Schedule A

Certified Project Description

Narrows Inlet Hydro Project

Amendment #4 to
Environmental Assessment Certificate #E13-04

April 20, 2017

Schedule A: Narrows Inlet Hydro Project

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1. OVERVIEW

tems sayamkwu Limited Partnership (Certificate Holder) is certified to develop the Narrows Inlet Hydro Project (Project) in the vicinity of the Tzoonie Valley at the head of Narrows Inlet, approximately 75 kilometres (km) north-west of Vancouver, British Columbia (Map 1 in Appendix A).

The project will include the following infrastructure:

- Up to three hydroelectric generating stations with a combined design capacity of 33 megawatts:
  - Chickwat Creek - A conventional run-of-river hydroelectric generating station with a design capacity of 19 megawatts (MW);
  - Upper Ramona Creek - A hydroelectric generating station which uses Ramona Lake as its water source with a design capacity of 7 MW; and
  - Lower Ramona Creek - A run-of-river hydroelectric generating station which uses water from Ramona Creek and the outflow from the Upper Ramona Creek component as its water sources with a design capacity of 7 MW.
- Up to three 25 kilovolt (kV) transmission lines, connecting each of the three new powerhouses, will feed into a new collector substation at the mouth of the Tzoonie River, along the existing Tyson Creek transmission line;
- The existing 25 kV line from Tyson Creek will be upgraded to 138 kV to transmit electricity from Narrows Inlet Hydro Project to the point of interconnection with BC Hydro 1L37, less than 6 km north of the Malaspina substation;
- One Operator's Residence;
- Upgraded and new roads and bridges for temporary construction activity and permanent operations; and
- Temporary construction facilities, including a land and floating construction camp, concrete batch plants, laydown and staging areas, borrow pits, and spoil areas.

With the exception of existing roads and bridges that do not require upgrades, all Project infrastructure must be located within the red Project boundaries identified on Map 2 to 5 in Appendix A. The location of permanent roads, new and replacement bridges, and temporary roads 1,000 metres (m) or longer associated with the components are shown on the maps; however, temporary roads or tracks less than 1,000 m are not shown. Permanent Project infrastructure, as listed above and described for each component, will be constructed within 100m of locations shown on the Project's component maps (Map 2 to 5 in Appendix A). The 100m leeway refers to all portions of the infrastructure in question such that any point within the structure could be transposed a maximum of 100m in any direction, except at the following three locations:

- A 150 m leeway is allowed for a 600 m section of the 25 kV feeder transmission line alignment for the Upper Ramona Component immediately north of the causeway that spans the east side of the head of Narrows, within shíshálh Nation Band Lands No. 8 Inlet (Map 4 in Appendix A), to avoid identified archeological sites.

- The submarine cable entry point on the east side of Sechelt Inlet will be at any location within the Submarine Cable Entry Point polygon shown on Map 5 in Appendix A.
- The submarine cable alignment will be at any location within the Submarine Transmission Line Corridor polygon shown on Map 5 in Appendix A.

Existing access roads to be used by the Project are shown on the maps. Requirements for new access roads are introduced under each component but their detailed restrictions are specified in Section 4.

The Project life has three phases: Construction, Operation, and Decommissioning. The Construction phase is defined as the period of time during which any of the following activities occur that are related to the building of new Project components and upgrades to existing infrastructure: vegetation clearing, earthworks, building, installing, replacing, repairing, altering, maintaining or removing works that modifies the land, vegetation and/or natural environment. Operation begins once the Leave to Commence Operation, associated with the *Water Act* license, is issued. Decommissioning begins once the Project shuts down operations and begins removing permanent Project infrastructure and rehabilitating the Project area.

2. DESCRIPTION OF THE HYDROELECTRIC COMPONENTS

2.1. CHICKWAT COMPONENT

The Chickwat Creek hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterways, powerhouse and switchyard, and feeder transmission line (Map 2 in Appendix A).

Upstream Works. The upstream works will include three separate intakes, the main intake on Chickwat Creek and a tributary intake on each of two un-named tributaries to Chickwat Creek (referred to as C1 and C2 respectively), and associated headponds.

