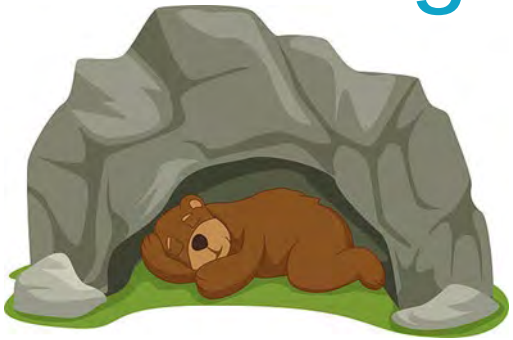
What impacts reservoir filling?

- **Environmental constraints**
- Weather
- Operational constraints
- Construction progress



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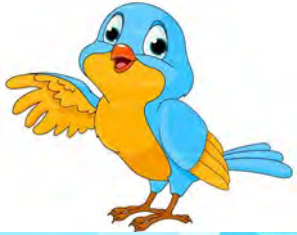
What impacts reservoir filling?

- Environmental constraints

- **Weather**



- Operational constraints
- Construction progress

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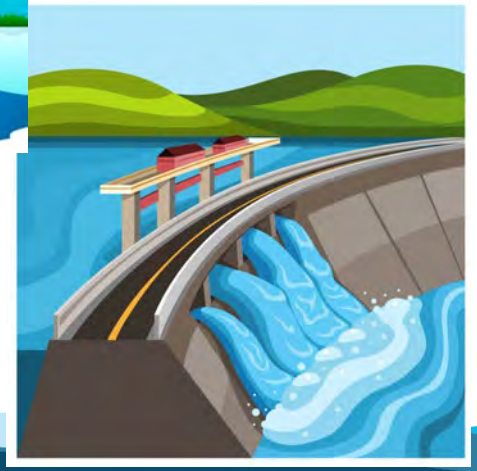
What impacts reservoir filling?

- Environmental constraints

- Weather

- **Operational constraints**



- Construction progress

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What impacts reservoir filling?

- Environmental constraints

- Weather

- Operational constraints

- **Construction progress**

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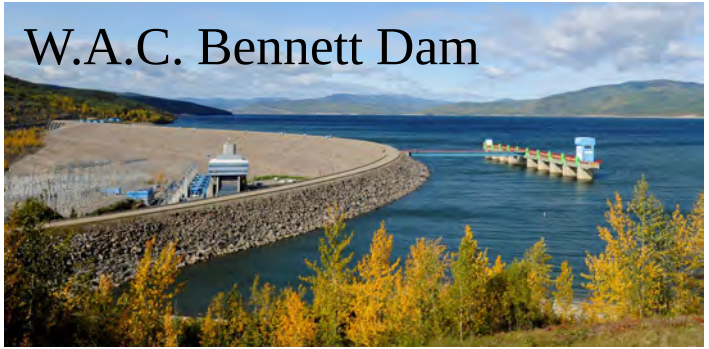
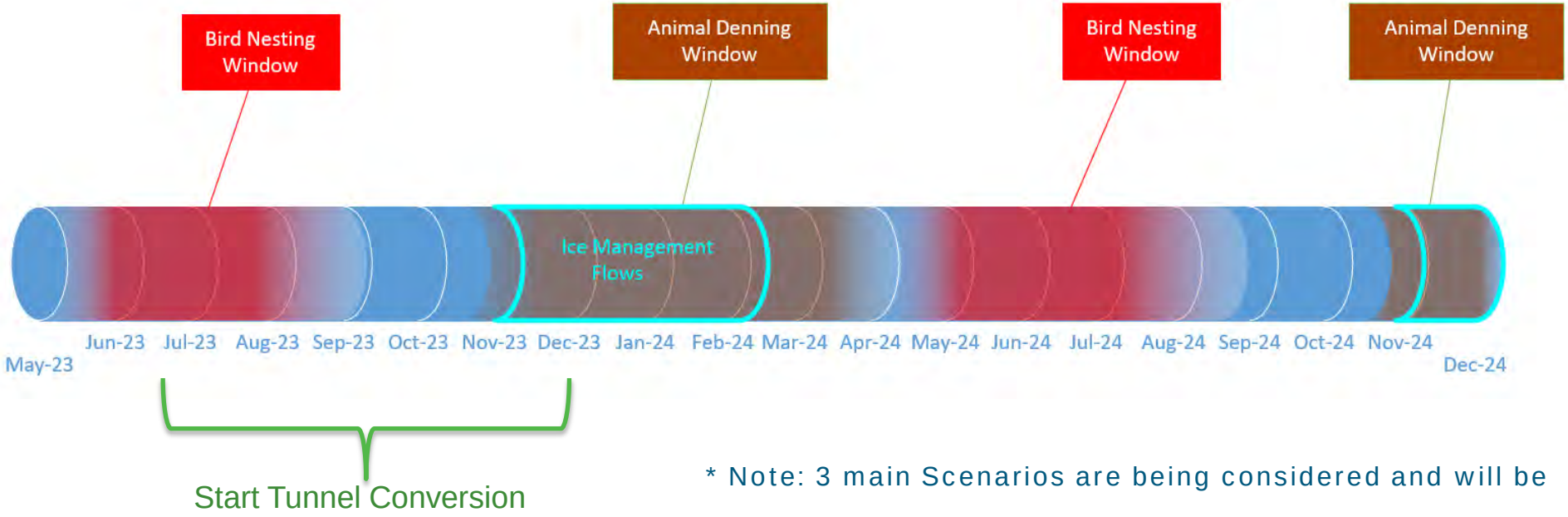
Water Management on the Peace River

