

Appendix EB30-A

System Impact Study Process Overview

Project Nujio'qonik: Amendment to the Environmental Impact Statement

Project Background/Context

Project Nujio'qonik intends to produce green hydrogen and ammonia using green energy provided by a wind farms. In March of 2023, World Energy GH2 submitted a *Large Customer Interconnection Request* to NL Hydro for the purchase of power for the NL Hydro grid. Given a combination of the cyclic nature of the wind and low energy generated from the wind farm during low wind speeds (primarily summer), WEGH2 requested an interconnection of 10MW power on a firm basis and 145MW non-firm power meaning an intent to purchase this power only when capacity is available from the NL Hydro grid as defined by NL Hydro.

A *Large Customer Interconnection Request* is used to apply for new load or increased load interconnections under NL Hydro's *Transmission Planning Large Customer Interconnection Request Process*. It applies to customers whose loads are likely to impact the operation of Hydro's electrical system in such a way that special consideration is required. Typically, these customers will be those:

- Whose peak demand is expected to be greater than 1,500 kVA;
- Who are supplied at 46 kV or greater on the primary side of any transformation equipment directly supplying them; or
- Whose equipment, location, load profile or other characteristics warrant special consideration in Hydro's opinion.

WEGH2 has been in discussion and consultation with NL Hydro since mid-2022. WEGH2 have had regular meetings with both NL Hydro's technical and leadership teams in order to ensure NL Hydro fully understand WEGH2's development plan and how it may interact with the Newfoundland and Labrador electrical system. NL Hydro has provided WEGH2 feedback and technical guidance to help ensure its plans are compatible with what NL Hydro indicatively believes will be acceptable for the grid interconnection. As part of this process, NL Hydro advised WEGH2 of the requirement to complete a System Impact Study, which as subsequently commenced.

WEGH2 is committed to continuing its work with NL Hydro and ensuring compliance with the results of the System Impact Study. WEGH2 recognizes the System Impact Statement as a requirement of the Environmental Impact Statement and will continue to work within the parameters laid out by NL Hydro.

The planned point of interconnection of Project Nujio'qonik with the Newfoundland & Labrador Electrical Grid, subject to System Impact Study completion, is NL Hydro existing Stephenville Terminal Station, see Figure 1. Project Nujio'qonik hydrogen-ammonia plant boundary limits are located approximately 500m from the terminal station. Note that the Stephenville Terminal Station will not be directly connected to our hydrogen-ammonia plant, rather it will be connected via a limited intertie to be constructed 230kV wind farm substation located adjacent to the hydrogen-ammonia plant that will be constructed by WEGH2. This substation will collect and distribute all of the generated electricity from WEGH2's wind farm, while facilitating an controlled 230kV intertie to the Stephenville Terminal Station (grid power), using the combined energy for distribution to the hydrogen-ammonia plant site.

Following the application for the interconnection which was filed on March 24, 2023, a System Impact Study Agreement was established between NL Hydro and WEGH2 on November 11, 2023 to facilitate the

System Impact Study, funded by WEGH2 but managed and executed by NL Hydro. This System Impact Study is currently underway.



Figure 1: Stephenville Terminal Station

Purpose of the System Impact Study

Given the Project Nujio'qonik application of inverter-based renewable technology (i.e. wind turbines and rectifier supplied electrolyzers) and some of the Project Nujio'qonik infrastructure (transmission lines) proximity to the HVdc converter station at Bottom Brook, it met NL Hydro requirement for triggering a detailed power system analysis under the System Impact Study. This System Impact Study scope outlines the overall scope of the power system studies and associated assumptions to be completed by NL Hydro Transmission Planning. The study will evaluate any impacts that Project Nujio'qonik and the proposed 230kV intertie will have on the Newfoundland & Labrador electrical grid. Particular focus will be on the potential effects to the operation, safety and the reliability of the system and infrastructure as well as any upgrades/changes required to facilitate the interconnection.

The System Impact Study /Interconnection Request Process

The System Impact Study determines the impact of Project Nujio'qonik by comparing simulation results of the case with our Project Nujio'qonik in service against the case without the Project Nujio'qonik. If adverse impacts were to be found during the process, appropriate design solutions to mitigate the impacts would be required. This study is facilitated by a set of simulation software called Power System Simulation for Engineering (PSS/E). Within this study, NL Hydro will use its' Transmission Planning Criteria to ensure system reliability during the operation phase of Project Nujio'qonik

The System Impact Study process will culminate in a “contribution estimate” to WEGH2 for the provision of services by NL Hydro to be able to provide the load to WEGH2; these services include the detailed design of any changes required to the grid as well as associated construction/modifications costs.

Following confirmation from WEGH2, NL Hydro will next complete a front-end engineering design (FEED) report to determine the specific system requirements to enable the provision of service to WEGH2 which will be required to pay in advance for the completion of the front-end engineering design report.

Depending on the complexity of meeting the service request, FEED costs can range between several hundred thousand and several million dollars. The completion of the FEED report will normally take approximately 24 weeks to complete; both cost and schedule will be defined by NLH during the SIS.

Following the FEED phase (conducted by NL Hydro), WEGH2 will then receive a formal quotation of the charge required for the provision of service (i.e., the Upstream Capacity Charge) and a tentative schedule for the provision of service. If WEGH2 accepts the quotation, the payment will be required in advance of initiating construction of transmission extension or upgrade.

Approval of Upstream Capacity Charge and the required capital work to provide service will normally be required by the Board of Commissioners of Public Utilities of Newfoundland and Labrador

The System Impact Study and FEED Timelines

The System Impact Study process has commenced with NL Hydro with the execution of the study agreement. The supporting agreement defines the requested project information required of WEGH2 to support the study/model which will be submitted in January, 2024. NL Hydro has advised that the process will take approximately 180 days (26 weeks) for completion.

As above, the FEED design and report will normally take approximately 24 weeks to complete. The culmination of the FEED design and report phase will result in a cost and schedule for the required capital work that will be managed by NL Hydro by paid by WEGH2.

Roles and Responsibilities

NL Hydro

NL Hydro's responsibilities are to conduct and manage the System Impact Study assessment based on the technical inputs provided by WEGH2 on Project Nujio'qonik and determine the impact (if any) of the proposed project, while working collaboratively with WEGH2 on required mitigations that will be imposed on the project to ensure system reliability.

NL Hydro will also complete a FEED report to determine the specific system requirements to enable the provision of service to WEGH2.

After the FEED design and report, NL Hydro will also prepare a quotation for the upstream capacity charge and manage the construction and testing of the transmission extension or upgrade that will be funded by WEGH2

WEGH2

WEGH2's responsibility includes supplying sufficient technical information accurately describing the design and architecture of the project sufficient in quality to support NL Hydro in conducting the system impact study. WEGH2 are also responsible for any changes to the design or architecture that are required to ensure system reliability as defined by NL Hydro.

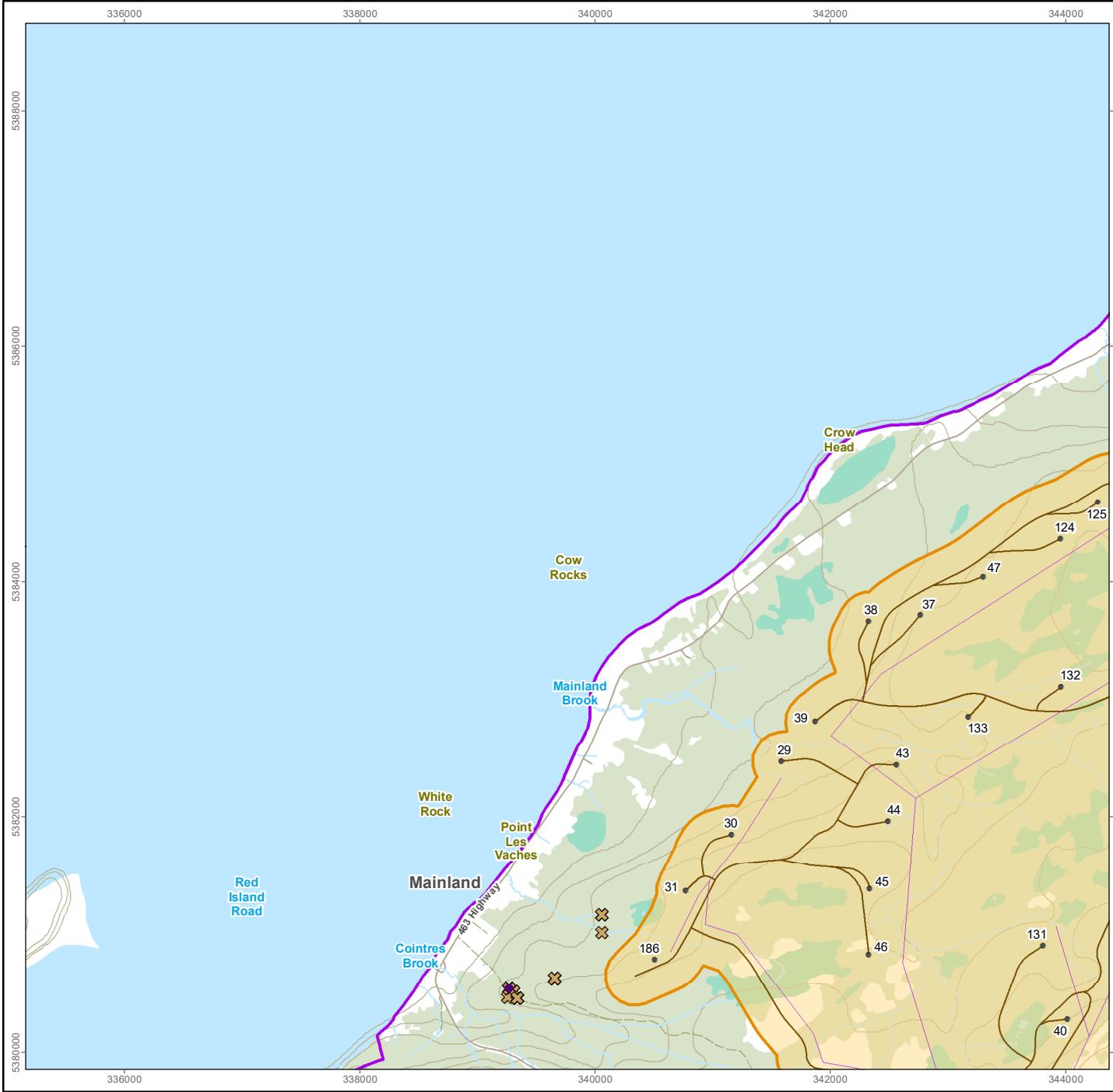
Furthermore, and most importantly, WEGH2 will be responsible for all of NL Hydro's costs for conducting the System Impact Study, subsequent FEED design, as well as the upstream capacity charge and the cost of the capital work required for the service for service request.

For the avoidance of doubt, no costs for this process and resulting construction costs for the transmission extension or upgrade will be borne/passed through to the Newfoundland and Labrador public or ratepayers.

Appendix MMD3-A

Mapbook: Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area

Project Nujio'qonik: Amendment to the Environmental Impact Statement



 Stantec

- ❖ Quarry - Archive
- Quarry - Lease or Permit
- Local Assessment Area

Proposed Project Features

- Turbine Location
- Collector Line
- Access Road
- Project Area

Other Features

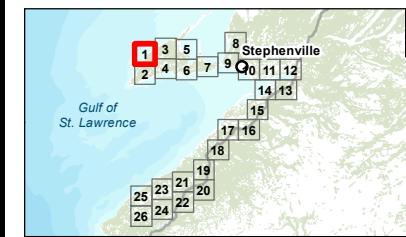
- Road
- Resource Road / Trail
- Contour (20 m)
- Watercourse
- Forested Area
- Waterbody
- Wetland



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Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; Government of NL Dept. of Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
3. Background: NRCan CanVec



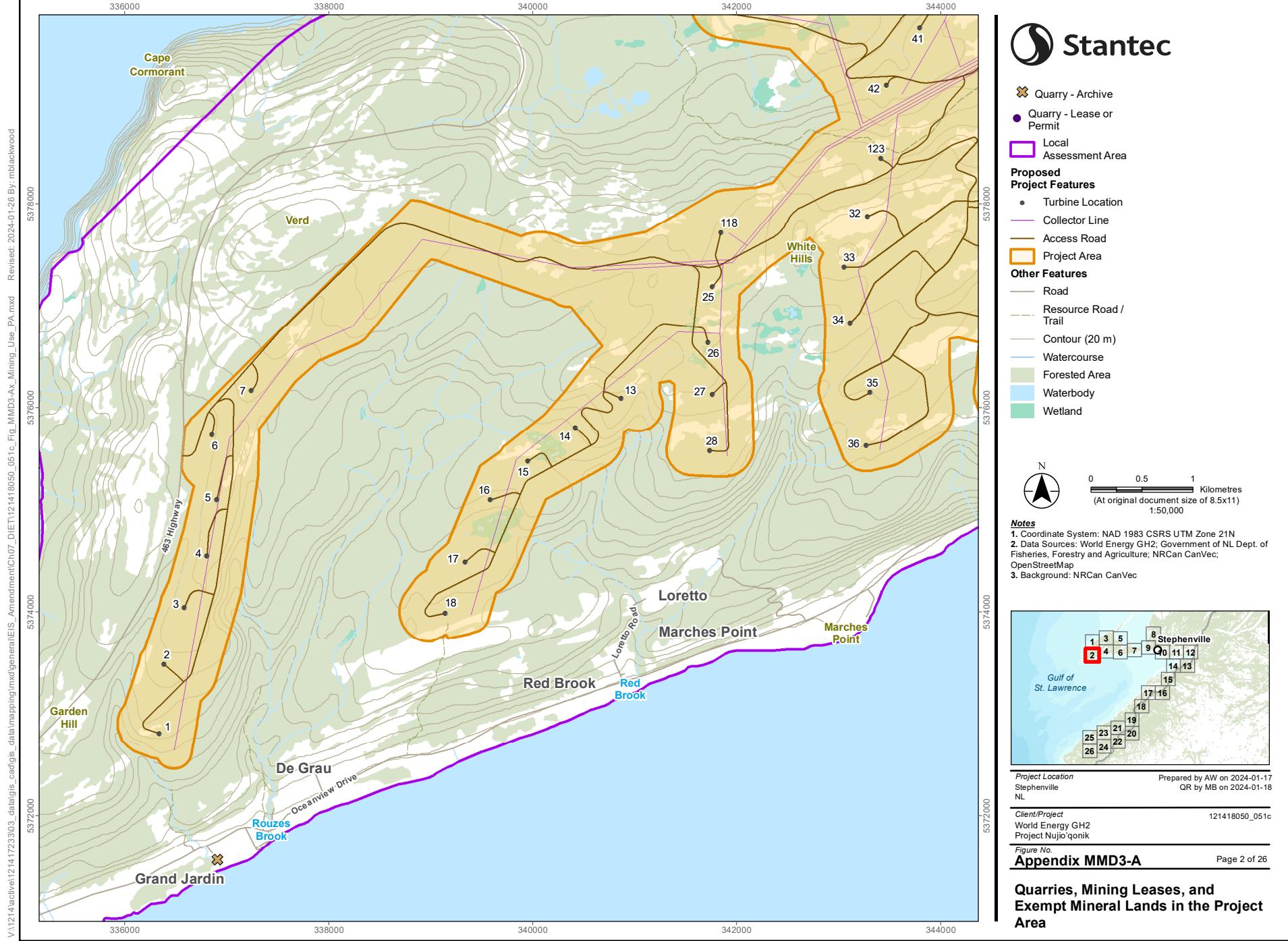
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QR by MB on 2024-01-18

