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20 June 2025

File MLP0020

# Mclvenna Bay Operating Ltd.

## Concentrate Loading Facility

### Environment Act Proposal



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## Executive Summary

### Introduction and Background

Mcllvenna Bay Operating Ltd. (MBO), a wholly owned subsidiary of Foran Mining Corporation (Foran), is proposing to develop a Concentrate Loading Facility (the Facility) on a private land zoned for industrial use in the Rural Municipality of Kelsey, Manitoba. The purpose of the Facility is to transload copper and zinc concentrates from the Mcllvenna Bay Operation in Saskatchewan into railcars for shipping to Canadian refineries via existing rail lines. The Mcllvenna Bay Operation is currently under construction and expects to begin operating and shipping copper and zinc concentrates in the first half of 2026.

MBO retained Misty Clifton Engineering LP (MCLP) to prepare this Environment Act Proposal (EAP) to obtain an Environment Act Licence for the Facility in accordance with the *Environment Act*.

### Description of Proposed Development

The proposed Facility will include a fully enclosed storage building for temporary storage and transloading of copper and zinc concentrates, office trailer and portable washroom, rail track and outdoor rail storage area, access road and security system. Concentrates will be delivered to the proposed Facility via covered truck from the Mcllvenna Bay Operation and transloaded onto rail for shipping to Canadian refineries.

The fully enclosed storage building will be constructed on a concrete foundation. Covered trucks and rail cars will enter the building in a drive through manner with roll up doors being utilized for both on entry and exit. Concentrates are predicted to be delivered via covered truck at a frequency of up to 19 trucks per day. Rail cars will be loaded for shipping approximately two to three times a week and shipped via the existing Hudson Bay Railway line. Construction of the Facility is expected to commence in Q3 2025, with operations commencing in Q1 2026.

### Potential Effects and Mitigation Measures

The EAP describes potential effects to the atmospheric, biophysical, and human environments, and mitigation measures to minimize impacts. The proposed Facility is located adjacent to an existing Hudson Bay Railway line and industrial developments on the edge of Cranberry Portage which is already subject to industrial activity and rail traffic.

The proposed Facility would result in air emissions and the generation of noise during construction and operation including use of mobile equipment, traffic on unpaved roads, and rail activities. Air emission and noise levels were evaluated and assessed and determined to be within applicable guidelines.

Effects to the hydrologic environment is not anticipated, as the proposed Facility is more than 500 m from the nearest surface waterbody.

The proposed Facility would result in both vegetation and habitat loss of approximately 0.06 km<sup>2</sup> (6 ha) of private land within the RM of Kelsey. The proposed developments are impacting an edge portion of the surrounding available habitat and are unlikely to substantially affect the overall distribution of vegetation or wildlife in the region.

Effects to human health are not anticipated as there are limited emissions from the proposed Facility and air emissions and noise levels are predicted to be below guideline levels.

Effects to Indigenous communities are not anticipated as the proposed Facility is located on private land where access for hunting and trapping is currently restricted, and the proposed Facility is more than 18 km from the nearest Indigenous community.

A heritage screening was submitted to the Historic Resources Branch and conditional approval was provided for the proposed Facility. MBO will adhere to conditions of the approval, including development of a heritage resource protection plan for construction.

The RM of Kelsey is supportive of the proposed Facility and has prepared a letter of support for the proposed Facility, which is appended to this submission. MBO will continue to engage with the RM of Kelsey over the life of the Facility.

The proposed Facility will result in a small positive impact to employment.

Unplanned events or upset conditions that could affect the environment are not anticipated, however, MBO will develop and implement an Emergency Response Plan that conforms to local and provincial guidelines.

### **Follow-up Plans**

The proposed Facility is anticipated to have negligible to minor impacts to the environment during all stages of its lifecycle. MBO will provide continuous oversight of the Facility during construction and operations to maintain proper storage of fuels, temporary storage and off-site disposal of wastes, as well as implementation of mitigation measures stated in this EAP.

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## 1.0 Introduction and Background

Mcllvenna Bay Operating Ltd. (MBO), a wholly owned subsidiary of Foran Mining Corporation (Foran), is proposing to develop a Concentrate Loading Facility (the Facility) on private land zoned for industrial use in the Rural Municipality of Kelsey, Manitoba (**Figure 1.1**). The purpose of the Facility is to transload copper and zinc concentrates from the Mcllvenna Bay Operation in Saskatchewan into railcars for shipping to Canadian refineries via an existing rail line.

MBO retained Misty Clifton Engineering LP (MCLP) to prepare this Environment Act Proposal (EAP) for submission to Manitoba Environment and Climate Change (MECC) Environmental Approvals Branch (EAB). The EAP is required to obtain a Licence for the Facility in accordance with the *Environment Act* (Manitoba).

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### 1.1 Proponent

MBO is a registered business pursuant to *The Corporations Act* in Manitoba (Business 10115875) and will be responsible for the Facility. MBO's Certificate of Registration can be provided to MECC upon request.

MBO is headquartered in Vancouver, British Columbia with an operations office in Saskatoon, Saskatchewan. Foran Mining Corporation is publicly traded on the TSX-V under the trading symbol "FOM" and on the OTCQX under the trading symbol "FMCXF."

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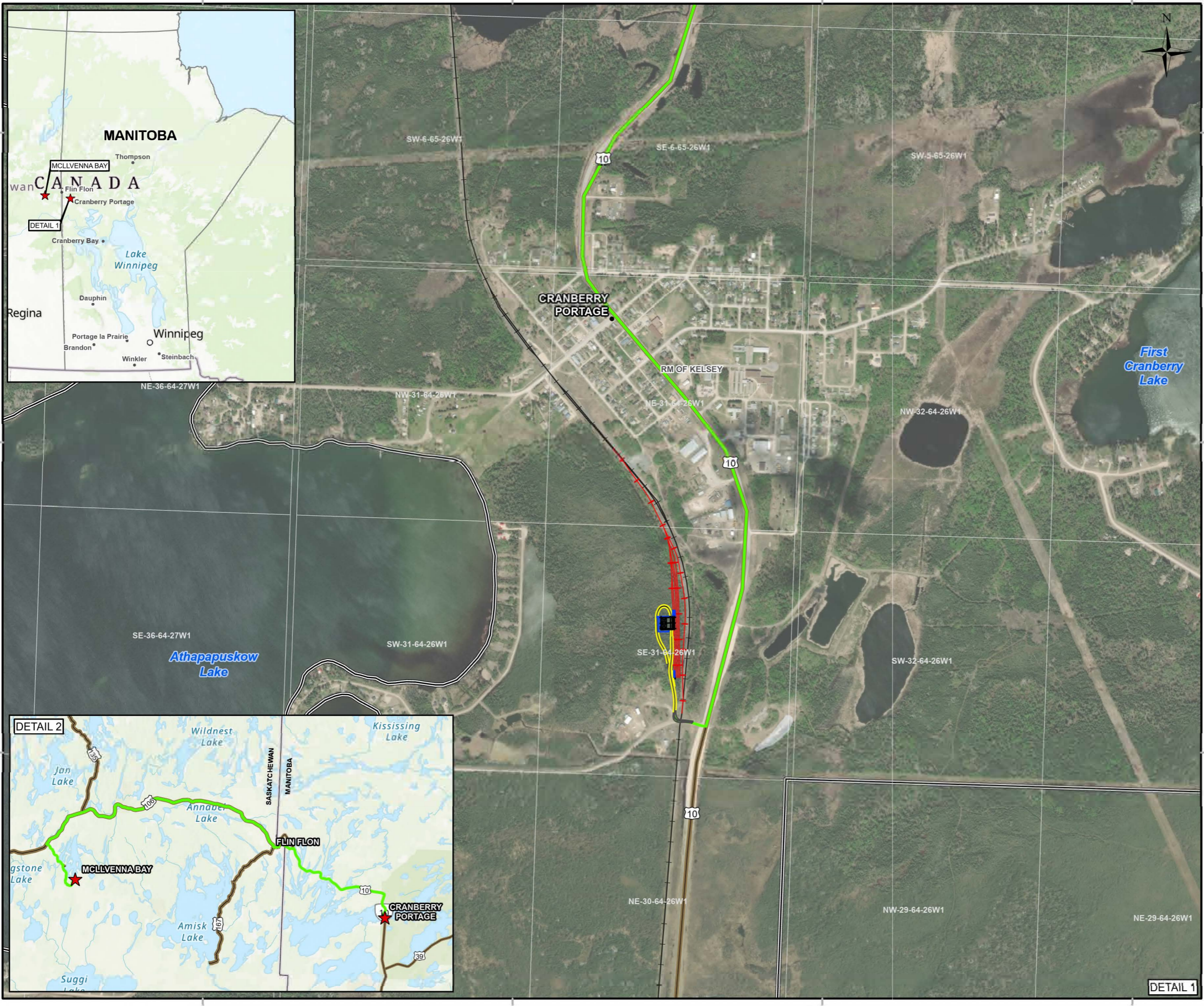
Phone: 306-808-4023

Email: [dbernier@foranmining.com](mailto:dbernier@foranmining.com)

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### 1.2 Rationale for the Development

The most cost-effective way to ship copper and zinc concentrates to Canadian refineries is via rail. The location of the proposed Facility is the nearest feasible access to the existing short line rail called the Hudson Bay Railway that is owned by Arctic Gateway Group. The Facility is required to be operational for the Mcllvenna Bay Operation to begin shipping copper and zinc concentrates in the first half of 2026. The Hudson Bay Railway short track rail line connects to a Canadian National rail line at The Pas, Manitoba and also continues on to a port Churchill Manitoba. These options will allow rail transport of the concentrates via existing routes to Canadian refineries located in Québec, Ontario, and British Columbia.



LEGEND

- COMMUNITY
- PROPOSED BUILDING
- PROPOSED ROAD SHOULDER
- PROPOSED PARKING
- PROPOSED ROAD
- PROPOSED TRACK
- TRANSPORT ROUTE
- RAILWAY
- HIGHWAY
- ▭ RURAL MUNICIPALITY

NOTES

1. DRAWING AND DATA WITHIN IT ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES.
2. NAD 1983 UTM ZONE 14N.



SCALE: 1:12,500

PA	2025 05 21	ISSUED FOR REVIEW	SC	KVG	
REV	DATE	DESCRIPTION	DES	DRN	APP



CLIENT: MCLLVENNA BAY OPERATING LTD. PROJECT LOCATION: CRANBERRY PORTAGE

TITLE: LOCATION PLAN

DWG No. MLP0020-ENDD-0002 FIG No. 1.1

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### 1.3 Regulatory Framework

The Facility is located on private lands zoned for industrial use within the RM of Kelsey. The land is currently being purchased by MBO from the RM of Kelsey. A municipal development permit will be required for the Facility from the RM of Kelsey.

The Facility will be provincially regulated by MECC and the Manitoba Railway Commissioner.

The Facility is considered a bulk materials handling facility which is a Class 1 Development in accordance with the *Classes of Development Regulations* MR 164/88 under the *Environment Act* (Manitoba). The Facility requires the submission of an EAP to obtain an Environment Act Licence.

The proposed Facility does not require a Dangerous Goods Handling and Transportation Act Licence pursuant to *The Dangerous Goods Handling and Transportation Act*, and does not require registration of the aboveground petroleum storage tank. A septic tank is not currently proposed at the Facility, however, if a septic tank is required, it must be registered pursuant to the *Onsite Wastewater Management Systems Regulation* (MR 83/2003).

A component of the proposed Facility, the railway line, will be considered part of the shortline railway in Manitoba that is regulated pursuant to *The Manitoba Railway Act*. The Railway Commissioner oversees the shortline railway in Manitoba. An application to construct and operate the railway line will be submitted to and obtained from the Railway Safety Officer by MBO.

The proposed Facility will be subject to the requirements of the Manitoba *Workplace Safety and Health Act* and its associated regulations, which are overseen by Manitoba Workplace Safety and Health.

The proposed Facility does not require any federal permits or approvals. Specific to this application, the proposed Facility does not require a federal environmental assessment, as it does not meet thresholds listed under the Physical Activities Regulations SOR/2019-285 under the *Impact Assessment Act*.

The proposed Facility is also subject to the requirements of applicable provincial and federal legislation and will comply with these requirements over its lifetime.

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### 1.4 Alternatives

Alternatives considered include trucking ore to refineries and other sites for transloading. Trucking ore to refineries was determined to be cost prohibitive. Other sites considered were eliminated due to costs and/or availability.

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### 1.5 Community Engagement

Engagement with the RM of Kelsey to discuss the proposed Facility began in 2024. As a result of that engagement and discussion, the RM of Kelsey has provided a letter of support and Council Resolution for development of the proposed Facility (**Appendix A**). The RM stated the Facility represents a significant and strategic infrastructure investment that will strengthen the logistical capabilities of the area and

enhance the efficient movement of goods by both truck and rail, and potentially provide more opportunities for Cranberry Portage to become a regional logistical hub to support northern development. They are committed to working collaboratively with MBO and the community to ensure the success of this initiative.

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## 2.0 Description of Proposed Development

The following description of the proposed Facility is based on the available engineering design information, which is currently approximately 60% complete. At this stage of engineering, major design elements are known however exact specifications may be adjusted as design progresses. The description focuses on main elements, which are not expected to change substantively. All dimensions and specifications are approximate.

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### 2.1 Location, Land Use, and Land Ownership

The proposed Facility is located in the RM of Kelsey on Parcel C Plan 28831 PLTO (Roll No. 40160) in the SE Quarter of Section 31 Township 64 Range 26 W1 (West of the 1<sup>st</sup> Meridian), south of the Town of Cranberry Portage. The land is currently being purchased by MBO from the RM of Kelsey.

The proposed Facility will be centered at approximate Universal Transverse Mercator (UTM) coordinates Zone 14 346501 m Easting and 6050419 m Northing. The proposed Facility will contain a rail line that will tie into an existing Hudson Bay Railway spur along a right-of-way that will be leased from Arctic Gateway Group. The proposed Facility will be accessed via a leased right of way from a private industrial user on Roll No. 40155.

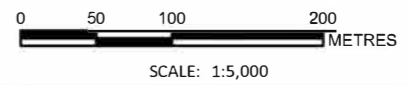
The proposed Facility is located on land zoned for Industrial land use (**Figure 2.1**, Manitoba Land Use and Development 2025). The proposed Facility is surrounded on three sides – north, south and east - by Industrial or Commercial development. The land north and south of the site is zoned as Industrial, the land west of the site is zoned as Parks and Recreation, and the land east of the site is zoned as Commercial and Limited Development.



- LEGEND**
- + PROPOSED TRACK
  - PROPOSED BUILDING
  - PROPOSED ROAD SHOULDER
  - PROPOSED PARKING
  - PROPOSED ROAD
  - RAILWAY
  - MANITOBA PARCEL
- MANITOBA ZONING BYLAWS**
- Rural/Agricultural
  - Residential
  - Commercial
  - Industrial
  - Institutional
  - Parks and Recreation
  - Open Space
- CC - Commercial Central  
 CH - Commercial Highway  
 CR - Commercial Resort  
 LD - Limited Development  
 MH - Industrial Heavy  
 NR - Natural Resource  
 PI - Public Institutional  
 PR - Parks and Recreation  
 RC - Residential Cottage  
 RS - Residential

**NOTES**

1. DRAWING AND DATA WITHIN IT ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES.
2. NAD 1983 UTM ZONE 14N.
3. ZONING (MANITOBA ZONING BY LAWS) AND PARCEL DATA (ROLL ENTRY) OBTAINED FROM THE MANITOBA GOVERNMENT OPEN DATA (2025).



PA	2025 05 21	ISSUED FOR REVIEW	SC	KVG	
REV	DATE	DESCRIPTION	DES	DRN	APP



CLIENT: MCLLVENNA BAY OPERATING LTD. PROJECT LOCATION: CRANBERRY PORTAGE

TITLE: LAND ZONING

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## 2.2 Project Overview

The proposed Facility will be a secure and monitored industrial facility with controlled access. The Facility will include the following main components:

- A concentrate loading building that will be fully enclosed with a concrete foundation and provide temporary storage of copper and zinc concentrates and transload of copper and zinc concentrates into railcars.
- An outdoor rail track and rail spurs to connect to the Hudson Bay Railway and to temporarily store railcars.
- Supporting infrastructure including an aboveground diesel tank, a power transformer and power meter, and a small portable office trailer.
- A security system.
- A gravel access road to the concentrate loading building.

Mobile equipment will operate within the proposed concentrate loading building and along the rail track.

Copper and zinc concentrates will be delivered via the private access road into the concentrate loading building via covered truck from the McIlvenna Bay Operation in Saskatchewan. Concentrate will be transloaded into railcars for shipping to Canadian refineries.

## 2.3 Project Infrastructure

An engineered drawing of the proposed Facility based on the current design is included in **Appendix B**. The proposed Facility will include the main infrastructure described in **Table 2.1**. Dimensions are approximate and will be refined as engineering progresses.

**Table 2.1 – Description of Proposed Facility Infrastructure**

Facility Element	Description
Concentrate Loading Building	<ul style="list-style-type: none"> <li>• Metal storage building constructed on a concrete foundation and footings.</li> <li>• Approximately 1,600 m<sup>2</sup> building with temporary storage capacity of approximately 6,000 wet metric tonnes of concentrate not including railcars.</li> <li>• Four roll-up doors for access - two for truck access and two for rail access. Trucks and rail cars will enter the building in a drive through manner with roll up doors being utilized for both on entry and exit.</li> <li>• Rail car weigh scale.</li> <li>• ~ 40 m of the connector rail line (total length slightly more than 900 m) will be located within the concentrate loading building.</li> <li>• Diesel powered loader and spare bucket operating within the building.</li> </ul>

**Table 2.1 – Description of Proposed Facility Infrastructure**

Facility Element	Description
Outdoor rail track/ line	<ul style="list-style-type: none"> <li>• Five outdoor rail spurs up to ~500 m in length to enable rail car loading and storage/switching (currently design range in length from ~330 m to 500 m).</li> <li>• Outdoor new rail track to enable rail access / egress from the concentrate loading building to the existing Hudson Bay Railway short track line (slightly more than 900 m long). Diesel powered rail car mover will move rail cars on the track and into and out of the concentrate loading building.</li> </ul>
Supporting infrastructure	<ul style="list-style-type: none"> <li>• Double-walled diesel above-ground storage tank (currently proposed as 500 US gallons or 1,893 L).</li> <li>• Small portable office trailer with propane tank for heating.</li> <li>• Portable toilet.</li> <li>• Transformer and power meter.</li> <li>• Industrial and domestic waste storage bins.</li> <li>• Third party provided hazardous waste storage bin.</li> </ul>
Access Road	<ul style="list-style-type: none"> <li>• Gravel access road (approximately 675 m long).</li> </ul>
Security System	<ul style="list-style-type: none"> <li>• Electronic site access gates.</li> <li>• Perimeter fence and remotely monitored closed-circuit television (CCTV).</li> </ul>
Mobile Equipment	<ul style="list-style-type: none"> <li>• Loader and spare buckets (inside concentrate loading building).</li> <li>• Rail car mover (inside concentrate loading building).</li> </ul>

## 2.4 Utilities and Services

There are currently no utilities or services connected to the proposed Facility location.

Electricity for the proposed Facility will be provided by Manitoba Hydro. A genset (<1 MW) may be required to provide power for short periods of time during construction and until Manitoba Hydro completes the tie-in connection, which is less than 500 m from the proposed Facility.

No water connection is planned for the proposed Facility. The portable toilet would contain a small container for potable water storage that would be secured from a supplier and any drinking water necessary for workers would be provided via bottled water jugs.

No septic tank or sewer system is planned for the proposed Facility. Sewer would be regularly pumped out of the portable toilet by a third party provider.

## 2.5 Project Activities

### 2.5.1 Construction

**Table 2.2** describes the planned construction sequencing for each facility element. Construction will be overseen by a qualified third party contractor.

Table 2.2 – Description of Construction Activities by Project Infrastructure	
Facility Element	Description of Construction Activities
Concentrate Loadout Building	<ul style="list-style-type: none"> <li>• Tree clearing and vegetation removal.</li> <li>• Earthworks associated with grading and backfilling.</li> <li>• Pouring the building concrete footings and foundation.</li> <li>• Assembly of the engineered building.</li> </ul>
Outdoor rail track/line	<ul style="list-style-type: none"> <li>• Tree clearing and vegetation removal.</li> <li>• Earthworks associated with backfilling, grading, and installation of the rail switching and tracks.</li> </ul>
Supporting infrastructure	<ul style="list-style-type: none"> <li>• Delivery and installation of office, toilet and fuel tanks by third party provider.</li> </ul>
Access Road	<ul style="list-style-type: none"> <li>• Tree clearing and vegetation removal.</li> <li>• Earthworks associated with grading and backfilling.</li> </ul>
Security System	<ul style="list-style-type: none"> <li>• Assembly of fence and gates.</li> </ul>

Clearing is proposed to be conducted within the proposed development area as well as a 20-m buffer surrounding the proposed development area. Backfill material (approximately 50,000 m<sup>3</sup> of blast rock, granular A and granular B) material is planned to be purchased from an existing off-site quarry approximately 4 km south of the proposed Facility.

Standard construction methods and equipment will be used during construction. Construction equipment could include mobile equipment such as front end loaders, an excavator, rock trucks, a dozer, a compactor, mobile crane, telehandler, a concrete pumper truck and rotary concrete trucks.

MBO will execute construction activities using qualified, accredited contractors with proven track records in delivering safe and high-quality work. Delivery of work to engineered specifications will be ensured through construction quality assurance and quality control (QA/QC) protocols. During construction, environmental management and mitigation measures that are required will be communicated to the qualified contractor

and their implementation overseen by MBO to comply with provincial and federal requirements. MBO will assign a Project Manager to provide continuous oversight. Mitigation measures that will be deployed to protect the environment during construction include:

- Pre-clearance surveys by qualified persons for status ranked / at risk vegetation or wildlife species and migratory birds, and identification of necessary setbacks and timing.
- Regular inspection of construction equipment for leaks, availability of spill kits on site, and use of spill trays for stationary construction equipment.
- Regular inspection of construction work areas for proper storage of waste and fuel.
- Routine tracking and clean-up of all spills that occur.

### **2.5.2 Operation**

The proposed Facility will be operated by MBO. Access to the Facility will be controlled by electronic gates and monitored via CCTV with a connection to the McIlvenna Bay Operation security office.

During operation, there will be daily deliveries of ore concentrate to the proposed Facility from the McIlvenna Bay Operation. The planned route within Manitoba will include Manitoba Highway 10, Ptarmigan Road and the privately owned and leased access road. These deliveries will occur 24 hours a day, 7 days a week. The maximum storage capacity in the concentrate loading building is 6,000 wet metric tonnes. Trucks with covered trailers will enter the concentrate loading building through a roll up door, side dump their loads, and exit through a secondary roll up door. Loaders will be used to push piles within the building minimizing the need for larger footprint. Within the concentrate loading building, rail cars will be loaded for shipment to Canadian smelters. Cars will be loaded within the enclosed building via a front-end loader, then covered with a fiberglass lid prior to moving outdoors to await pickup from the rail service provider. A rail car mover will be used to move the rail cars in and out of the Facility for loading.

Rail cars will be shipped from the proposed Facility via the Hudson Bay Railway by Arctic Gateway Group. Rail car shipments are expected to occur two to three times per week. Rail activities are expected to occur during the daytime.

### **2.5.3 Decommissioning and Reclamation**

MBO will comply with all regulatory requirements related to decommissioning and reclamation. The proposed Facility is expected to be utilized for several decades. MBO currently expects that decommissioning and reclamation of the privately owned site would involve securing the site for sale and future industrial use consistent with the private land zoning. This would involve removal of any hazardous substances or wastes, remediation as required and may potentially involve demolition of permanent infrastructure including the railway line.

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## **2.6 Emissions and Waste**

The proposed Facility will be a source of air emissions during both the construction and operations phases. During the construction phase, the major sources of emissions are expected to be exhausts from the onsite mobile equipment and fugitive dust from earthworks. Construction air emissions will be transient and

temporary in nature. Operations phase air emissions will be generated from fuel combustion by the front loader used for the concentrate loading and handling, diesel car mover utilized for the railcars shunting at the Facility, and trucking of concentrate to the site. Additional particulates (dust) emissions will be released to the ambient air from traffic on the unpaved access road. Calculated predicted emission releases for all investigated compounds in air are expected to be within the applicable ambient air quality standards for both construction and operation. The full air quality impact assessment is provided in **Appendix C**.

The proposed Facility will be a source of noise emissions during both the construction and operations phases. During the construction phase, the main noise sources will be the construction equipment and powered construction tools. The operation phase of the phase will generate noise because of concentrate moving/loading by the front loader, and railcars shunting on the newly constructed rail tracks. The predicted sound levels at the Points of Reception (PORs) due to the proposed Facility do not exceed the Manitoba Guidelines for sound level limits. The full noise impact assessment is provided in **Appendix D**.

Domestic wastewater/sewage will be regularly removed from the proposed Facility via a third party licensed provider.

Industrial waste materials (construction waste, metal, wood, cardboard) will be temporarily stored and then removed from the proposed Facility and disposed of at an appropriate facility for recycling or disposal using a third party.

Waste dangerous goods / hazardous waste generated at the proposed Facility will be temporarily stored in an appropriate facility prior to removal off-site by a licensed provider.

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## 2.7 Traffic

Concentrate will be delivered to the proposed Facility via existing roads within the province of Manitoba including Manitoba Highway 10, classified as a primary arterial road, to Ptarmigan Lodge Road, classified as a rural road, to the leased private access road. The proposed access route within the vicinity of the proposed Facility is shown on **Figure 1.1**. Concentrate is proposed to be delivered by a truck-trailer combination expected to have the capacity to store approximately 40 tonnes of concentrate per load. Each day that the McIlvenna Bay Operation is shipping ore concentrate, the average daily trips are expected to range up to 38 trips including delivery to the Facility and return to the McIlvenna Bay Operation.

A traffic impact assessment was completed to review the potential traffic impacts of transporting concentrate to the proposed Facility via truck (**Appendix E**). The analysis confirmed that Manitoba Highway 10 and the Ptarmigan Lodge Road can be expected to continue carrying traffic volumes within their respective guidelines after the addition of traffic associated with the proposed Facility and therefore no adjustments to roadway classifications are required to accommodate the proposed Facility. The analysis also illustrated that no intersection improvements were warranted at the Manitoba Highway 10 and Ptarmigan Lodge Road intersection. The analysis recommended an improvement to the geometry of the intersection at Highway 10 and Ptarmigan Lodge Road intersection including improvement to the southbound right turn corner radii plus a taper leading to the intersection. MBO will work with Manitoba

Transportation and Infrastructure to make the necessary upgrades to allow ample turning radii for the proposed ore concentrate trucks.

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### 2.8 Workforce

The proposed Facility will support a small workforce. During construction, the workforce is estimated at an average of approximately 10 persons per day. During operations, two people are expected to work at the Facility on a daily basis (including day shift and night shift) with an additional two persons on rail loading days. Up to ten truck drivers per day would transport concentrate to the Facility.

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### 2.9 Schedule

The proposed Facility is currently in the design phase and the final schedule is being developed. The preliminary schedule is outlined in **Table 2.3**, pending regulatory approvals. The environmental impact statement for the McIlvenna Bay Project considered a facility operating period up to 34 years and a 6 year decommissioning period.

Table 2.3 – Preliminary Project Schedule	
Task	Date (estimated)
Design	H1 2025
Construction	H2 2025
Operation	Q1 2026
Decommissioning	TBD

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### 2.10 Emergency Response Plan

MBO intends to develop an Emergency Response Plan prior to operating the proposed Facility. The Emergency Response Plan and Fire Safety Plan will be filed and approved by the local Fire Department in accordance with Section 2.8 of the Manitoba Fire Code.