Main Intake. The main intake will be located on Chickwat Creek approximately 3 km upstream of the confluence with the Tzoonie River, and within 100 m of UTM NAD 83 5522113 Northing, 448217 Easting, zone 10. It will be constructed of reinforced concrete. It will include a traditional lateral intake with an Obermeyer type gated overflow weir, an intake channel, and sluiceway. A fish ladder will be installed to support upstream and downstream fish migration, and mitigate potential fish entrainment at the intake. The intake will also maintain an instream flow release (IFR). Access to the intake will be through an existing logging road unless the location of the intake changes. If the location of the intake changes by less than 100 m, a new permanent (less than 300 m) access road will be created to connect to the existing logging road.

Tributary Intakes. The intakes on C1 (Kid - s-xwixwtl'ay-ulh Creek) and C2 tributaries (Mountain Goat - s-xwitl'ay Creek) will be located within 100m of UTM NAD 83 5520719 Northing, 448359 Easting, and of UTM NAD 83 5521709 Northing, 447858 Easting, zone 10, respectively. The two tributary intakes will allow for maintenance of an IFR. Access to the C1 Tributary will follow an upgraded road and will require the construction of a short new permanent road (less than 500m). Access to the C2 Tributary will be via an access track (less than 800m) adjacent to the C2 penstock.

Waterways. There will be a total of three penstock pipes. A penstock pipe will convey water from each of the two tributary intakes to the main intake, and another from the main intake to the powerhouse. The pipes may have both buried and above ground sections. Their locations, within a 100m leeway, are shown on Map 2 in Appendix A.

Powerhouse. The powerhouse will be located on the east side of Chickwat Creek approximately 1 km upstream of the confluence with the Tzoonie River and within 100m of UTM NAD 83 5520401 Northing, 449138 Easting, zone 10. The powerhouse will contain no more than 2 turbines and 2 generators, and associated control equipment. The control equipment must allow for the regulation of flow rates during start-up and shut-down so that ramping rates in Chickwat Creek, as specified in the Table of Conditions, are not exceeded. Access to the powerhouse will be provided by reactivating a decommissioned logging road and rail bed. The transformer will be located in a switchyard located outside of the powerhouse.

Water from the turbine(s) will be released into a tailrace and returned to Chickwat Creek.

Feeder Transmission Line. The electricity generated at the Chickwat powerhouse will be transmitted along a new 25 kV transmission line, maximum of 2 km long, that will tie into the existing Tyson Creek transmission line approximately 3 km from the new collector 138 kV substation at the mouth of the Tzoonie River (Map 4).

2.2. UPPER RAMONA COMPONENT

The Upper Ramona hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterway, powerhouse and switchyard, and feeder transmission line (Map 3 in Appendix A).

Upstream Works. The upstream works will include a submerged intake located in Ramona Lake within 100m of UTM NAD 83 5514344 Northing, 451708 Easting, zone 10. The intake will be a tunnel tap design located on the lake bed at a depth of 26 m ± 5 m below the natural lake surface elevation, within. An Alimak shaft building will be constructed to access the intake controls within 100 m of UTM NAD 83 5514325 Northing, 451619 Easting, zone 10. The IFR will be provided by gravity through the tunnel tap and will discharge near 207 m downstream of the natural lake outlet within 50 m of UTM NAD 83 5514374 Northing, 451380 Easting, zone 10. Access to the intake will be by helicopter during Construction and Operation. No permanent roads will be built but no more than 1,000m of temporary access roads may be constructed, if required.

Waterway. A tunnel and penstock pipe will convey water from the intake to the powerhouse. The penstock may have both buried and above ground sections and will connect with the tunnel at the portal within 100m of UTM NAD 83 5513470 Northing 450678 Easting, zone 10. The waterway location, within 100m, is shown on Map 3 in Appendix A. A new permanent road, up to 2,500m in length, will be constructed to access the tunnel portal from the powerhouse and to construct the penstock.

Powerhouse. The powerhouse will be located on the north side of Ramona Creek approximately 3 km upstream of the confluence with Narrows Inlet and within 100m of UTM NAD 83 5512612 Northing, 450054 Easting, zone 10. The powerhouse will contain a turbine, a generator, a transformer and associated control equipment. The control equipment will include regulation of flow rates during start-

up and shut-down so that ramping rates, as specified in the Table of Conditions, are not exceeded. The transformer will be located in a switchyard outside the powerhouse. Access to the powerhouse will be provided by an existing logging road that will be reactivated unless the location of the powerhouse changes. If the location changes, a new access road (less than 500 m) will be created to connect to the existing logging road.

A tailrace will return the water to Ramona Creek above the main intake of the Lower Ramona component.