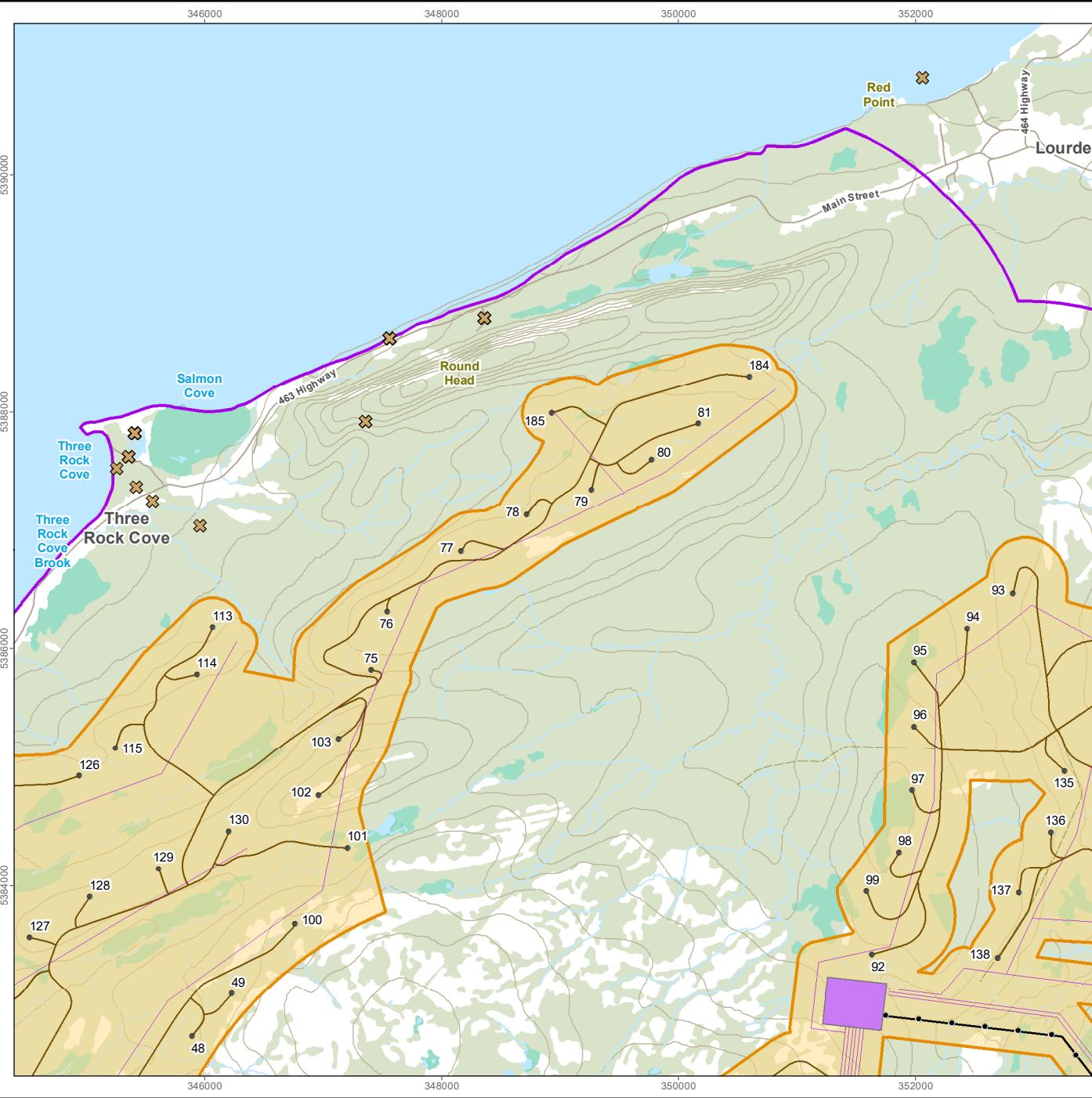
Client/Project
World Energy GH2
Project Nujio'qonik

Figure No.
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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area





Stantec

- ✖ Quarry - Archive
- Quarry - Lease or Permit
- Local Assessment Area

Proposed Project Features

- Turbine Location
- Transmission Line 230 KV
- Collector Line
- Access Road
- Substation
- Project Area

Other Features

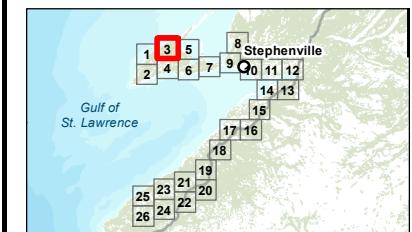
- Road
- Resource Road / Trail
- Contour (20 m)
- Watercourse
- Forested Area



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Notes

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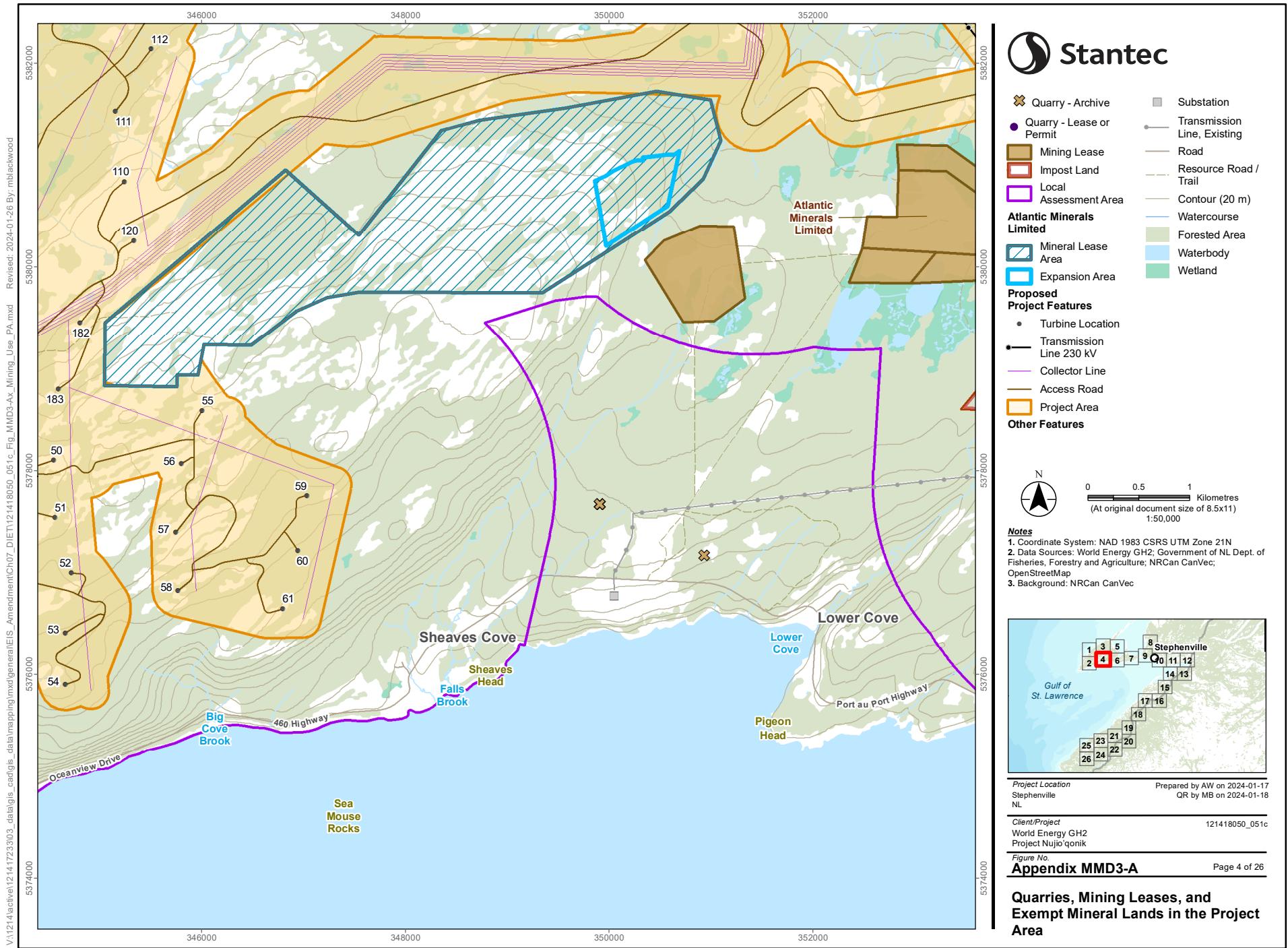
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Client/Project
World Energy GH2
Project Nujio'qonik

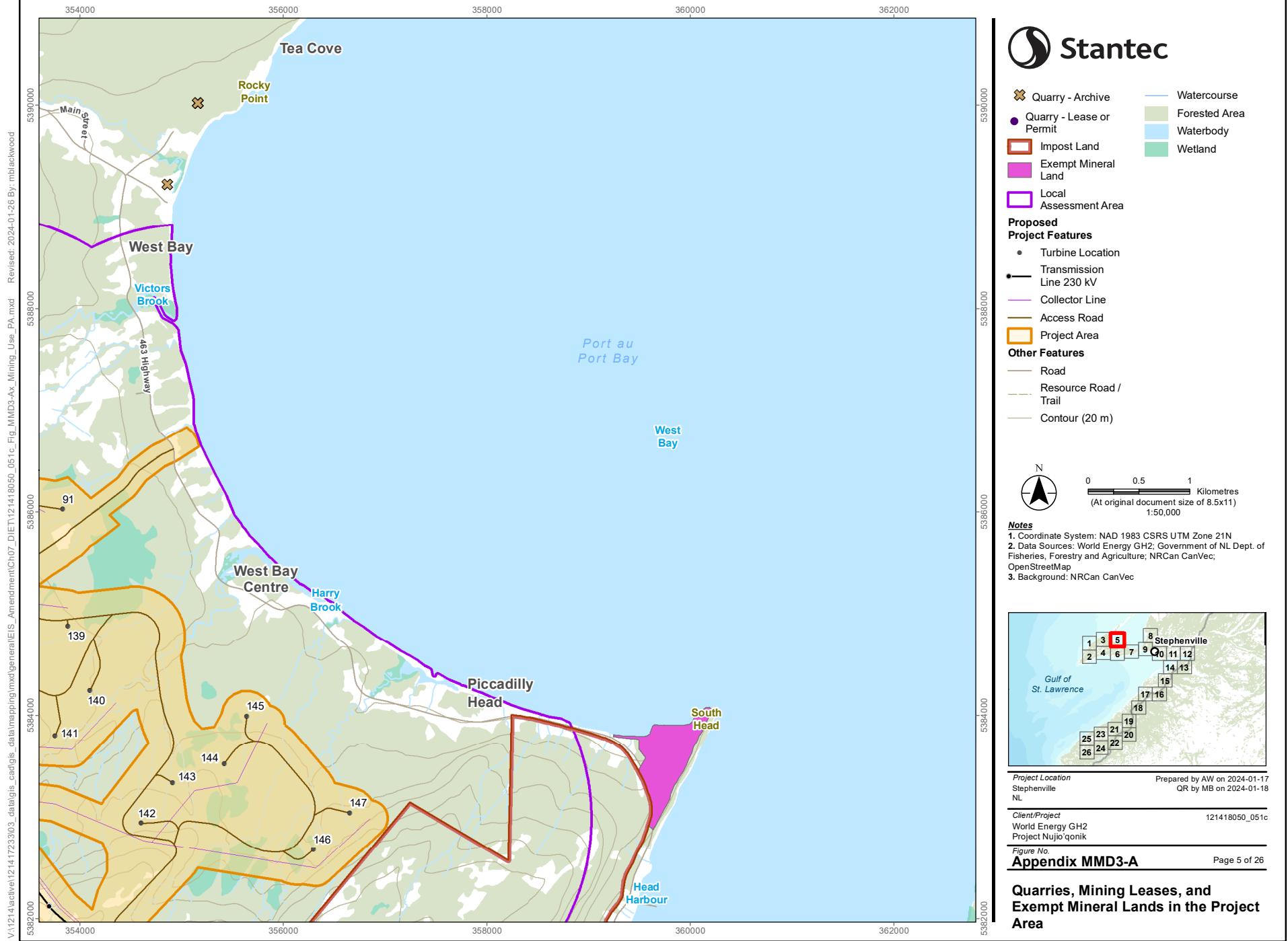
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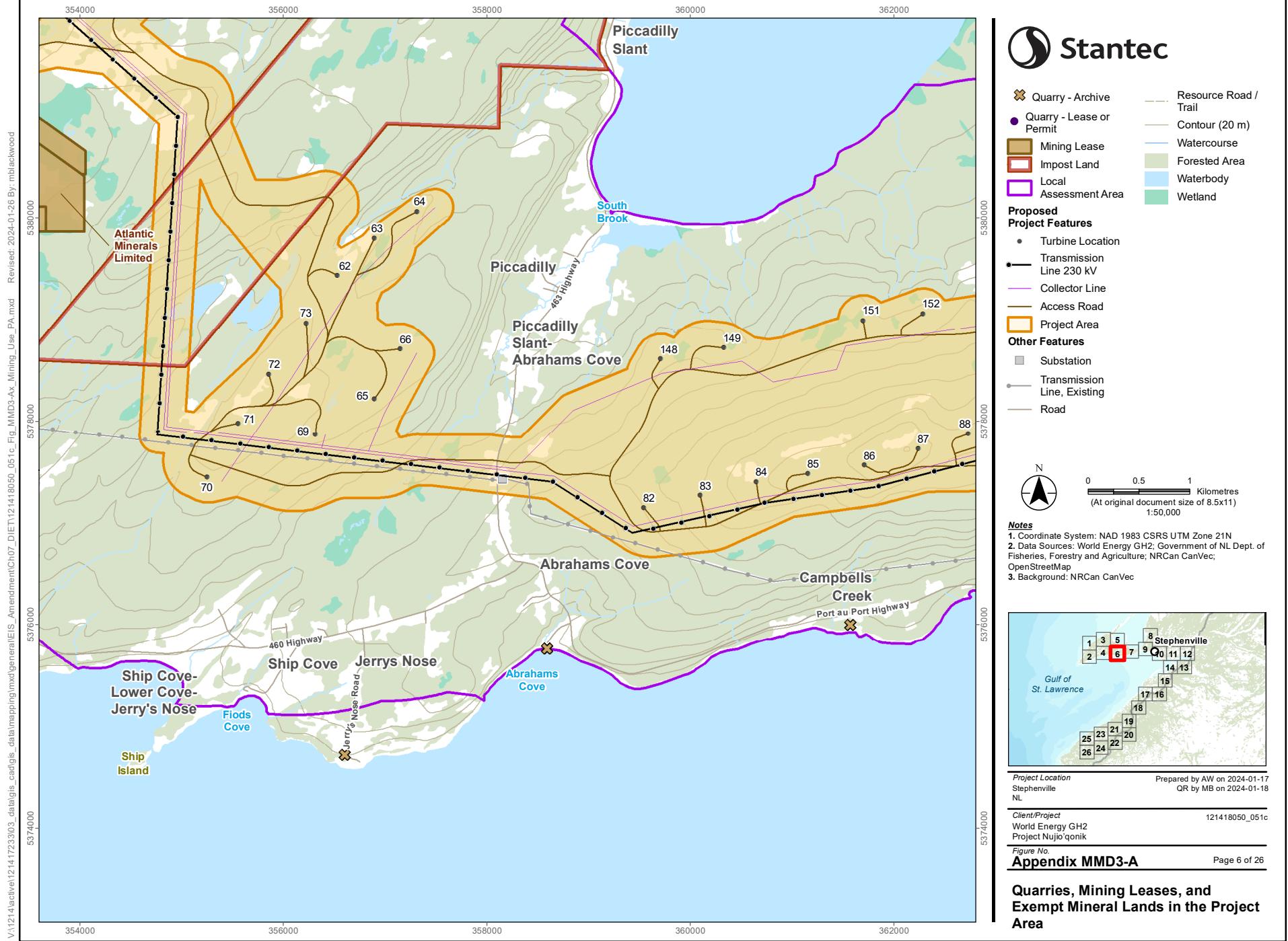
Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