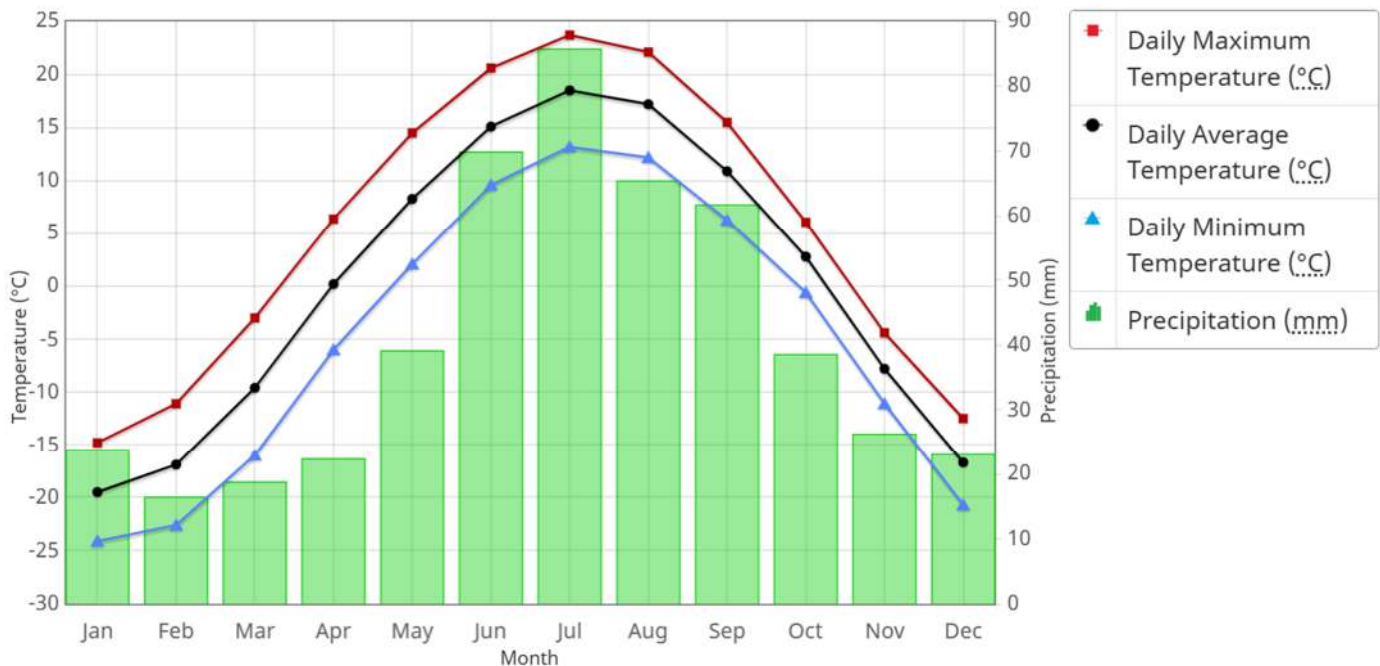
## 3.0 Description of the Environment

### 3.1 Climate and Atmospheric Environment

#### 3.1.1 Climate

The climate is characterized by short, cool summers and long, cold, snowy winters (Smith et al. 1998). Climate data are available from the nearest Environment and Climate Change Canada (ECCC) climate composite weather station at Flin Flon, Manitoba. The most recent summary of climate normal is for the 30-year period from 1991 to 2020 (ECCC 2025a); relevant information is summarized below and illustrated in **Figure 3.1**.

- Daily mean temperature ranged from a high of 18.5°C in July to a low of -19.5°C in January.
- Average annual precipitation was 490.6 mm with approximately 31% occurring as snowfall.
- Average monthly precipitation was highest in July (85.7 mm) and lowest in February (16.4 mm).
- Annual average wind speed was 10 km/h, predominantly coming from the north (October through February) and south (March through September).



**Figure 3.1 – Temperature and Precipitation Normals for the Nearest Weather Station the Flin Flon Composite Station (ECCC 2025a)**

### 3.1.2 Air Quality

Ambient air quality monitoring data in Manitoba is available for Winnipeg, Brandon, Flin Flon, and Thompson through the Manitoba Ambient Air Quality Program. (Government of Manitoba 2025). Air quality is not available for the RM of Kelsey. Manitoba generally has good air quality. Poorer air quality tends to occur because of exceptional events (e.g. wildfire smoke) and transboundary pollutants from south of the border or other Canadian provinces.

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## 3.2 Biophysical Environment

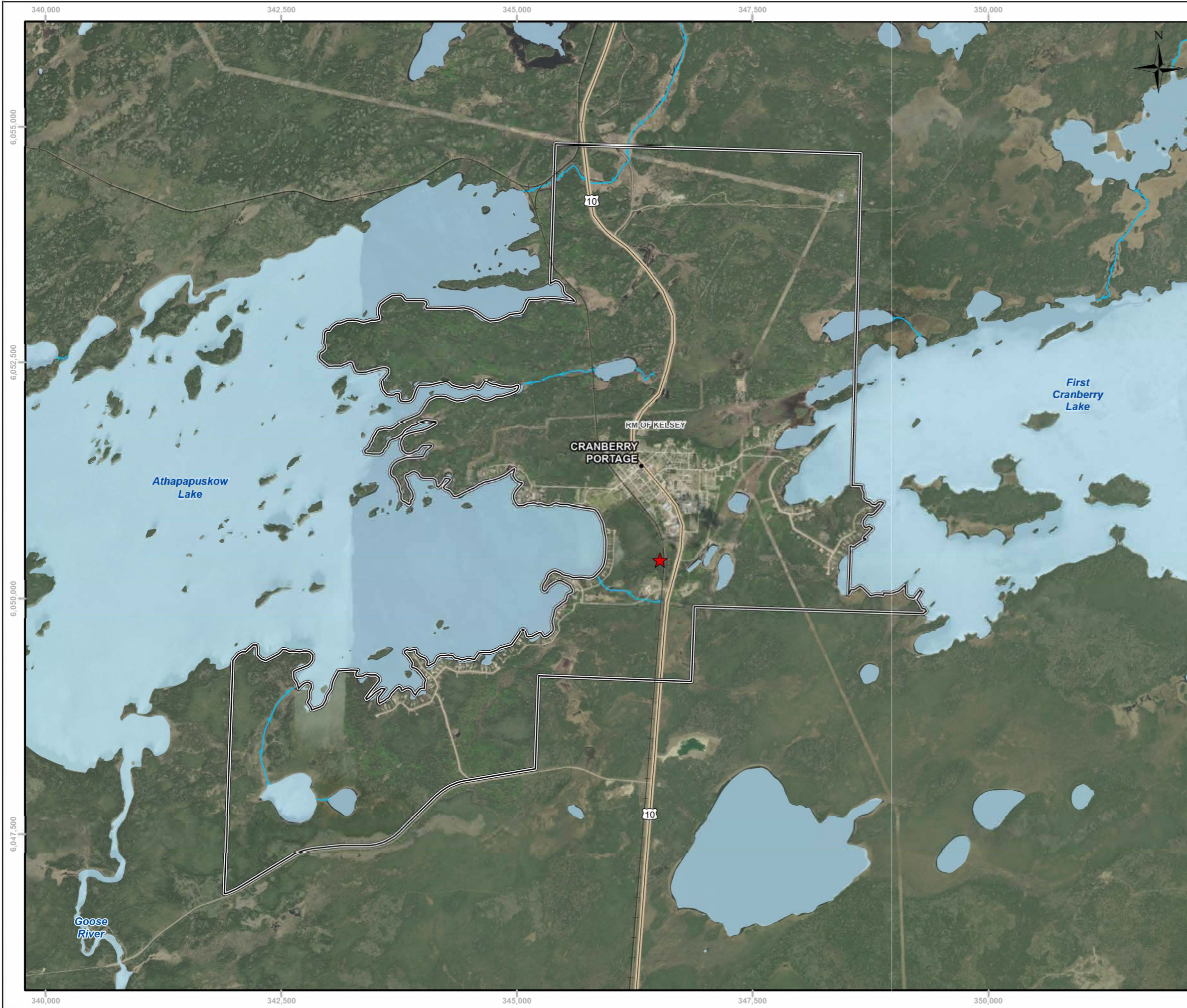
### 3.2.1 Surface Water

The proposed Facility is located within the Reed Lake Ecodistrict, which is part of the Nelson River drainage system and forms part of a number of watersheds (Smith et al. 1998). Lakes of various sizes and an irregular bedrock-control-led network of streams drain generally eastward. From a planning perspective, the proposed Facility is located within the Manitoba watershed district of Kelsey.

There are no open waterbodies within the boundary of the proposed Facility or within 500 m of the proposed Facility. Natural waterbodies in the area are shown on **Figure 3.2** and include Athapapuskow Lake (~ 600 m west), First Cranberry Lake (~ 1.4 km east), and two small unnamed lakes (600 m and 900 m east, respectively). Constructed lagoons are present within the townsite approximately 300 m to the east.

### 3.2.2 Hydrogeology

A geotechnical investigation was completed for the proposed Facility (MCLP, 2025). The stratigraphy of the proposed development area consisted of organic soil overlying variable layers of sand, silt, and clay glaciolacustrine sediments. The glaciolacustrine sediments had variable thickness and condition. Groundwater levels were measured between 2.0 m to 2.5 m below ground surface.

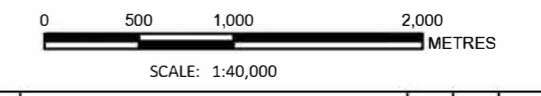


**LEGEND**

- ★ PROJECT LOCATION
- COMMUNITY
- RAILWAY
- HIGHWAY
- WATERCOURSE
- ▭ RURAL MUNICIPALITY
- ▭ PROVINCE
- WATERBODY

**NOTES**

1. DRAWING AND DATA WITHIN IT ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE CONSIDERED SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES.  
 2. NAD 1983 UTM ZONE 14N.



PA	2025 05 21	ISSUED FOR REVIEW	SC	KVG	
REV	DATE	DESCRIPTION	DES	DRN	APP



CLIENT: MCLLVENNA BAY OPERATING LTD. PROJECT LOCATION: CRANBERRY PORTAGE

TITLE: WATERBODIES

DWG No. MLP0020-ENDD-0004 FIG No. 3.2

### 3.2.3 Terrain and Soils

The proposed Facility is in the Reed Lake Ecodistrict of the Churchill River Upland Ecoregion in the Boreal Shield Ecozone in Canada. The proposed Facility is located on the extreme southern edge of the Boreal Shield Ecozone, approximately 1 km north of the Cormorant Lake Ecodistrict of the Mid-Boreal Lowland Ecoregion in the Boreal Plains Ecozone. It is likely that the terrain and soil conditions for the proposed development area are somewhat transitional between the two Ecodistricts.

The Reed Lake Ecodistrict is characterized by short, cool summers and long, cold, snowy winters (Smith et al. 1998). This combined with a mean annual precipitation of 490.6 mm, results in a cold to moderately cold, humid, Cryoboreal soil climate. These climatic conditions result in a short growing season, limiting forest productivity in the district.

The natural terrain of the Reed Lake Ecodistrict is a hummocky to undulating morainal plain that is thinly covered by stoney, sandy morainal veneers and glaciolacustrine blankets; the elevation throughout the district ranges from 335 metres above sea level (masl) to 255 masl (Smith et al. 1889). The proposed Facility is located on the southern edge of the Ecodistrict, on the boundary between the relatively level, Paleozoic limestone belt (Manitoba Plain), and the hummocky to hilly Kazan Upland section of the Precambrian Shield.

Undisturbed soils in the Reed Lake Ecodistrict are well to excessively well drained Dystic Brunisols which have developed on shallow, sandy textured, stony veneers of water-worked glacial till (Smith et al. 1998). Significant areas of bedrock are subdominant. Peat-filled depressions in the district are a complex of poorly drained Typic (deep) and Terric (shallow) Fibrisolic and Mesisolic soils overlaying loamy to clayey glaciolacustrine sediments. Widely distributed patches of permafrost occur in the peatlands. Poor natural drainage and heat conductance properties limit the usefulness of organic soils.

The Cormorant Lake Ecodistrict is less bedrock controlled, relative to the Reed Lake Ecodistrict; it is characterized by hummocky morainal plain with thin, discontinuous glacial till veneers (Smith et al. 1998). Glacial deposits vary in thickness from less than 10 cm (on limestone bedrock outcrops) to greater than 30 cm.

Undisturbed dominant soils in the Cormorant Lake Ecodistrict are well to imperfectly drained Eluviated Eutric Brunisols that have developed on veneers and blankets of extremely calcareous, very cobbly to gravelly, loamy textured, water-worked glacial till and gravelly beach deposits. Poorly to very poorly drained peaty Gleysolic soils and slightly to moderately decomposed organic soils are widespread. This Ecodistrict displays excessive amounts of stones and cobbles, shallow rooting depth to bed rock, and poor natural drainage which limits soil productivity.

### 3.2.4 Vegetation and Wildlife Habitat

Undisturbed vegetation within the Reed Lake Ecodistrict is typical of the northern boreal forest region (Smith et al. 1998) where forest fire is the predominant natural disturbance affecting vegetation. When mature, imperfectly drained sites support closed stands of black spruce or mixed stands of black spruce, jack pine, and trembling aspen. Mature sites along rivers and lakeshores support white spruce in addition to the species listed above. Bog peatlands support open stands of black spruce with moss ground cover, while fens generally support open tamarack, sedge and shrub vegetation. Jack pine is prevalent in many habitat types due to the frequency of forest fires.

The ecoregion, with its heavily forested uplands and large number of waterbodies and rivers of various sizes, provides habitat for many typical boreal wildlife species (Smith et al. 1998). Large bodied upland species typical of the ecoregion include moose, woodland caribou, black bear, lynx, and wolf; with smaller upland species such as beaver, muskrat, and snow-shoe hare also thriving. Many species of aquatic and upland birds occupy the regions varied habitat offerings including sandhill crane, grouse, waterfowl, pelicans, and boreal forest species.

Undisturbed vegetation within the development area for the proposed Facility is typical of the local and regional area. The majority of the available land is considered edge habitat, as the proposed development will be situated adjacent to existing commercial and industrial facilities to the south, north and east, and within 500 m of a residential development to the west. The proposed development area includes mixed upland forest, treed bog peatland, shrubby regrowth, a previously disturbed area, and an area of pre-disturbed industrial land along the eastern edge (and extending to the north and south of the proposed Facility) in the form of an active rail right-of-way. **Figures 3.3 to 3.5** are representative photographs of the vegetation and wildlife and avian habitat observed in the proposed development area during the geotechnical investigation for the proposed Facility.



**Figure 3.3 – Photograph of Treed Bog and Previously Disturbed Area in the Proposed Development Area**



**Figure 3.4 – Photograph of Mixedwood Forest in the Proposed Development Area**



**Figure 3.5 – Photograph of Mixedwood Forest and Edge Habitat Adjacent to the Existing Hudson Bay Railway Line in the Proposed Development Area**

### 3.2.5 Migratory Birds, Status Ranked Species and Species at Risk

MCLP sent an information request to the Manitoba Conservation Data Centre of the Wildlife Branch of Manitoba Natural Resources and Indigenous Features (MB CDC) for records of plant, animal and insect species that are provincially ranked with a status of S1, S2 or S3 and were previously documented within section 31-64-26-W1M (**Appendix F**). MB CDC provided search results for the land section as a whole and both a 2 km and 5 km radius around the section. The results are presented in **Table 3.1**.

A historical observation of limestone oak fern (*Gymnocarpium robertianum*) was documented within the land section and both the 2 km and 5 km radii, in the 1970s. Limestone oak fern is a boreal fern species restricted to alkaline habitats (Pryer 1990). The species is provincially ranked as S1 but is not classified under the provincial *Endangered Species and Ecosystems Act* or the federal *Species At Risk Act*.

MB CDC identified two wildlife species within the search areas: woodland caribou (*Rangifer tarandus caribou*), and common tern (*Sterna hirundo*).

Woodland caribou are listed as Threatened both at both the provincial and federal level. The proposed Facility is located within the boreal woodland caribou range, which extends across Manitoba's boreal zone from the Lynn Lake area in the northwest to the Blake Lake area in the southwest. Woodland caribou prefer old-growth forests and peatlands where there is an abundance of terrestrial lichens; the forest-dwelling populations in Saskatchewan and Manitoba generally avoid areas of young regrowth, clear-cuts or disturbed areas, and aspen/poplar-dominated sites (Thomas and Gray 2002). The proposed Facility is within the Naosap Caribou Management Unit, as delineated in the provincial woodland caribou recovery

strategy (Government of Manitoba 2015). This management unit is considered to have a high degree of both natural and anthropogenic disturbances. The majority of the available land in the vicinity of the Facility is considered edge habitat and has a high degree of anthropogenic disturbance, hence considered low-quality habitat for woodland caribou.

Common tern is not considered a species at risk in Manitoba or federally. This species typically nests in small, loose colonies on the edges of large open-water waterbodies. Since the nearest open waterbody is >500 m from any of the proposed Facility, impacts to shore birds or waterbirds are not anticipated.

**Table 3.1 – Provincial Historical Observations of Status Ranked Species Within 5 km of Section 31-64-26 WPM**

Location	Scientific Name	Common Name	S Rank <sup>1</sup>	Classification under ESEA <sup>2</sup>	SARA <sup>3</sup> Classification	Comments
Within section, 2 km and 5 km radii	<i>Coregonus zenithicus</i>	Shortjaw Cisco	S2	-	-	Fish - small freshwater whitefish; found in deeper waters of lakes (2001 observation)
Within section, 2 km and 5 km radii	<i>Gymnocarpium robertianum</i>	Limestone Oak Fern	S1	-	-	Plant - historical observation 1974
Within section, 2 km and 5 km radii	<i>Rangifer tarandus caribou</i>	Woodland Caribou – boreal ecotype	S2S3	Threatened	Threatened	Mammal
Within 5 km radii	<i>Sterna hirundo</i>	Common Tern	S5B	-	-	Bird - provincial setback of 750 m on nesting colonies <sup>4</sup> (2011 observation)

Notes:

Source: MB CDC, 2025

<sup>1</sup> (NatureServe Explorer 2025)

<sup>2</sup> Endangered Species and Ecosystems Act

<sup>3</sup> Federal *Species at Risk Act* Schedule 1

<sup>4</sup> (Government of Manitoba 2021)

The proposed Facility is located within federally-defined migratory bird zone B6, with an annual breeding bird nesting window from 30 April to 15 August (ECCC 2025b). The habitat present within the area provides habitat for migratory birds.

### 3.2.6 Fish and Fish Habitat

The Reed Lake Ecodistrict supports numerous fish-bearing waterbodies and rivers (Smith et al. 1998). Common fish species include northern pike, walleye, lake char and lake pike. MB CDC identified one fish species occurrence within a 5 km radius of 31-64-26 W1, the shortjaw cisco (*Coregonus zenithicus*), which is a small whitefish that frequents the deeper waters of large lakes. Since the nearest open waterbody is >500 m from the proposed Facility, impacts to fish and fish habitat are not anticipated.

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### 3.3 Human Environment

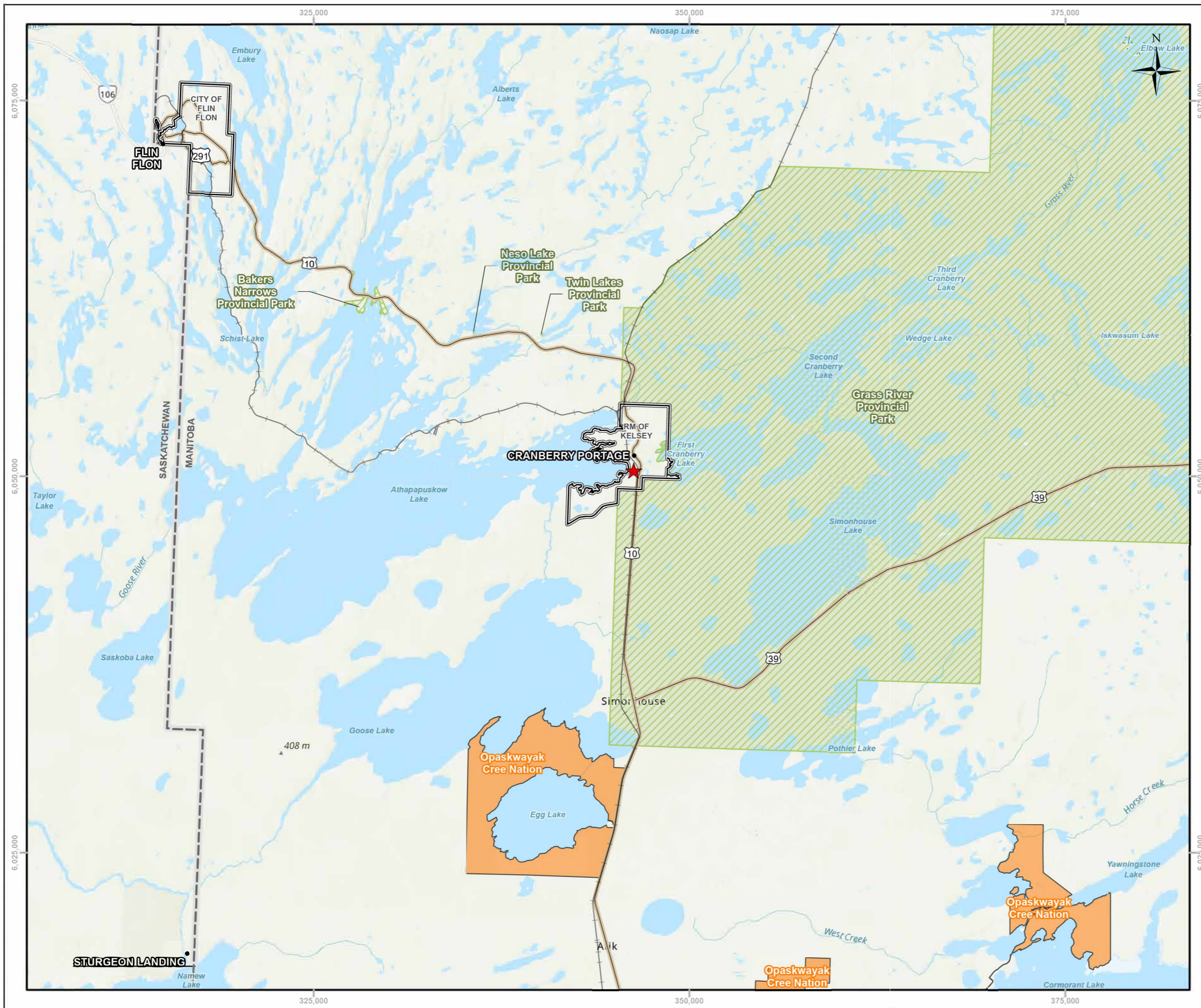
The proposed Facility is located on private land zoned for industrial use in the RM of Kelsey, south of the Town of Cranberry Portage. The RM of Kelsey has a population of 2,181 and the Town of Cranberry Portage has a population of 608 (Statistics Canada 2023). The RM of Kelsey is approximately 868 km<sup>2</sup> and includes the towns of Cranberry Portage, Freshford, Grace Lake, Moostissostikwan, Ralls Island, Rocky Lake, The Pas, Umpherville, Wanless and Westray.

The proposed Facility is located directly adjacent and west of the existing Hudson Bay Railway, a shortline railway in Manitoba that is owned and operated by Arctic Gateway Group. An industrial facility (Greg's Manufacturing) is directly south of the proposed Facility, which specializes in precision wood products tailored for the mining, drilling, and industrial sectors.

There are no protected areas adjacent to the proposed Facility. The Grass River Provincial Park is adjacent to the RM boundaries to the north, east and south (**Figure 3.6**). The provincial park covers 2,250 km<sup>2</sup> and is home to woodland caribou, moose and a variety of waterfowl (Travel Manitoba 2025). Twin Lakes Provincial Park, Neso Lake Provincial Park, and Bakers Narrows Provincial Park are located along Highway 10 northwest of Cranberry Portage.

Hunting and trapping is restricted on private land in Manitoba and requires the permission of the landowner or occupant. There are no known land users accessing the private land proposed for the Facility for hunting, trapping or other purposes.

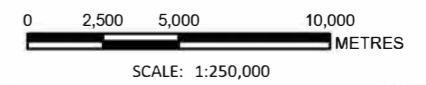
Opaskwayak Cree Nation is more than 18 km southwest from the proposed Facility with reserve land located approximately 18 km south and 34 km southwest on the perimeters of Egg Lake and Yawningstone Lake, respectively (**Figure 3.6**). The community of Opaskwayak is located approximately 90 km south of the proposed Facility, along Manitoba Highway 10. The Opaskwayak Cree Nation comprises over 6,000 members (Opaskwayak 2025).



- LEGEND**
- ★ PROJECT LOCATION
  - COMMUNITY
  - RAILWAY
  - HIGHWAY
  - ▭ RURAL MUNICIPALITY
  - ▭ FIRST NATIONS LAND
  - ▨ PROVINCIAL PARK
  - ▭ PROVINCE

**NOTES**

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- NAD 1983 UTM ZONE 14N.



PA	2025 05 21	ISSUED FOR REVIEW	SC	KVG	
REV	DATE	DESCRIPTION	DES	DRN	APP



CLIENT: MCLLVENNA BAY OPERATING LTD. PROJECT LOCATION: CRANBERRY PORTAGE

TITLE: LAND USE

DWG No. MLP0020-ENDD-0003 FIG No. 3.6

\\EgnyreDrive\clifton\Shared\Active Projects\Misty Clifton\MLP\MLP0020 Concentrate Loading Facility\500 Working\GIS\Drawing\MLP0020\_Concentrate>Loading\_Facility\MLP0020\_Concentrate>Loading\_Facility.aprx SIZE 11x17

### 3.3.1 Heritage Resources

MCLP contacted the Historic Resources Branch (HRB) of Manitoba Sport, Culture, Heritage and Tourism to conduct a heritage screening of properties 40160 and 40155. The HRB provided conditional approval for the proposed Facility (**Appendix G**).

---

## 4.0 Potential Effects and Mitigation Measures

The potential effects of construction, operation and decommissioning of the proposed Facility on the environment are described in this section.

---

### Atmospheric Environment

#### 4.1.1 Potential effects

Activities associated with construction and operation that have the potential to affect the atmospheric environment including air quality and noise include:

- Dust emissions from clearing / grubbing of vegetation and earthworks during construction.
- Dust emissions from vehicle traffic on unpaved roads during construction and operation.
- Air and noise emissions from the operation of heavy equipment used during construction.
- Air and noise emissions from the operation of mobile equipment during operation.
- Noise emissions from railway traffic during operation.
- Trucking of concentrate to the Facility during operation.

#### 4.1.2 Mitigations

The proposed Facility is located adjacent to an existing Hudson Bay Railway line and industrial developments on the edge of Cranberry Portage which is already subject to industrial activity and rail traffic. MBO will implement the following mitigation measures to minimize effects to the atmospheric environment:

- Rail activities and construction activities are expected to be limited to daytime hours, i.e., between 7:00 am and 10:00 pm. If construction needs to be undertaken outside of the normal daytime hours, local residents shall be informed beforehand of the type of construction planned and the expected duration.
- A baghouse will be installed on the concentrate loading building to minimize emissions.
- Keep equipment well-maintained and fitted with efficient muffling devices.
- Implement reduced vehicle speed limits or other speed control measures within the Facility.
- Suppress dust on the unpaved access road as necessary. Conduct visual monitoring of dust to determine when suppression is needed.
- If possible, avoid earth moving during the high wind periods.
- Avoid unnecessary vehicles and equipment idling.
- Implement regular maintenance of vehicles and construction equipment to reduce combustion emissions and maximize fuel efficiency.

#### 4.1.3 Assessment of Potential Effects

The potential effects of the proposed Facility on the atmospheric environment, including air quality and noise, were assessed through an air quality impact assessment (**Appendix C**) and noise impact assessment (**Appendix D**). Calculated predicted emission releases for all investigated compounds in air are expected to be within the applicable ambient air quality standards. The predicted sound levels at the Points of Reception (PORs) due to the Facility do not exceed the Manitoba Guidelines for sound level limits.

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## 4.2 Biophysical Environment

### 4.2.1 Potential effects

Due to the distance of the proposed Facility from open surface waterbodies, there are no anticipated effects to the aquatic environment including fish and fish habitat.

Effects to the hydrologic and hydrogeologic environments are not anticipated, as the proposed Facility is more than 500 m from the nearest surface waterbody and the RM of Kelsey sources water from Athapapuskow Lake.

The proposed Facility will have a limited impact on the biophysical environment through the development of approximately 6 hectares (ha) (0.06 km<sup>2</sup>) of privately-owned forested land within SE 31-64-26 W1, in the RM of Kelsey on about 9% of a single quarter section. The proposed development area is surrounded on three sides by commercial and industrial development. Potential effects include:

- Potential effects to vegetation, soils and terrain from clearing and earthworks.
- Potential effects to wildlife, species at risk, and migratory birds from the loss of 6 ha of wooded and edge habitat.