- Williston Reservoir – 60% of BC Hydro energy storage
- GM Shrum & Peace Canyon generating stations – 30% of BC Hydro capacity
- Williston basin runoff: 50% snowmelt, 50% rainfall
- Multi-year reservoir operation
- Discharge is constrained by downstream ice formation/break-up in the winter



Constraints for Conversion and Filling



* Note: 3 main Scenarios are being considered and will be covered in future presentations

2022/23 Construction – Scenarios

Considering the constraints there are three scenarios for timing of the conversion and filling works

Scenario 1	Scenario 2	Scenario 3
Convert in 2023, reservoir fill in 2023	**Convert in 2023, reservoir fill in 2024**	**Convert in 2024, reservoir fill in 2024**
• Tunnel 1: Gates closed in fall 2023 • Tunnel 2: Orifices installed in fall 2023, then Tunnel #1 gates closed for reservoir filling	• Tunnel 1: Gates remain open until fall 2024 • Tunnel 2: Orifices installed in fall 2023, then Tunnel #2 gate re-opened and remains open until reservoir filling in fall 2024	• Tunnel 1: Gates remain open until fall 2024 • Tunnel 2: Orifices installed in 2024, then the Tunnel #1 gates are closed for reservoir filling in late summer/fall 2024

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EAC Amendment - Retaining Temporary Structures

Karen von Mueldorfer

EAC Amendment - Retaining Temporary Structures

Reservoir clearing crossing

Cache Creek Diversion Channel

- The project's EAC allows for the construction of temporary structures to support project activities, including:
  - causeways to access islands for reservoir clearing
  - causeways to access river material for construction of Highway 29 realignment
  - bridges with bridge abutments and riprap
  - stream diversion channels to avoid Highway 29 realignment construction sites
  - debris management infrastructure (debris piles)

Proposed EAC Amendment Retaining Temporary Structures

- Condition 4 of the EAC requires that the Fisheries and Aquatic Habitat Management Plan include a clause requiring that **temporary structures be removed "as soon as they are no longer required"**
- In some cases, removing these structures may result in greater environmental harm than leaving them in place for reservoir filling
- For example, removing structures can increase the risk of:
    - sedimentation during in-stream works
    - disturbance to banks or river-bed
    - potential spill from equipment working in/near water

Proposed EAC Amendment Retaining Temporary Structures

Therefore, BC Hydro is proposing to leave temporary structures in place, to be inundated, if:

- **removing the structure will result in harm to fish and fish habitat, and/or**
- **leaving the structure in place will provide a benefit to fish**