Feeder Transmission Line. The electricity generated at the Upper Ramona powerhouse will be transmitted to the collector 138 kV substation at the mouth of the Tzoonie River via a new single pole overhead 25 kV transmission line with maximum length of 10 km Map 3 and Map 4 in Appendix A). As described in Section 1, a 150 m leeway will be allowed for a 600 m section of the 25 kV feeder transmission line alignment for the Upper Ramona Component immediately north of the causeway that spans the east side of the head of Narrows, within shíshálh Nation Band Lands No. 8 Inlet (Map 4 in Appendix A), to avoid identified archeological sites.

2.3. LOWER RAMONA COMPONENT

The Lower Ramona hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterways, powerhouse and switchyard, and feeder transmission line (Map 3 in Appendix A).

Upstream Works. The upstream works will include two separate intakes and associated headponds.

> *Main intake*. The main intake will be located on Ramona Creek approximately 3 km upstream of the confluence with Narrows Inlet and within 100m of UTM NAD 83 5512563 Northing, 450051 Easting, zone 10. It will be constructed of reinforced concrete. An IFR pipe will be included to meet IFR requirements. Access will be provided by an existing logging road that will be reactivated unless the location of the intake changes. If the location changes by less than 100 m, a new access road (less than 500 m) will be created to connect to the existing logging road.
>
> *Tributary Intake*. One tributary intake will be located on an un-named tributary of Ramona Creek (referred to as R1 but preferentially referred to as Marten - s-p'il-us Creek) within 100m of UTM NAD 83 5511963 Northing, 449947 Easting, zone 10 (Map 3 in Appendix A). It will be constructed of reinforced concrete. Access to the tributary intake will be provided by a new permanent road, up to 1000m in length.

Waterways. A penstock pipe will convey water from the tributary intake to the main intake and another pipe from the main intake to the powerhouse. Both penstocks may have both buried and above ground sections. Their locations, within 100m, are shown on Map 3 in Appendix A.

Powerhouse. The powerhouse will be located on the south side of Ramona Creek approximately 500 m upstream of the confluence with Narrows Inlet and within 100m of UTM NAD 83 5511987 Northing, 448538 Easting, zone 10. The powerhouse will contain a turbine, a generator, a transformer and associated control equipment. The control equipment design will provide regulation of flow rates during

start-up and shut-down so that specified ramping rates in Ramona Creek are not exceeded. The transformer will be located in a switchyard located inside or outside of the powerhouse.

A tailrace will return the water to Ramona Creek. The design and operation protocol that ensures that fish are not stranded will be approved by a QP. Access to the powerhouse will be provided by a new no more than 1,000m permanent road.

Feeder Transmission Line. The electricity generated at the Lower Ramona powerhouse will be transmitted to the 138 kV new collector substation at the mouth of the Tzoonie River via the same single pole overhead transmission line as the Upper Ramona component. A maximum of 10 km of new feeder 25 kV transmission line will be constructed to bring the power from the Lower Ramona powerhouse to a connection point on the Upper Ramona feeder transmission line. A temporary road (construction track) less than 1,000m will be required to construct this new transmission line segment between the existing road and the main penstock.

3. SUBSTATION AND TRANSMISSION COMPONENT

The 25 kV transmission lines (See Map 2, Map 3 and Map 4 in Appendix A) from each of the three new powerhouses and the existing Tyson Creek powerhouse will all feed into a new collector substation located near the mouth of the Tzoonie River approximately 2 km upstream from the head of Narrows Inlet (Map 4 in Appendix A). Here the voltage will be increased to 138 kV. The substation will consist of a 3-phase step-up transformer, approximately 100 MW in capacity, and associated cooling heat exchangers, 3 phase breakers, disconnect switches, and manual and automatic controls.

Electricity will be transmitted from the collector substation to the point of interconnection with BC Hydro's transmission grid via a 138 kV transmission line (Map 5 in Appendix A). The point of interconnection is located on the Sechelt Peninsula near Ruby Lake. The transmission line will connect with BC Hydro 1L37, less than 6 km north of the Malaspina substation.

The submarine cable alignment will be anywhere within the Submarine Transmission Line Corridor polygon shown on Map 5 in Appendix A. As described in Section 1, the cable entry point on the east side of Sechelt Inlet and the end of the transmission line in this location will be placed within the Submarine Cable Entry Point polygon shown on Map 5 in Appendix A. The 138 kV transmission line will consist of the following elements:

- No more than 20 km of existing line built for the Tyson Creek Project;
- No more than 15 km of new single pole overhead line;
- No more than 3 km of new submarine cable under Sechelt Inlet; and
- No more than 500 m of buried cable where the cable enters and leaves Sechelt Inlet.