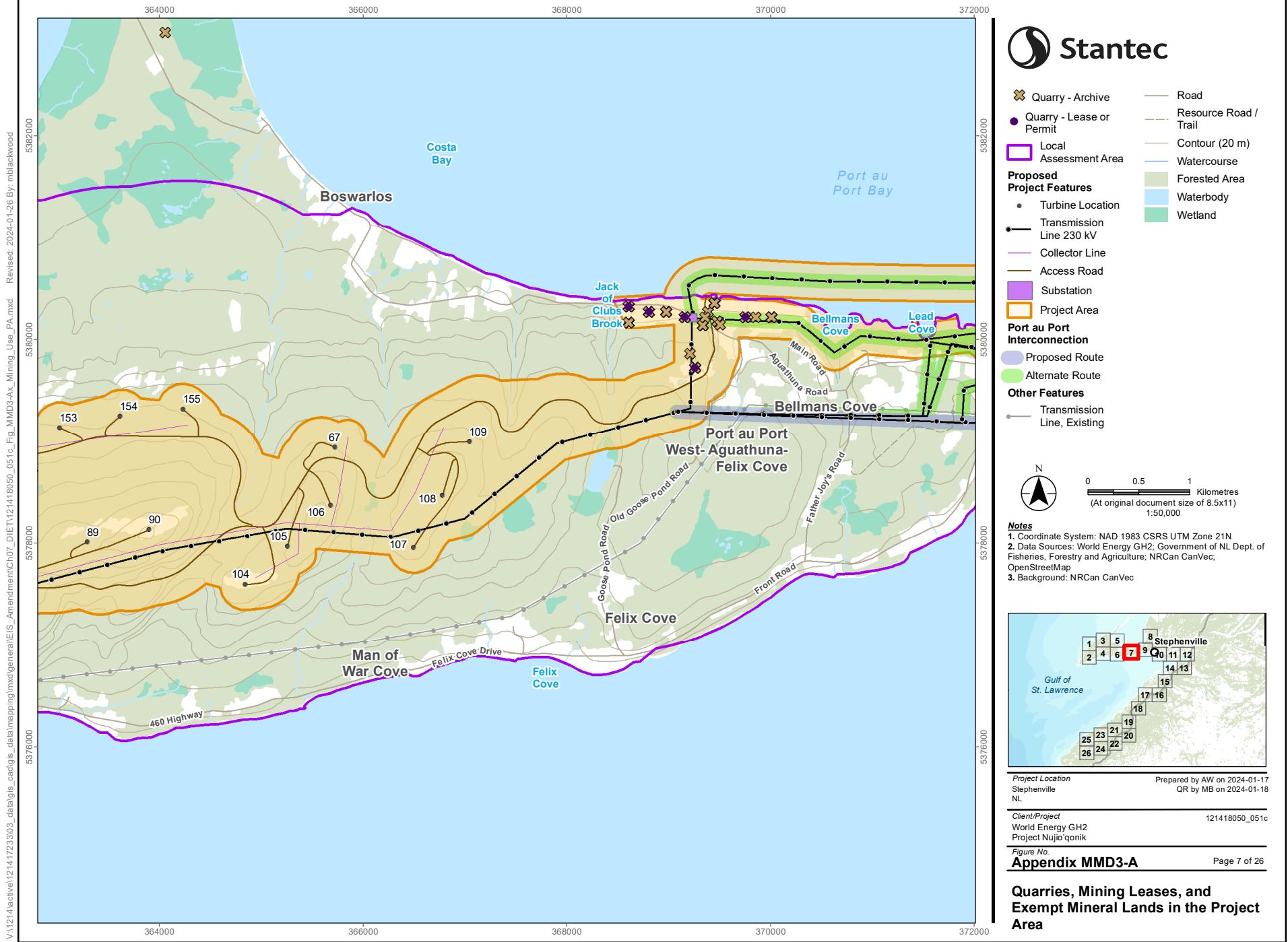
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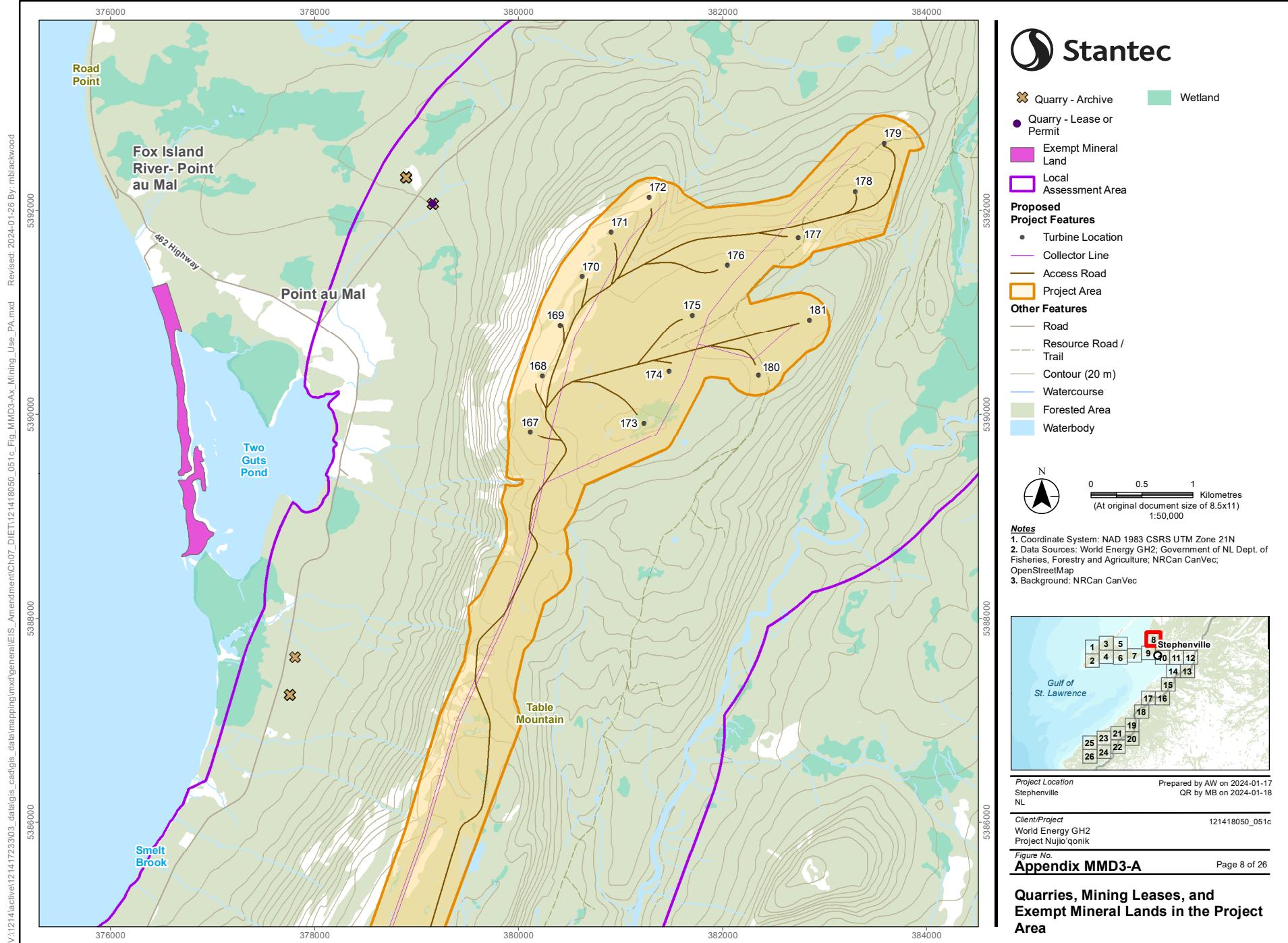
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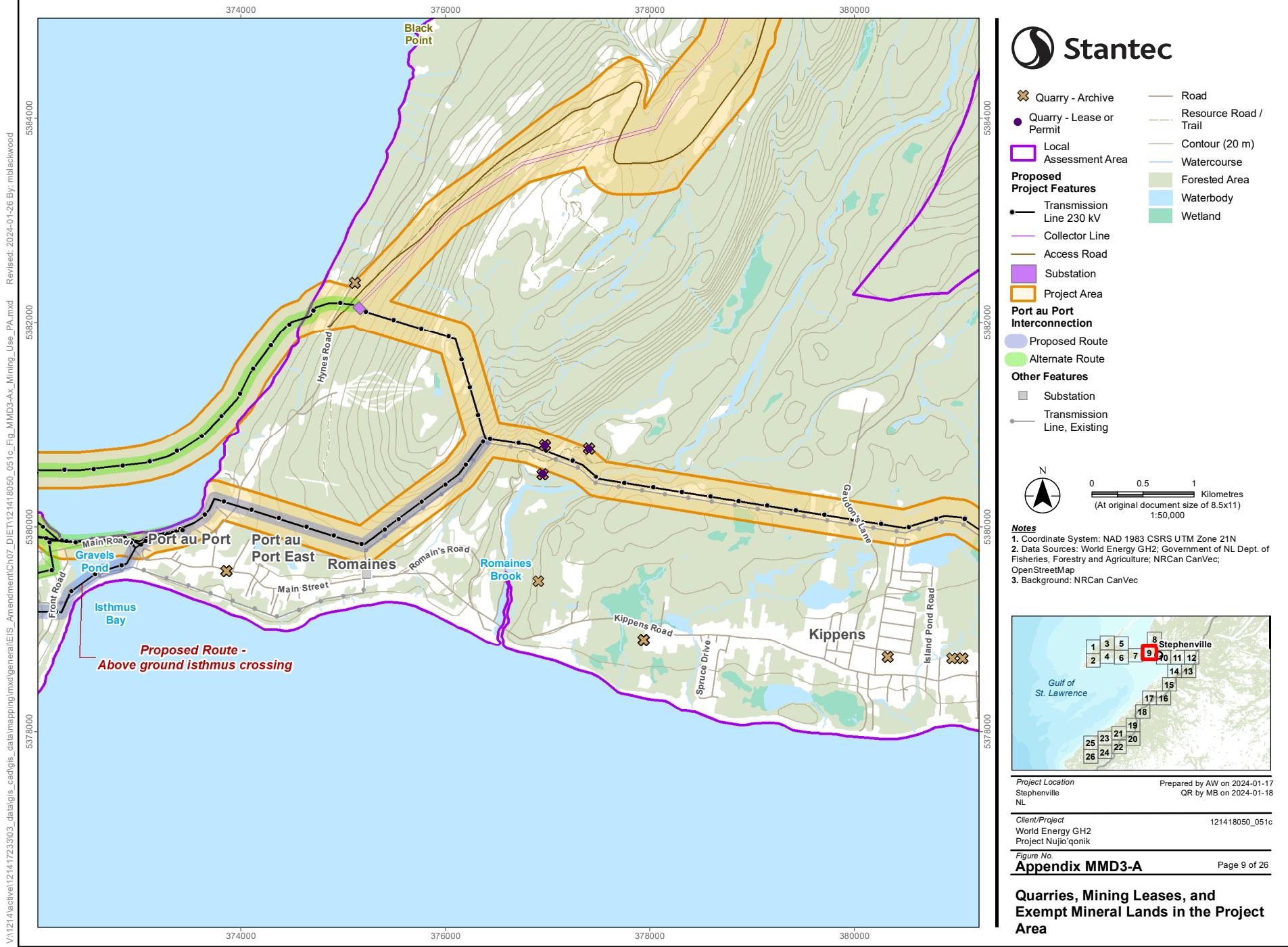
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Stantec