### 4.2.2 Mitigations

The proposed Facility is located adjacent to an existing Hudson Bay Railway line and industrial developments on the edge of Cranberry Portage which is already subject to industrial activity and rail traffic. MBO will implement the following mitigation measures to minimize effects to the biophysical environment:

- Pre-clearance surveys by qualified persons for status ranked / at risk vegetation or wildlife species and migratory birds, and identification of necessary setbacks and timing.
- Regular inspection of construction equipment for leaks, availability of spill kits on site, and use of spill trays for stationary construction equipment.
- Regular inspection of construction work areas for proper storage of waste and fuel.
- Routine tracking and clean-up of all spills that occur.

#### 4.2.3 Assessment of Potential Effects

Through the implementation of mitigation measures, the potential effects to the biophysical environment are expected to be minor and localized.

---

### 4.3 Human Environment

#### 4.3.1 Potential effects

There is no potential interaction between the proposed Facility and human health – predicted air emissions from the building are well within guideline values and there are no other emissions from the proposed Facility.

There is no potential interaction between the proposed Facility and Indigenous communities. The proposed Facility is located on private lands zoned for industrial use that are not accessible for hunting or trapping and greater than 18 km from the nearest Indigenous community. MBO will comply with the conditions of the approval obtained from the Historic Resources Branch to protect heritage resources.

The proposed Facility has the potential to positively affect employment during construction and operation.

#### 4.3.2 Mitigations

MBO will implement the following mitigation measures to minimize adverse effects to the human environment:

- MBO will implement the following measures identified in the conditional approval obtained from the Historic Resources Branch (**Appendix G**):
- The proposed development area will remain in the industrial zone.
- The Facility will adhere to sections 46 and 51 of the *Heritage Resources Act*.
- MBO will develop and implement a heritage resource protection plan for construction. In the event that heritage objects or human remains are discovered on site, activities will stop at that location immediately and the Historic Resources Branch will be notified.

#### 4.3.3 Assessment of Potential Effects

With mitigations, predicted residual effects to the human environment are negligible.

---

### 4.4 Unplanned Events and Upset Conditions

#### 4.4.1 Potential Effects

Unplanned events or upset conditions are unlikely to occur at the proposed Facility because the proposed Facility will generate minimal air emissions that are primarily associated with the use of typical mobile equipment indoors in a ventilated building. Additionally, concentrate transloading will occur within a fully enclosed building from covered trucks into covered railcars, liquid fuels will be stored and dispensed from dual contained containers, and fire breaks will be maintained around proposed Facility infrastructure to minimize risk associated with wildfire.

#### 4.4.2 Mitigations

MBO will implement the following mitigation measures to minimize effects from unplanned events and upset conditions:

- MBO will develop and implement an Emergency Response Plan prior to operating the proposed Facility. The Emergency Response Plan and Fire Safety Plan will be filed and approved by the local Fire Department in accordance with Section 2.8 of the Manitoba Fire Code.
- Health and safety measures will be developed in accordance with applicable legislation and industry standards, including *The Workplace Safety and Health Act* and the *Workplace Safety and Health Regulation*.
- MBO will comply with all relevant federal and provincial legislation, regulations, codes and guidelines during design, construction and operation of the Facility.

#### 4.4.3 Assessment of Potential Effects

With mitigation, predicted residual effects associated with unplanned events are negligible.

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## 5.0 Follow-up Plans

The proposed Facility encompasses a fully enclosed building and rail track with limited storage of hazardous substances or waste. The EAP summarizes that the Facility's construction, operation and decommissioning will have a negligible to minor impact on the environment.

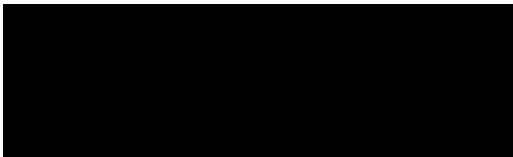
MBO will provide continuous oversight of the Facility during construction and operations to maintain proper storage of fuels, temporary storage and off-site disposal of wastes, as well as implementation of mitigation measures stated in this EAP.

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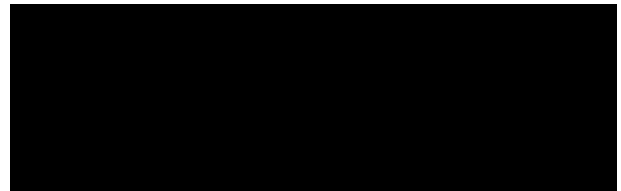
## 6.0 Closure

Misty Clifton Engineering LP (MCEL) prepared this Environment Act Proposal (EAP) for McIlvenna Bay Operating Ltd. (MBO) for their proposed Concentrate Loading Facility in Manitoba.

Misty Clifton Engineering LP



Lyndsey MacBride MSc PGeo  
Director, Environment



Sonya Coyston BSc PBIol  
Wildlife Biologist

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MISTY CLIFTON  
—ENGINEERING—

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# Appendix A

## RM of Kelsey Letter of Support



T (306) 975-0401  
F (306) 975-1076

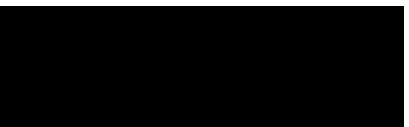
[saskatoon@clifton.ca](mailto:saskatoon@clifton.ca)  
[www.mistyventures.ca](http://www.mistyventures.ca)

# RESOLUTION FORM

## Rural Municipality of Kelsey

Resolution No.: \_\_\_\_\_

Date: April 30<sup>th</sup>, 2025

Moved by Councillor: 

*DAVID*

Seconded by Councillor 

BE IT RESOLVED THAT council for the RM of Kelsey approve the attached letter of support for the development of the proposed transload facility by McIlvenna Bay Operating Ltd. (Foran Mining Corporation) in Cranberry Portage, Manitoba.

For: 5

Against: \_\_\_\_\_

Abstained: \_\_\_\_\_

Motion Carried:  Motion Defeated: \_\_\_\_\_



RURAL MUNICIPALITY OF  
**KELSEY**

P.O. Box 578, 264 Fischer Avenue The Pas, MB R9A 1K6  
Phone (204) 623-7474 or toll free 1-888-535-7391  
Fax: (204) 623-4546  
Email: [rmkelsey@mymts.net](mailto:rmkelsey@mymts.net)

April 30<sup>th</sup>, 2025

To Whom It May Concern,

**Re: Letter of Support for the Development of a Transload Facility in Cranberry Portage**

On behalf of the Rural Municipality of Kelsey, I am pleased to provide this letter of support accompanied by Rural Municipality of Kelsey Council Resolution for the development of the proposed transload facility by McIlvenna Bay Operating Ltd. (Foran Mining Corporation) in Cranberry Portage, Manitoba.

This project represents a significant and strategic infrastructure investment in our region. The planned development includes the acquisition of the necessary lands and the construction of a 400-meter access road, the installation of up to six new rail spur lines, and the creation of a concentrate storage facility. This facility will strengthen the logistical capabilities of the area and enhance the efficient movement of goods by both truck and rail and potentially provide more opportunities for Cranberry Portage to become a regional logistical hub to support northern development.

The Rural Municipality of Kelsey sees this project as an opportunity to promote sustainable economic development, create employment, and potentially establish our community as a hub for resource logistics and transportation in the north. We are committed to working collaboratively with McIlvenna Bay Operating, our partners, and the community to ensure the success of this initiative.

We look forward to seeing this project come to fruition and to the long-term benefits it will bring to the region.

Sincerely,

Jerry Hlady

Chief Administrative Officer  
Rural Municipality of Kelsey

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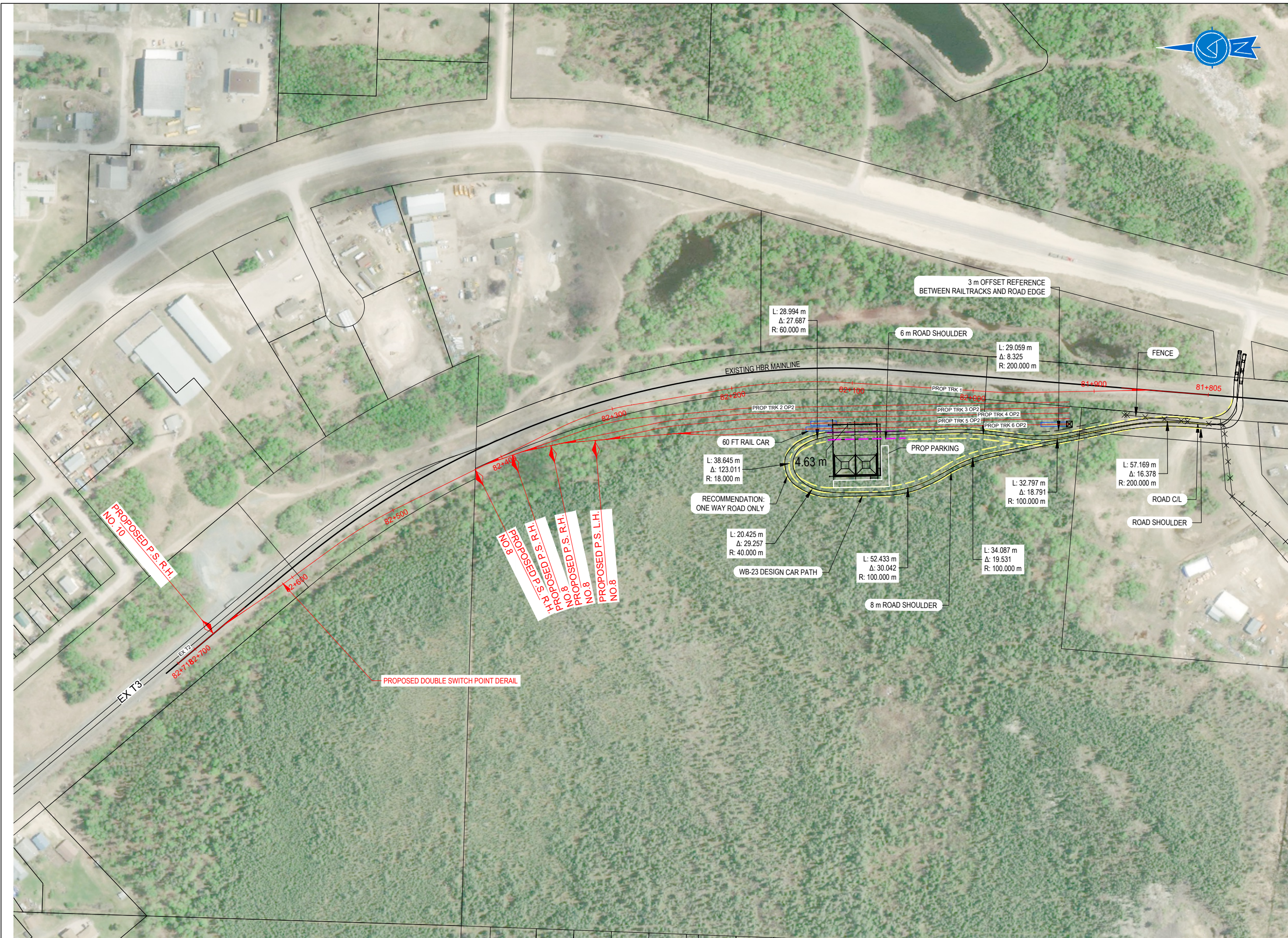
# Appendix B

## Drawing



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[www.mistyventures.ca](http://www.mistyventures.ca)



DRAFT

ENGINEER			
CLIENT			
PROJECT	XXXXXX	XXXXXX	XXXXXX
DRAWING NAME	XXXXXX	XXXXXX	XXXXXX
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REV. BY	XXXXXX	FILE NO.	XXXXXX
		DATE	XXXXXX
		DWG. NO.	XXXXXX

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# Appendix C

## Air Quality Impact Assessment



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20 June 2025

MLP0020

# **McIlvenna Bay Operating Ltd. Air Quality Impact Assessment, Concentrate Loading Facility Cranberry Portage, Manitoba**



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## Executive Summary

Mcllvenna Bay Operating Ltd., a subsidiary of Foran Mining Corp. (Foran), is proposing to construct a Concentrate Loading Facility (the Project) on private land zoned for industrial use at the south end of the Town of Cranberry Portage, Manitoba. The Facility will be used to transload the metal ore concentrate from the Mcllvenna Bay Operation to the existing railway for the transport to smelters for further ore processing.

Misty Clifton Engineering LP (MCLP) has completed an air quality impact assessment (AQIA) of the proposed Facility in support of the Environment Act Proposal (EAP) being submitted to Manitoba Environment and Climate Change (MECC), Environmental Approvals Branch (EAB). This report summarizes the methods, assumptions, technical data, and prediction results of the assessment.

The proposed Facility will be a source of air emissions during both the construction and operations phases. During the construction phase, the major sources of atmospheric emissions are expected to be exhausts from the onsite mobile equipment and fugitive dust. Expected Facility-related construction air emissions will be transient and temporary in nature. The key contaminants from mobile equipment combustion will be sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM).

Operations phase air emissions will be generated because of fuel combustion by the front loader used for the concentrate loading and handling, and diesel car mover utilized for the railcars shunting at the Facility. Additional particulates (dust) emissions will be released to the ambient air because of the traffic on the unpaved access road.

For the evaluated gaseous and particulate compounds, calculations predicted emission releases for all investigated compounds in air should be within the applicable ambient air quality standards. Gaseous and particulate contaminant sources included in the presented assessment will be augmented by the fugitive emissions originating mainly from the non-road equipment use and re-fuelling at the Facility. These additional fugitive sources of gaseous and particulate emissions are expected to be invariably a magnitude lower than the gaseous emissions included in the combustion calculations. Therefore, the assessment results for the gaseous and particulate investigated compounds indicate that ambient air concentrations originating from the proposed Facility for this group of contaminants in air should not present a potential hazard for humans or the environment, and additional mitigation/abatement measures focused on these compounds are not deemed necessary at this time.

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## Acronyms

**AQHI** - Air Quality Health Index

**CACs** – Criteria Air Contaminants

**CAAQS** - Canadian Ambient Air Quality Standards

**CCME** - Canadian Council of Ministers of the Environment

**CO** – Carbon Monoxide

**CoPC** – Contaminant of Potential Concern

**ECCC** – Environment and Climate Change Canada

**EMS** – Environmental Management System

**GLCs** – Ground level concentrations

**HSE** – Health, Safety and Environment

**HP** – Horsepower

**MW** – Megawatt

**MMBTU/h** – Million Metric British Thermal Units per hour

**NAD** – North American Datum

**NO<sub>2</sub>** – Nitrogen Dioxide

**NO<sub>x</sub>** – Nitrogen Oxides

**NPRI** – National Pollutant Release Inventory (Canada)

**PM<sub>2.5</sub>** – Fine Particulate Matter with a mean aerodynamic diameter of 2.5 microns or smaller

**PM<sub>10</sub>** – Particulate Matter with a mean aerodynamic diameter of 10 microns or smaller

**VOCs** – Volatile Organic Compounds

**SO<sub>2</sub>** – Sulphur Dioxide

**TSP** – Total Suspended Particulates

**U.S. EPA** – The United States Environmental Protection Agency

---

# 1.0 Introduction

---

## 1.1 General

Mcllvenna Bay Operating Ltd., a subsidiary of Foran Mining Corp. (Foran), is proposing to construct a Concentrate Loading Facility (the Facility) on private land zoned for industrial use at the south end of the Town of Cranberry Portage, Manitoba. The Facility will be used to transload the metal ore concentrate from the Mcllvenna Bay Operation in Saskatchewan to the existing railway for the transport to smelters for further ore processing.

Misty Clifton Engineering LP (MCLP) has completed an air quality impact assessment (AQIA) of the Project operations in support of the Environment Act Proposal (EAp) being submitted to Manitoba Environment and Climate Change (MECC), Environmental Approvals Branch (EAB). This report summarizes the methods, assumptions, technical data, and prediction results of the assessment.

The main highlights of the proposed Facility are as follows:

- Establish fully enclosed concentrate loading building for temporary storage and transloading of copper and zinc concentrates on private land zoned for industrial use within the Regional Municipality of Kelsey.
- Storage building would be approximately 1600 m<sup>2</sup> and have a concrete pad, footings and be fully enclosed for both dumping and loading operations.
- Building would be complimented with a small portable office trailer.
- Facility would be controlled by electronic gates and be monitored via CCTV with connection to Mcllvenna Bay site security.
- Concentrates would be delivered via truck from Mcllvenna Bay to Cranberry Portage.
- Trucks will enter a roll up door, dump, the exit drive through secondary roll up door.
- Loaders will be used to push piles within the building minimizing the need for larger footprint.
- Up to five rail spurs will be established to enable rail car loading and storage/switching.
- Rail cars would be loaded 2 to 3 times per week for shipment to Canadian smelters.
- Cars will be loaded within the enclosed building via front end loader.

---

## 1.2 Site Description

The Facility is located at the south end of Cranberry Portage, a part of the Regional Municipality of Kelsey, Manitoba. Access to the proposed Facility is from Highway 10 on the east side of the Facility. The area investigated for this Facility is located west of the existing Hudson Bay Railway (HBR) mainline. The proposed development area is forested on both sides of the existing rail track and details of previous earthworks and development are unknown.

The proposed transload Facility is designed for up to five rail tracks located west of the Hudson Bay Railway (HBR) mainline, as part of the Flin Flon Subdivision, between Mile 50 and 51. The total length of

the proposed tracks is approximately one kilometre, expecting to accommodate a total of one hundred rail cars. Additional unpaved access roads will be constructed in the area.

The Facility location is shown in Appendix A, Figure 1.

---

### 1.3 Regulatory Framework

In cooperation with Environment and Climate Change Canada, ambient air monitoring is being conducted on selected urban areas within the Province of Manitoba. Additional monitoring stations are being considered to improve area of coverage and to enhance decision-making. The Province is an active partner in the Canada Air Quality Health Index forecasting (AQHI) program. The AQHI is designed to help Manitobans make informed decisions about protecting themselves and their family from the effects of air pollution. The AQHI is currently available for Winnipeg and Brandon and is being considered for Flin Flon and Thompson.

Canadian jurisdictions are required to publish annual provincial reports on the achievement of the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter (PM<sub>2.5</sub>) and ground-level ozone. The report compares the concentrations of fine particulate matter (PM<sub>2.5</sub>) and ozone for the 3-year period 2013 to 2015 with the standards under the Canadian Ambient Air Quality Standards (CAAQS). This reporting is part of the new national Air Quality Management System (AQMS) that the Canadian Council of Ministers of the Environment (CCME) agreed to implement in 2012.

For the current reporting period of 2013 to 2015, all air quality reporting areas (Winnipeg, Brandon, Flin Flon and Thompson) were in achievement of the Canadian Ambient Air Quality Standards (CAAQS) requirements for fine particulate matter (PM<sub>2.5</sub>) and ground level ozone. Notwithstanding, Manitoba will continue to implement air quality management strategies to prevent deterioration or keep the clean air clean and to address any other air quality issues that may arise.

---

### 1.4 Environmental Receptors

The nearest environmental receptors were identified using satellite imagery and land use plans to identify existing dwellings based on the planned Facility location, operation, and activities. These locations are representative of the most exposed noise sensitive residential dwellings surrounding the proposed Facility in each direction. These receptors are summarized in Table 1-1 and illustrated in Appendix A, Figure 2.

**Table 1-1 – Receptors Summary Table**

Receptor ID	Location		UTM Coordinates (Zone 14)	
	Description	Distance to the Project Centre	Easting (m)	Northing (m)
POR 1	Residential dwellings west of the Project	548 m	345975.53	6050418.65
POR 2	Residential dwellings north of the Project	642 m	346392.96	6051059.58
POR 3	Residential dwellings north east of the Project	685 m	346944.62	6050972.41

### 1.5 Meteorological Conditions at the Site

The nearest provincially operated meteorological station is situated in Flin Flon to the north of the Facility. Meteorological data collected for 5 years (2012-2016) in the study area were used to construct the Wind Rose diagram presented in Appendix A, Figure 3. Diagram implies prevalent wind direction at the Facility at the axis north east to south west and north west to south east, respectively.

Wind class frequency distribution diagram (Appendix A, Figure 4) shows that winds with the speed between 2.1 and 3.6 m/s are prevalent at the Facility (48% of the overall time).

## 2.0 Air Emission Sources

### 2.1 Air Emission Sources Identification

The proposed Facility will be a source of air emissions during both the construction and operations phases. During the construction phase, the major sources of atmospheric emissions are expected to be exhausts from the onsite mobile equipment and fugitive dust. Expected Facility-related construction air emissions will be transient and temporary in nature. The key contaminants from mobile equipment combustion will be sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM).

Operations phase air emissions will be generated because of fuel combustion by the front loader used for the concentrate loading and handling, concentrate hauling and diesel car mover utilized for the railcars shunting at the site. Additional particulates (dust) emissions will be released to the ambient air because of the traffic on the unpaved access road to the Facility.

## 2.2 Estimated Air Emissions – Project Construction

The construction phase of the Facility is estimated to last 6 to 8 months. All construction activities related to the Facility will be occurring during the daytime period. The main construction activities will be connected to the new rail spurs just to the west of the existing HBR and erecting an approximately 1600 m<sup>2</sup> concentrate loading building. The presented emissions estimates are for the expected onsite mobile equipment composition provided by MBO and 8 months of construction assuming 6 days a week and 12-hours construction day duration. Diesel fuel is assumed to be used in the mobile equipment used throughout the duration of the proposed Facility. The emissions estimates are based on the equipment emission data available in the U.S. Environmental Protection Agency (U. S. EPA) MOVES database and the applicable U.S. EPA AP-42 emission factors.

**Table 2-1 – Estimated Air Emissions during the Construction Phase**

Equipment	# of Units	Assumed Power (HP)	Total Fuel Consumption (L)	Estimated Air Emissions (kg)				
				SO <sub>2</sub>	NO <sub>x</sub>	CO	VOCs	PM
Excavator	1	290	69,020	1.81	477.4	253.3	97.4	14.6
Rock Truck	2	600	159,469	4.19	5,628.4	3,977.9	1,075.1	236.2
Bulldozer	1	121	20,390	0.54	398.6	214.4	81.4	12.3
Compactor	1	150	51,000	1.37	1,976	1,048	403.4	60.6
Front Loader	1	217	103,292	2.71	714.6	539.4	145.7	32
<b>Estimated Air Emissions Total for 8 months of Construction Work (kg)</b>				<b>10.62</b>	<b>9,195</b>	<b>6,033</b>	<b>1,803</b>	<b>355.7</b>

Additional expected sources of air emissions during the construction work can be summarized as follows:

- Fugitive particulates emissions generated resulting from vegetation grubbing, grading, soil excavation, soil transport, soil loading/unloading and compaction;
- Fugitive VOC emissions from the fuel storage and equipment refuelling at the construction site; and
- Fugitive particulate emissions resulting from the traffic on unpaved temporary construction roads.

### 2.3 Estimated Air Emissions – Operations, Combustion Sources

Concentrate will be handled and loaded to the railcars using a diesel-powered front loader within the future concentrate loading building. Operations will also include a regular railcars movement and shunting to facilitate the concentrate loading. A diesel car mover will be utilized to move the railcars within the Facility. Based on the information provided by MBO, energy for the building’s HVAC systems is planned to be supplied from the public electric grid.

The presented emissions estimates are for the expected onsite mobile equipment composition provided by MBO and one year of operations assuming 5 days a week and 8-hours work day duration. Diesel fuel is assumed to be used in the mobile equipment used throughout the duration of the operations phase. The emissions estimates are based on the equipment emission data available in the U.S. Environmental Protection Agency (U. S. EPA) MOVES database and the applicable U.S. EPA AP-42 emission factors.

**Table 2-2 – Estimated Air Emissions – Operations, Combustion Sources**

Equipment	# of Units	Assumed Power (HP)	Total Fuel Consumption (L)	Estimated Air Emissions (kg)				
				SO <sub>2</sub>	NO <sub>x</sub>	CO	VOCs	PM
Loco Tractor	1	173	122,401	3.22	846.8	639.2	172.7	37.9
Front Loader	1	217	154,938	4.07	1,071.9	809.1	218.6	48
<b>Estimated Air Emissions Total per Operations Year (kg)</b>				<b>7.29</b>	<b>1,919</b>	<b>1,448</b>	<b>391.3</b>	<b>85.9</b>

In addition to the emissions calculated in Table 2-2, emissions from the combustion sources during the operations will include some fugitive VOC emissions released to the atmosphere as a result of the on-site refuelling and equipment maintenance. These emissions are however to be expected to a range of

magnitude lower than VOCs emissions produced directly by the fuel combustion, and therefore, will constitute an insignificant contribution to the overall emission profile for the facility.

#### 2.4 Estimated Air Emissions – Operations, Concentrate Haulage

Copper and zinc concentrate will be transported to the Facility from the McIlvenna Bay mine using the heavy-duty trucks. Transportation Impact Assessment prepared for the Project estimates 31.8 combined (in and out) trips during the 24-hours period between the mine and the loading facility. Emission estimates are based on a 50 km long trip (an approximate distance between Cranberry Portage and Flin Flon along the Highway 10) by a Class VIIIb heavy-duty double long-haul semi-tractor trailer rig and emission factors stated in the U.S. EPA-420-F-08-21 document. Calculated estimated emissions resulting from the Project-related concentrate haulage per year are summarized in the following Table:

Table 2-3 – Estimated Air Emissions – Operations, Concentrate Haulage						
Estimated Emissions (kg/year)	Compound in Air					
	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOCs	PM <sub>10</sub>	PM <sub>2.5</sub>
	19.58	3979.26	1,125.7	197.34	93.78	86.16

#### 2.5 Estimated Air Emissions – Operations, Unpaved Roads Traffic

The Facility operations will include a regular incoming heavy truck concentrate hauling traffic to the facility at an approximate rate of 16 trucks a day. Within the Facility, these vehicles will travel on the unpaved roads with an estimated length of 400 m. To estimate potential dust (particulates) emissions generated as a result, MCLP used the methodology stated in the U.S. EPA AP 42, Chapter 13: Miscellaneous Sources, Section 2.2 document and made the following assumptions:

- Roads silt content will be about 10%.
- On average 10 trucks a day with a tare up to 40 tonnes (loaded) and up to 10 tonnes (empty) will traverse about 400 m of the unpaved roads within the facility.
- There will be approximately 120 days per a year where weather conditions will be conducive for road dust generation (i.e., no snow cover, wet ground after precipitation etc.).
- Road dust emissions at the Facility will be controlled by watering on “As and When Required” basis.

The resulting dust emissions estimates generated by the traffic on unpaved roads are summarized in Table 2-4.

**Table 2-4 – Estimated Air Emissions – Operations, Unpaved Roads Traffic**

Emissions		Annual uncontrolled emissions (tonnes)	Adjustment factor ADJ for natural mitigations	Annual adjusted emissions for natural mitigation (tonnes)	Dust control methods adjustment	Total Release	Units
<b>Total Particulate Matter</b>	<b>TPM</b>	<b>10.979</b>	<b>38%</b>	<b>4.223</b>	<b>45%</b>	<b>1.900</b>	<b>tonnes</b>
<b>Particulate matter less than 10 µm</b>	<b>PM<sub>10</sub></b>	<b>3.241</b>	<b>38%</b>	<b>1.246</b>	<b>45%</b>	<b>0.561</b>	<b>tonnes</b>
<b>Particulate Matter less than 2.5 µm</b>	<b>PM<sub>2.5</sub></b>	<b>0.324</b>	<b>38%</b>	<b>0.125</b>	<b>45%</b>	<b>0.056</b>	<b>tonnes</b>

### 2.6 Estimated Air Emissions – Operations, Concentrate Dumping and Loading

Generally, concentrate dumping and loading can generate dust emissions. In the particular case of the proposed Facility emissions generating potential dust will be diminished by the following:

- The Facility HVAC system effluent exit will be equipped by the dust collector.
- Bulk material handled (copper and zinc concentrate) is likely to contain a very little of silt.
- Both concentrate dumping and loading will be confined to the enclosed building. As a result, most if not all the generated dust will be kept in the structure.

As a result of the above-mentioned Facility's operation features, dust emissions contribution generated during the concentrate dumping and loading to the overall emission profile of the Facility can be expected to be negligible.