Access to the majority of the transmission line will be by existing roads (at the request of shíshálh Nation). However, temporary access tracks will be required to install some poles, while others may require helicopter access.

4. ACCESS INFRASTRUCTURE

A combination of existing access roads and newly constructed permanent and temporary roads and tracks will be required to access Project locations. Map 2 to 5 in Appendix A identify the locations (within 100m) of all permanent roads, and all temporary roads that may be 1,000 m or longer. Temporary roads or tracks that will be less than 1,000 m are not shown on the maps. New and replacement bridges associated with access to the hydroelectric components are also shown on the maps.

Temporary roads and tracks are defined as those that are only required for Project Construction. Permanent roads and bridges are defined as those that are required for Project Operation, and may also be used for Project Construction. All temporary, new, and upgraded roads will be located within the red Project boundary. The use of existing permanent access roads and forestry roads that do not require upgrades may occur outside of the red Project boundary.

Access road restrictions are specified at the level of the entire Project and not individually restricted in terms of length, width, or start and end points. A maximum of 10 km of new permanent road and 5 km of new temporary roads and tracks will be constructed for the Project. Permanent and temporary reactivation of existing roads will occur in the vicinity of all Project components.

A permanent helipad may be required to access the Upper Ramona intake, with maximum size of 1 ha. Temporary helicopter landing pads and staging areas (helipads) may also be required during the construction of the transmission line.

5. TEMPORARY PROJECT COMPONENTS

Temporary project components are those facilities which are required only during the Construction phase of the Project. The temporary components shown on Map 2 to 5 in Appendix A (construction camps and certain laydown areas) will be located within 100m of the locations indicated. Locations of some of the temporary Project components not shown on maps are described below. All temporary project components must be located entirely within the red Project boundary. Temporary project components include:

- Construction Camp – The Project will require two temporary camps. A temporary land camp designed to house up to 99 workers will be built at the staging area at the head of Narrows Inlet (Map 4 in Appendix A). The temporary land camp shall have a footprint not exceeding 5 ha. A floating camp will accommodate up to 50 workers.
- Concrete Batch Plants – No more than three concrete batch plants will be required to produce the concrete needed for construction of Project infrastructure.
- Laydown and Staging areas – Laydown areas are used to temporarily store construction material and equipment. There are several laydown areas associated with each hydroelectric component.
- Borrow pits and spoil areas – Borrow pits are used to source the aggregate required during Construction. Spoil areas are used to store excavated soil either temporarily or permanently. There are several borrow pits and spoil areas associated with each Project component.

5.1. DECOMMISSIONING OF TEMPORARY PROJECT COMPONENTS

At the end of the Construction phase all temporary project components will be removed and the sites rehabilitated to the standards described in the Construction Environmental Management Plan (CEMP).

Temporary facilities that will be decommissioned are:

- temporary access roads and tracks;
- temporary bridges;
- temporary helipads;
- temporary concrete batch plant sites;
- temporary borrow pits and spoil areas;
- temporary laydown and staging areas; and
- temporary construction camps.