- ❖ Quarry - Archive
- Quarry - Lease or Permit
- Local Assessment Area

Proposed Project Features

- ★ Hydrogen / Ammonia Plant Location
- Transmission Line 230 KV
- Project Area

Other Features

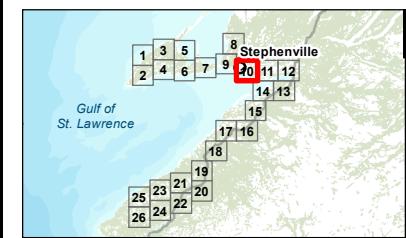
- Substation
- Electrical Generation
- Transmission Line, Existing
- Road
- Resource Road / Trail



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Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; Government of NL Dept. of Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
3. Background: NRCan CanVec



Project Location

Prepared by AW on 2024-01-17

QR by MB on 2024-01-18

Client/Project

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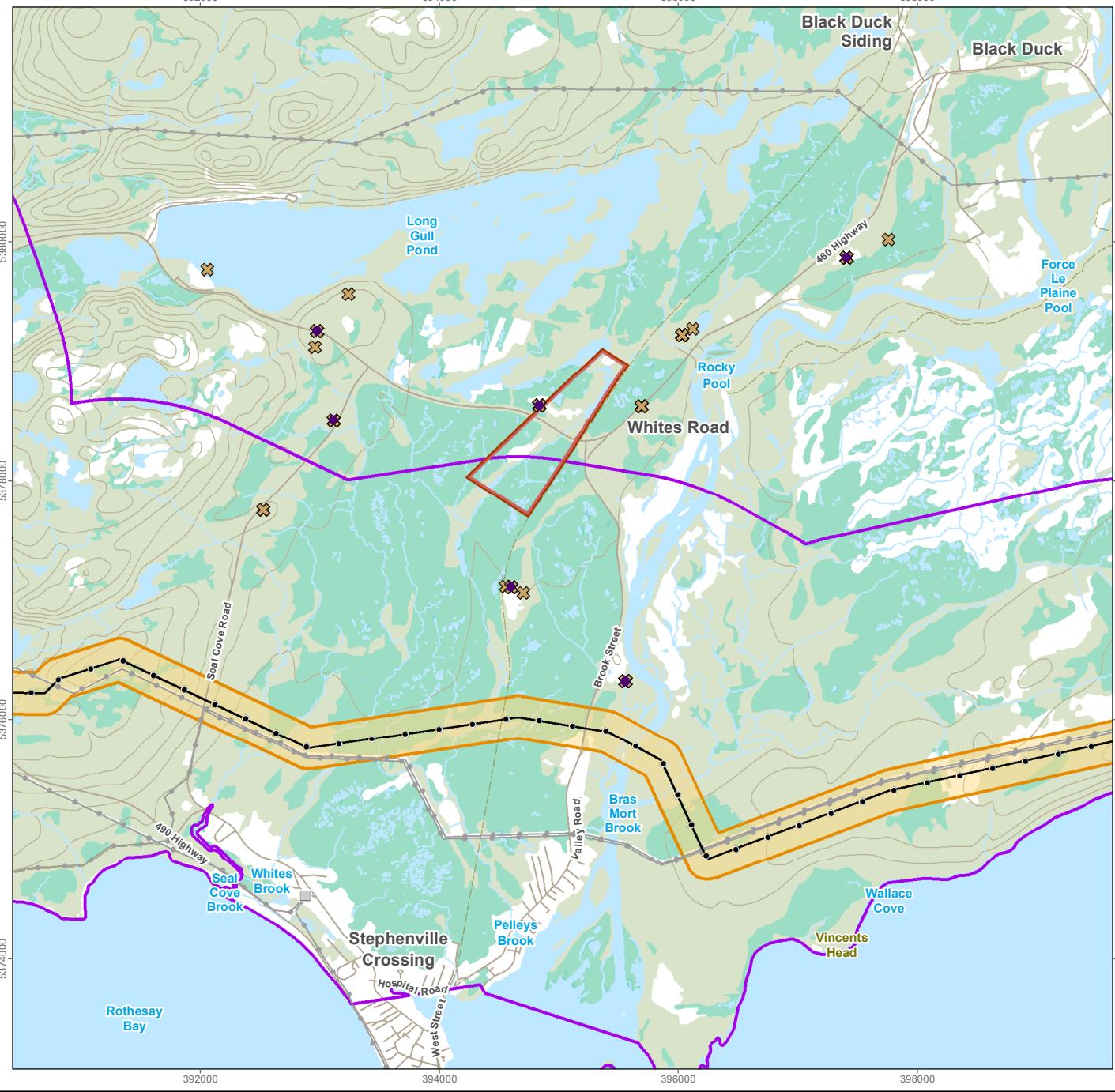
World Energy GH2

Project Nujo'qonik

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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



Stantec

Quarry - Archive
Quarry - Lease or Permit
Impost Land
Local Assessment Area

Proposed Project Features

Transmission Line 230 KV
Project Area

Other Features

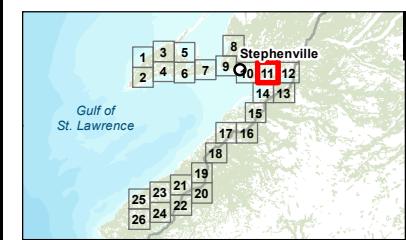
Substation
Transmission Line, Existing
Road
Resource Road / Trail
Contour (20 m)
Watercourse
Forested Area



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Notes

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Project Location

Prepared by AW on 2024-01-17
QR by MB on 2024-01-18

Client/Project

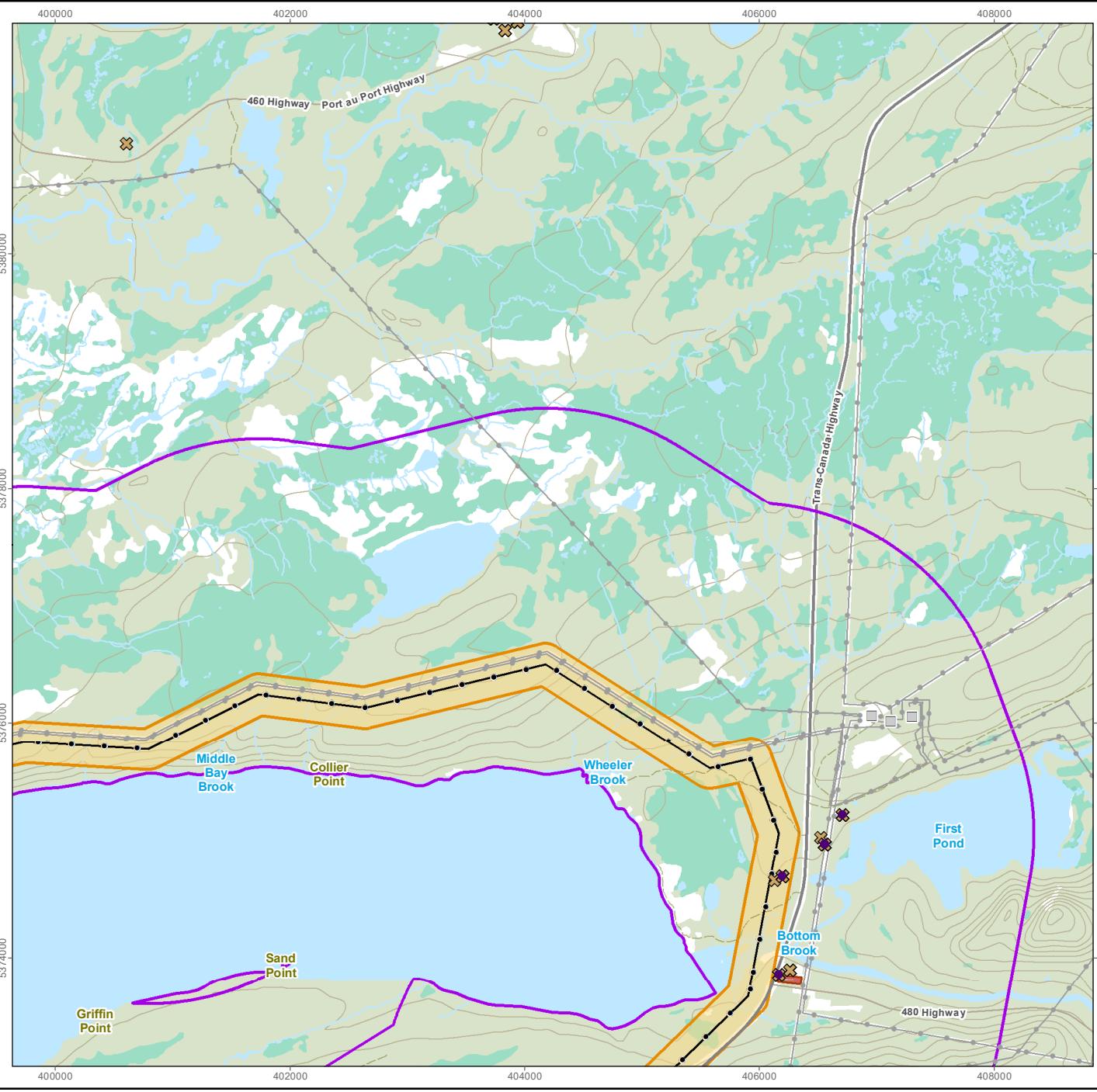
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Figure No.

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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



 Stantec

Quarry - Archive

Quarry - Lease or Permit

Impost Land

Local Assessment Area

Watercourse

Forested Area

Waterbody

Wetland

Proposed Project Features

Transmission Line 230 KV

Project Area

Other Features

Substation

Transmission Line, Existing

Trans-Canada Highway

Road

Resource Road / Trail

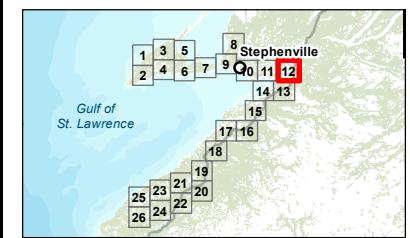
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Project Location

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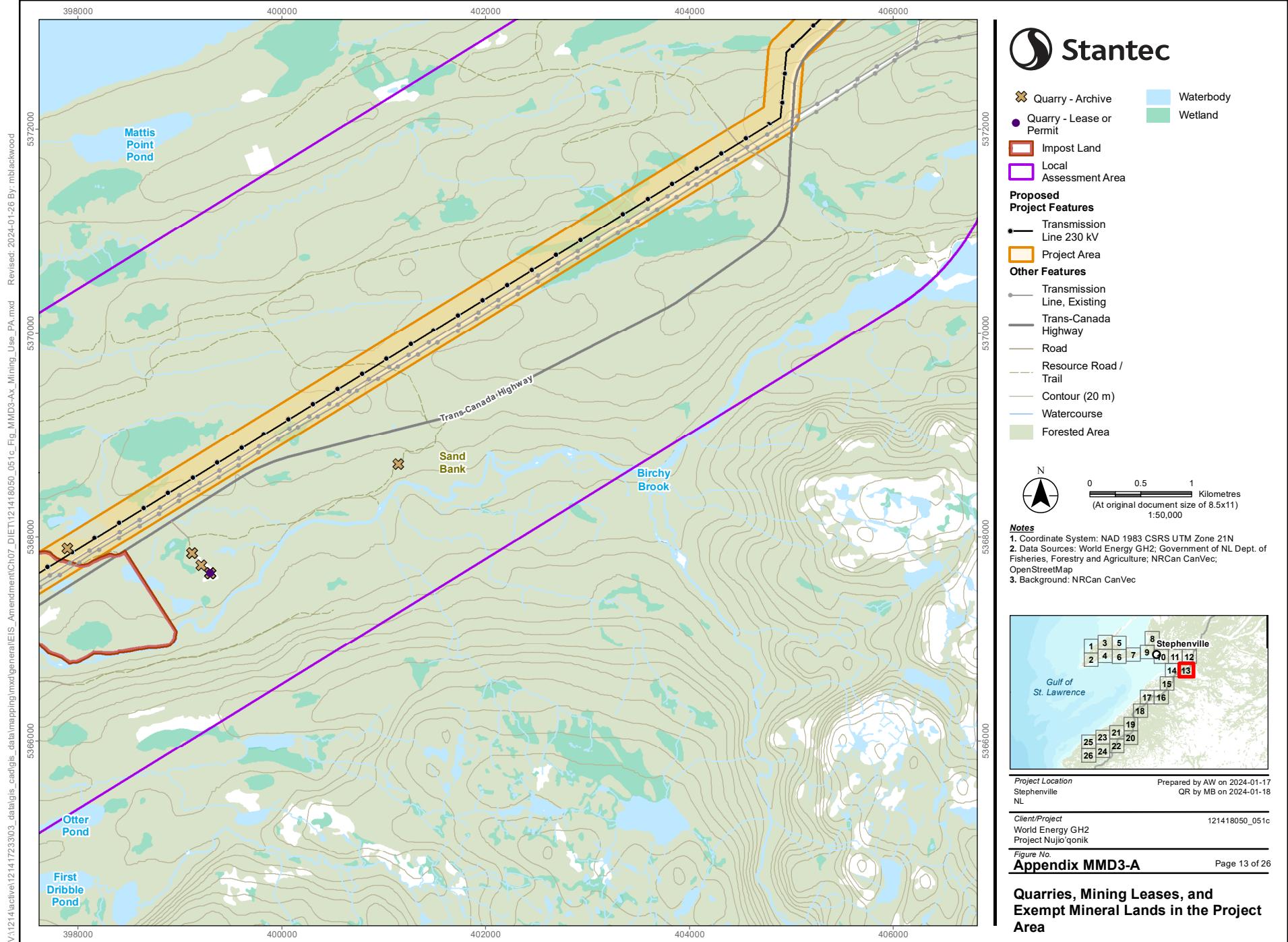
Client/Project