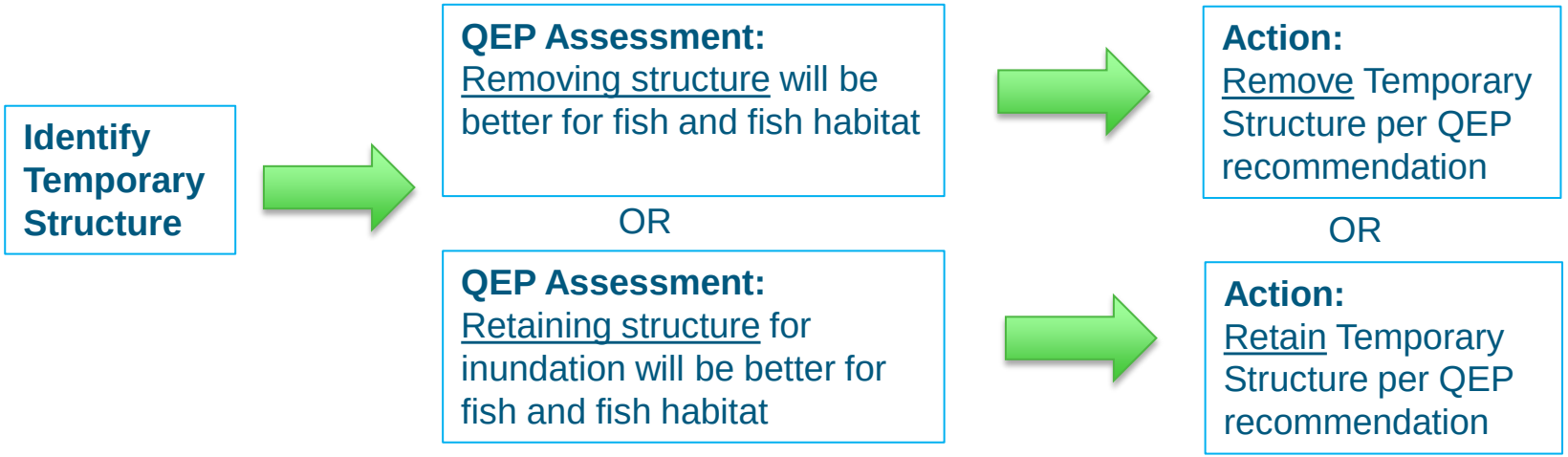
Any structures that will potentially be retained for reservoir filling will be assessed by a Qualified Environmental Professional.

Proposed EAC Amendment
Retaining Temporary Structures

Existing EAC Text – Condition 4	Proposed EAC Text – Condition 4
The EAC Holder must manage harmful Project effects on fish and fish habitats during the construction and operation phases by implementing mitigation measures detailed in a Fisheries and Aquatic Habitat Management Plan. The Fisheries and Aquatic Habitat Management Plan must be developed by a QEP. The Fisheries and Aquatic Habitat Management Plan must include at least the following: • Remove temporary structures **as soon as they are no longer required.**	The EAC Holder must manage harmful Project effects on fish and fish habitats during the construction and operation phases by implementing mitigation measures detailed in a Fisheries and Aquatic Habitat Management Plan. The Fisheries and Aquatic Habitat Management Plan must be developed by a QEP. The Fisheries and Aquatic Habitat Management Plan must include at least the following: • Remove temporary structures **as soon as they are no longer required, unless removing the structure is likely to result in harm to fish and fish habitat, and/or retaining the structure will provide a benefit to fish, as assessed by a Qualified Environmental Professional.**

Proposed EAC Amendment
Retaining Temporary Structures

Decision Process for Retaining Temporary Structures



Proposed EAC Amendment Retaining Temporary Structures

- **Next Steps**
  - Early December - BC Hydro will share a draft EAC Amendment Application with Indigenous Nations for feedback
  - BC Hydro is developing a list of proposed structures to be left in place for review by a QEP
  - Late January – submit final EAC Amendment request to EAO

Questions?

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Site C Construction Employment Forecast

Krista Drost

Site C Project Construction Employment Forecast

- As of September 30, 2022 the project is approximately 70% complete
- Although there is still a lot of work to complete in 2023, employment will start to trend down from our recent project high of 5,554 in October 2022.

Workforce Composition

- Total workforce decrease due to the completion of on and off site works
- We will see the composition of the workforce change.
- Civil trades such as heavy equipment operators and truck drivers will decrease in numbers while still remaining key to project success

Trades Required: 2023

- Other skilled trades will make up a higher proportion of the smaller work force
- The percentage of trades such as carpenters, labourers and ironworkers will increase
- Majority of these trades will mainly be employed by AFDE
- AFDE will continue to have consistent similar trade requirement throughout the first half of 2023.