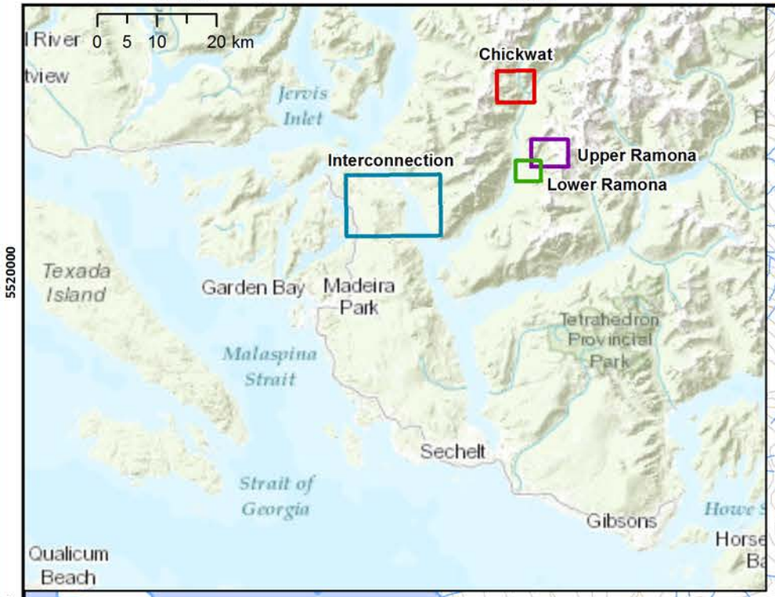
6. OPERATOR'S RESIDENCE

An operator's residence will accommodate no more than 5 persons during Project Operation. The operator's residence will be located on the same site as the temporary construction camp. The residence will use the septic field and water source installed for the construction camp.

Appendix A – Project Maps

NARROWS INLET HYDRO PROJECT

Project Overview



Data sources:
Project infrastructure provided by Narrow Inlet Hydro Holding Corp.
Land designations and features provided by DataBC.

Legend

Hydroelectric Component
- Chickwat
- Lower Ramona
- Upper Ramona
- Interconnection
- Carlson

Infrastructure
- Intake
- Powerhouse
- Portal
- Substation
- Interconnection
- Surface Mounted Penstock
- Tributary Tap
- Buried Penstock
- Tunnel
- Submarine Cable Entry Point
- Submarine Transmission Line Corridor

Transmission Lines
- Overhead Transmission Line
- Overhead Transmission Line -
- Underground Transmission Line
- Overhead Transmission Line - Existing

Roads
- Existing Road
- New Road - Permanent
- New Road - Temporary

Land Designations and Features
- shíshálh Nation Band Lands
- Parks and Protected Areas
- 100m Contour

0 0.5 1 2 3 4 Km

Scale: 1:85,000

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Coordinate System: NAD 1983 UTM Zone 10N

Prepared by:
Ecofish Research Ltd.
for NIHHC

Map 1

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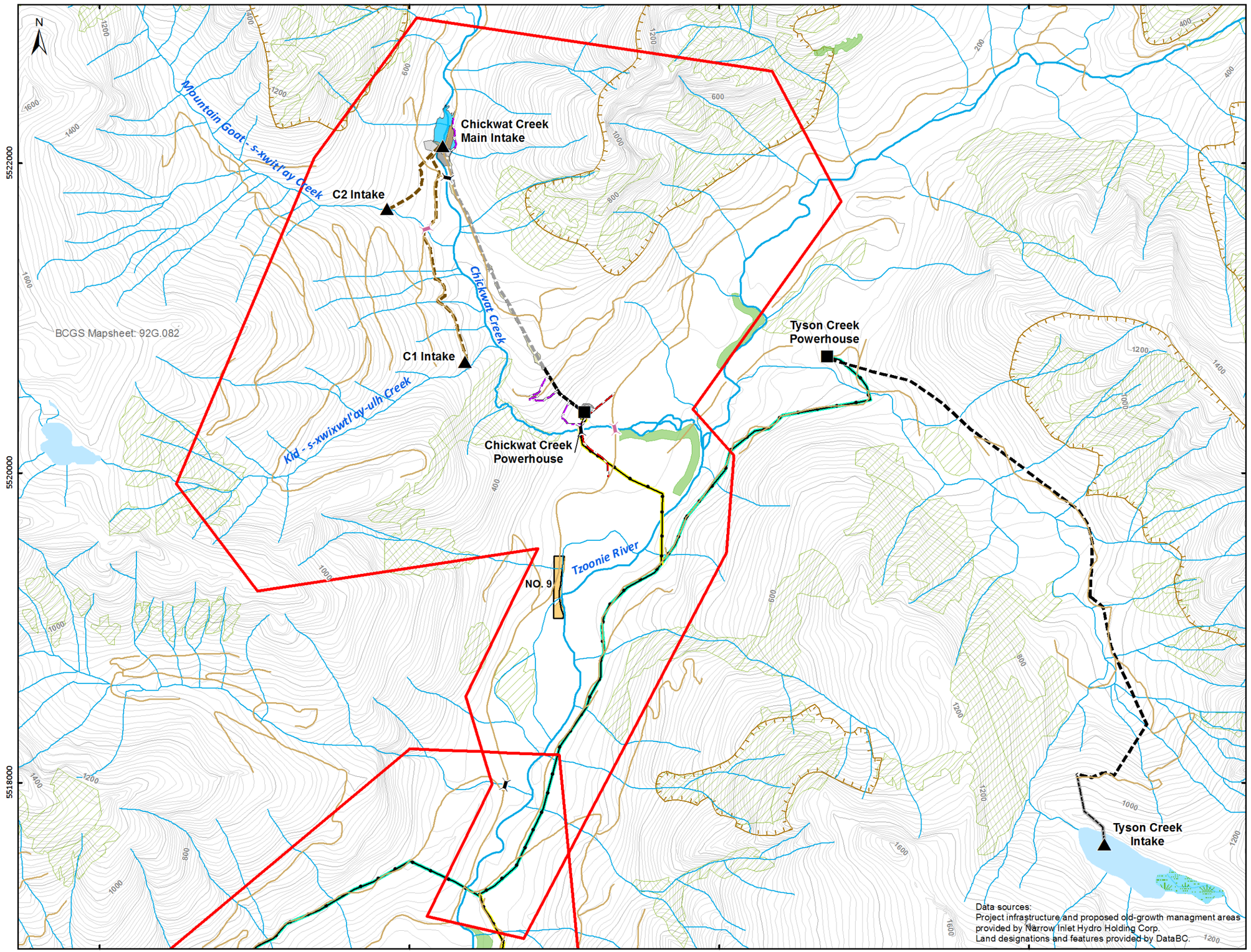