### 2.7 Odour

Neither the Facility's construction phase, nor the operations are expected to be a major source of the compounds in the ambient air that might cause odour issues. Bulk material to be handled/loaded at the Facility is expected to contain a trace or none of VOCs that could be precursors to odour perceptions by the human receptors.

VOC releases related to the fuel combustion, or equipment re-fuelling/maintenance are highly unlikely to present any odour perception issues related to the Facility considering the distance to the nearest environmental receptor (> 500 m).

### 2.8 Recommended Air Quality Management Measures

Applicable ambient air quality management measures applicable for the Facility can be summarized as follows:

- Implement reduced vehicle speed limits or other speed control measures within the Facility.
- Suppress dust on the unpaved access road as necessary using water trucks. Conduct visual monitoring of dust to determine when suppression is needed.
- If possible, avoid earth moving during the high wind periods.
- Avoid unnecessary vehicles and equipment idling.
- Implement the regular maintenance program of vehicles and construction equipment to reduce combustion emissions and maximize fuel efficiency.

---

## 3.0 Air Quality Impact Assessment Results

For the evaluated gaseous and particulate compounds, calculations predicted emission releases for all investigated compounds in air should be within the applicable ambient air quality standards. Gaseous and particulate contaminant sources included in the presented assessment will be augmented by the fugitive emissions originating mainly from the non-road equipment use and re-fuelling at the Facility. These additional fugitive sources of gaseous and particulate emissions are expected to be invariably a magnitude lower than the gaseous emissions included in the combustion calculations. Therefore, the assessment results for the gaseous and particulate investigated compounds indicate that ambient air concentrations originating from the Facility for this group of contaminants in air should not present a potential hazard for humans or the environment, and additional mitigation/abatement measures focused on these compounds are not deemed necessary at this time.

The results of the air quality impact assessment incorporate the most recent Facility information available for Facility operations, as of June 2025. Should any changes to the Facility assumptions occur (e.g., new equipment, facility layout, equipment usage etc.), the affected Facility components and activities should be reassessed to verify that the ambient air quality standards are not exceeded.

---

## 4.0 Limitations

This Air Quality Impact Assessment was prepared by Misty Clifton Engineering LP for McIlvenna Bay Operating Ltd. and the Regulator. The material in it reflects Misty Clifton Engineering LP's best judgment available to it at the time of preparation. Any use which a third party makes of this Assessment, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Misty Clifton Engineering LP accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on this Plan.

This assessment has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, expressed or implied, is made.

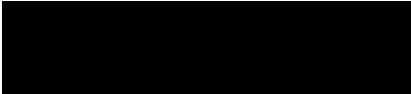
Site information was obtained from McIlvenna Bay Operating Ltd. Misty Clifton Engineering LP accepts no responsibility for any deficiencies or inaccuracies in the information provided in this Plan that are the direct result of intentional or unintentional misrepresentations, errors or omissions of the information reviewed.

Our conclusions and recommendations are preliminary and based upon the information obtained. The work was based in part upon the environmental quality guidelines and regulations in effect when the work was begun. Future regulatory changes may require reassessment of the findings of this document.

Yours truly,

**Misty Clifton**

Prepared by:



20/6/2025

**Daniel Budai, P.Eng.**  
**Senior Environmental Engineer**

**Engineers and Geoscientists Manitoba**  
**Certificate of Authorization** 

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## References

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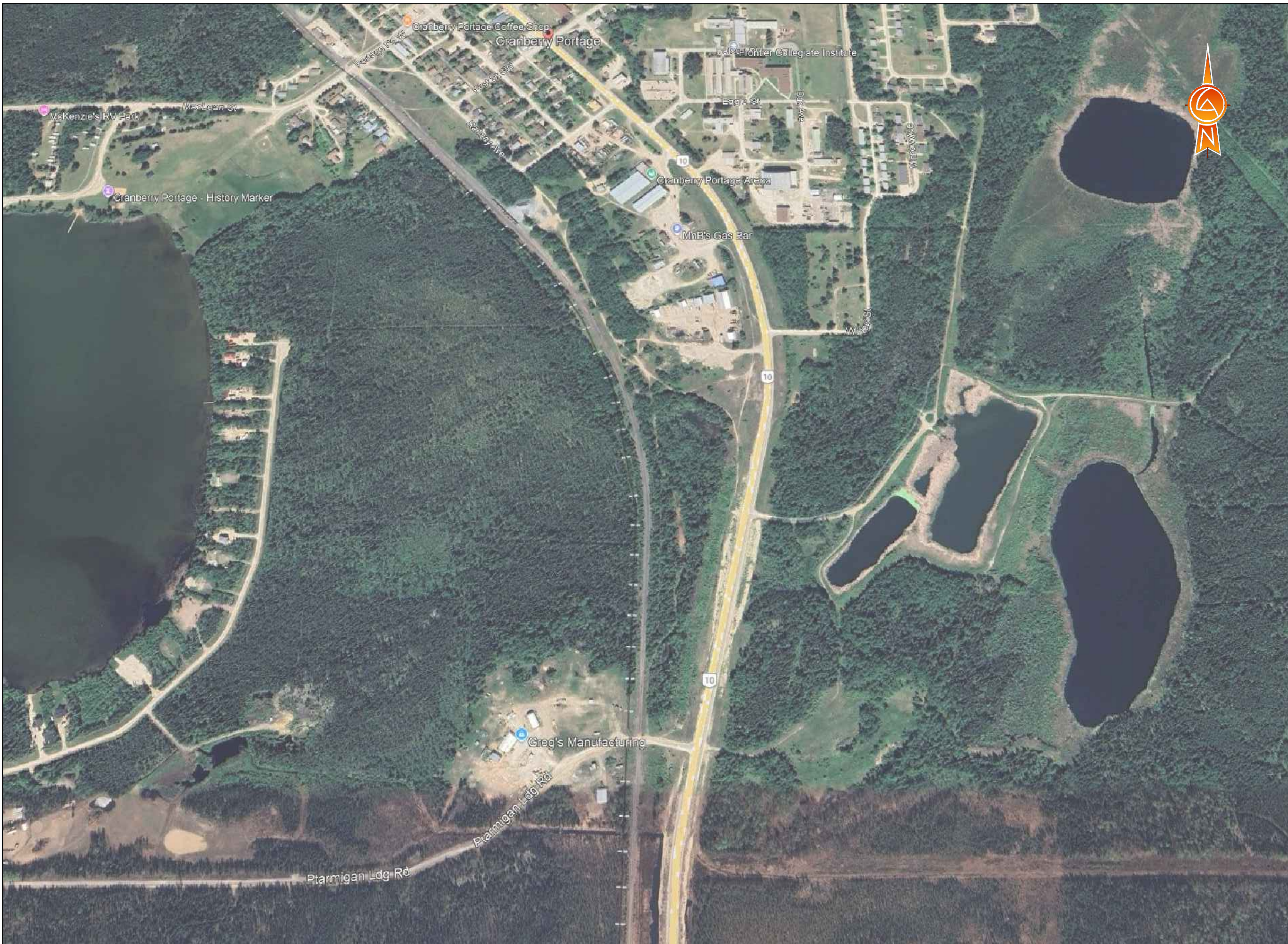
# Appendix A

## Figures



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[www.mistyventures.ca](http://www.mistyventures.ca)



LEGEND

NOTES:

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ENGINEER  MISTY CLIFTON  
ENGINEERING

CLIENT MCILVENNA BAY OPERATING LTD.

PROJECT AIR QUALITY IMPACT ASSESSMENT  
CONCENTRATE LOADING FACILITY  
CRANBERRY PORTAGE, MB

DRAWING NAME  
SITE LOCATION PLAN

DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
DWN. BY	LW	PROJECT NO.	MLP0020	DWG. NO.	
REV. BY	CEG	FILE NO.			01



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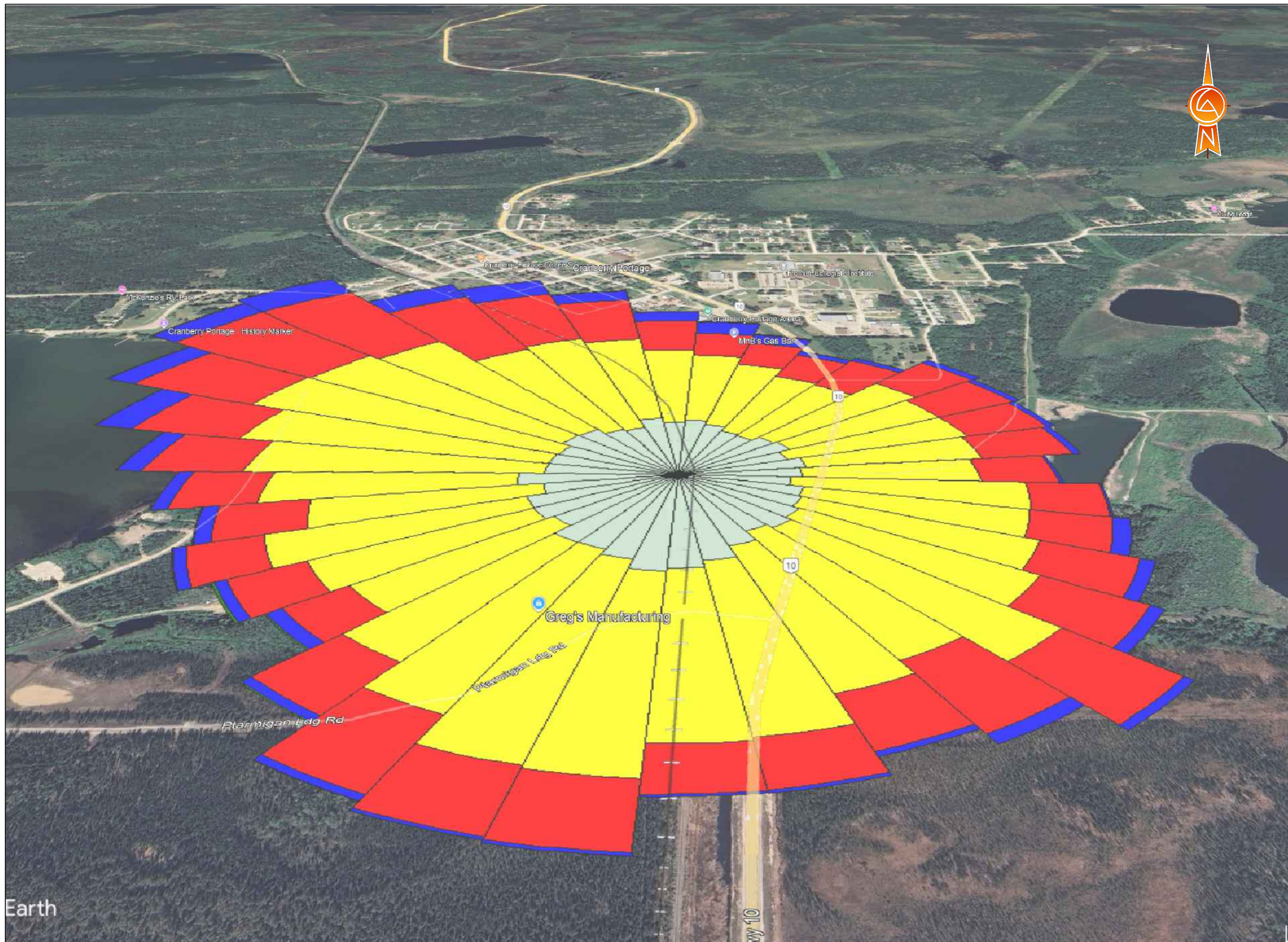
ENGINEER  MISTY CLIFTON ENGINEERING

CLIENT MCILVENNA BAY OPERATING LTD.

PROJECT AIR QUALITY IMPACT ASSESSMENT  
 CONCENTRATE LOADING FACILITY  
 CRANBERRY PORTAGE, MB

DRAWING NAME  
 ENVIRONMENTAL RECEPTOR LOCATIONS


DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
DWN. BY	LW	PROJECT NO.	MLP0020	DWG. NO.	
REV. BY	CEG	FILE NO.			02



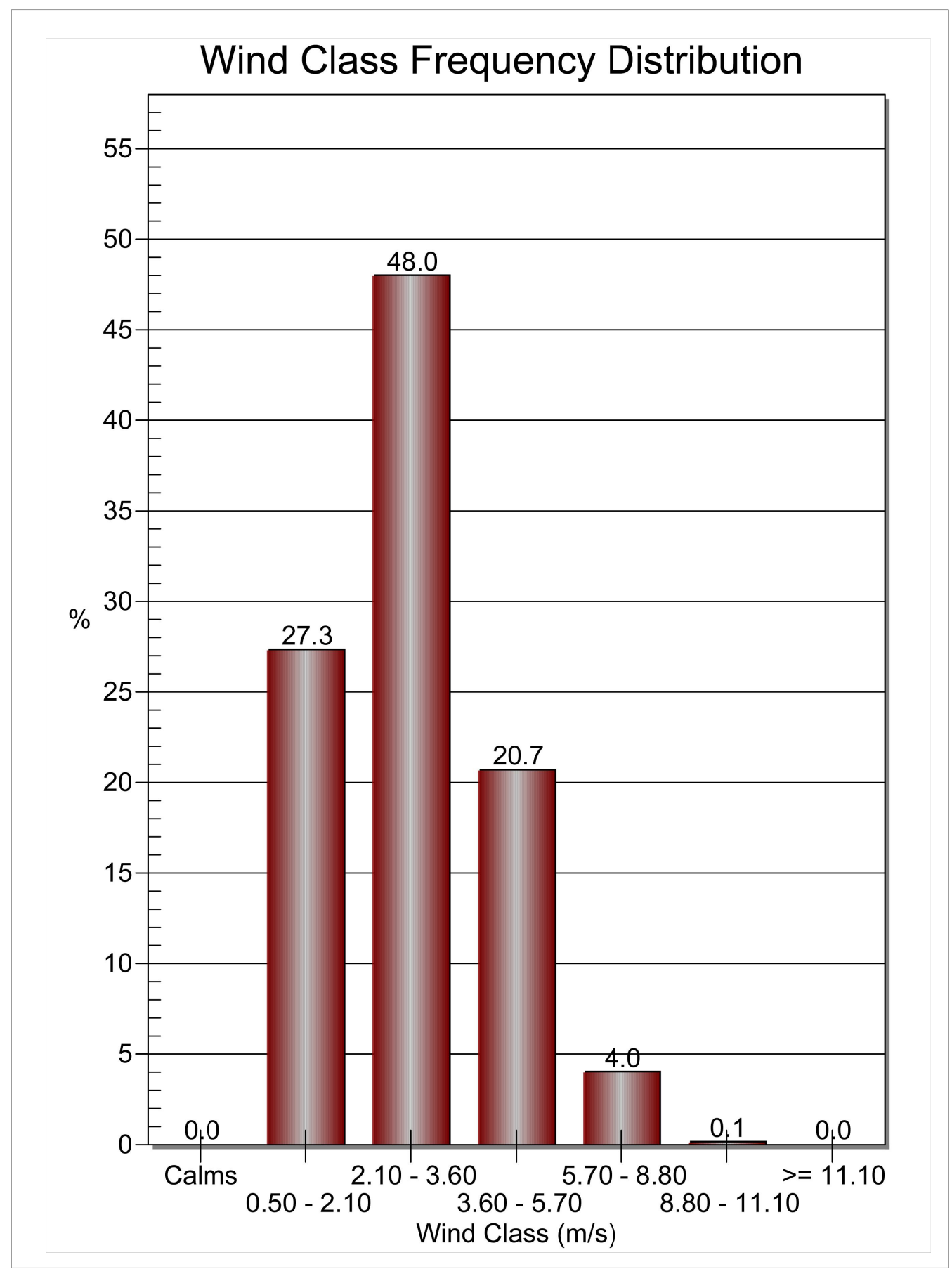
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ENGINEER	 <b>MISTY CLIFTON ENGINEERING</b>		
CLIENT	MCILVENNA BAY OPERATING LTD.		
PROJECT	AIR QUALITY IMPACT ASSESSMENT CONCENTRATE LOADING FACILITY CRANBERRY PORTAGE, MB		
DRAWING NAME	WIND SPEED AND DIRECTION DISTRIBUTION AT THE SITE		
DSGN. BY	DB	SCALE	NTS
DWN. BY	LW	PROJECT NO.	MLP0020
REV. BY	CEG	FILE NO.	
		DATE	2025-05-29
		DWG. NO.	
			03

Earth



WRPLOT View 10.0.1 - Lakes Environmental Software

ENGINEER					
CLIENT	MCILVENNA BAY OPERATING LTD.				
PROJECT	AIR QUALITY IMPACT ASSESSMENT CONCENTRATE LOADING FACILITY CARNBERRY PORTAGE, MB				
DRAWING NAME	WIND CLASS AND DIRECTION DISTRIBUTION AT THE SITE				
DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
DWN. BY	LW	PROJECT NO.	MLP0020	DWG. NO.	
REV. BY	CEG	FILE NO.			04

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# Appendix D

## Noise Impact Assessment



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20 June 2025

MLP0020

# **McIlvenna Bay Operating Ltd. Noise Impact Assessment, Concentrate Loading Facility Cranberry Portage, Manitoba**



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## Executive Summary

Mcllvenna Bay Operating Ltd., a subsidiary of Foran Mining Corp. (Foran), is proposing to construct a Concentrate Loading Facility (the Facility) on private land zoned for industrial use at the south end of the Town of Cranberry Portage, Manitoba. This facility will be used to transload the metal ore concentrate from the Mcllvenna Bay Operation to the existing railway for the transport to smelters for further ore processing.

Misty Clifton Engineering LP (MCLP) has completed a noise impact assessment (NIA) of the proposed Facility in support of the Environment Act Proposal (EAP) being submitted to Manitoba Environment and Climate Change (MECC), Environmental Approvals Branch (EAB). This report summarizes the methods, assumptions, technical data, and prediction results of the assessment.

The proposed Facility will be a source of noise during both construction and operations phases. Based on the available information regarding the Facility, construction activities will be limited to the daytime period, i.e., between 7:00 am and 10:00 pm, however during operations concentrate truck delivery and rail loading may occur 24 hours per day, 7 days per week.

During the construction phase, the main noise sources will be the construction equipment and powered construction tools. The operation phase of the phase will generate noise because of concentrate moving/loading by the front loader, and railcars shunting on the newly constructed rail tracks.

Noise impacts on the surrounding environment due to the Facility have been assessed. Provided that operating activities of the Facility are within the assumptions described in this report, the predicted sound levels at the Points of Reception (PORs) due to the Project do not exceed the Manitoba Guidelines for sound level limits.

The results of the NIA incorporate the most recent Facility information available for Facility operations, as of June 2025. Should any changes to the Facility assumptions occur (e.g., new equipment, facility layout, equipment usage etc.), the affected Facility components and activities should be reassessed to verify that the guidance sound level limits are not exceeded.

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## Glossary

**Attenuation** – The reduction of sound intensity achieved by various means (e.g. air, humidity, and porous materials) that may be natural or anthropogenic.

**Barrier** – An obstacle on the propagation path of sound between a source and a receiver. Obstacles may be composed wholly, or by a combination, of berms, walls, or fences; are free of gaps within or below its extents; and of sufficient mass to prevent significant transmission of sound.

**Daytime** – Defined as the hours from 07:00 to 22:00.

**Day-night Sound Level ( $L_{dn}$ )** – Describes a receiver’s cumulative noise exposure over a 24-hour period, where nighttime events (22:00 to 07:00) are increased by 10 dB to account for humans’ greater sensitivity to noise.

**Decibel (dB)** – The standard unit of measurement for sound levels. Describes the ratio between the sound pressure under consideration and a reference pressure level. Unless otherwise noted, decibel values relate to a reference pressure level of  $2 \times 10^{-5}$  Pascals.

**Decibel – “A-Weighted [Network]” (dBA)** – A frequency weighting network intended to approximate the response of the healthy human ear to sounds of different frequencies. Overall sound levels calculated or measured using the A-weighting network are indicated by dBA rather than dB.

**Energy Equivalent Sound Level ( $L_{eq}$ )** – The equivalent constant sound level over a specified time period “T” that would have the same sound energy as the actual (i.e. unsteady) time-varying sound over the same period of time.

**Frequency** – The number of times per second that a sine wave of sound repeats itself. It can be expressed in cycles per second, or Hertz (Hz).

**Hertz (Hz)** – A unit of frequency, expressed as cycles per second.

**Mitigation** – Measures, such as administrative or engineering methods, to reduce, eliminate, or control impacts on the environment.

**Night-time** – Defined as the hours from 22:00 to 07:00.

**Octave** – The interval for which the upper band frequency is twice the lower band frequency is an octave. For acoustic measurements, octave bands start at a centre frequency of 1,000 Hz and go either up or down from that point at a 2:1 ratio. The next upper centre frequency is 2,000 Hz, followed by 4,000 Hz, etc. The next lower centre frequency is 500 Hz followed by 250 Hz, etc.

**Point of Reception (POR) or Receptor** – A stationary position, at which sound levels are specified, measured or predicted.

**Sound** – A pressure-wave motion in a medium, such as air or water. The pressure-wave propagates to distant points through rapid oscillatory compression/rarefaction in the medium.

**Sound Level** – Generally, refers to the weighted sound pressure level that may be linear or weighted (e.g., A-or C-weighted) and expressed in decibels.

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# 1.0 Introduction

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## 1.1 General

Mcllvenna Bay Operating Ltd., a subsidiary of Foran Mining Corp. (Foran), is proposing to construct a Concentrate Loading Facility (the Facility) on private land zoned for industrial use at the south end of Cranberry Portage, Manitoba. The Facility will be used to transload the metal ore concentrate from the Mcllvenna Bay Operation in Saskatchewan to the existing railway for the transport to smelters for further ore processing.

Misty Clifton Engineering LP (MCLP) has completed a noise impact assessment (NIA) of the Facility operations in support of the Environment Act Proposal (EAP) being submitted to Manitoba Environment and Climate Change (MECC), Environmental Approvals Branch (EAB). This report summarizes the methods, assumptions, technical data, and prediction results of the assessment.

The main highlights of the proposed transloading facility are as follows:

- Establish fully enclosed concentrate loading building for temporary storage and transloading of copper and zinc concentrates on private land zoned for industrial use within the Regional Municipality of Kelsey.
- Storage building would be approximately 1600 m<sup>2</sup> and have a concrete pad, footings and be fully enclosed for both dumping and loading operations.
- Building would be complimented with a small portable office trailer.
- Facility would be controlled by electronic gates and be monitored via CCTV with connection to Mcllvenna Bay site security.
- Concentrates would be delivered via truck from Mcllvenna Bay to Cranberry Portage.
- Trucks will enter a roll up door, dump, the exit drive through secondary roll up door.
- Loaders will be used to push piles within the building minimizing the need for larger footprint.
- Up to five rail spurs will be established to enable rail car loading and storage/switching.
- Rail cars would be loaded -2 to 3 times per week for shipment to Canadian smelters.
- Cars will be loaded within the enclosed building via front end loader.

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## 1.2 Site Description

The Facility is located at the south end of Cranberry Portage, a part of the Regional Municipality of Kelsey, Manitoba. Access to the proposed Facility is from Highway 10 on the east side of the Facility. The area investigated for this Facility is located west of the existing Hudson Bay Railway (HBR) mainline. The proposed development area is forested on both sides of the existing rail track and details of previous earthworks and development are unknown.

The proposed transload Facility is designed for up to five rail tracks located west of the HBR mainline, as part of the Flin Flon Subdivision, between Mile 50 and 51. The total length of the proposed tracks is approximately one kilometre, expecting to accommodate a total of one hundred rail cars. Additional unpaved access road will be constructed in the area.

The site location is shown in Appendix A, Figure 1.

### 1.3 Regulatory Framework

The Province of Manitoba has published the Guidelines for Sound Pollution (MEMD, 2000), which provides quantitative limits on noise emissions to the outdoor environment. These sound level limits have been adopted for this noise impact assessment.

The Guidelines for Sound Pollution (the ‘Manitoba Guideline’) provides target sound levels limits for noise emissions to the outdoor environment at points of reception (PORs). The Manitoba Guideline defines a POR as “any point on the premises of a person where sound originating from other than those premises is received.” These target sound level limits are separated by maximum desirable and maximum available sound levels and vary depending on the type of areas including designated residential, commercial, and industrial areas. Table 1-1 presents the Manitoba Guideline sound level objectives for residential areas.

<b>Table 1-1 – Manitoba Guideline Sound Level Objectives for Residential Areas (dBA)</b>				
	<b>L<sub>eq(24)</sub></b>	<b>L<sub>dn</sub></b>	<b>L<sub>eq(1) (day)</sub></b>	<b>L<sub>eq(1) (night)</sub></b>
<b>Maximum Desirable Sound Level</b>	-	55	55	45
<b>Maximum Acceptable Sound Level</b>				
<b>Summer or year-round operations</b>	-	60	60	50
<b>Predominant discrete tone(s) or appreciable impulsive/impact character</b>	-	55	55	45
<b>Winter operations only or temporary operations</b>	-	65	65	55

### 1.4 Assessment Locations

The nearest Point of Receptions (PORs) were identified using satellite imagery and land use plans to identify existing dwellings based on the planned Project area, operation, and activities. These locations are representative of the most exposed noise sensitive residential dwellings surrounding the Project area in each direction. These PORs are summarized in Table 1-2 and illustrated in Appendix A, Figure 2.

Table 1-2 – Point of Reception Summary Table				
POR ID	Location		UTM Coordinates (Zone 14)	
	Description	Distance to the Project Centre	Easting (m)	Northing (m)
POR 1	Residential dwellings west of the Project	548 m	345975.53	6050418.65
POR 2	Residential dwellings north of the Project	642 m	346392.96	6051059.58
POR 3	Residential dwellings north east of the Project	685 m	346944.62	6050972.41

## 2.0 Noise Sources

### 2.1 Noise Sources Identification

The proposed Facility will be a source of noise during both the construction and operations phases. Based on the available information regarding the Facility, all activities will be limited to the daytime period, i.e., between 7:00 am and 10:00 pm.

During the construction phase, the main noise sources will be the construction equipment and powered construction tools. The operation phase of the Facility will generate noise within the fully enclosed concentrate loading building because of concentrate moving/loading by the front loader, concentrate hauling trucks traffic and will generate noise outside as a result of the railcars shunting on the newly constructed rail tracks.

### 2.2 Construction Noise

Duration of the construction phase of the Facility is estimated to last 6 to 8 months. All construction activities related to the Facility will occur during the daytime period. The main construction activities will be connected to the new rail spurs just to the west of the existing Hudson Bay Railway and erecting the 43 m x 37 m concentrate handling and loading building. Based on the geotechnical report prepared for the Facility, these construction activities will not require piling that could be a major source of noise and vibration.

The methodology and parameters stated in the Washington State Department of Transportation: *Environmental Guidance – Noise* (WS DoT 2017) were used to assess construction noise impacts related

to the proposed Facility. Table 2-1 summarizes noise characteristics for the commonly used construction equipment and tools as stated in the WS DoT 2017 Guidance:

<b>Table 2-1 – Typical Maximum Construction Equipment A-Weighted Sound Levels at 15 m</b>	
<b>Noise Source</b>	<b>A-Weighted Sound Level (dBA)</b>
<b>Earth Moving</b>	
Dozers	81-88
Front End Loaders	81
Graders	79-83
Earth Haulers	88-90
Dump Trucks	82
<b>Materials Handling</b>	
Mobile Cranes	83
Concrete Mixers	82
<b>Auxiliary Equipment</b>	
Generators	78
Compressors	87

The noise emissions of various alternatives during the construction likely would differ somewhat depending on the types and number of pieces of mechanized equipment in use at a given time and location and on the duration of construction activities (the usage factor). With use of the typical construction equipment the noise levels are expected to be like those shown in Table 2-2, which refers to the typical construction scenario stated in the WS DoT 2017 Guidance and involves a construction equipment mix operated at full power.

Table 2-2 – Construction Noise Impact to the Surrounding Environment (WS DoT 2017)	
Distance (m)	Estimated Construction Noise (dBA)
15.2	88
30.4	78.5
61	71
122	63.5
244	56
488	48.5
975	41

Used noise attenuation is based on the values for soft, grassy surfaces. Noise contours based on the above Table are shown in Appendix A, Figure 3.