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Trades Required: 2023

- Boilermakers will decrease as penstock and scroll casings are completed.
- Turbines and generator work will increase slightly and shift to more millwrights, pipefitters and electricians/winders
- Balance of Plant work will increase and will require trades such as welders, insulators, carpenters, mechanics, pipefitters, electricians

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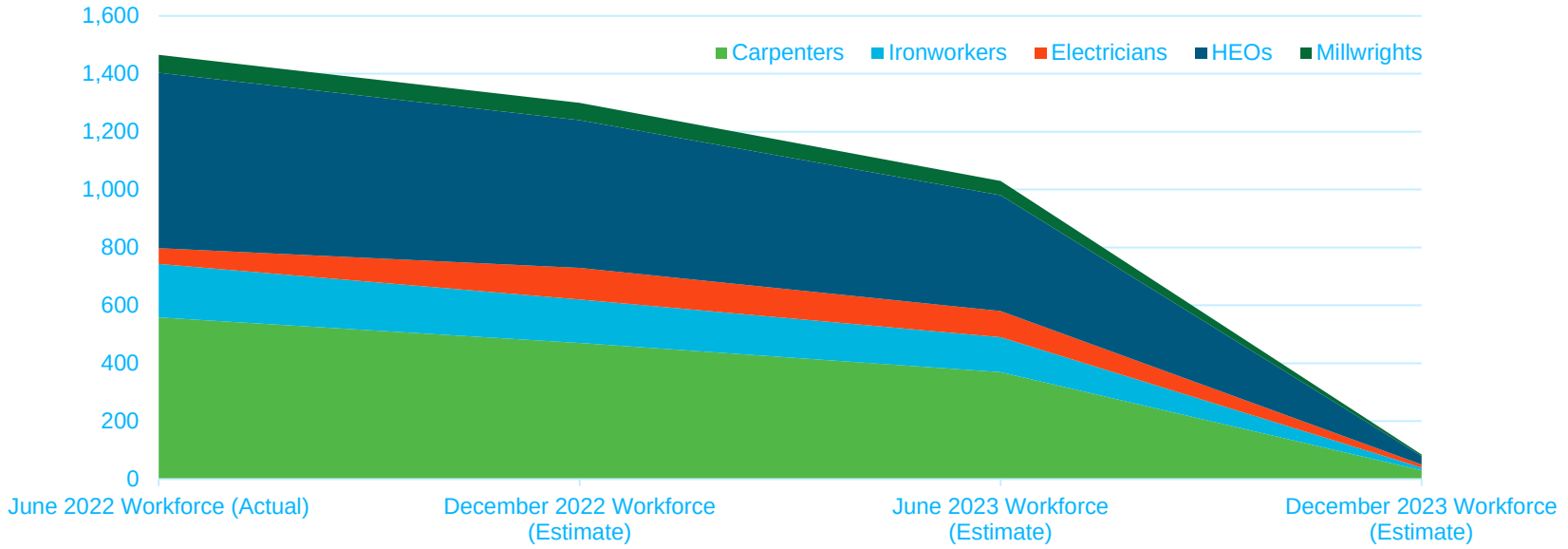
Workforce Composition