NARROWS INLET HYDRO PROJECT

Chickwat Component

Legend

- Project Boundary

Infrastructure

- Intake
- Powerhouse
- New/Replacement Bridge
- Existing Bridge
- Tunnel
- Surface Mounted Penstock
- Tributary Tap
- Buried Penstock
- Overhead Transmission Line
- Overhead Transmission Line - Existing
- RipRap
- Headpond
- Intake Structure
- Clearing Area
- Temporary Construction Boundary
- Laydown Area
- Penstock Temporary ROW

Roads

- Existing Road
- New Road - Permanent
- New Road - Temporary

Land Designations and Features

- Wetland
- Wildlife Tree Retention Area
- Mountain Goat Winter Range
- Old-growth Management Area (proposed)
- shíshálh Nation Band Lands
- Tantalis - Surveyed Parcels
- Index Contour (100 m)
- Intermediate Contour (20 m)

0 0.25 0.5 1 km

Scale: 1:24,000

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Map 2

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448000 450000 452000

5514000 5512000

NO.6A

Ramona Creek

Lower Ramona Powerhouse

0 50 100 200 m

NARROWS INLET

NO. 6A

Ramona Creek

Ramona Lake

IFR Pipe Outlet

Upper Ramona Intake

Alimak Shaft Building

Portal

Upper Ramona Powerhouse

Lower Ramona Intake

Lower Ramona Powerhouse

R1 Intake

Marten - s-p'il-us Creek

BCGS Mapsheet: 92G.072

Data sources:
Project infrastructure, private lands and proposed old-growth managment areas provided by Narrow Inlet Hydro Holding Corp.
Land designations and features provided by DataBC.

NARROWS INLET HYDRO PROJECT

Upper and Lower Ramona Components

Legend

- Project Boundary

Infrastructure

- Intake
- Powerhouse
- Portal
- New/Replacement Bridge
- Existing Bridge
- Surface Mounted Penstock
- Buried Penstock
- Tributary Tap
- Tunnel
- IFR Discharge Pipe
- Overhead Transmission Line
- Borrow Area (proposed)
- Laydown Area (proposed)

Roads

- Existing Road
- New Road - Permanent
- New Road - Temporary

Land Designations and Features

- Wildlife Tree Retention Area
- Mountain Goat Winter Range
- Old-growth Management Area (proposed)
- shíshálh Nation Band Lands
- Private Land
- Tantalis - Surveyed Parcels
- Index Contour (100 m)
- Intermediate Contour (20 m)