World Energy GH2
Project Nujio'qonik

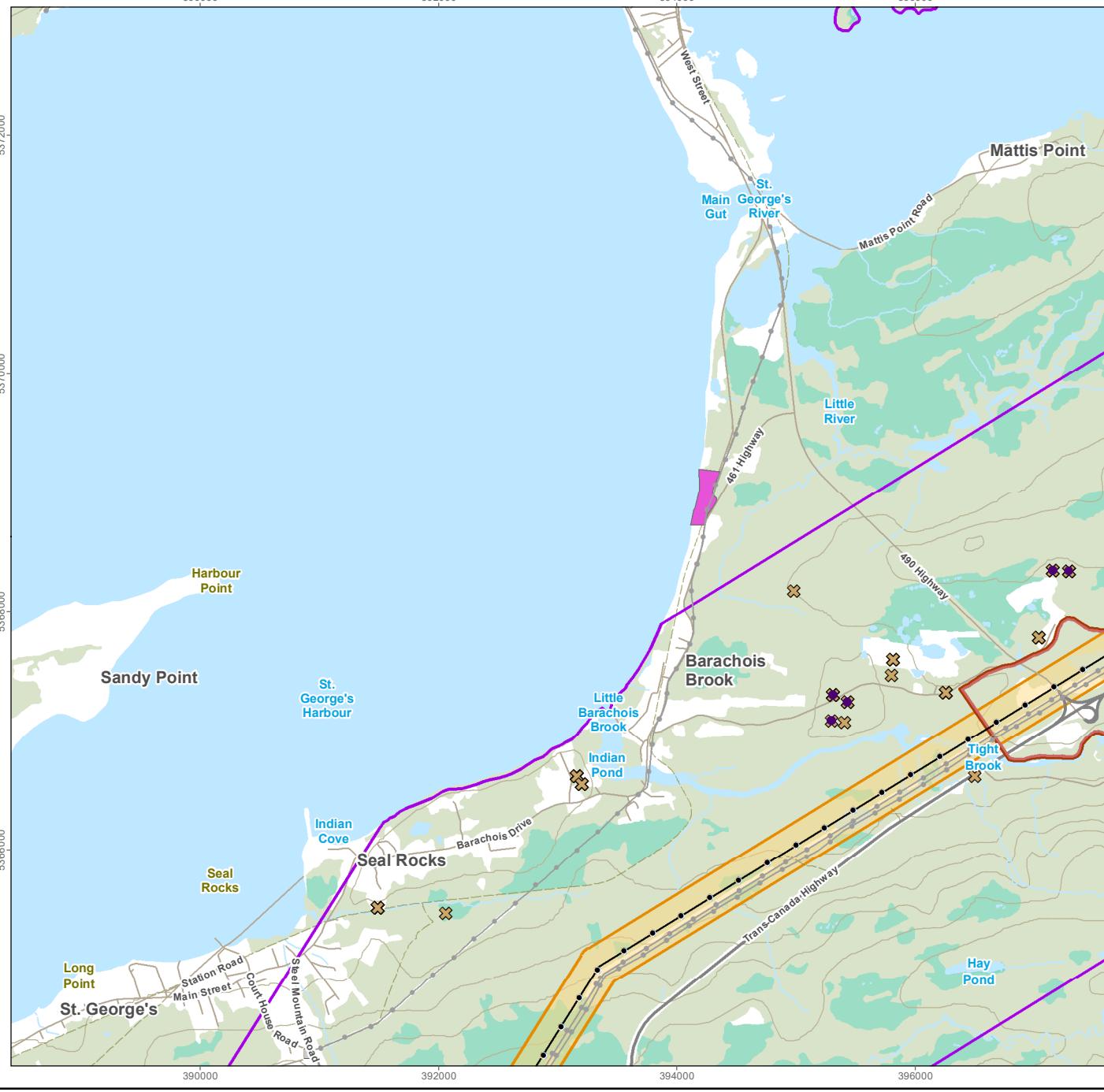
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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



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 Stantec

 Quarry - Archive
 Quarry - Lease or Permit
 Impost Land
 Exempt Mineral Land
 Local Assessment Area

Proposed Project Features

- Transmission Line 230 kV
- Project Area

Other Features

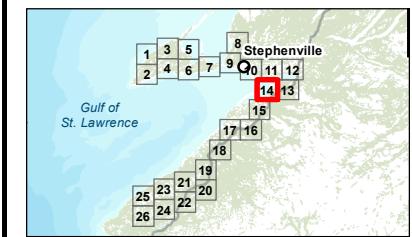
- Substation
- Transmission Line, Existing
- Trans-Canada Highway
- Road
- Resource Road / Trail



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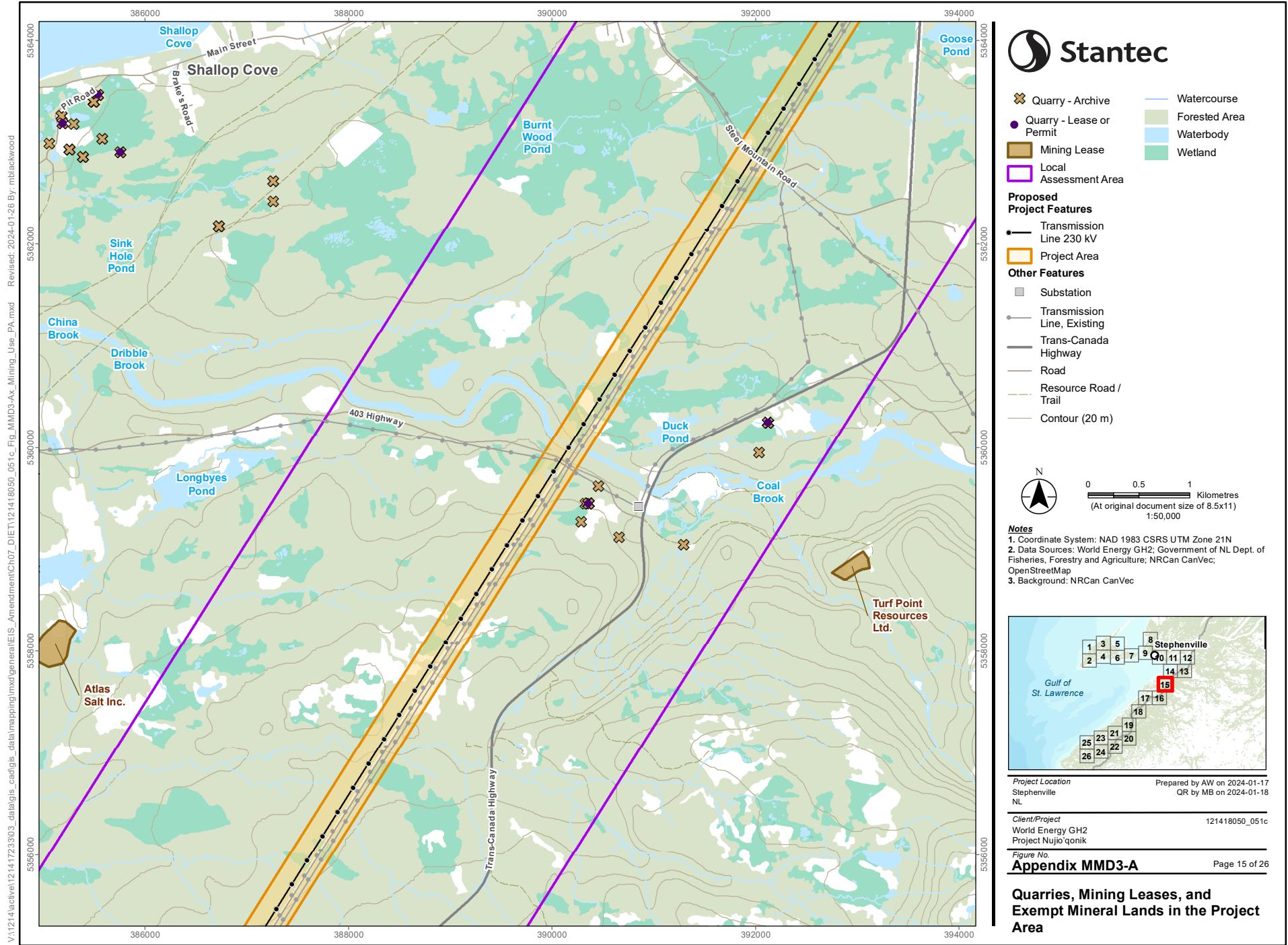


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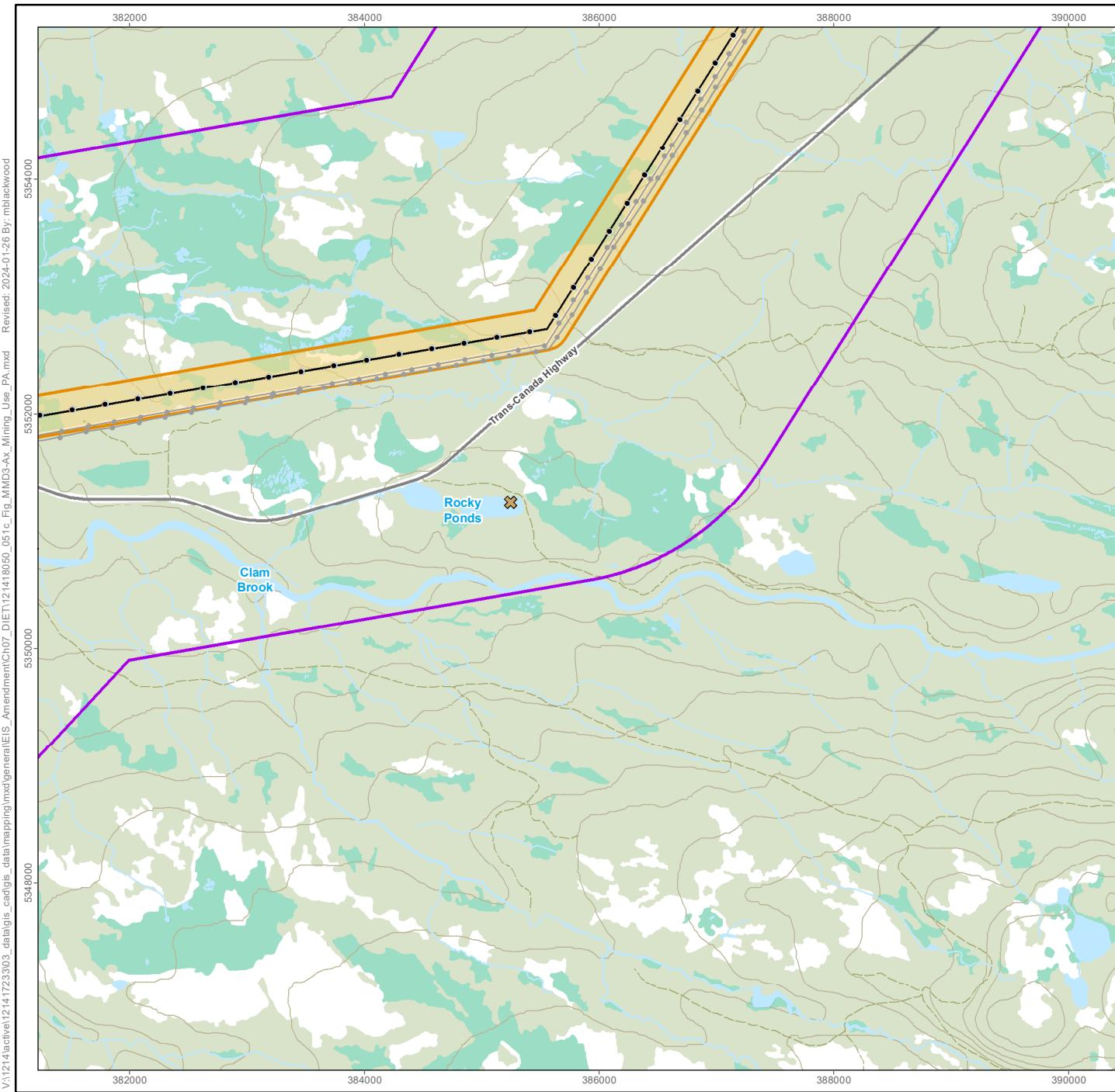
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Project Nujio'qonik

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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



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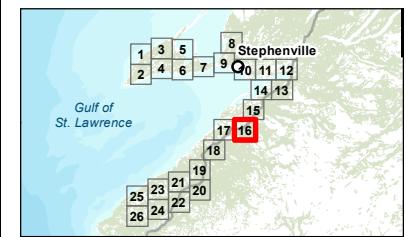
-  Quarry - Archive
-  Quarry - Lease or Permit
-  Local Assessment Area

Proposed Project Features

- Transmission Line 230 kV
- Project Area
- Other Features**
- Transmission Line, Existing
- Trans-Canada Highway
- Resource Road / Trail
- Contour (20 m)
- Watercourse
- Forested Area
- Waterbody
- Wetland



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Project Location Prepared by AW on 2024-01-17
Stephenville QR by MB on 2024-01-18