Site C Key Trades Estimates: AFDE, PRHP, Voith, BoP



** Not a total project workforce number

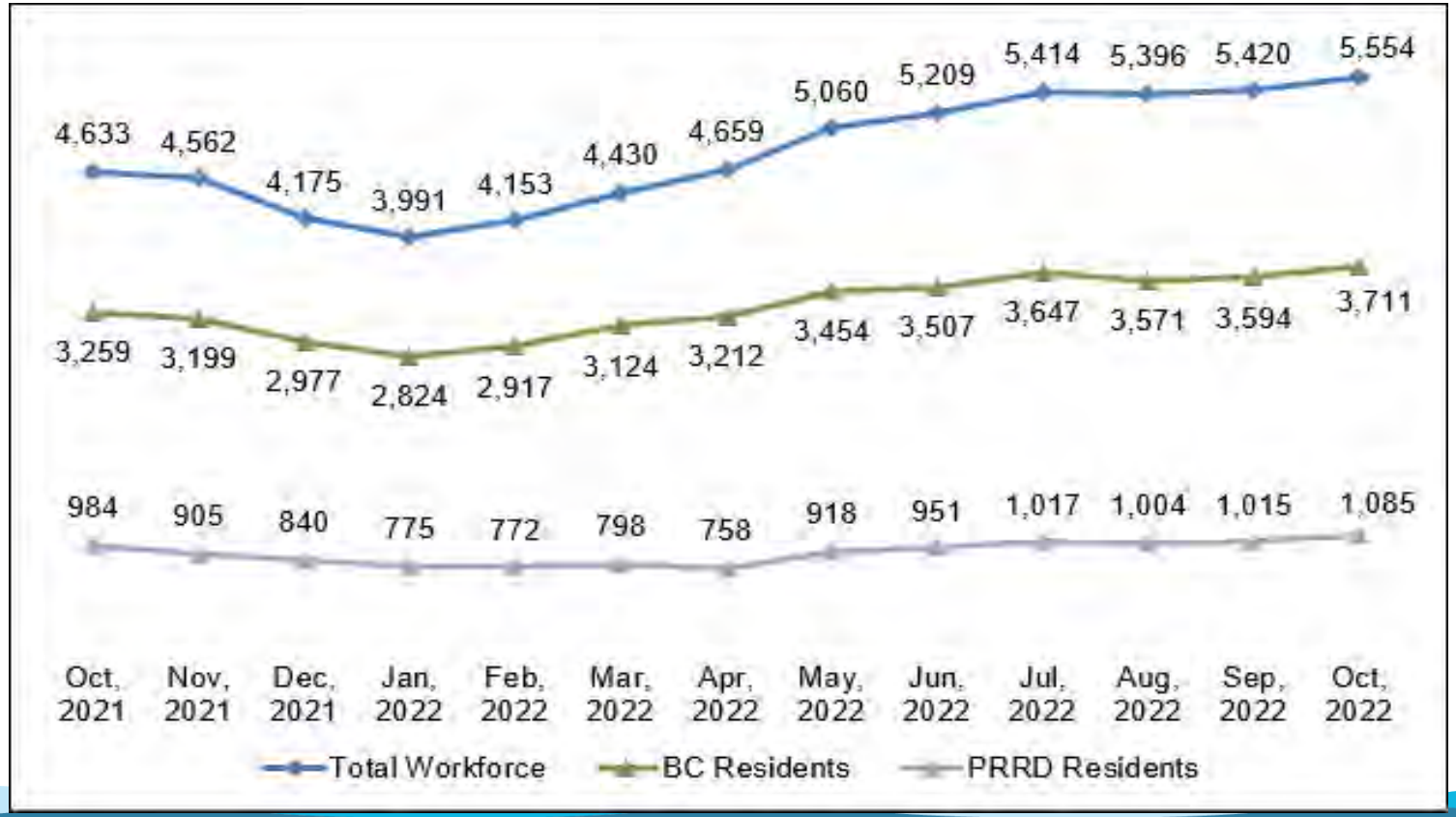
Employment Statistics

- The **October** workforce numbers are the total workforce numbers and include workers working off the dam site area, workers working from home and/or workers who may have been on site at any time in that month.

- BC Hydro requires all major contractors to report employment information.
- Total of **5,554** workers in October 2022: **3,711** from BC (67%), **1,085** from PRRD (23%)

Site C Employment Statistics – October 2022			
	# of total workers	**# of B.C. primary residents**	**% of B.C. workers**
Construction and non-construction contractors	4,731	2,949	62%
Engineers and project team	823	762	93%
Total workforce	5,554	3,711	67%

Site C Jobs Annual Trends



2022 Q3 Regional Business Participation

Companies engaged by BC Hydro and Site C contractors to provide goods and services in relation to Site C construction between July to September 2022

Community	# of businesses	Community	# of businesses
Arras	1	Montney	2
Baldonnel	1	Pink Mountain	2
Cecil Lake	1	Pouce Coupe	3
Charlie Lake	23	Prince George	26
Chetwynd	38	Rolla	2
Dawson Creek	27	Rose Prairie	2
Fort St. John	411	Taylor	9
Hudson's Hope	18	Tumbler Ridge	3
Moberly Lake	10		
Total		**579**	

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Questions?

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