It should be noted that the presented construction noise propagation scenario represents at the same time the worst-case scenario since it does not account for the noise attenuating properties of the forest belts to the west and east of the Facility. These belts may attenuate noise in the range 6-10 dBA compared to the soft ground depending on the forest geometry.

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### 2.3 Operations Noise-Concentrate Loading and Hauling

Concentrate will be handled and loaded to the railcars using a front loader within the future concentrate loading building. Additional noise will be resulting from the concentrate hauling trucks entering and leaving the Facility. Concentrate truck delivery and rail loading may occur 24 hours per day, 7 days per week. A typical front loader noise and dump truck combined noise impacts at the surrounding environment calculated using the WS DoT 2017 Guidance are summarized in Table 2-3.

Table 2-3 – Concentrate Loading/Handling Noise Impact to the Surrounding Environment (WS DoT 2017)	
Distance (m)	Estimated Operations Noise (dBA)
15.2	83.5
30.4	76
61	68.5
122	61
244	53.5
488	46
975	38.5

Used noise attenuation is based on the values for soft, grassy surfaces. Noise contours based on the above Table are shown in Appendix A, Figure 4.

It should be noted that the presented noise propagation scenario represents at the same time the worst-case scenario since it does not account for the noise attenuating properties of the building walls (up to -3 dBA depending on the wall thickness and insulation), and of the forest belts to the west and east of the Facility. These belts may attenuate noise in the range 6-10 dBA compared to the soft ground depending on the forest geometry.

#### 2.4 Operations Noise-Railway Traffic

The Facility will include a regular railcars movement and shunting to facilitate the concentrate loading. Diesel electric loco tractor will be utilized to move the railcars within the Facility. To estimate noise impacts generated by this added railway traffic, Clifton used methodology and equations recommended by The United States Federal Transit Administration (FTA).

The following equations were used to calculate noise exposures at a standard distance of 50 ft. for fixed guideway:

- Locomotives  $L_{eq}(1hr)$  at 50 ft:  $SEL_{ref} + 10 \log(N_{loco}) + K \log(S/50) + 10 \log(V) - 35.6$
- Rail Cars  $L_{eq}(1hr)$  at 50 ft:  $SEL_{ref} + 10 \log(N_{cars}) + 20 \log(S/50) + 10 \log(V) - 35.6 + Adj_{track}$

Noise attenuation by distance was calculated using the following equation:

- $C_{distance} = -15 \log(D/50)$

The Facility-related railway traffic noise assessment results are presented in Appendix B as summary results tables and noise impact plots. Summary table shows calculated cumulative noise impact at the PORs as 38 dBA and 37 dBA, respectively. This value is well below estimated existing background noise value at the POR locations, and below noise criteria values for moderate and several noise impact, respectively.

### 2.5 Recommended Noise Mitigation Measures

Recommended noise mitigation measures for construction and operations phase of the Facility are as follows:

- If construction needs to be undertaken outside of the normal daytime hours, local residents shall be informed beforehand of the type of construction planned and the expected duration.
- Keep equipment well-maintained and fitted with efficient muffling devices.
- Idling of equipment will be restricted to the minimum necessary to perform the specified work.
- Avoid unnecessary revving of engines and switch off equipment when not required (do not idle).
- Minimize drop heights of materials.
- Offset usage of heavy equipment (schedule non-concurrent use).

## 3.0 Noise Impact Assessment Results

The daytime and nighttime 1-hour equivalent ( $L_{eq}$ ) sound levels, and day-night equivalent sound levels ( $L_{dn}$ ), were predicted at the identified PORs by methods stated in Section 2.0. The results are summarized in Table 3-1.

Table 3-1 – Predicted Project Noise Levels				
POR ID	Meets Sound Level Criteria? (Y/N)			
	Daytime	Nighttime	Day-Night Equivalent	
POR 1	Y	Y	Y	
POR 2	Y	Y	Y	
POR 3	Y	Y	Y	

Noise impacts on the surrounding environment due to the Concentrate Loading Facility have been assessed. Provided that operating activities of the Project are within the assumptions described in this

report, the predicted sound levels at the PORs due to the Facility do not exceed the Manitoba Guidelines for sound level limits.

The results of the noise impact assessment incorporate the most recent Facility information available for Facility operations, as of June 2025. Should any changes to the Facility assumptions occur (e.g., new equipment, facility layout, equipment usage etc.), the affected Facility components and activities should be reassessed to verify that the guidance sound level limits are not exceeded.

The Facility will cause direct changes in the ambient noise levels near the Facility and along the access roads. The identified mitigation measures will minimize the extent of these alterations. Results of the noise assessment indicate that noise levels during construction and operations will be below the applicable permissible sound level at all identified PORs.

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## 4.0 Limitations

This Noise Impact Assessment was prepared by Misty Clifton Engineering Ltd. for McIlvenna Bay Operating Ltd. and the Regulator. The material in it reflects Misty Clifton Engineering Ltd.'s best judgment available to it at the time of preparation. Any use which a third party makes of this Assessment, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Misty Clifton Engineering Ltd. accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on this Plan.

This Assessment has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, expressed or implied, is made.

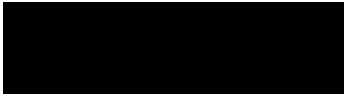
Site information was obtained from McIlvenna Bay Operating Ltd. Misty Clifton Engineering Ltd. accepts no responsibility for any deficiencies or inaccuracies in the information provided in this Plan that are the direct result of intentional or unintentional misrepresentations, errors or omissions of the information reviewed.

Our conclusions and recommendations are preliminary and based upon the information obtained. The work was based in part upon the environmental quality guidelines and regulations in effect when the work was begun. Future regulatory changes may require reassessment of the findings of this document.

Yours truly,

**Misty Clifton**

Prepared by:



06/20/2025

**Daniel Budai, P.Eng.**  
**Senior Environmental Engineer**

**Engineers and Geoscientists Manitoba**  
**Certificate of Authorization No. 7791**

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## References

MEMD (Manitoba Environmental Management Division). 2000. Guidelines for Sound Pollution. March 2000, Winnipeg, MB.

US Department of Transportation, Federal Transit Administration – Transit Noise and Vibration Impact Assessment, Manual, September 2018.

Canadian Transportation Agency – Railway Noise Measurement and Reporting Methodology, 2011.

David A. Bies and Colin H. Hansen. 2009. Engineering Noise Control Theory and Practice – Fourth Edition. Chippenham, Wiltshire.

Washington State Department of Transportation: Environmental Guidance – Noise, 2017.

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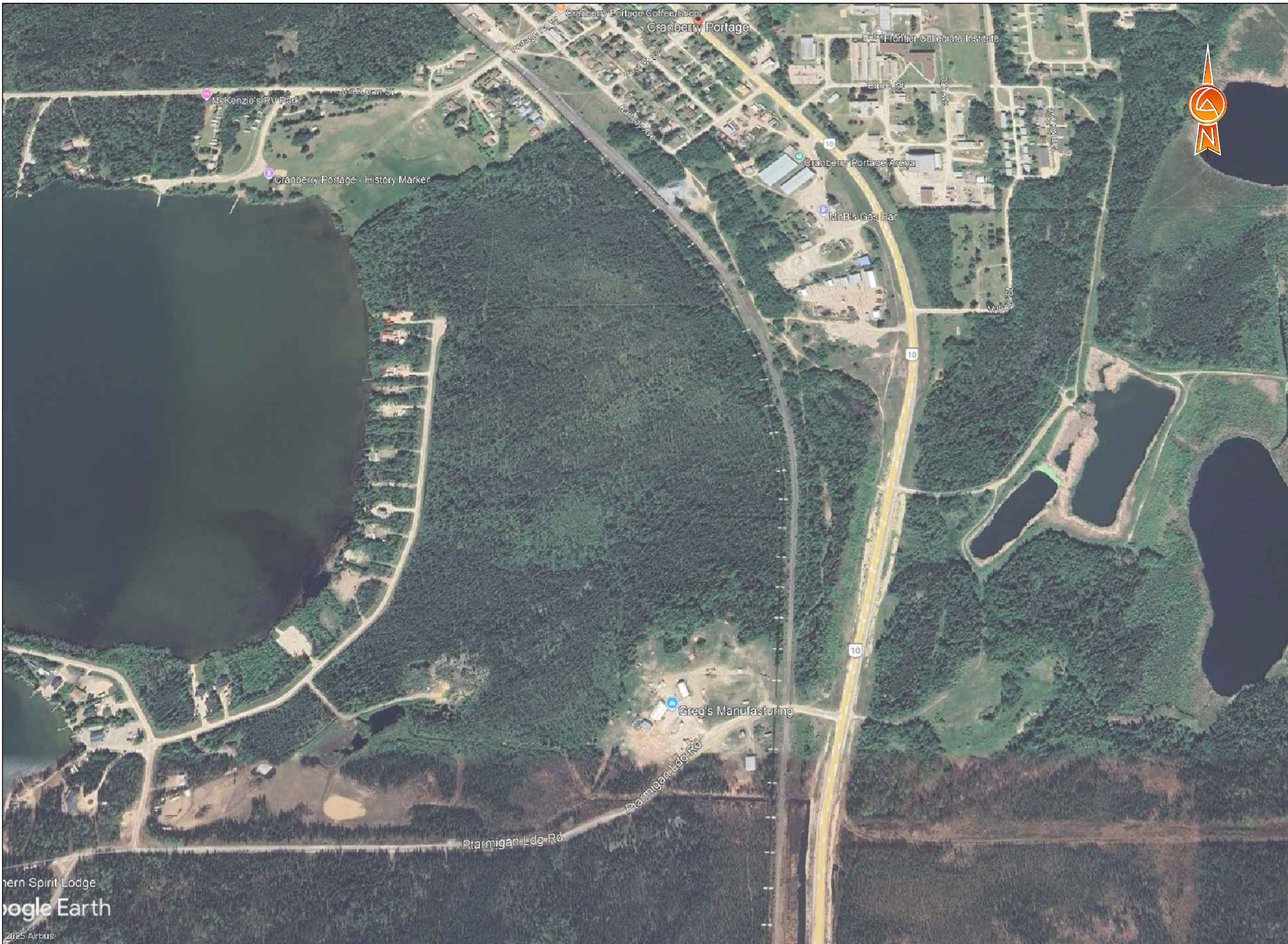
# Appendix A

## Figures



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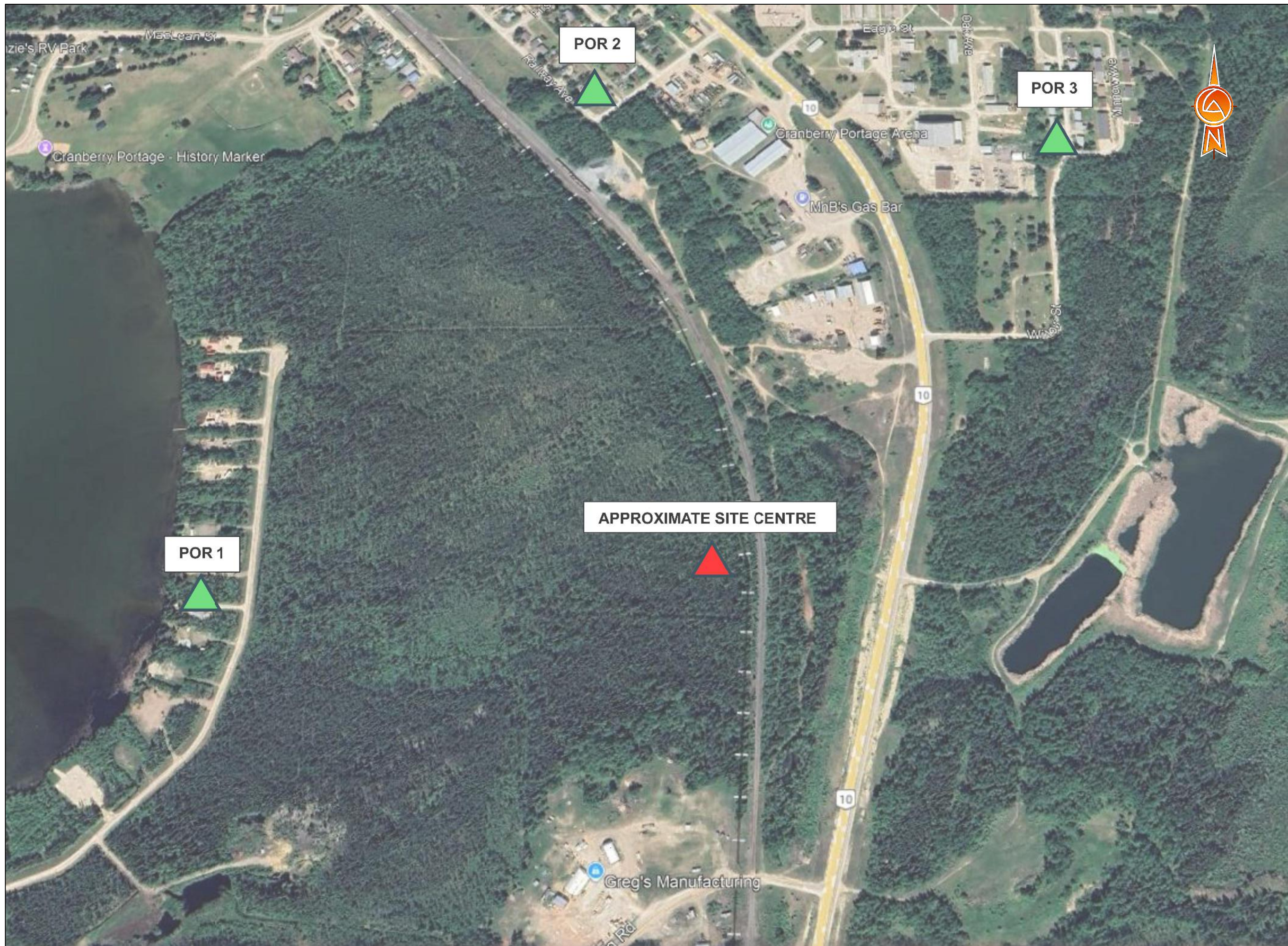
ENGINEER  MISTY CLIFTON  
ENGINEERING

CLIENT MCILVENNA BAY OPERATING LTD.

PROJECT NOISE IMPACT ASSESSMENT-CONCENTRATE LOADING FACILITY  
CRANBERRY PORTAGE, MB

DRAWING NAME  
SITE LOCATION PLAN

DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
DWN. BY	LW	PROJECT NO.	MLP0020	DWG. NO.	
REV. BY	CEG	FILE NO.			01



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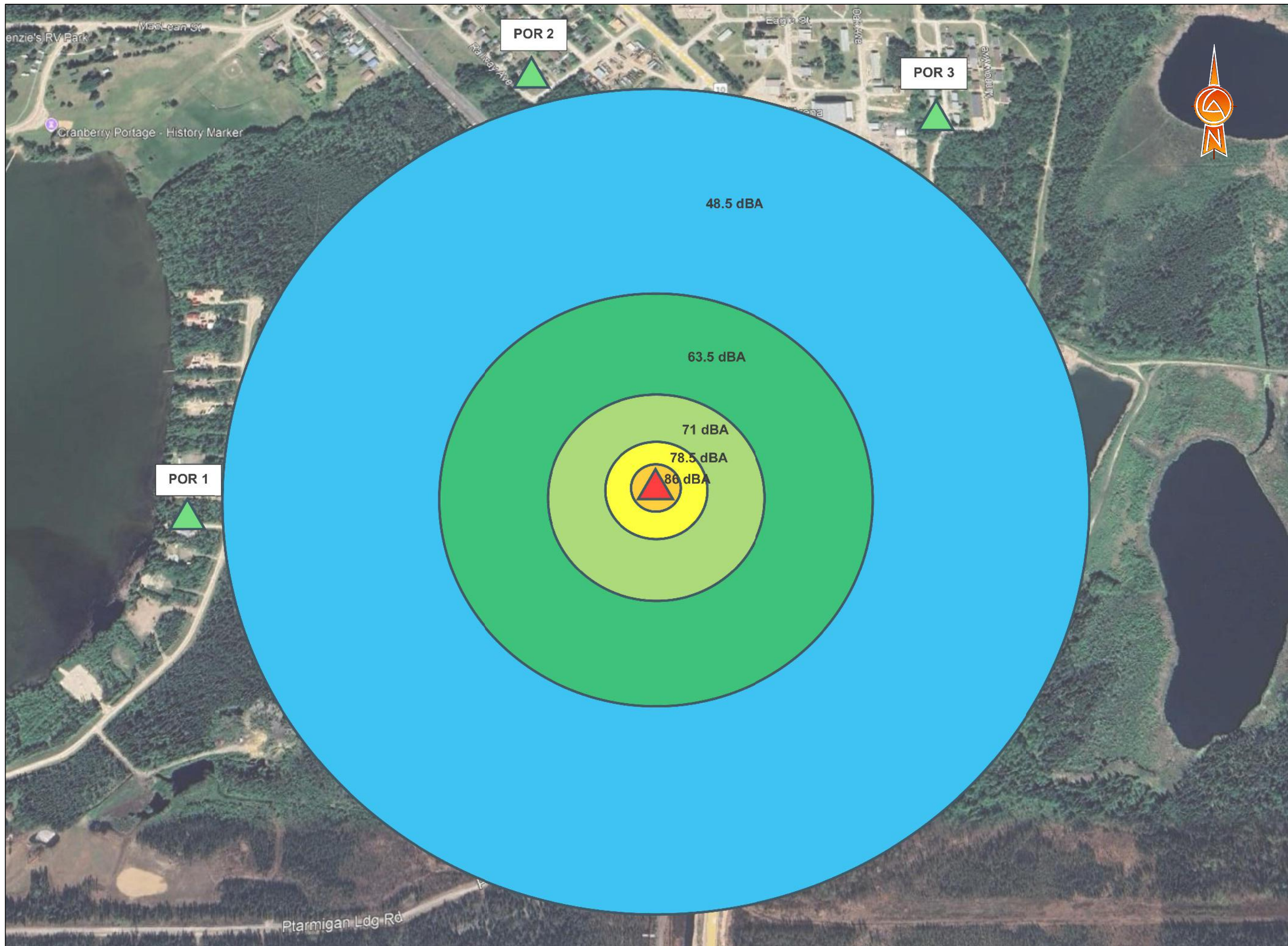
ENGINEER  MISTY CLIFTON ENGINEERING

CLIENT MCILVENNA BAY OPERATING LTD.

PROJECT NOISE IMPACT ASSESSMENT-CONCENTRATE LOADING FACILITY CRANBERRY PORTAGE, MB

DRAWING NAME  
POINTS OF RECEPTION LOCATIONS

DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
DWN. BY	LW	PROJECT NO.	MLP0020	DWG. NO.	
REV. BY	CEG	FILE NO.			02



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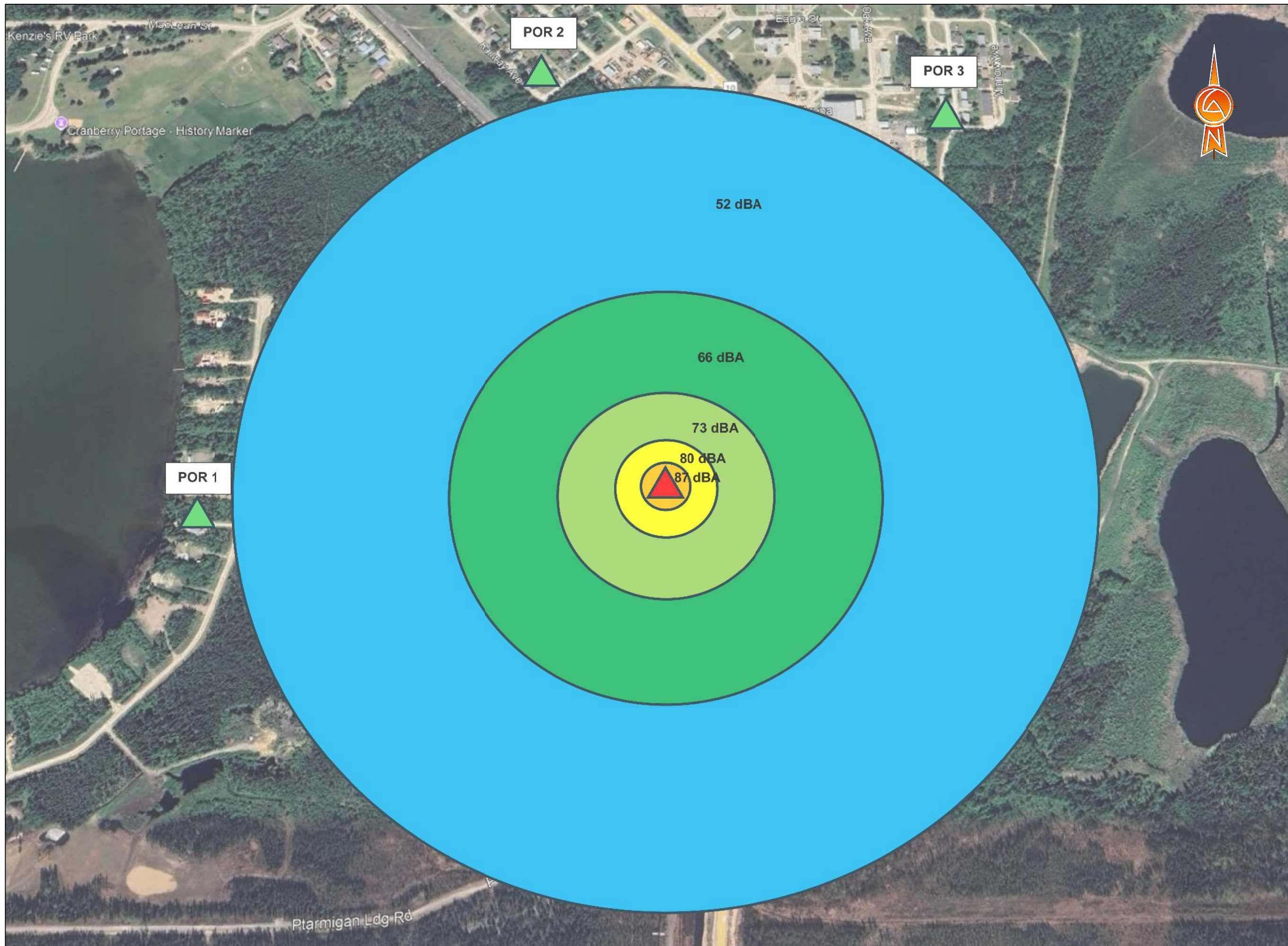
ENGINEER  MISTY CLIFTON ENGINEERING

CLIENT MCILVENNA BAY OPERATING LTD.

PROJECT NOISE IMPACT ASSESSMENT-CONCENTRATE LOADING FACILITY CRANBERRY PORTAGE, MB

DRAWING NAME ESTIMATED NOISE PROPAGATION TYPICAL CONSTRUCTION NOISE

DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
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PROJECT NOISE IMPACT ASSESSMENT-CONCENTRATE LOADING FACILITY CRANBERRY PORTAGE, MB

DRAWING NAME  
 ESTIMATED NOISE PROPAGATION  
 OPERATIONS NOISE - CONCENTRATE LOADING AND MOVING


DSGN. BY	DB	SCALE	NTS	DATE	2025-05-29
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REV. BY	CEG	FILE NO.			04



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PROJECT	NOISE IMPACT ASSESSMENT-CONCENTRATE LOADING FACILITY CRANBERRY PORTAGE, MB		
DRAWING NAME	ESTIMATED NOISE PROPAGATION OPERATIONS NOISE - RAILWAY TRAFFIC		
DSGN. BY	DB	SCALE	NTS
DWN. BY	LW	PROJECT NO.	MLP0020
REV. BY	CEG	FILE NO.	05
		DATE	2025-05-29
		DWG. NO.	

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# Appendix B

## Tables and Impact Plots



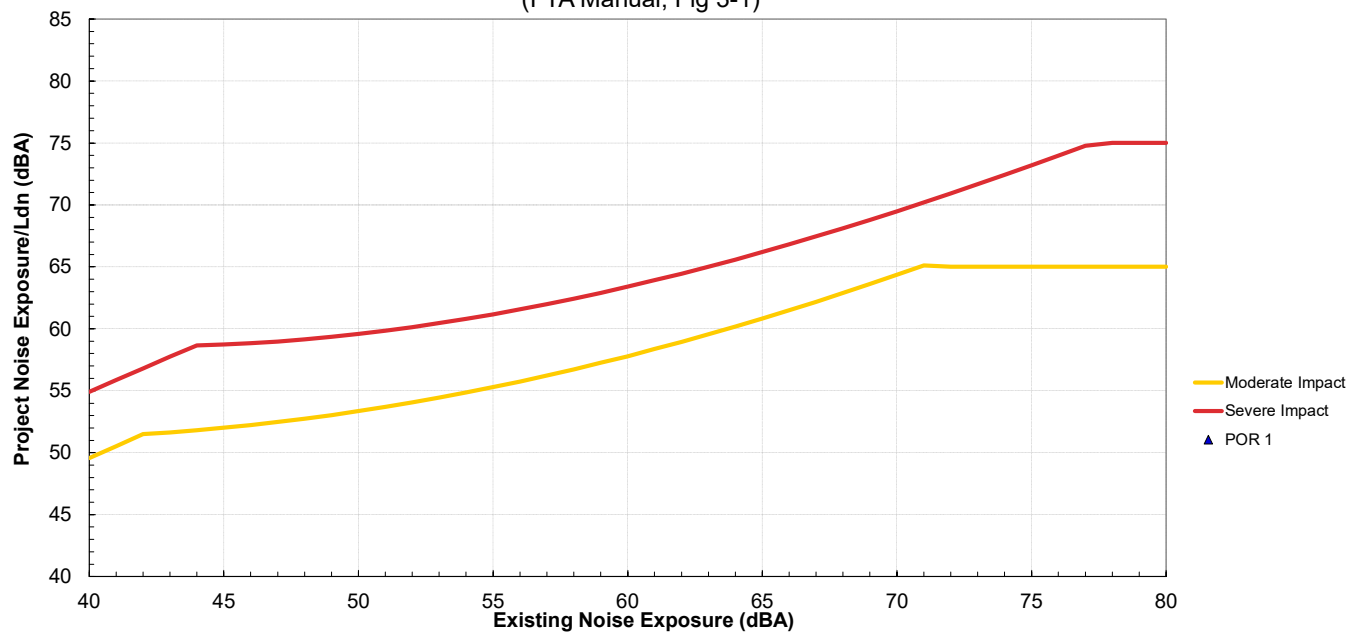
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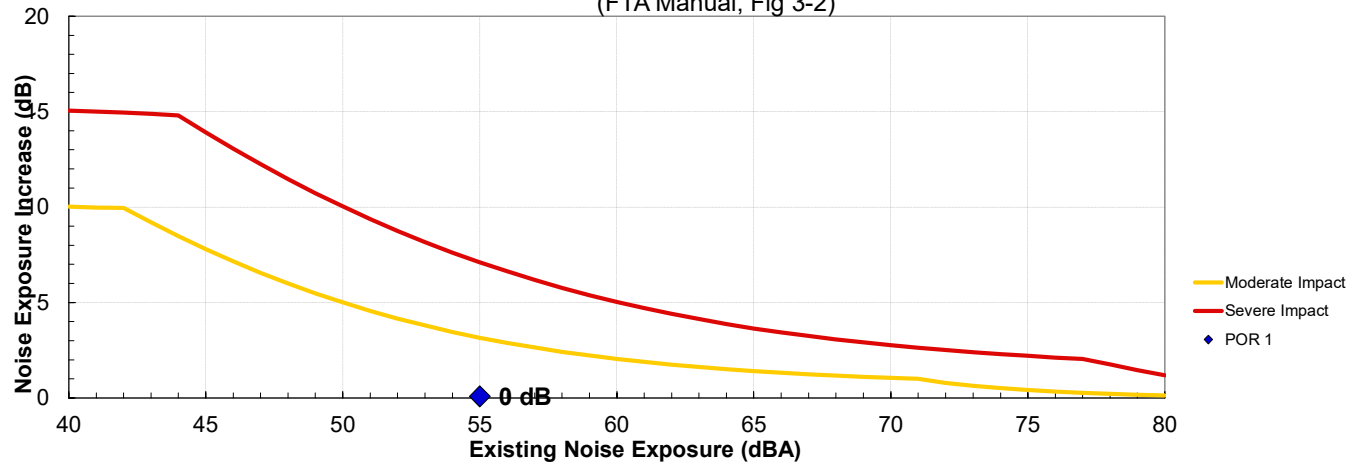
**Project:** FORAN - Concentrate Loading Facility  
**Receiver:** POR 1