0 0.25 0.5 1 km

Scale: 1:20,000

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Map 3

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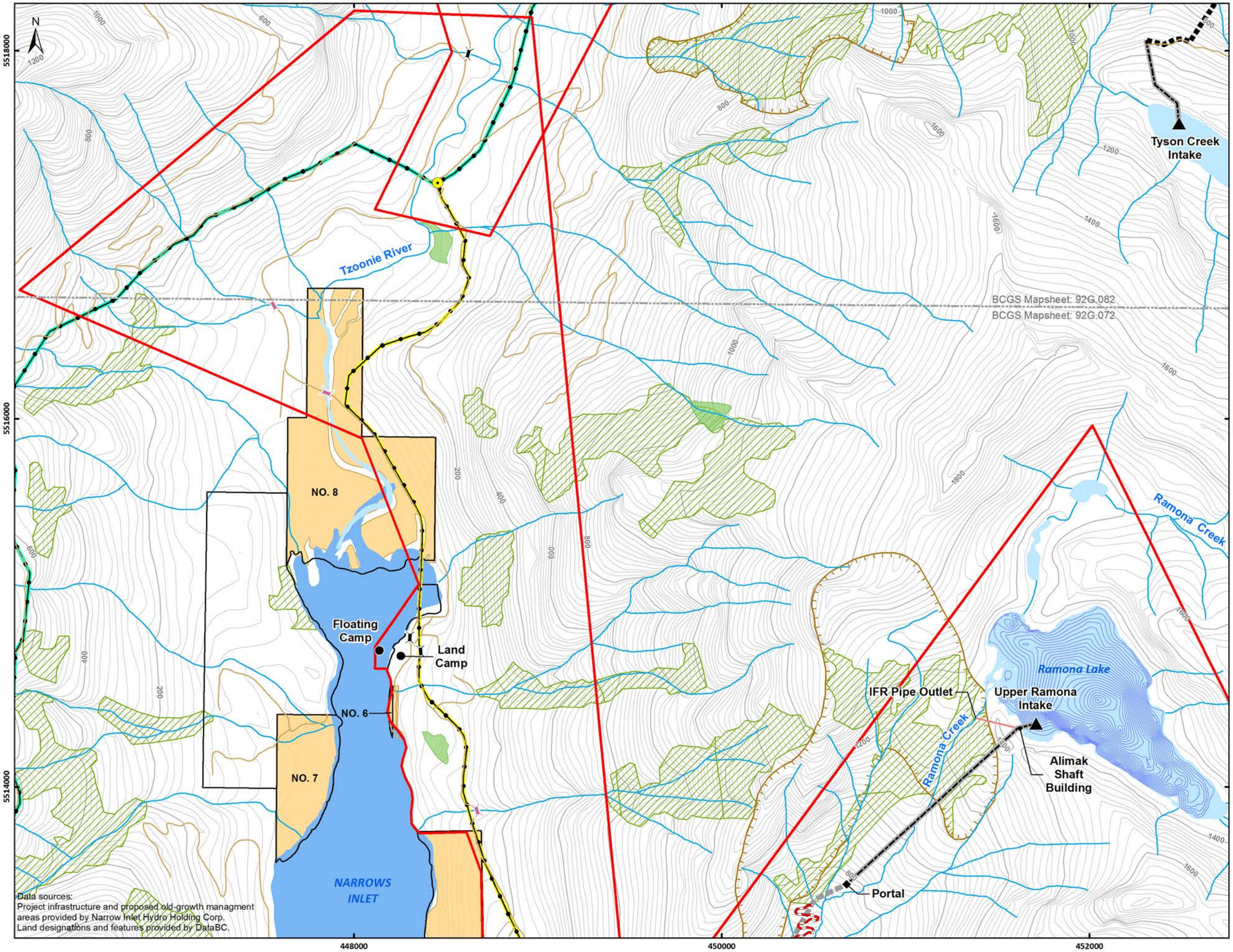
NARROWS INLET HYDRO PROJECT

Collector Substation and Construction Camps



Legend

- Project Boundary

Infrastructure

- Intake
- Construction Camp
- Portal
- New/Replacement Bridge
- Existing Bridge
- Substation
- Surface Mounted Penstock
- Buried Penstock
- Tunnel
- IFR Discharge Pipe
- Tunnel
- Overhead Transmission Line
- Overhead Transmission Line - Existing

Roads

- Existing Road
- New Road - Permanent

Land Designations and Features

- Wildlife Tree Retention Area
- Mountain Goat Winter Range
- Old-growth Management Area (proposed)
- shíshálh Nation Band Lands
- Tantalis - Surveyed Parcels
- Index Contour (100 m)
- Intermediate Contour (20 m)