Client/Project 121418050_051c
World Energy GH2
Project Nucléaire

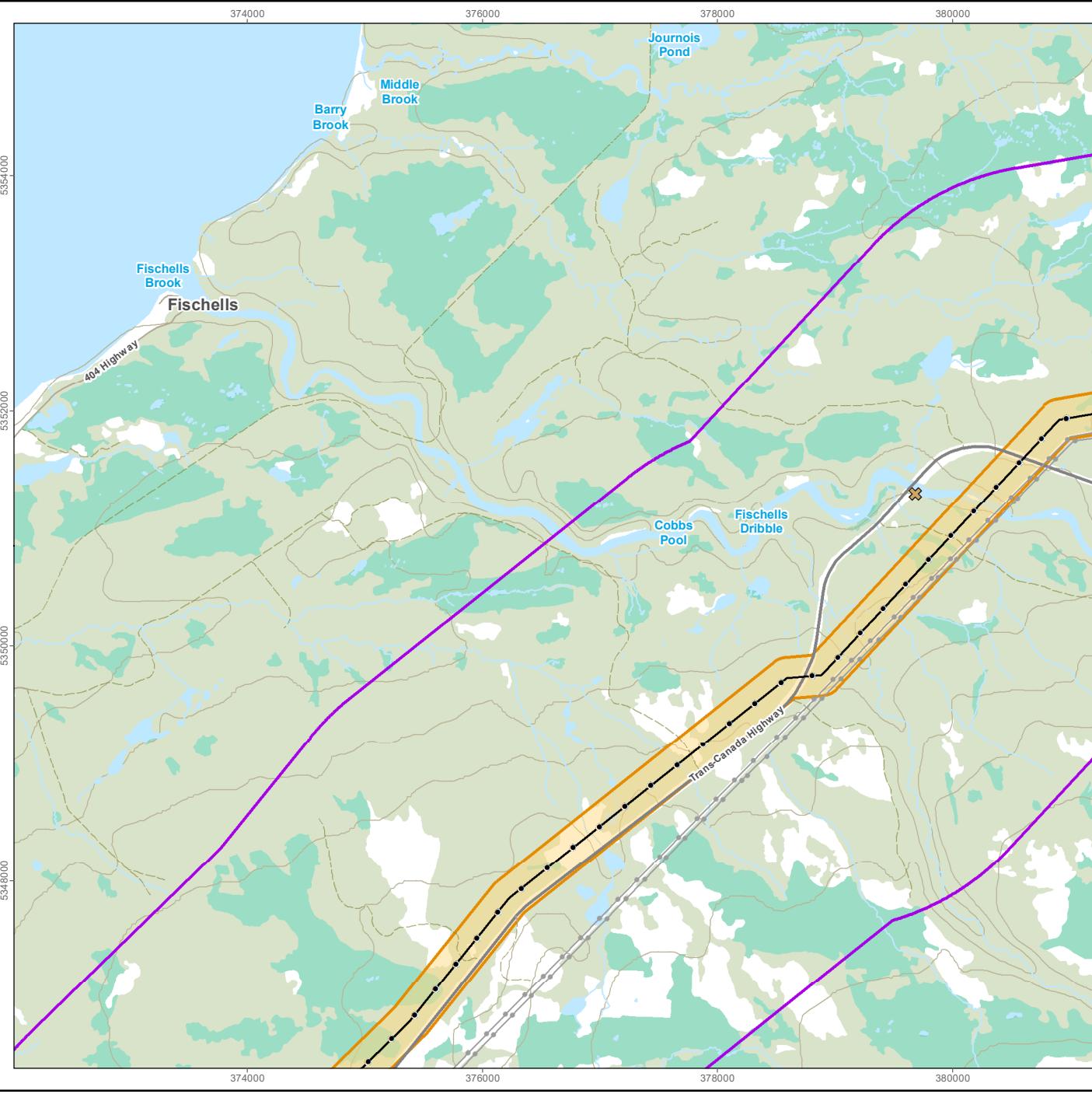
Figure No.

Appendix MMD3-A

Section 1: Methodology

Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area

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Stantec

Quarry - Archive
Quarry - Lease or Permit

Local Assessment Area

Proposed Project Features

Transmission Line 230 kV

Project Area

Other Features

Transmission Line, Existing

Trans-Canada Highway

Road

Resource Road / Trail

Contour (20 m)

Watercourse

Forested Area

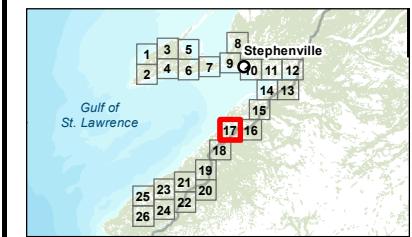
Waterbody



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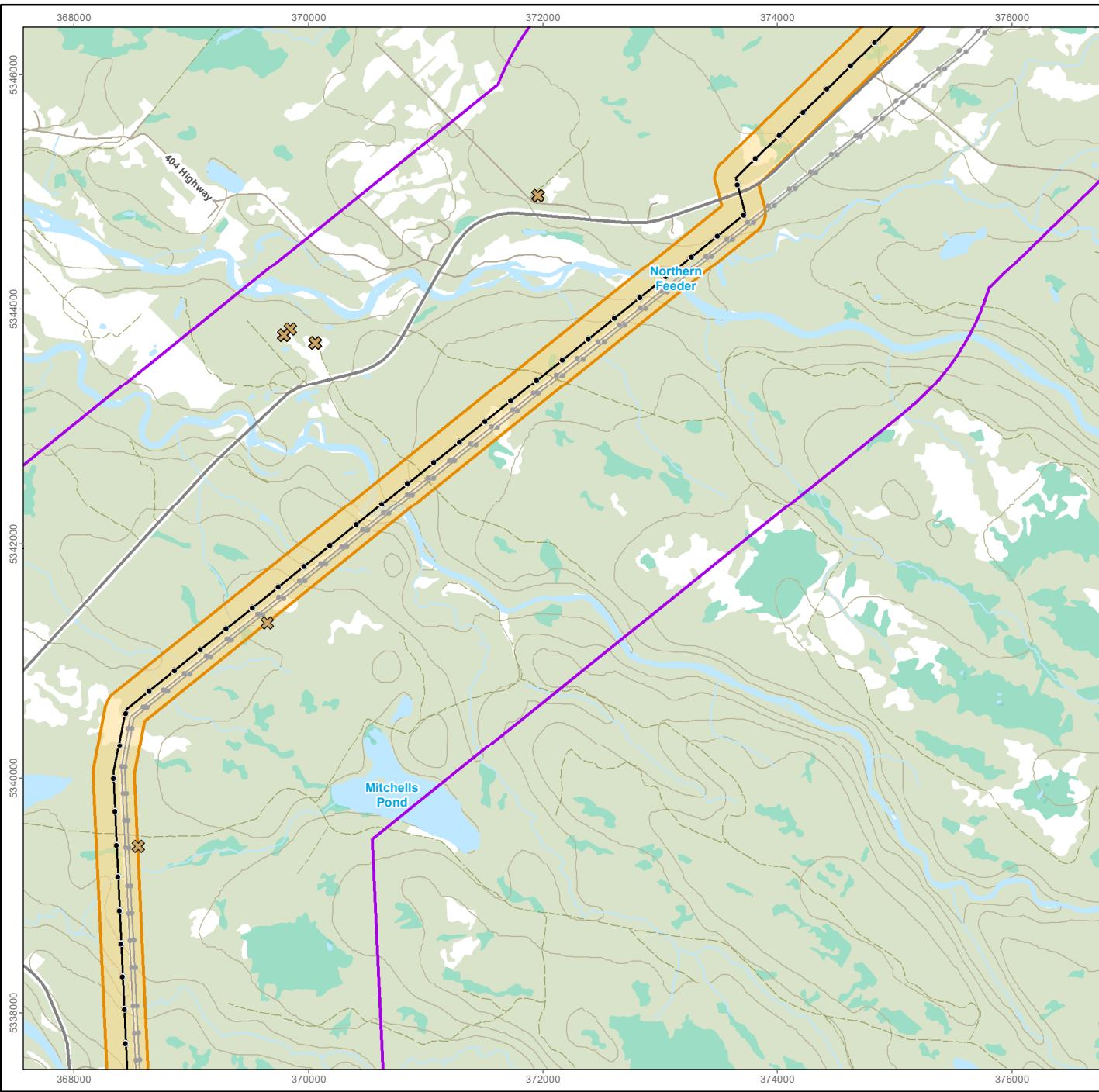


Project Location Stephenville, NL Prepared by AW on 2024-01-17
QR by MB on 2024-01-18

Client/Project World Energy GH2
Project Nujjo'qonik
121418050_051c

Figure No. Appendix MMD3-A
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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



Stantec

Quarry - Archive
Quarry - Lease or Permit

Local Assessment Area

Proposed Project Features

Transmission Line 230 kV
Project Area

Other Features

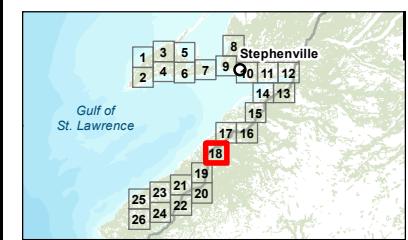
Transmission Line, Existing
Trans-Canada Highway
Road
Resource Road / Trail
Contour (20 m)
Watercourse
Forested Area
Waterbody



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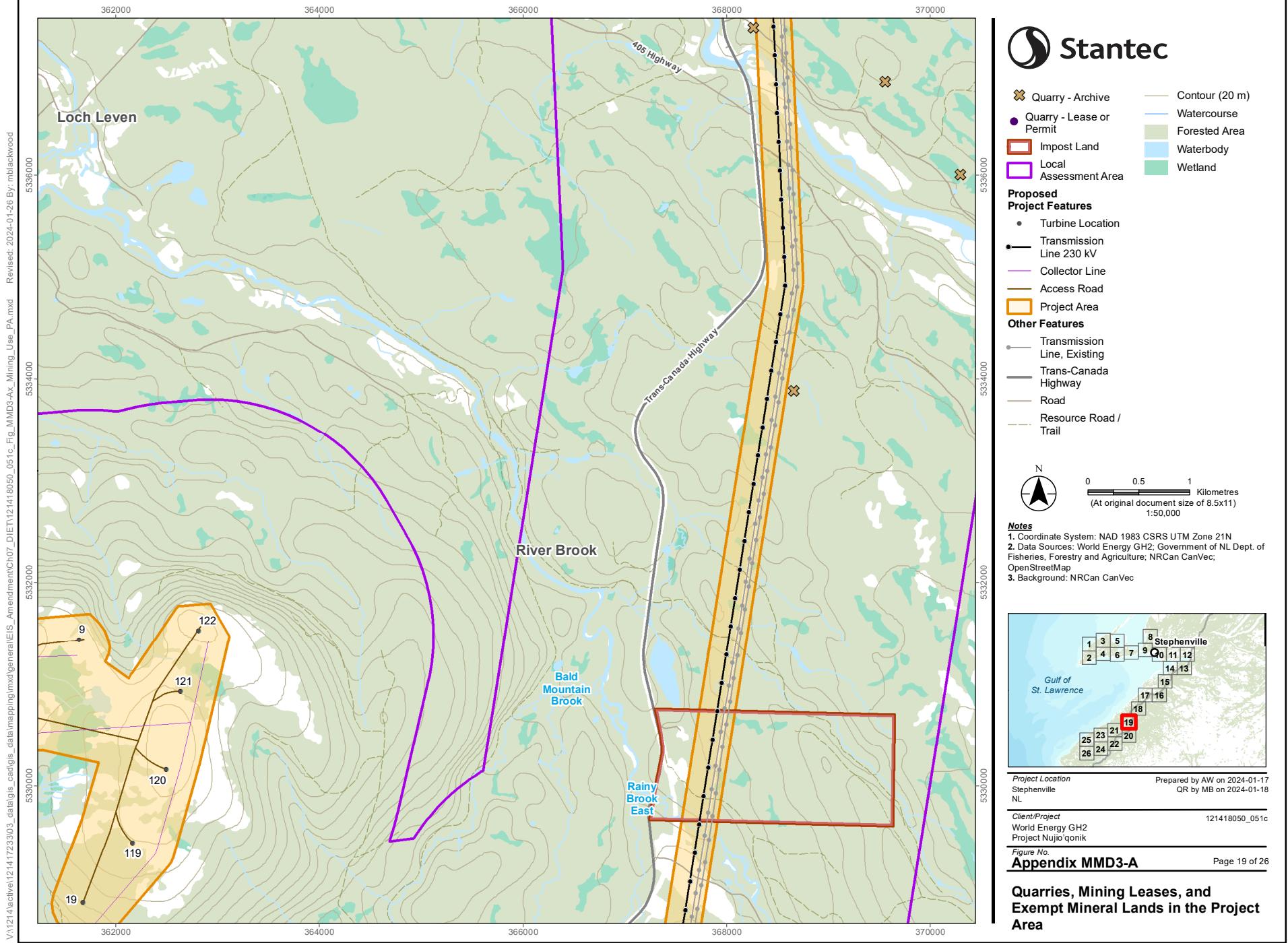