<b>Source</b>	<b>Distance</b>	<b>Project Ldn</b>	<b>Existing Ldn</b>	<b>Noise Criteria</b>		<b>Impact?</b>
				<b>Mod. Impact</b>	<b>Sev. Impact</b>	
1 Diesel Electric Locomotive	1797 ft	38.0 dBA	55 dBA	55 dBA	61 dBA	None
2 --	50 ft		55 dBA	55 dBA	61 dBA	
3 --	50 ft		55 dBA	55 dBA	61 dBA	
4 --	70 ft		55 dBA	55 dBA	61 dBA	
5 --	ft		55 dBA	55 dBA	61 dBA	
6 --	ft		55 dBA	55 dBA	61 dBA	
<b>Combined Sources</b>		<b>38 dBA</b>	<b>55 dBA</b>	<b>55 dBA</b>	<b>61 dBA</b>	<b>None</b>

**Noise Impact Criteria**  
(FTA Manual, Fig 3-1)



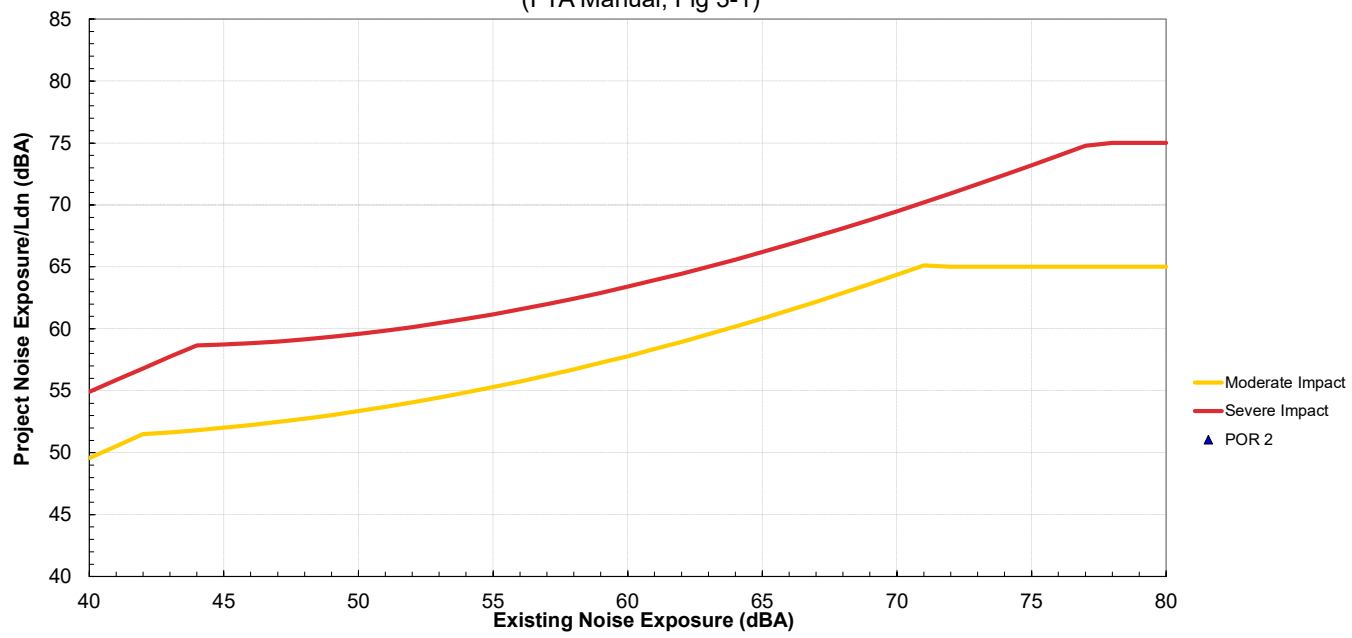
**Increase in Cumulative Noise Levels Allowed**  
(FTA Manual, Fig 3-2)



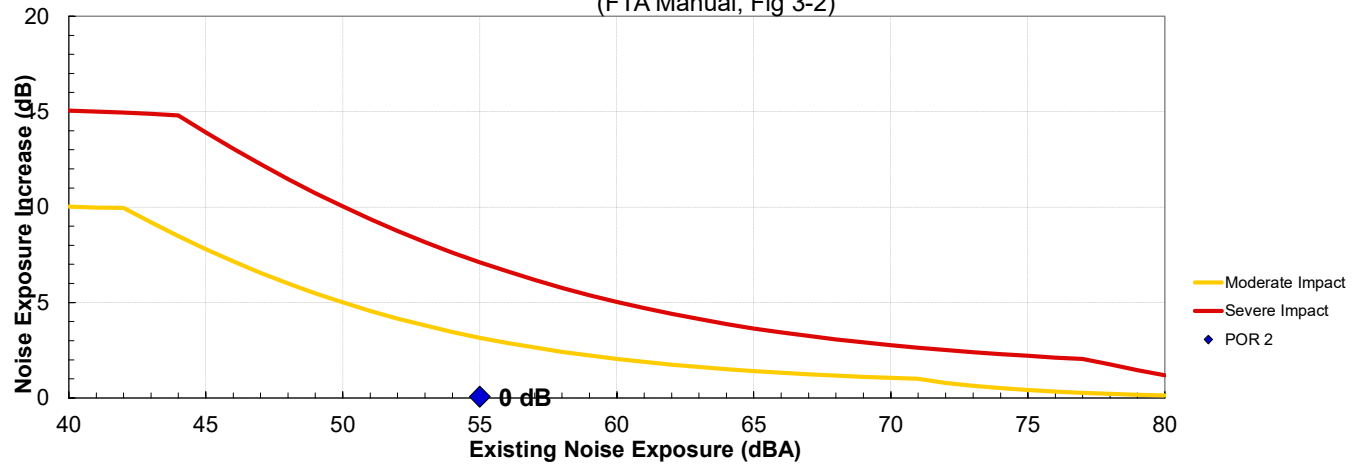
**Project:** FORAN - Concentrate Loading Facility  
**Receiver:** POR 2

<b>Source</b>	<b>Distance</b>	<b>Project Ldn</b>	<b>Existing Ldn</b>	<b>Noise Criteria</b>		<b>Impact?</b>
				<b>Mod. Impact</b>	<b>Sev. Impact</b>	
1 Diesel Electric Locomotive	2106 ft	37.0 dBA	55 dBA	55 dBA	61 dBA	None
2 --	50 ft		55 dBA	55 dBA	61 dBA	
3 --	50 ft		55 dBA	55 dBA	61 dBA	
4 --	70 ft		55 dBA	55 dBA	61 dBA	
5 --	ft		55 dBA	55 dBA	61 dBA	
6 --	ft		55 dBA	55 dBA	61 dBA	
<b>Combined Sources</b>		<b>37 dBA</b>	<b>55 dBA</b>	<b>55 dBA</b>	<b>61 dBA</b>	<b>None</b>

**Noise Impact Criteria**  
(FTA Manual, Fig 3-1)



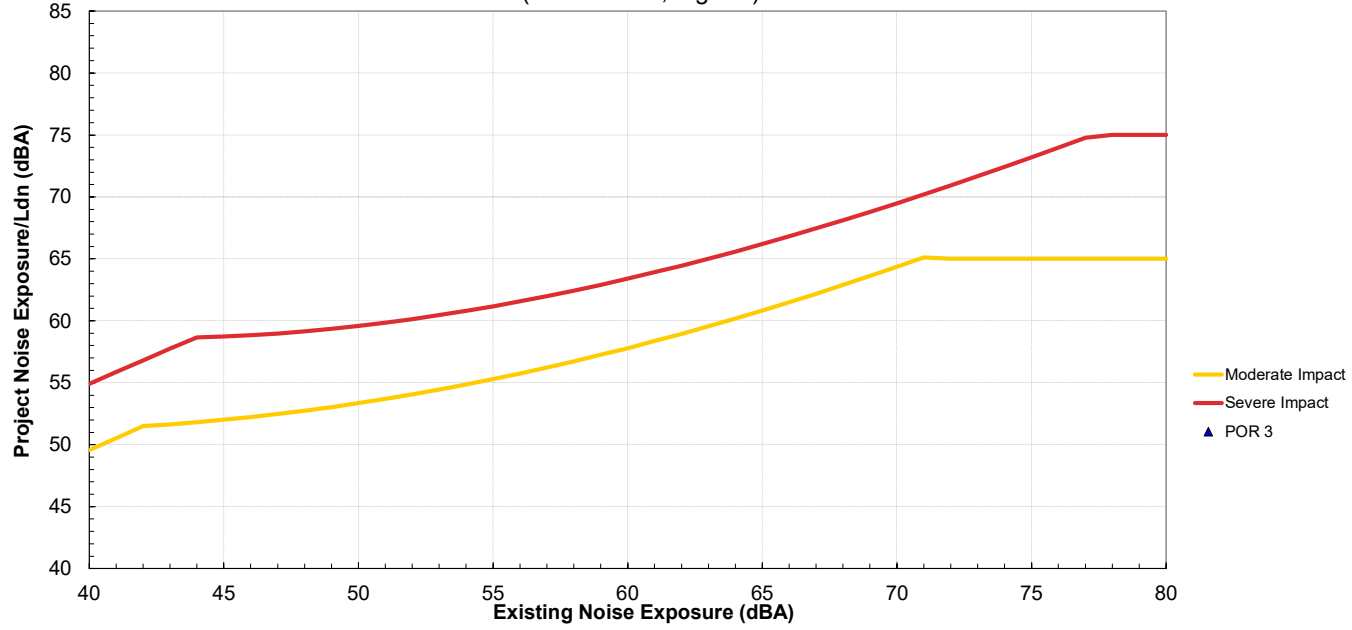
**Increase in Cumulative Noise Levels Allowed**  
(FTA Manual, Fig 3-2)



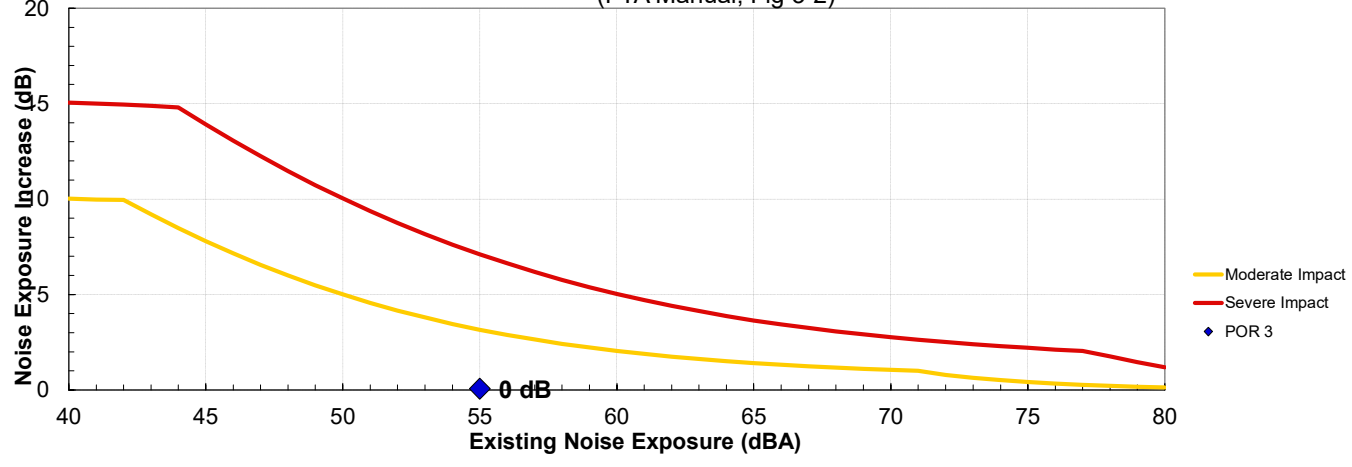
**Project:** FORAN - Concentrate Loading Facility  
**Receiver:** POR 3

<b>Source</b>	<b>Distance</b>	<b>Project Ldn</b>	<b>Existing Ldn</b>	<b>Noise Criteria</b>		<b>Impact?</b>
				<b>Mod. Impact</b>	<b>Sev. Impact</b>	
1 Diesel Electric Locomotive	2247 ft	36.6 dBA	55 dBA	55 dBA	61 dBA	None
2 --	50 ft		55 dBA	55 dBA	61 dBA	
3 --	50 ft		55 dBA	55 dBA	61 dBA	
4 --	70 ft		55 dBA	55 dBA	61 dBA	
5 --	ft		55 dBA	55 dBA	61 dBA	
6 --	ft		55 dBA	55 dBA	61 dBA	
<b>Combined Sources</b>		<b>37 dBA</b>	<b>55 dBA</b>	<b>55 dBA</b>	<b>61 dBA</b>	<b>None</b>

**Noise Impact Criteria**  
(FTA Manual, Fig 3-1)



**Increase in Cumulative Noise Levels Allowed**  
(FTA Manual, Fig 3-2)



---

# Appendix E

## Traffic Impact Assessment



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# Foran McIlvenna Bay Site Update

## Transportation Impact Assessment

Draft V2

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Prepared for  
Foran Mining Corporation

Date  
April 23, 2025

Project Number  
02-24-0047

## CORPORATE AUTHORIZATION

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Date: 2025-04-23

Project #: 02-24-0047

Status: Draft V2

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Engineer's Stamp

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## CHANGE LOG

This report was updated to reflect a third trucking route option being contemplated by Foran. This is an update to the first version of this report dated July 17, 2024 which had considered two trucking route options at the time. This version of the report (Final V2) therefore includes the following changes as compared to the Final V1 TIA:

- Inclusion of the Route 3 travel route context, which is proposed to be a deviation of Route 2 to continue through Flin Flon along Highway 10, into Manitoba through Cranberry Portage, and into a proposed transload facility accessed via Ptarmigan Lodge Road.
- Analysis of the Route 3 highway access requirements including intersection capacity and treatment analysis where heavy vehicles would be required to turn on/off Highway 10 at Ptarmigan Lodge Road.
- Geometric review of Highway 10 & Ptarmigan Lodge Road considering heavy vehicle movements in/out of the contemplated transload facility.

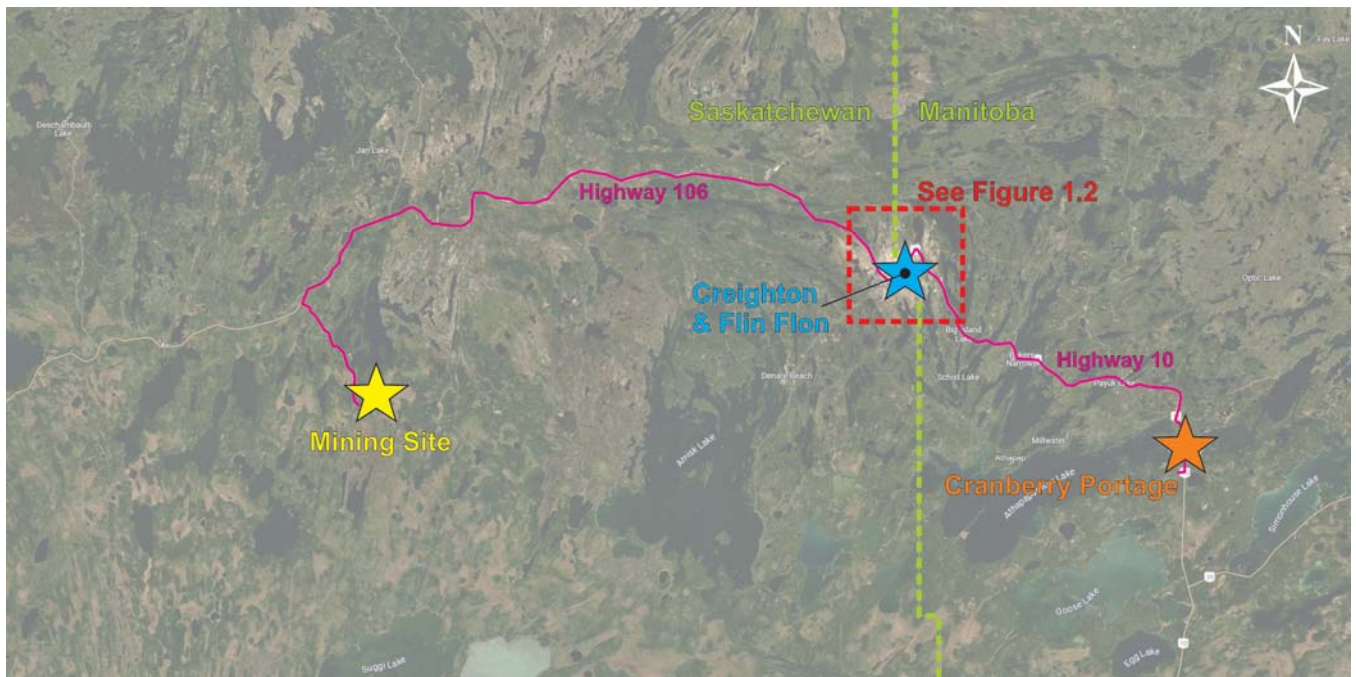
## 1. EXECUTIVE SUMMARY

Foran is seeking development approval for an industrial mining site located in rural Saskatchewan with access via Highway 106 near Hanson Lake, approximately 80km west of Creighton and Flin Flon, SK.

A Transportation Impact Assessment (TIA) had previously been completed for the development<sup>1</sup> which focused on site trip generation and the Hanson Lake Access to the site. The Saskatchewan Ministry of Highways (MoH) has requested this subsequent TIA to review the traffic impacts of three heavy vehicle routing options through the communities of Creighton, Flin Flon, and Cranberry Portage east of the site.

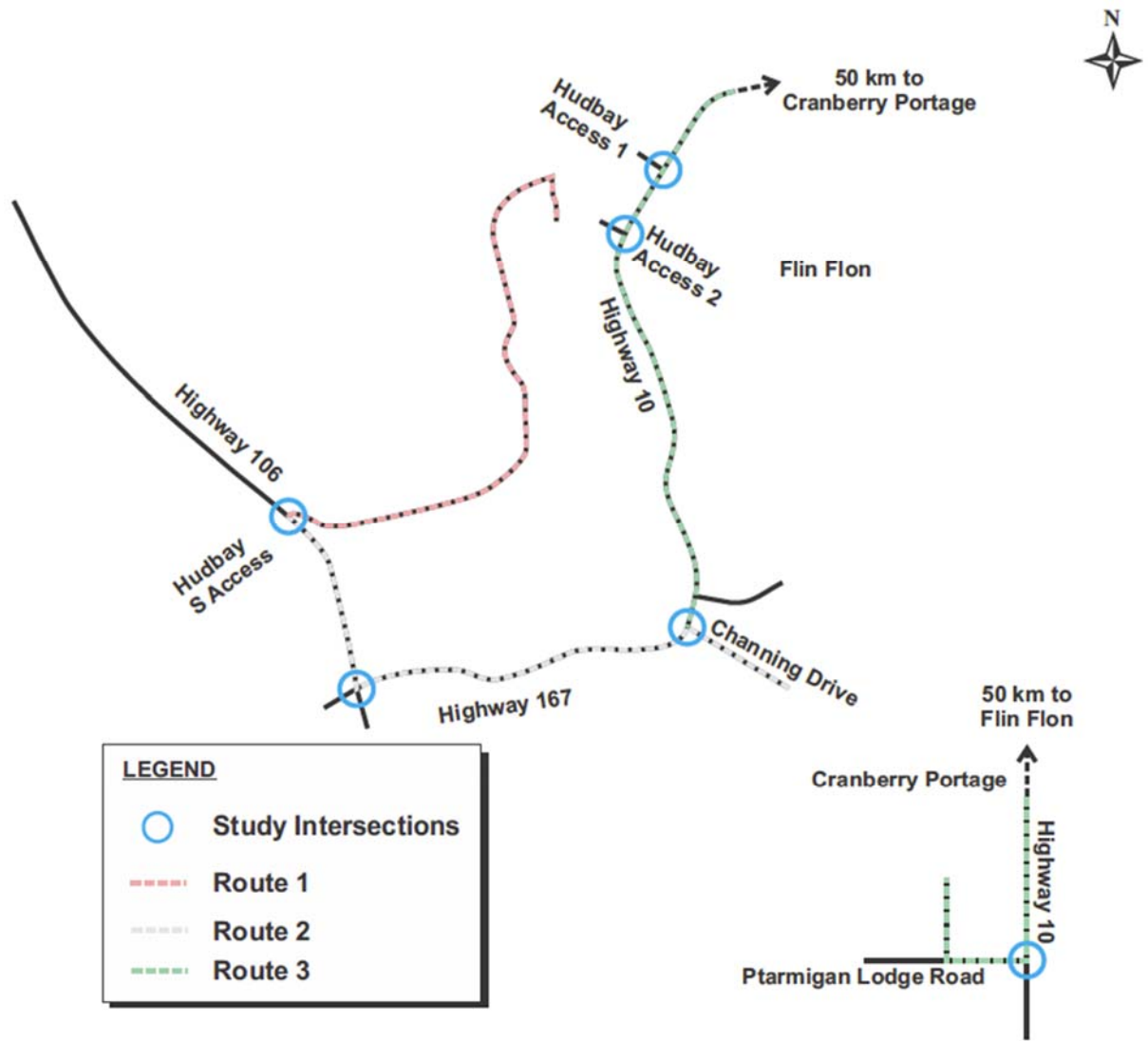
Context of the mining site location and the three heavy vehicle routing options are shown in **Figure 1.1** and **Figure 1.2**.

**Figure 1.1: Overall Context**



<sup>1</sup> Foran McIlvenna Bay Site TIA (02-22-0174), Bunt & Associates, February 2, 2023

Figure 1.2: Heavy Vehicle Route Options



## 1.1 Trip Generation

The anticipated traffic volumes that the site will generate during its peak year of operation are summarized in **Table 1.1** for total annual traffic, **Table 1.2** for average daily traffic, and **Table 1.3** for peak hour traffic used in the analysis within this study. It is noted that the traffic volumes shown in the following tables are total trips (vehicles entering the site + vehicles leaving the site). It is also noted that the project is considering increasing productivity by up to 20% from initial estimates; this contingency was therefore included in the trip generation estimates and all analysis within this study was completed assuming the 20% increase to be included. The full year-by-year breakdown of expected annual traffic is included in **Appendix B**.

**Table 1.1: Operation Year 1 Total Annual Vehicle Trips**

DIRECTION TO/FROM	MINE	PROCESSING	CONSTRUCTION	LNG	CU CONC.	ZN CONC.	COURIERS	PERSONNEL	TOTAL
Highway	500	1,010	250	0	6,600	5,000	365	825	14,550
106 North	(600)	(1,212)	(300)	(0)	(7,920)	(6,000)	(438)	(990)	(17,460)
Highway	1,500	3,030	750	1,600	0	0	1,095	275	8,250
106 South	(1,800)	(3,636)	(900)	(1,920)	(0)	(0)	(1,314)	(330)	(9,900)
<b>TOTAL</b>	<b>2,000</b> <b>(2,400)</b>	<b>4,040</b> <b>(4,848)</b>	<b>1,000</b> <b>(1,200)</b>	<b>1,600</b> <b>(1,920)</b>	<b>6,600</b> <b>(7,920)</b>	<b>5,000</b> <b>(6,000)</b>	<b>1,460</b> <b>(1,752)</b>	<b>1,100</b> <b>(1,320)</b>	<b>22,800</b> <b>(27,360)</b>

1. Brackets indicate values with 20% increase.

**Table 1.2: Operation Year 1 Average Daily Trips**

DIRECTION TO/FROM	MINE	PROCESSING	CONSTRUCTION	LNG	CU CONC.	ZN CONC.	COURIERS	PERSONNEL	TOTAL
Highway	1.4	2.8	0.7	0.0	18.1	13.7	1.0	2.3	39.9
106 North	(1.7)	(3.4)	(0.8)	(0.0)	(21.7)	(16.4)	(1.2)	(2.8)	(47.9)
Highway	4.1	8.3	2.1	4.4	0.0	0.0	3.0	0.8	22.6
106 South	(4.9)	(10.0)	(2.5)	(5.3)	(0.0)	(0.0)	(3.6)	(1.0)	(27.1)
<b>TOTAL</b>	<b>5.5</b> <b>(6.6)</b>	<b>11.1</b> <b>(13.3)</b>	<b>2.7</b> <b>(3.2)</b>	<b>4.4</b> <b>(5.3)</b>	<b>18.1</b> <b>(21.7)</b>	<b>13.7</b> <b>(16.4)</b>	<b>4.0</b> <b>(4.8)</b>	<b>3.0</b> <b>(3.6)</b>	<b>62.5</b> <b>(75.0)</b>

1. Brackets indicate values with 20% increase.

**Table 1.3: Operation Year 1 Peak Hour Trips**

DIRECTION TO/FROM	AM PEAK HOUR TRIPS		PM PEAK HOUR TRIPS	
	IN	OUT	IN	OUT
<b>Highway 106 North</b>	3 (4)	1 (1)	1 (1)	3 (4)
<b>Highway 106 South</b>	2 (2)	1 (1)	1 (1)	2 (2)
<b>TOTAL</b>	<b>5</b> <b>(6)</b>	<b>2</b> <b>(2)</b>	<b>2</b> <b>(2)</b>	<b>5</b> <b>(6)</b>

1. Brackets indicate values with 20% increase.

## 1.2 Findings & Recommendations

Study findings and recommendations are described in **Table 1.4**.

**Table 1.4: Findings & Recommendations**

SECTION		FINDINGS
Intersection Analysis	Existing	All study intersections are currently operating acceptably.
	2024 Post Development	All study intersections continue to operate acceptably with the addition of site traffic in all routing scenarios.
	2044 Background	All study intersections continue to operate acceptably with the addition of background traffic growth.
	2044 Post Development	All study intersections continue to operate acceptably with the addition of background traffic growth and site traffic in all routing scenarios.
Roadway Analysis	Existing	All roadways currently carry daily traffic volumes within their respective guidelines.
	2024 Post Development	All roadways remain within their daily volume guidelines with the addition of site traffic in all routing scenarios.
	2044 Background	All roadways remain within their daily volume guidelines with the addition of background traffic growth.
	2044 Post Development	All roadways remain within their daily volume guidelines with the addition of background traffic growth and site traffic in all routing scenarios.
Warrants	Intersection Treatments	<p>Highway 167 / Channing Drive Intersection</p> <ul style="list-style-type: none"> <li>A northbound right turn lane is warranted by 2044 due to Background traffic volumes. This turn lane is not warranted at the existing (2024) nor Opening Day after development (2024) horizons in either routing scenarios but is triggered by the 2044 horizon due to the growth of background through traffic on the highway.</li> </ul>
	Illumination	No new street light illumination is warranted at study intersections throughout the study horizons and all site traffic routing scenarios.
Access Geometry Review	Route 1 – Highway 106 & HudBay South Access	Route Option 1 which uses the HudBay South Access with Highway 106 can accommodate the heavy vehicle movements without the need for road geometry revisions given the existing oversized design of the access. Based on an onsite review of the access conditions, regrading of the access may be required when it is reopened to truck traffic.
	Route 2 – Highway 167 & Channing Avenue	Revisions to the existing Highway 167 & Channing Avenue geometry are recommended if truck Route Option 2 is used by the project. Improvement of the northbound right turn corner radii plus a taper leading to the intersection are recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. These revisions are shown in concept within Section 5 of this report.
	Route 3 – Highway 10 & Ptarmigan Lodge Road	Revisions to the existing Highway 10 & Ptarmigan Lodge Road geometry are recommended if truck Route Option 3 is used by the project. Improvement of the southbound right turn corner radii plus a taper leading to the intersection are recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. These revisions are shown in concept within Section 5 of this report.

## 2. INTRODUCTION

Foran is seeking development approval for an industrial mining site located in rural Saskatchewan with access via Highway 106 near Hanson Lake, approximately 80km west of Creighton and Flin Flon, SK.

A Transportation Impact Assessment (TIA) had previously been completed for the development<sup>2</sup> which focused on site trip generation and the Hanson Lake Access to the site. The Saskatchewan Ministry of Highways (MoH) has requested this subsequent TIA to review the traffic impacts of two heavy vehicle routing options through the communities of Creighton and Flin Flon east of the site. A third route option is now also being considered which travels further east into Manitoba to a proposed railway access south of Cranberry Portage. The previous TIA is included in **Appendix E**.