0 0.25 0.5 1 km

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Map 4

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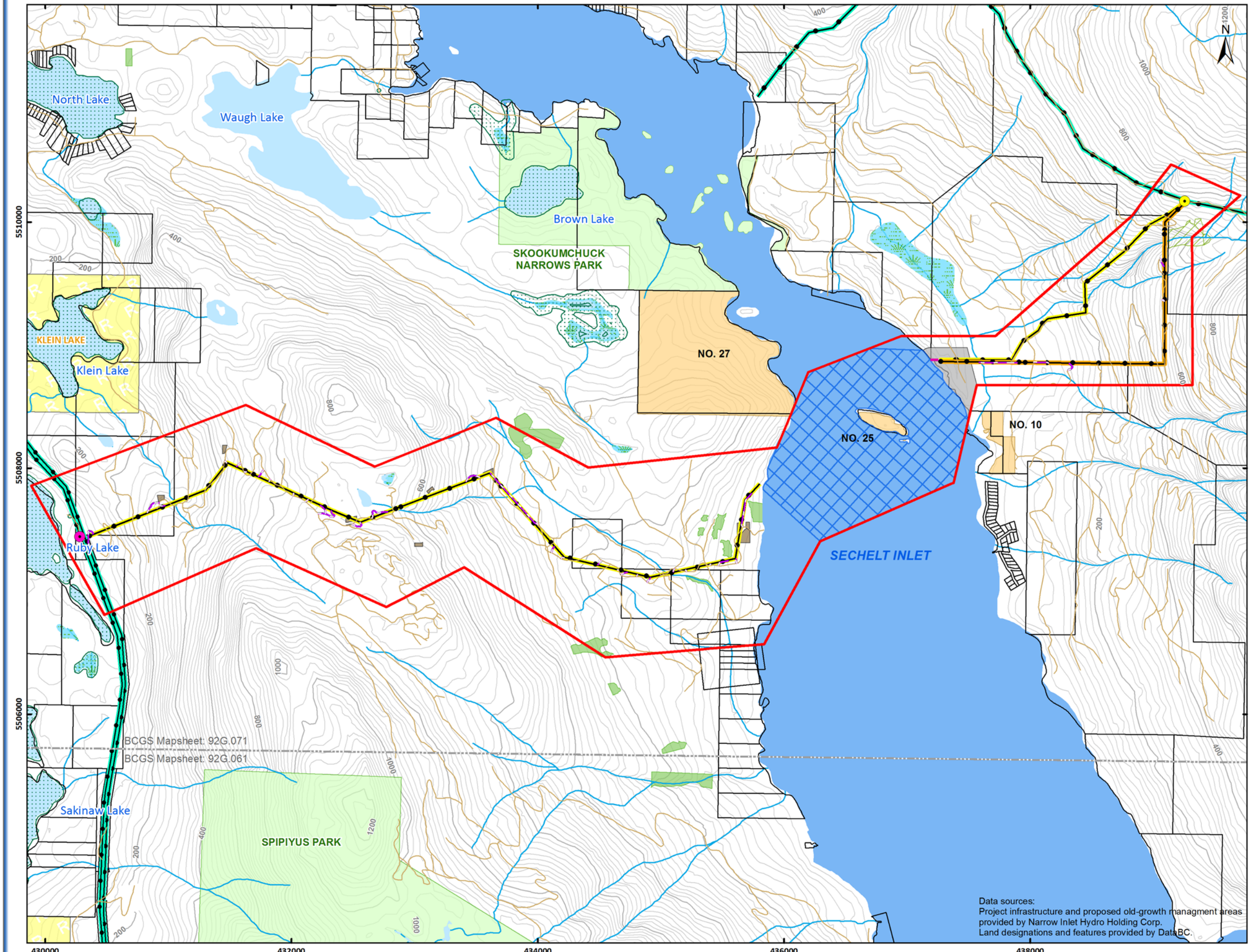
NARROWS INLET HYDRO PROJECT

Transmission Line and Interconnection



Legend

- Project Boundary

Infrastructure

- Substation
- Interconnection
- Laydown Area
- Submarine Cable Entry Point
- Submarine Transmission Line Corridor

Transmission Lines

- Overhead Transmission Line
- Overhead Transmission Line - Alternative
- Underground Transmission Line
- Overhead Transmission Line - Existing

Roads

- Existing Road
- New Road - Temporary

Land Designations and Features

- Wetland
- Non-Sensitive Occurrences
- Old-growth Management Area (proposed)
- Wildlife Tree Retention Area
- shíshálh Nation Band Lands
- Recreational Sites
- Parks and Protected Areas
- Tantalis - Surveyed Parcels
- Index Contour (100 m)
- Intermediate Contour (20 m)

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