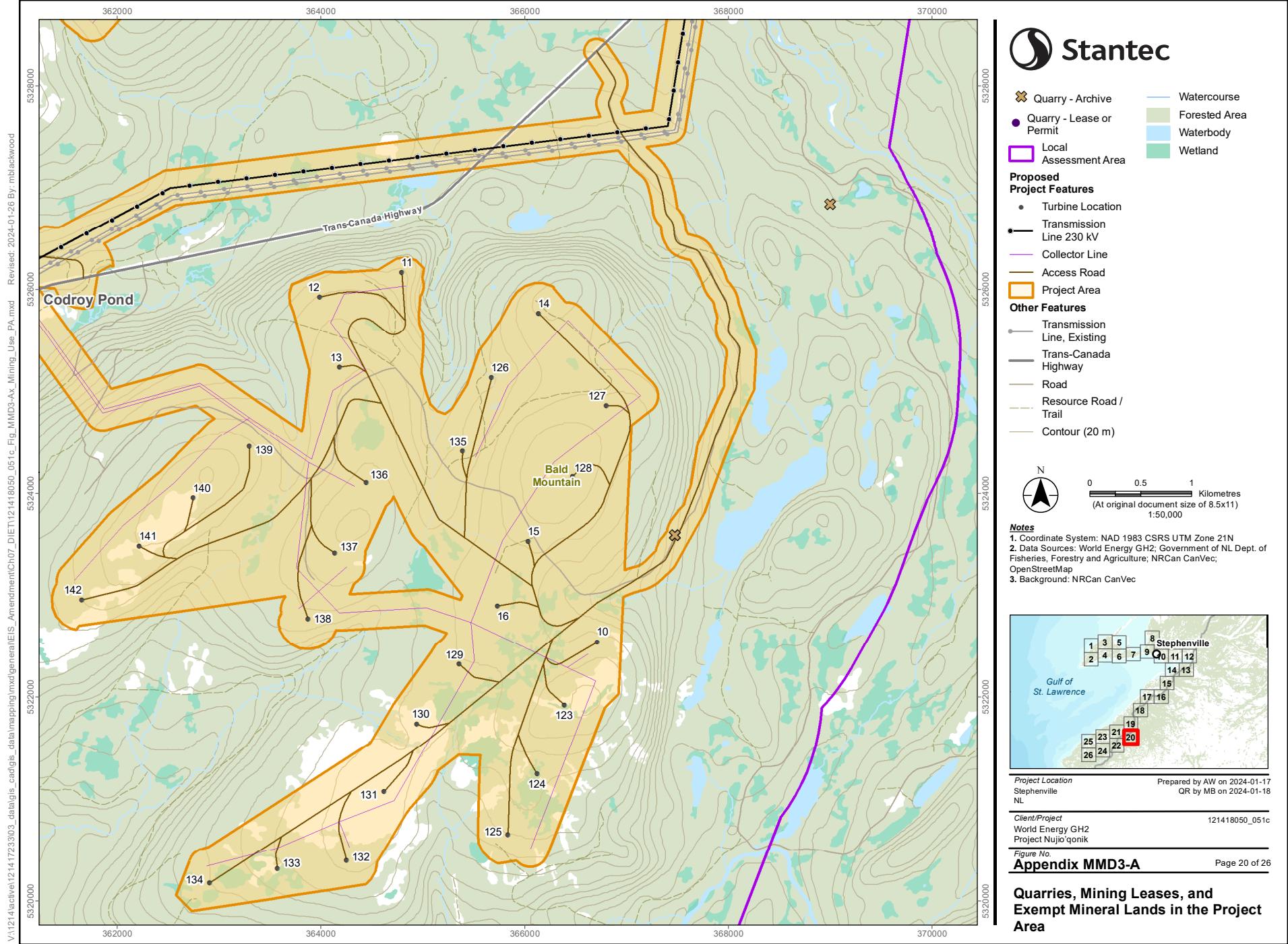
Project Location Stephenville NL Prepared by AW on 2024-01-17
QR by MB on 2024-01-18

Client/Project World Energy GH2
Project Nujio'qonik

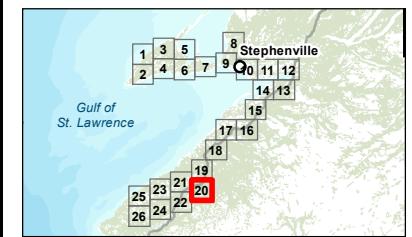
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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area





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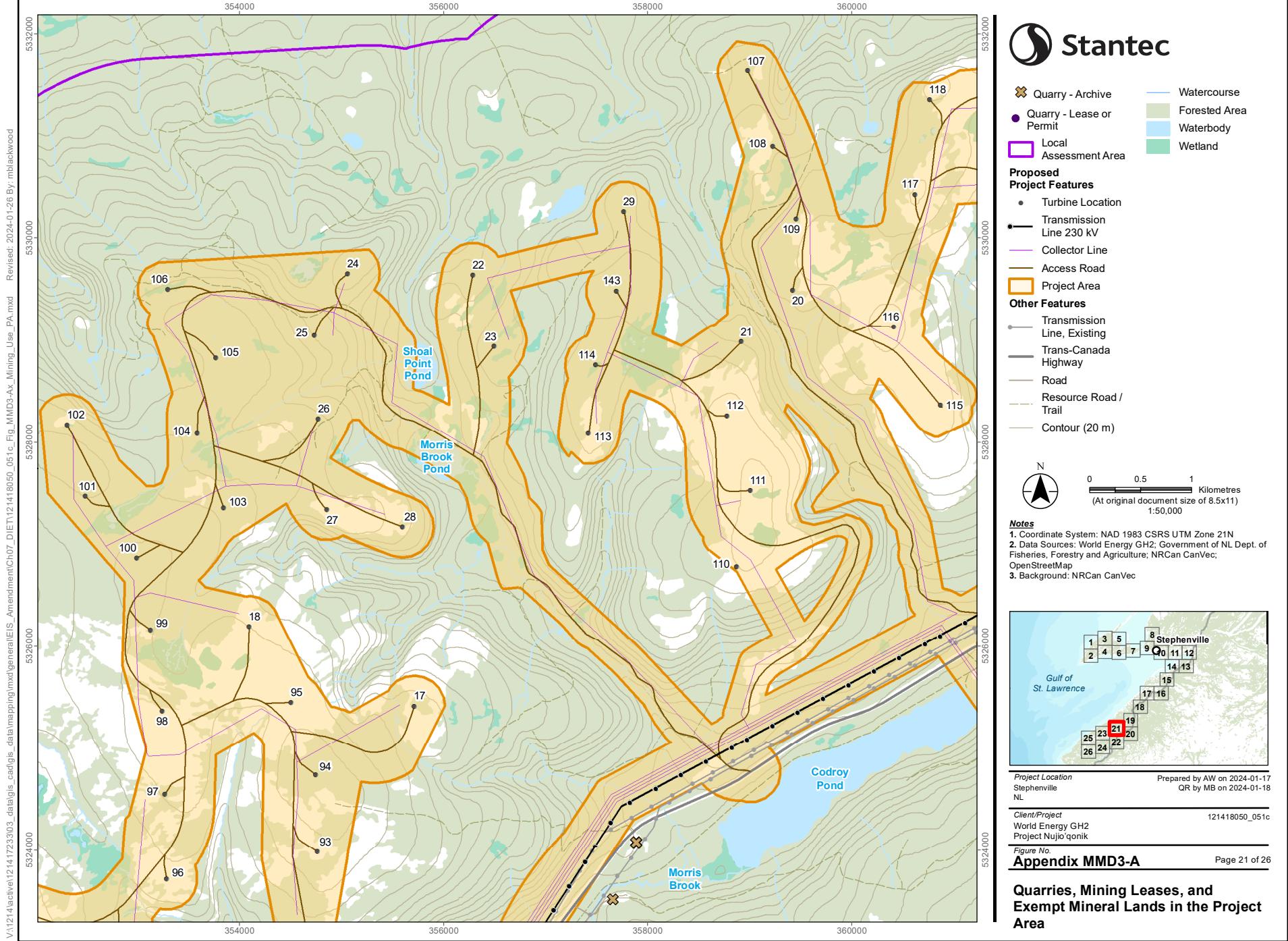


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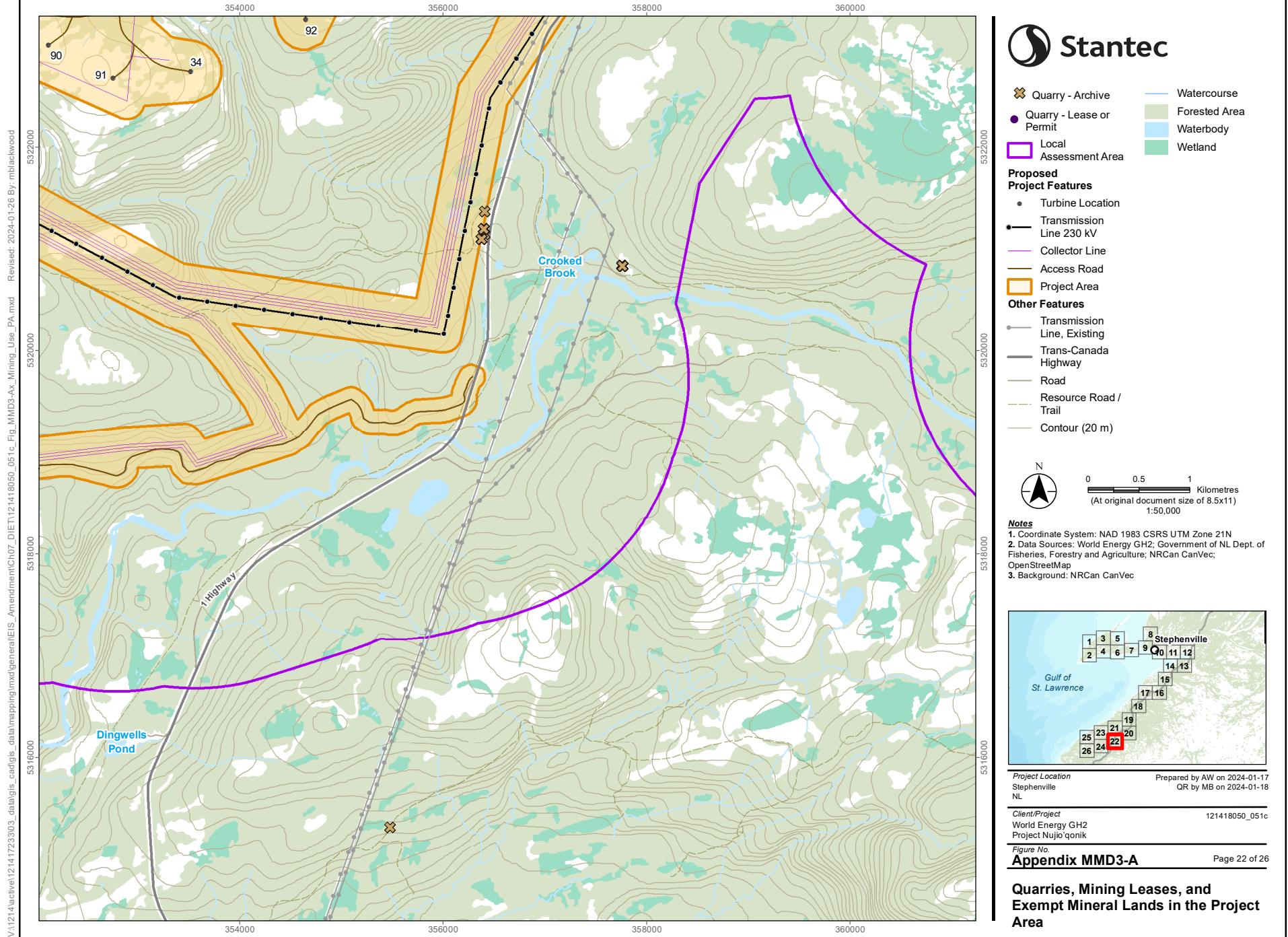
Client/Project
 World Energy GH2
 Project Nujio'qonik

Figure No.
Appendix MMD3-A

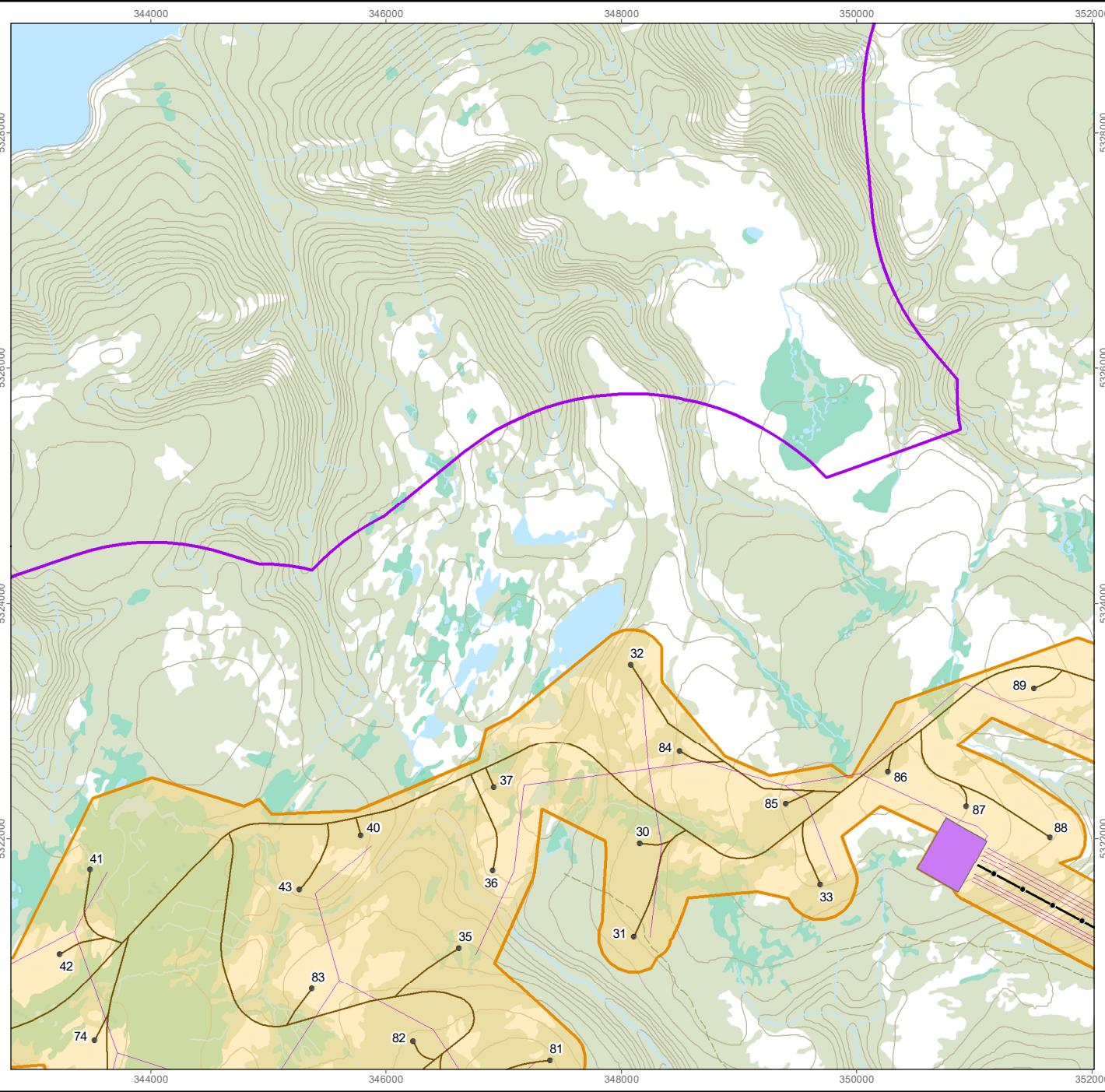
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 Stantec