### 2.1 Scope of Work

The scope of work for this study was confirmed to include the following:

#### Development Trip Generation

- *Trip Generation* – Calculate development trips generation for the weekday AM & PM peak hours to determine expected new site trips based on ITE or local data.
- *Trip Assignment* – Assign development trips to the network based on the truck routing planned for the development.

#### Traffic

- *Historical Data* – Acquire available historic traffic data for the following road links:
  - Highway 106 within and north of Creighton, SK
  - Highway 167 between Crighton and Flin Flon, SK
  - Highway 10 within Flin Flon, MB
  - Highway 10 south of Cranberry Portage
- *Traffic Counts* – Obtain or estimate 6-hour weekday traffic data at following intersections along the three routing options:
  - Highway 10 & Huidbay North Access
  - Highway 10 & Huidbay South Access
  - Highway 106 & Creighton Creek North Access
  - Highway 106 & Highway 167
  - Highway 167 & Channing Drive
  - Highway 10 & Ptarmigan Lodge Road
- *Background Traffic* – Increasing existing traffic by an annual growth percentage to obtain future traffic volumes. The background traffic does not include those from the proposed site.
- *Horizons* – Review traffic conditions for:
  - Existing
  - Opening Day + 20 years (2044)

<sup>2</sup> Foran McIlvenna Bay Site TIA (02-22-0174), Bunt & Associates, February 2, 2023

- *Intersection Capacity* - Complete weekday AM and PM peak hour analysis at both Background and After Development scenarios.
- *Roadway Link Capacity* - Complete link capacity analysis for roadway links along the highway.
- *Intersection Warrants* - Identify the required intersection treatment at study intersections based on Province of Saskatchewan (MoH) warrants.
- *Lighting Warrants* - If and where necessary, complete lighting warrants based on MoH.
- *Recommendations* - Identify improvements required to support background or development traffic.

## 3. DEVELOPMENT

### 3.1 Trip Generation

The unique nature of this site did not lend itself to the utilization of standard industry trip generation rates. As a result, it was necessary to generate vehicle traffic estimates based on first principles and on data provided by the developer. Based on the production levels of the mine that Foran anticipates, Foran had provided annual traffic estimates for the lifespan of the mining project. These annual estimates were broken down by highway travel direction based on trip purpose (concentrate hauling, personnel, etc.) and are provided in **Appendix B**.

Based on information provided by the developer, the site is expected to generate the largest traffic volumes during Year 1 of operation, with marginally lower traffic levels expected in the following years. To be conservative, the estimated Year 1 traffic volumes were used in this analysis.

The anticipated Year 1 annual traffic volumes are summarized in **Table 3.1** for total trips over the span of the year. It is noted that the traffic volumes shown in the following tables are total trips (vehicles entering the site + vehicles leaving the site). It is also noted that the developer is considering increasing productivity by up to 20% of initial estimates, thus increasing the associated truck traffic. This contingency was included in the trip generation estimates and all analysis completed within this study assumed the 20% increase to be included.

**Table 3.1: Operation Year 1 Total Annual Vehicle Trips**

DIRECTION TO/FROM	MINE	PROCESSING	CONSTRUCTION	LNG	CU CONC.	ZN CONC.	COURIERS	PERSONNEL	TOTAL
Highway 106 North	500 (600)	1,010 (1,212)	250 (300)	0 (0)	6,600 (7,920)	5,000 (6,000)	365 (438)	825 (990)	14,550 (17,460)
Highway 106 South	1,500 (1,800)	3,030 (3,636)	750 (900)	1,600 (1,920)	0 (0)	0 (0)	1,095 (1,314)	275 (330)	8,250 (9,900)
<b>TOTAL</b>	<b>2,000 (2,400)</b>	<b>4,040 (4,848)</b>	<b>1,000 (1,200)</b>	<b>1,600 (1,920)</b>	<b>6,600 (7,920)</b>	<b>5,000 (6,000)</b>	<b>1,460 (1,752)</b>	<b>1,100 (1,320)</b>	<b>22,800 (27,360)</b>

1. Brackets indicate values with 20% increase.

As the values shown in Table 3.1 are annual trip estimates, they were used to estimate the average daily and peak hour trips to/from the mining site for the purpose of the intersection capacity and warrant analysis summarized in this report. Foran has confirmed that the mining operations are planned to occur 365 days per year during the project lifespan, therefore the average daily traffic volumes were estimated by dividing the annual trip totals by 365 days. The average daily trips that the mining site will generate are summarized in **Table 3.2**. It is noted that these trips are not rounded in the below table as they reflect the average trips that can be expected on a typical day of Year 1 operation. However, the numbers were rounded up to the nearest whole number where daily volumes were used within the study analysis.

**Table 3.2: Operation Year 1 Average Daily Trips**

DIRECTION TO/FROM	MINE	PROCESSING	CONSTRUCTION	LNG	CU CONC.	ZN CONC.	COURIERS	PERSONNEL	TOTAL
Highway 106 North	1.4 (1.7)	2.8 (3.4)	0.7 (0.8)	0.0 (0.0)	18.1 (21.7)	13.7 (16.4)	1.0 (1.2)	2.3 (2.8)	39.9 (47.9)
Highway 106 South	4.1 (4.9)	8.3 (10.0)	2.1 (2.5)	4.4 (5.3)	0.0 (0.0)	0.0 (0.0)	3.0 (3.6)	0.8 (1.0)	22.6 (27.1)
<b>TOTAL</b>	<b>5.5 (6.6)</b>	<b>11.1 (13.3)</b>	<b>2.7 (3.2)</b>	<b>4.4 (5.3)</b>	<b>18.1 (21.7)</b>	<b>13.7 (16.4)</b>	<b>4.0 (4.8)</b>	<b>3.0 (3.6)</b>	<b>62.5 (75.0)</b>

1. Brackets indicate values with 20% increase.

Similar to the daily volume estimates summarized in Table 3.2, peak hour site trip generation was estimated based on first principles and the provided annual trip estimates for the purpose of the intersection capacity and warrant analysis summarized in this report. The following methodology was used to estimate the peak hour mining traffic volumes based on the annual volumes provided by Foran:

- As confirmed by Foran, trips associated with Cu and Zn concentrate may occur any time of day, 7 days per week. Therefore 1 inbound and 1 outbound trip is assumed to occur during peak hours (31.8 Cu & Zn Conc. trips per day divided by 24 hours and rounded up).
- Trips associated with personnel buses would likely occur before and after the street peak hour, however these were included in the analysis peak hour volumes to represent the peak hour of the site.
- All other trips not associated with personnel or concentrate hauling will occur 7 days per week within the site operating hours (12 hours per day). Peak hour volumes for these trips were estimated by dividing the total remaining trips by 12.
- The resulting peak hour trips used in this study analysis are summarized in **Table 3.3**.

**Table 3.3: Operation Year 1 Peak Hour Trips**

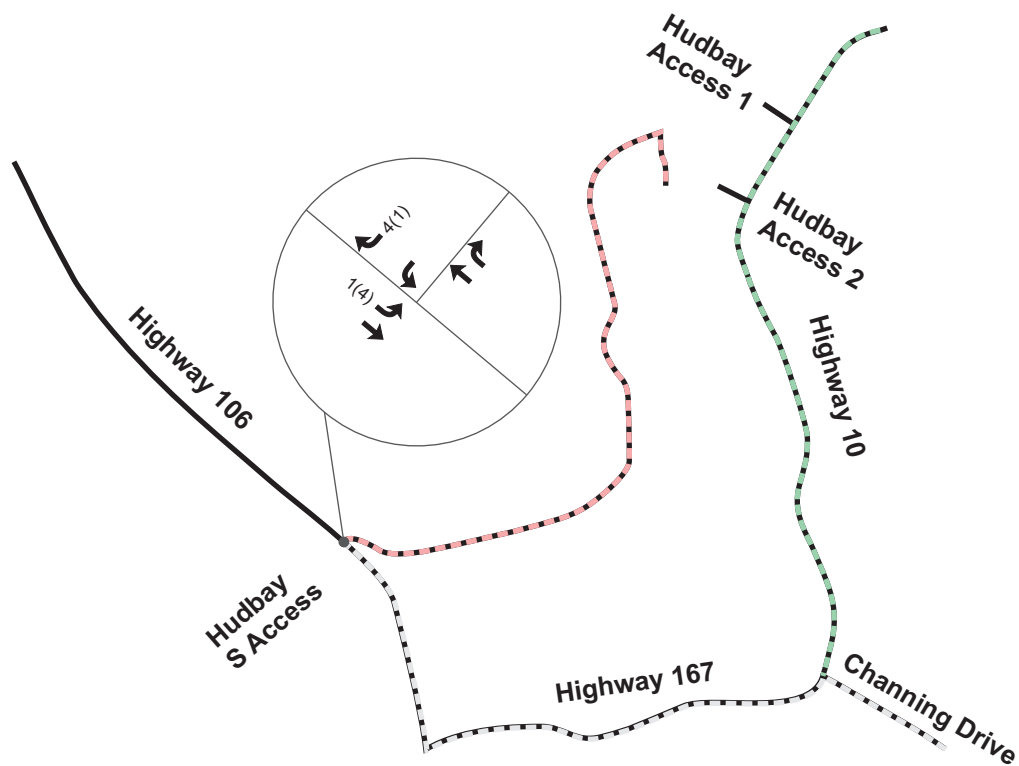
DIRECTION TO/FROM	AM PEAK HOUR TRIPS		PM PEAK HOUR TRIPS	
	IN	OUT	IN	OUT
<b>Highway 106 North</b>	3 (4)	1 (1)	1 (1)	3 (4)
<b>Highway 106 South</b>	2 (2)	1 (1)	1 (1)	2 (2)
<b>TOTAL</b>	<b>5 (6)</b>	<b>2 (2)</b>	<b>2 (2)</b>	<b>5 (6)</b>

1. Brackets indicate values with 20% increase.

As the anticipated site traffic to/from Highway 106 north will be primarily heavy vehicles (concentrate hauling, personnel buses, delivery trucks), all peak hour site traffic was considered to be heavy vehicles within this analysis. Three truck routing scenarios were considered in this study. It is noted that only one of the three truck routing scenarios will be used by the project, therefore three versions of analysis were completed and summarized in this study which applies all site traffic to each of the truck routes separately in order to evaluate all routing scenarios. In each route scenario, the site traffic was distributed along the road network following the considered truck routing option. It is noted that not all peak hour trips listed in Table 3.3 will necessarily use the future transload facility access as only the concentrate hauling trucks will

travel to/from the transload facility, however all peak hour traffic in Table 3.3 was assigned to/from the transload facility for analysis purposes as the 1-2 non-concentrate hauling trips will generate along Highway 106/Highway 10 east of the mining site. This results in a peak hour analysis scenario where 1 to 2 additional heavy vehicles use the transload facility access beyond the average peak hour estimates.

The resulting peak hour site traffic volumes assigned to the study intersections are illustrated in **Exhibit 3.1**, **Exhibit 3.2**, and **Exhibit 3.3**.

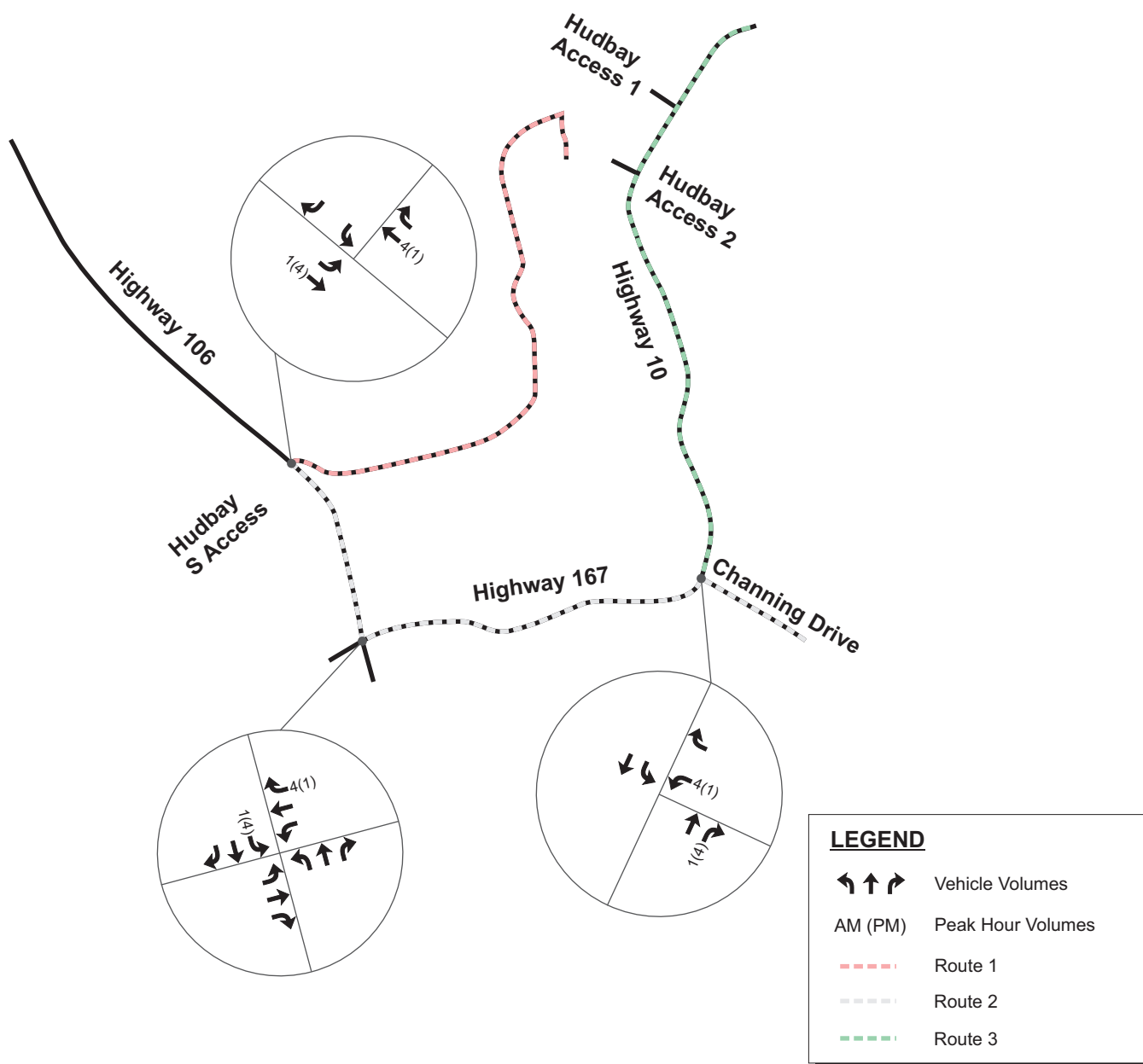


**LEGEND**

	Vehicle Volumes
AM (PM)	Peak Hour Volumes
	Route 1
	Route 2
	Route 3

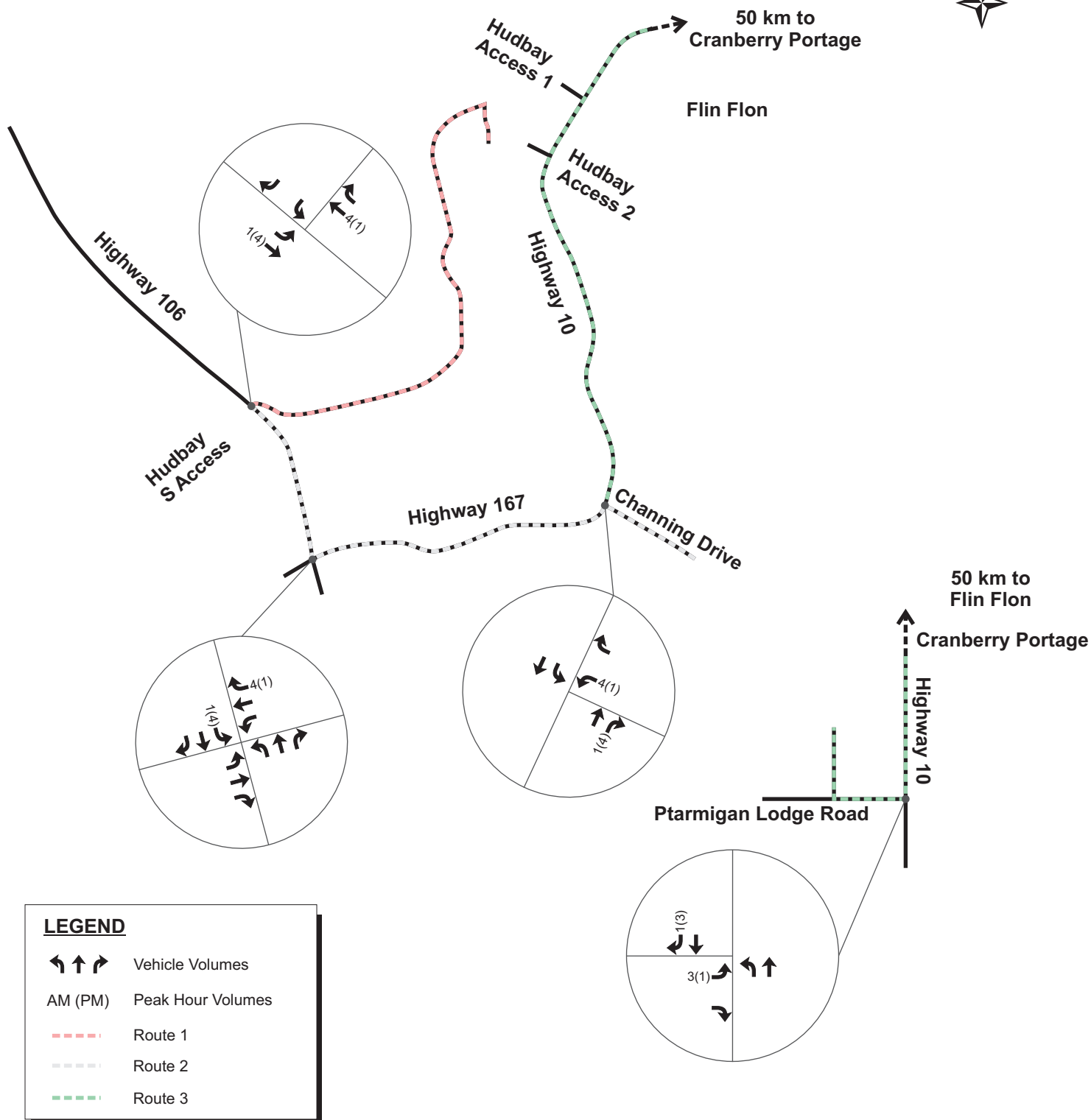
**Exhibit 3.1**  
**Site Traffic Volumes - Route Scenario 1**





**Exhibit 3.2**  
**Site Traffic Volumes - Route Scenario 2**





**Exhibit 3.3**  
**Site Traffic Volumes - Route Scenario 3**



## 4. TRAFFIC CONDITIONS

### 4.1 Road Network

The characteristics of roadways within the study area were obtained from Manitoba Provincial Highways Functional Classification Map and Saskatchewan Rural Road Classification of Provincial Highways Map. Details are summarized in **Table 4.1**.

**Table 4.1: Existing Roadway Characteristics**

ROADWAY	CLASSIFICATION	CROSS-SECTION		POSTED SPEED	FACILITIES	
		# Lanes	Median		Shoulder	Illumination
Highway 10	Primary Arterial	2	No	70 km/h	Yes	No
Highway 106	Rural Road Classification 2	2	No	70 km/h	Yes	No
Highway 167	Rural Road Classification 3	2	No	60 km/h	Yes	No
Channing Drive	Rural Municipal Road	2	No	50 km/h	No	No
Ptarmigan Lodge Road	Rural Road	2	No	50 km/h	No	No

### 4.2 Intersections

Existing intersection configurations and controls at study intersections are illustrated in **Exhibit 4.1**.

### 4.3 Volumes

#### 4.3.1 Existing / 2024 Background

Traffic counts used in this study are summarized in **Table 4.2** and included in **Appendix B**. Existing traffic volumes are summarized in **Exhibit 4.2**.

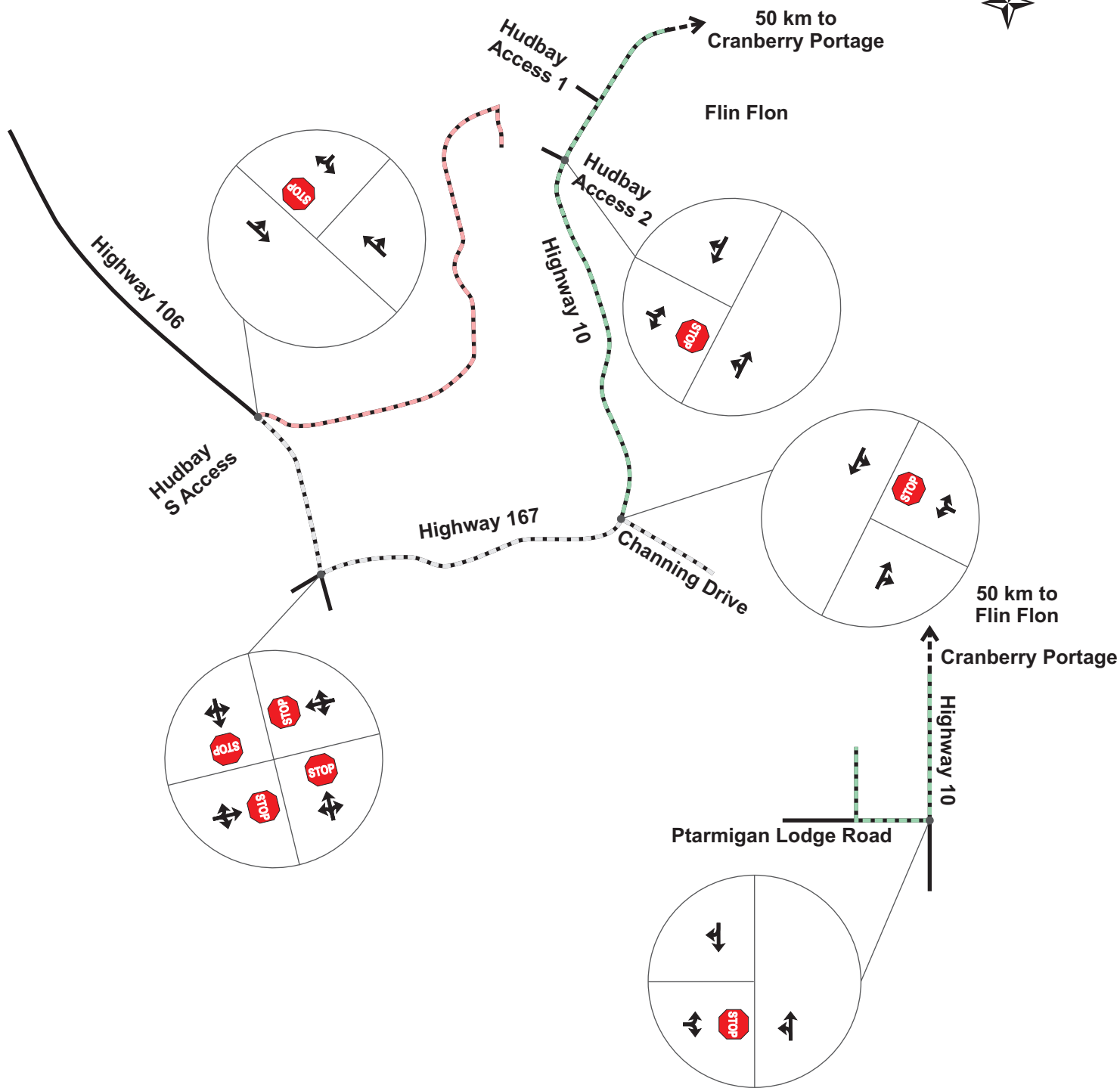
**Table 4.2: Data Collection Summary**

INTERSECTION	COUNT DATE	DAY OF WEEK	SOURCE
Highway 10 & Huidbay North Access	April 24, 2024	Wednesday	Bunt & Associates
Highway 10 & Huidbay South Access			
Highway 106 & Creighton Creek North Access			
Highway 106 & Highway 167			
Highway 167 & Channing Drive			
Highway 10 (AADT south of Cranberry Portage)	2023 AADT		Manitoba Transportation and Infrastructure

It is noted that the north access of Huidbay landfill site is gated, and no turning movements were observed during the time of counting. Therefore, the intersection of Highway 10 and Huidbay North Access were excluded in this study. For Highway 10 & Ptarmigan Lodge Road, background peak hour turning movements at the intersection were estimated using available 2023 AADT data and comparison between the ratio of AADT to peak hour data available at the nearby intersection of Highway 10 and 1 Street SW within Cranberry Portage.

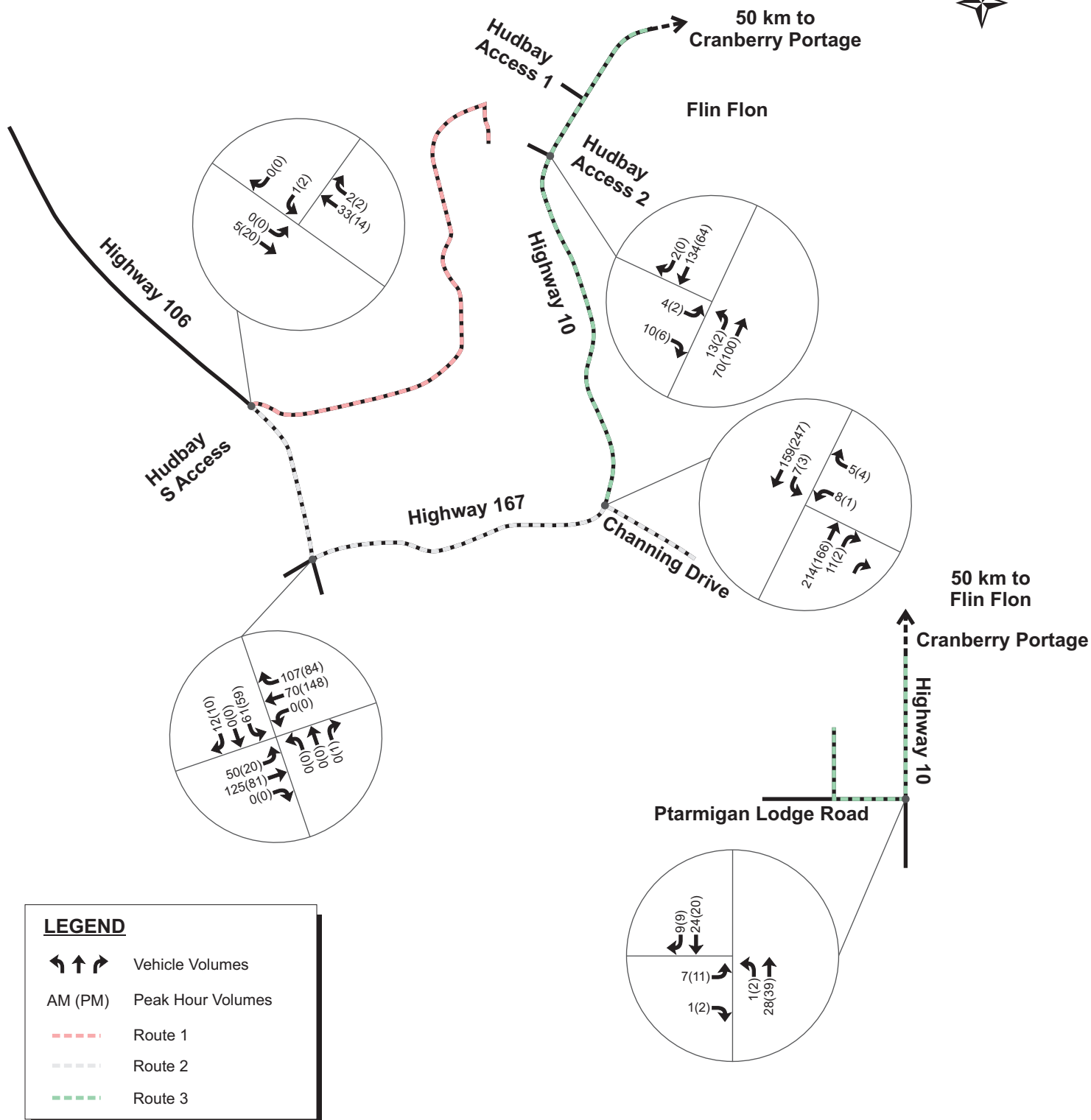
### 4.3.2 2044 Background

Background traffic is traffic that would be present on the road network in future years regardless of the development of the site. This traffic is representative of yearly growth on the roadways as well as other residential, commercial, or industrial developments that have been approved in the area. Based on historical data for Highway 106 provided by Saskatchewan MoH for the years 2012 through to 2021, a linear growth rate of 2% per year was applied to existing traffic volumes along highways to forecast 2044 background traffic. 2044 Background traffic volumes are illustrated in **Exhibit 4.3**.