Quarry - Archive
Quarry - Lease or Permit

Local Assessment Area

Proposed Project Features

- Turbine Location
- Transmission Line 230 KV
- Collector Line
- Access Road
- Substation

Other Features

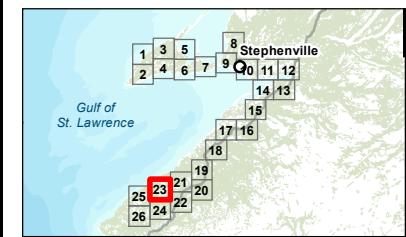
- Resource Road / Trail
- Contour (20 m)
- Watercourse
- Forested Area
- Waterbody



0 0.5 1 Kilometres
(At original document size of 8.5x11)
1:50,000

Notes

- Coordinate System: NAD 1983 CSRS UTM Zone 21N
- Data Sources: World Energy GH2; Government of NL Dept. of Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
- Background: NRCan CanVec

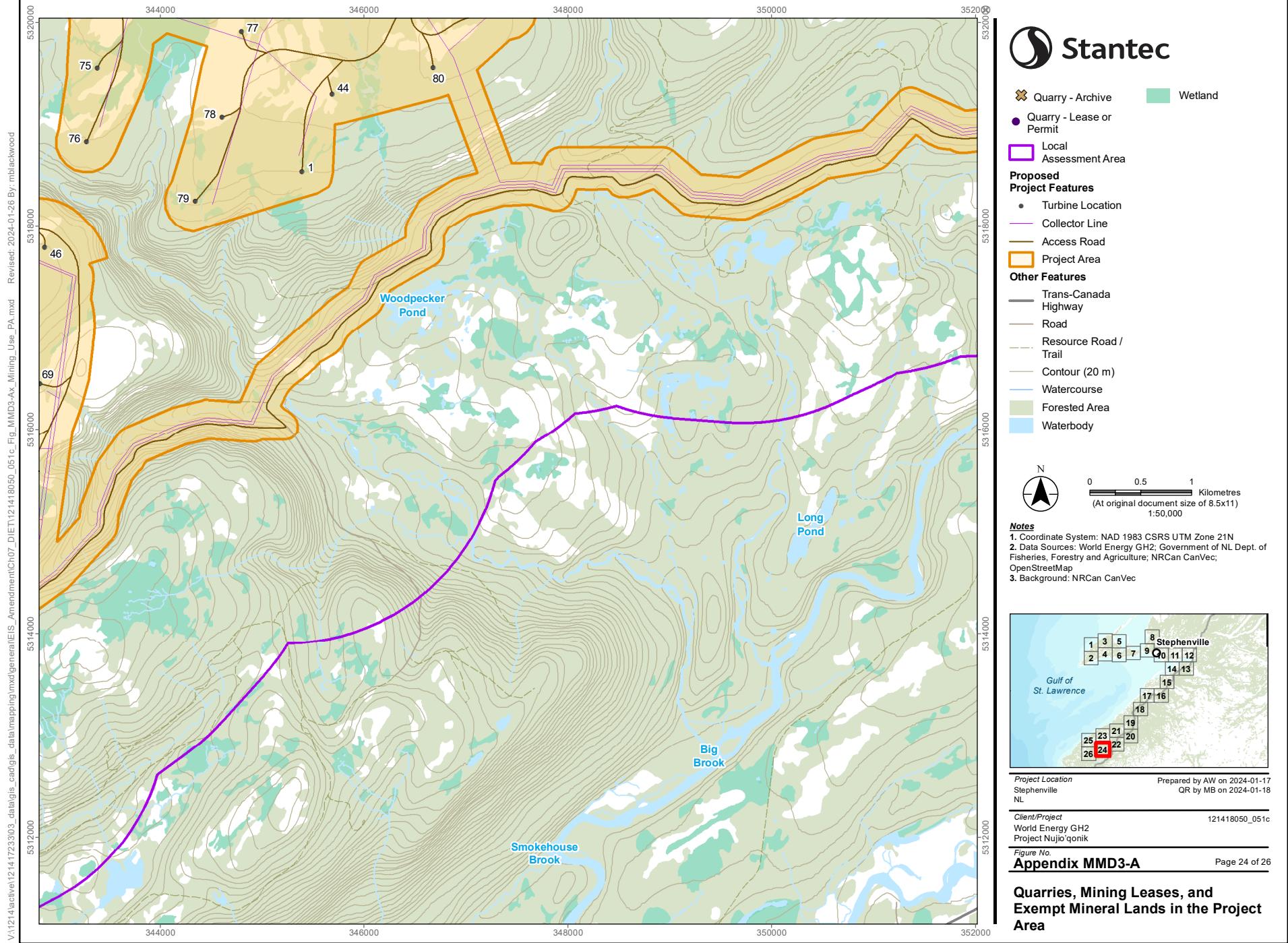


Project Location Stephenville NL Prepared by AW on 2024-01-17
QR by MB on 2024-01-18

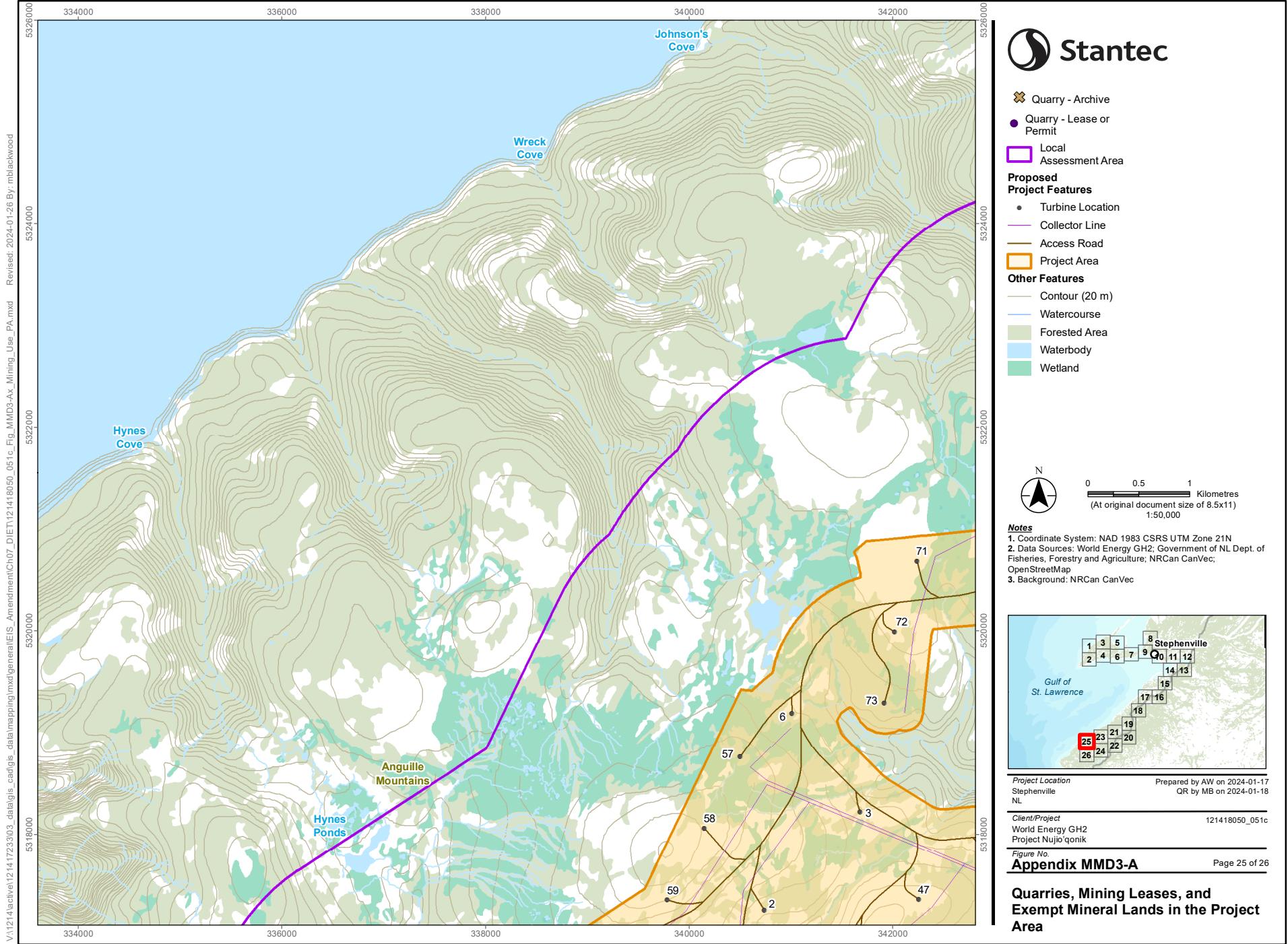
Client/Project World Energy GH2 Project Nujio'qonik
121418050_051c

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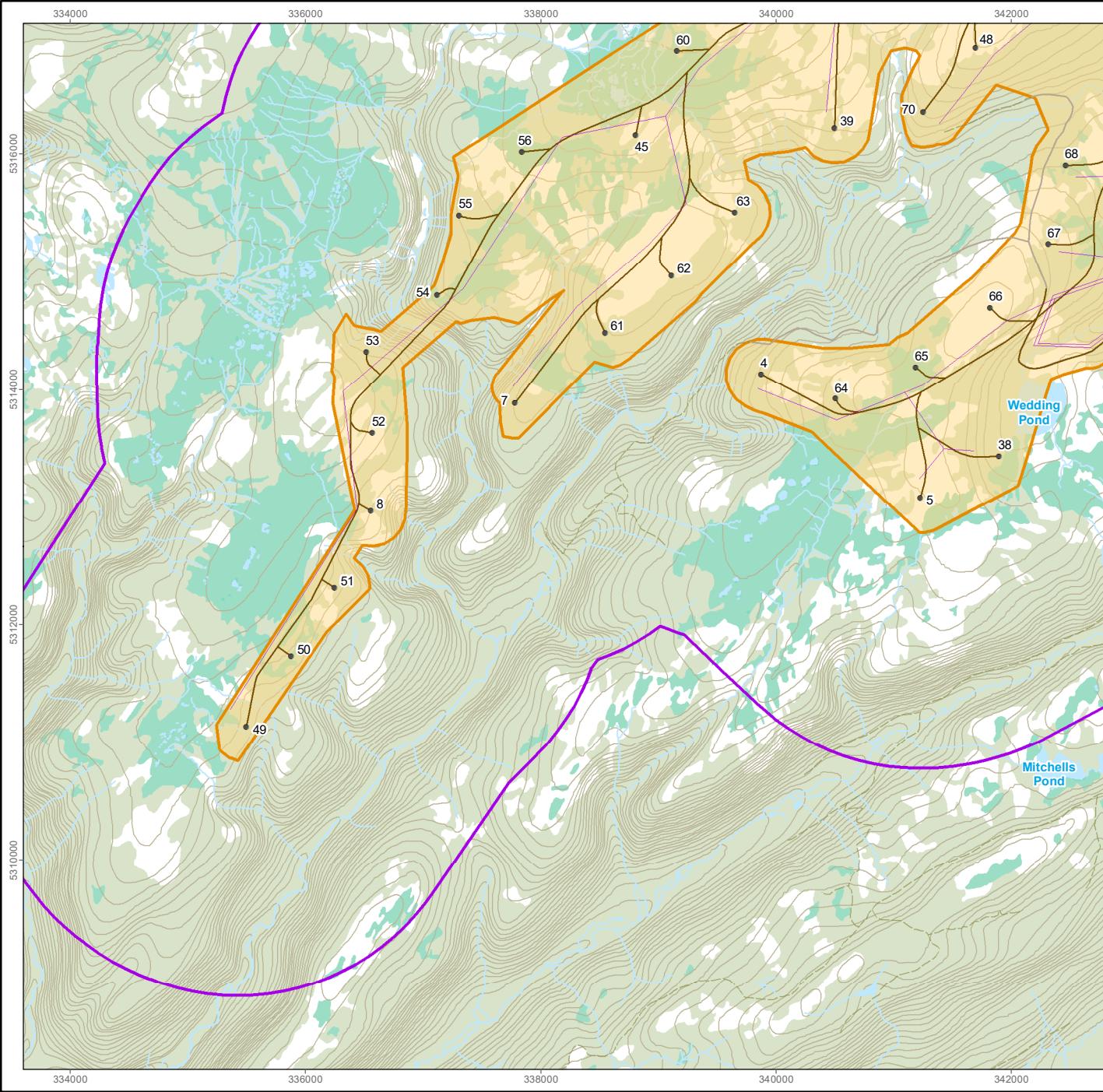
Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area



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- ◊ Quarry - Archive
- Quarry - Lease or Permit
- Local Assessment Area

Proposed Project Features

- Turbine Location
- Collector Line
- Access Road
- Project Area

Other Features

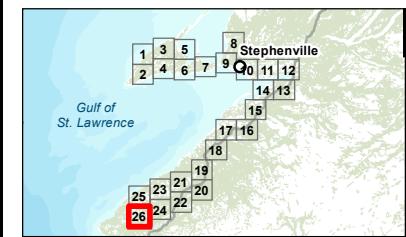
- Road
- Resource Road / Trail
- Contour (20 m)
- Watercourse
- Forested Area
- Waterbody
- Wetland



0 0.5 1 Kilometres
(At original document size of 8.5x11)
1:50,000

Notes

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3. Background: NRCan CanVec



Prepared by AW on 2024-01-17
QR by MB on 2024-01-18

Client/Project World Energy GH2
Project Nujio'qonik

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Quarries, Mining Leases, and Exempt Mineral Lands in the Project Area