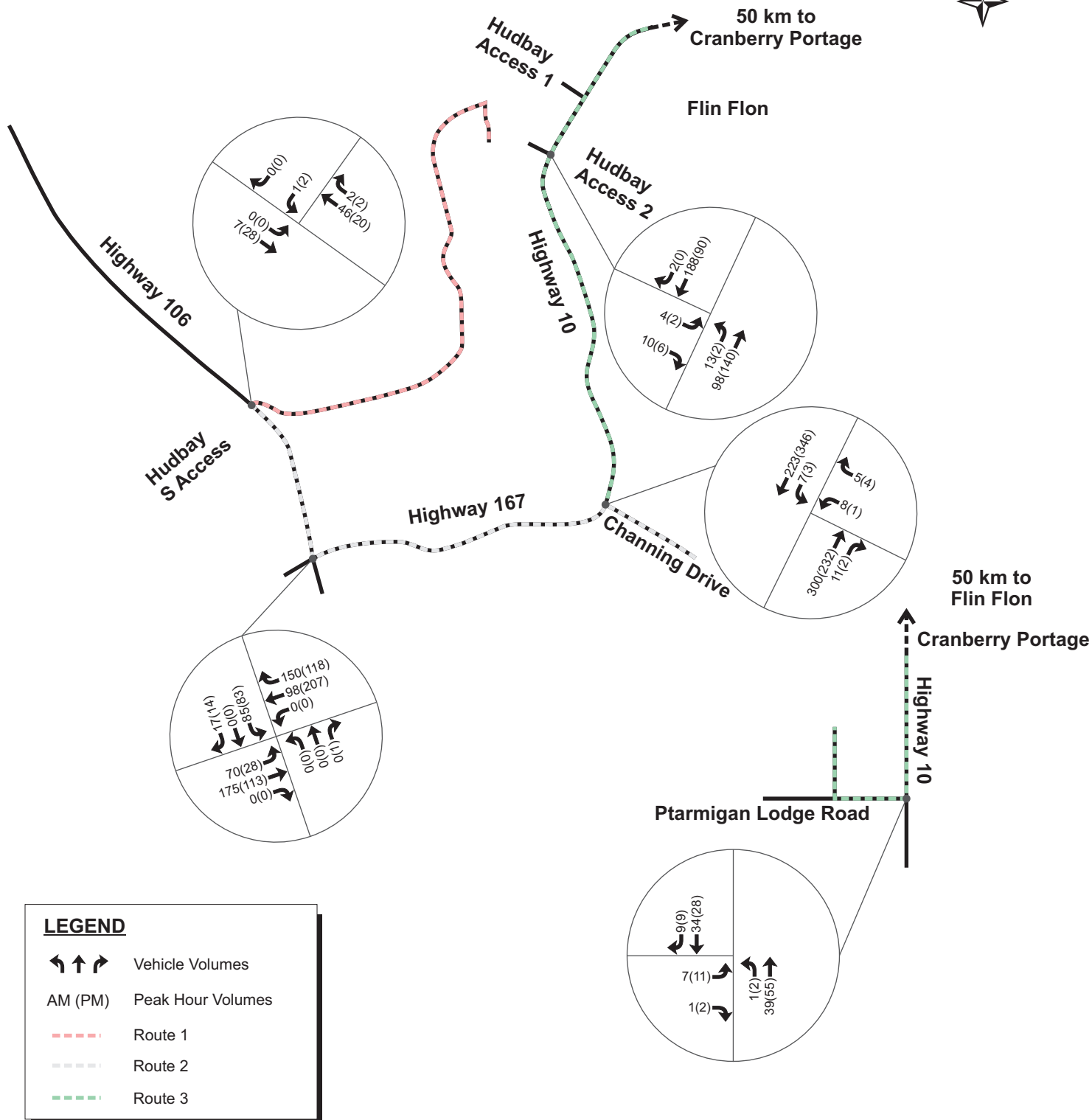
**Exhibit 4.1**  
**Existing Intersection Configurations**





**Exhibit 4.2**  
**Existing Traffic Volumes**





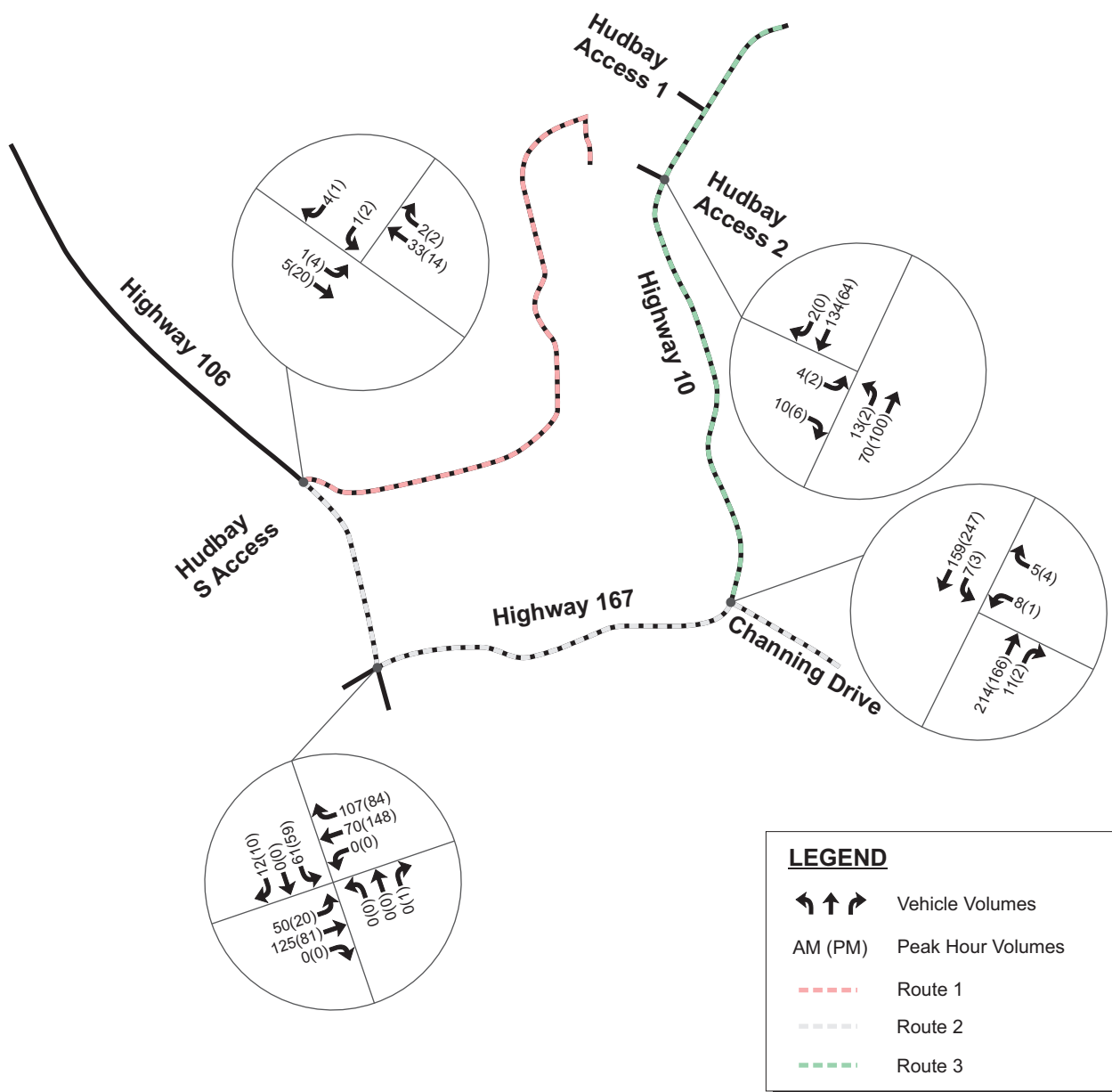
**Exhibit 4.3**  
**2044 Background Traffic Volumes**



### 4.3.3 After Development

Site generated traffic volumes (**Exhibit 3.1**, **Exhibit 3.2**, and **Exhibit 3.3**) were added to existing and 2044 Background traffic volumes to forecast the 2024 and 2044 After Development traffic volumes illustrated in **Exhibit 4.4** to **Exhibit 4.9**.

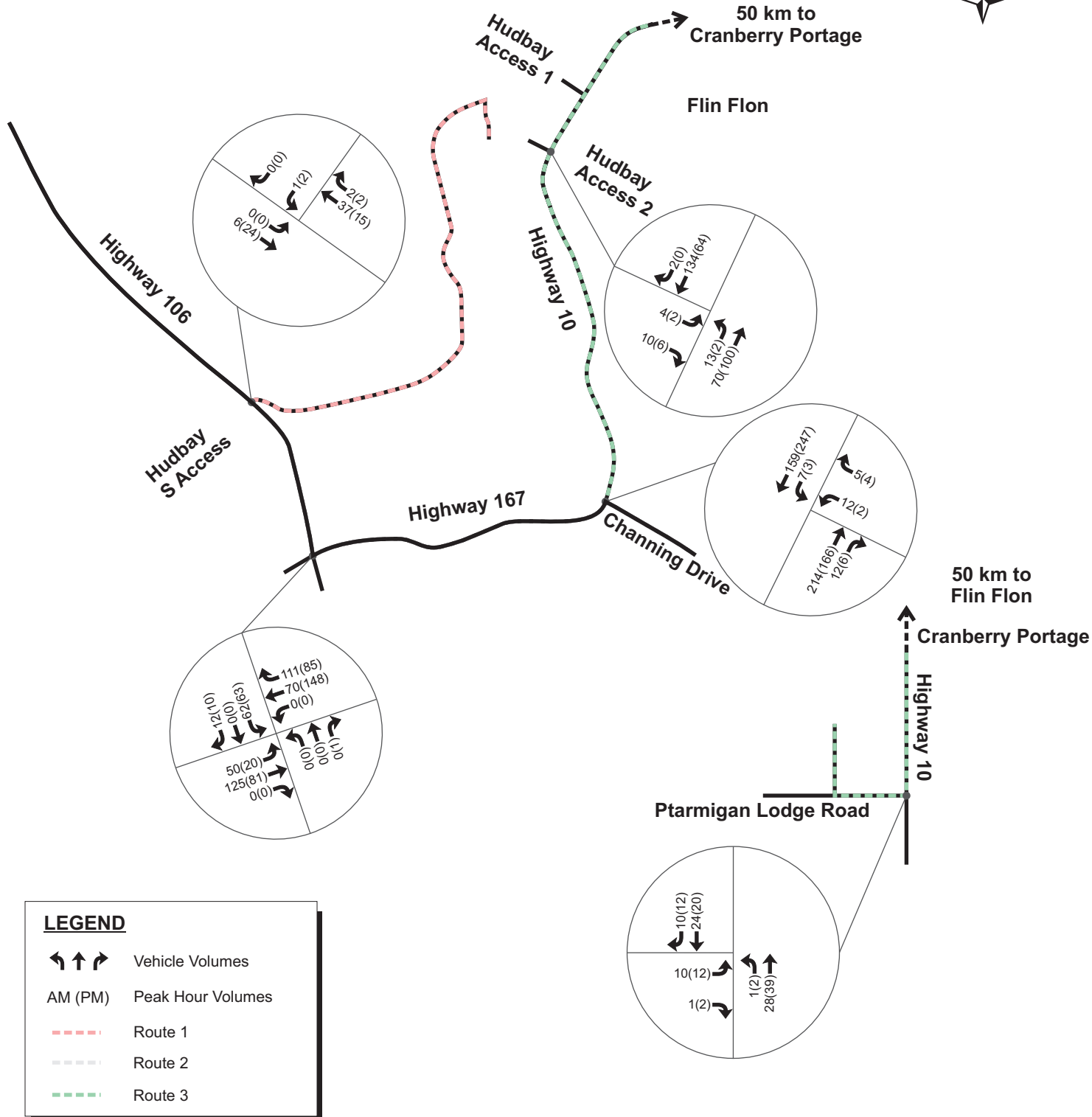
It is noted that the site traffic volumes are relatively low (40 – 50 trips per day, 4-5 trips per peak hour), and therefore do not result in a perceptible change to the results of technical traffic analysis as it relates to intersection level of service or requirement for geometric improvements based on volume. The perceptible change the Project will have on the study area road network will be the presence of 40 – 50 additional trucks per day traveling through the highways which could be noticed by residents of local communities as well as daily commuters.



**Exhibit 4.4**  
**2024 After Development Traffic Volumes –**  
**Route Scenario 1**

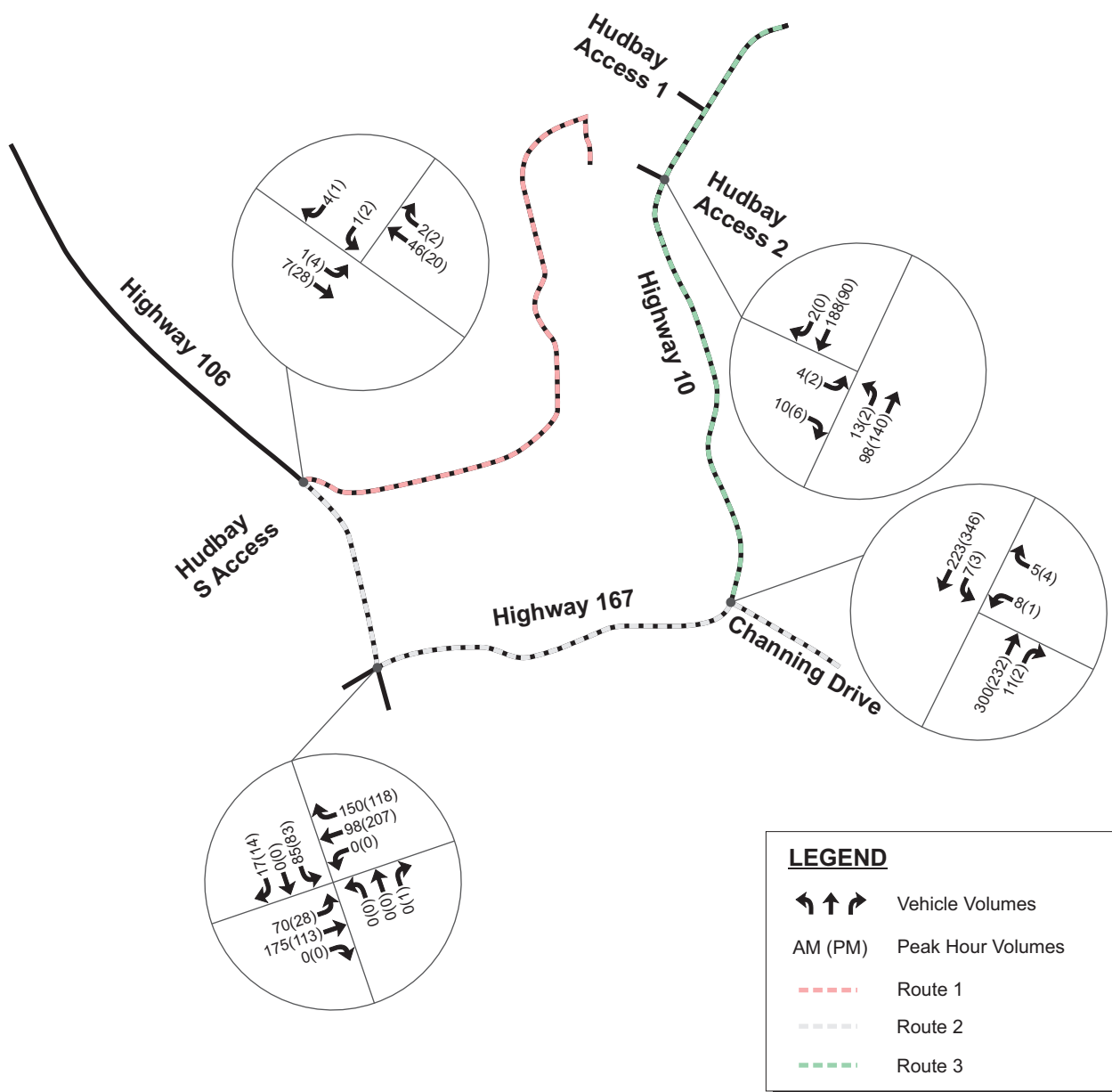






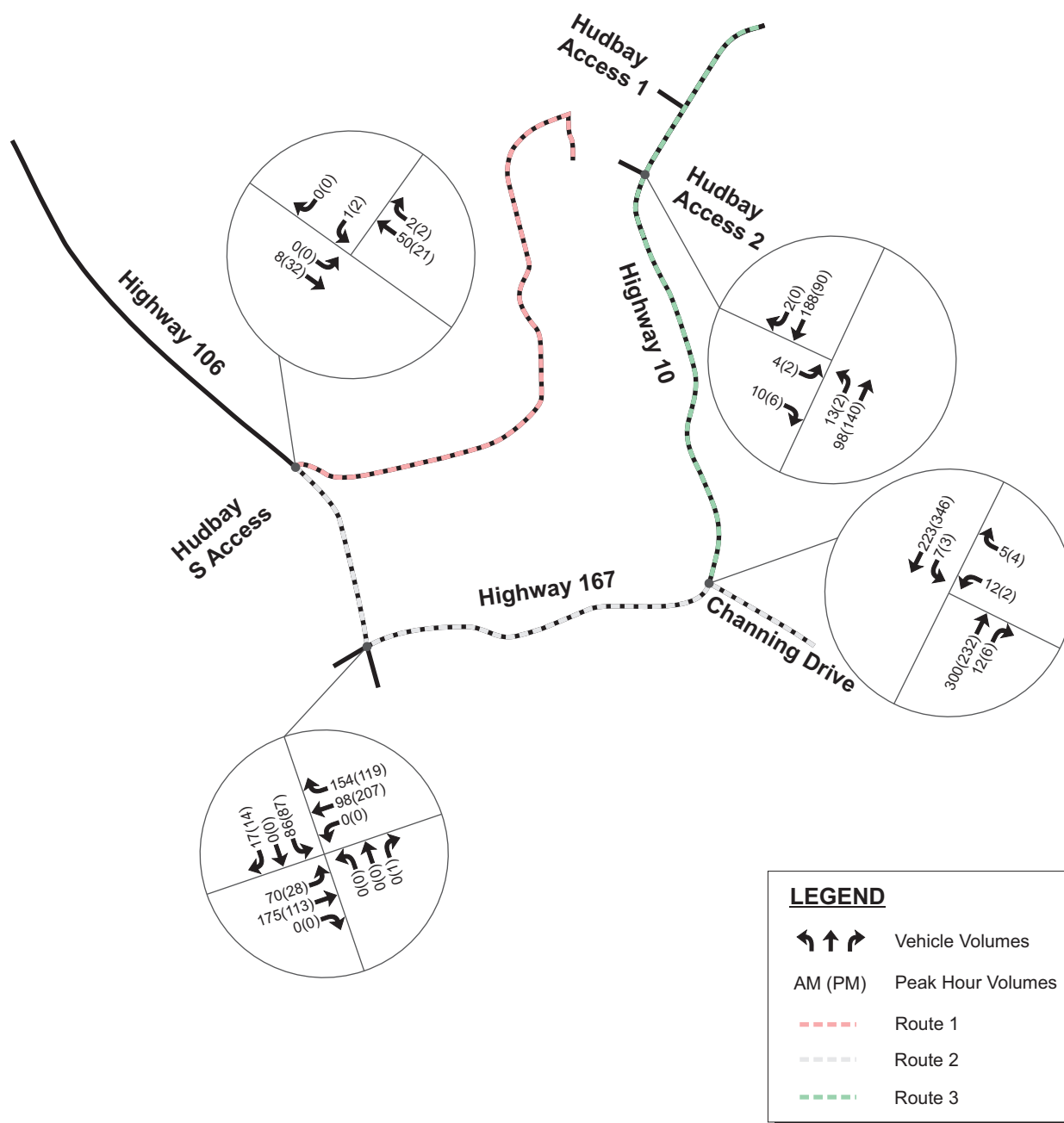
**Exhibit 4.6**  
**2024 After Development Traffic Volumes -**  
**Route Scenario 3**





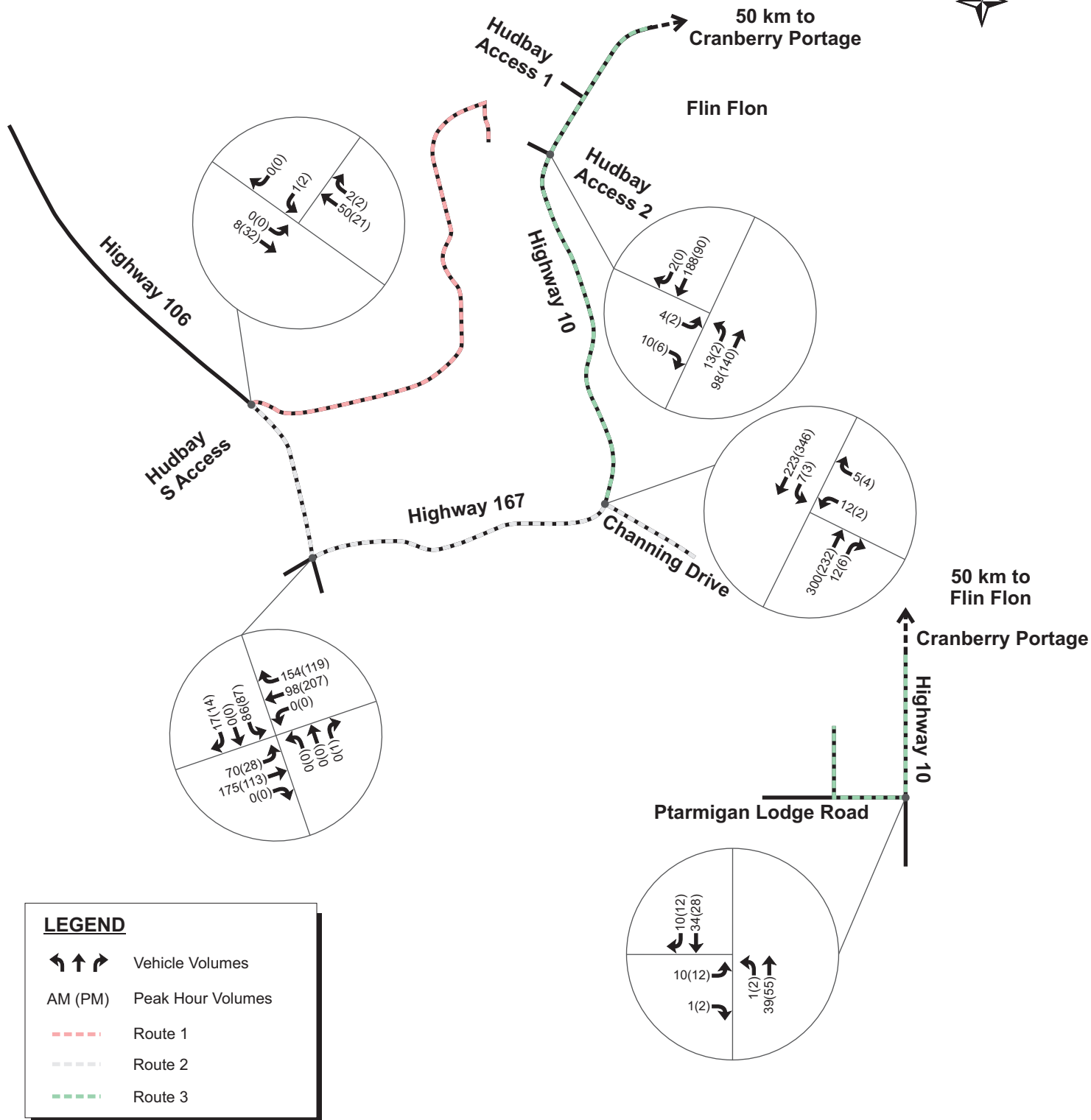
**Exhibit 4.7**  
**2044 After Development Traffic Volumes -**  
**Route Scenario 1**





**Exhibit 4.8**  
**2044 After Development Traffic Volumes -**  
**Route Scenario 2**





**Exhibit 4.9**  
**2044 After Development Traffic Volumes -**  
**Route Scenario 3**



## 4.4 Intersection Analysis

Synchro 11 traffic analysis software was used to review intersection operational conditions based on the methods outlined in the Highway Capacity Manual. Traffic operations were assessed using the performance measures of volume-to-capacity (v/c) and Level of Service (LOS).

The volume-to-capacity (v/c) ratio of an intersection movement represents the ratio between the demand volume and available capacity. Typically for rural and highway intersections, a v/c ratio of 0.85 or less is acceptable. The Level of Service (LOS) rating is based on average vehicle delays ranging from LOS A (minimal delay) to LOS F (significant delay). Typically for rural and highway intersections, an overall LOS C with a LOS D on any single approach is acceptable. The intersection analysis within this study is completed per these parameters.

Intersection capacity analysis was completed for the following scenarios:

- Background
  - Existing (2024)
  - Long Term (2044)
- After Development
  - Opening Day (2024)
  - Long Term (2044)

The analysis was completed with a saturation flow rate (rate at which a constant flow of vehicles could use a single lane of traffic) of 1850 vehicles per hour, which is typical of highway conditions. The peak hour factors (PHF) and heavy vehicle percentages were obtained from the original counts, otherwise the minimum PHF for AM and PM were assumed to be 0.92 and 0.95 respectively. The analysis used a minimum heavy vehicle percentage of 2% and a minimum hourly volume of 5 vehicles per movement where observed values were less than these minimums. Minimum numbers of pedestrians and bikes were assumed to be 10 and 5 where street crossing is available at Highway 106 & Highway 167 in Creighton.

The volume to capacity (v/c) ratio, level of service, average control delay (in seconds), and 95<sup>th</sup> percentile queue (in metres) are summarized in this report. Synchro output reports are provided in **Appendix C**.

4.4.1 Background Analysis

Existing

Existing intersection analysis is summarized in **Table 4.3** based on the intersection configurations illustrated in **Exhibit 4.1** and volumes illustrated in **Exhibit 4.2**.

**Table 4.3: Existing Intersection Analysis**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	4	<5	<0.02	A	2	<5
	NWB	1	0.02	A	0	<5	<0.02	A	0	<5
	SWB	1	<0.02	A	9	<5	<0.02	A	9	<5
	<i>Overall</i>		-	A	2.0	-	-	A	2.2	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.24	A	9	20	0.14	A	9	18
	WB	1	0.22	A	9	27	0.29	A	9	30
	NB	1	0.02	A	8	11	0.02	A	8	11
	SB	1	0.11	A	9	16	0.11	A	9	15
	<i>Overall</i>		-	A	8.5	-	-	A	8.6	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.02	B	11	<5	<0.02	B	11	<5
	NB	1	0.14	A	0	<5	0.11	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.5	-	-	A	0.3	-
Highway 10 & Hudbay S Access <i>(EB Stop)</i>	EB	1	0.02	A	10	<5	<0.02	A	10	<5
	NB	1	<0.02	A	2	<5	<0.02	A	1	<5
	SB	1	0.09	A	0	<5	0.04	A	0	<5
	<i>Overall</i>		-	A	1.0	-	-	A	0.7	-
Highway 10 & Ptarmigan Lodge Road <i>(EB Stop)</i>	EB	1	<0.02	A	9	<5	0.02	A	9	<5
	NB	1	<0.02	A	1	<5	<0.02	A	0	<5
	SB	1	0.02	A	0	<5	0.02	A	0	<5
	<i>Overall</i>		-	A	1.8	-	-	A	2.0	-

**Long Term**

2044 Background intersection analysis is summarized in **Table 4.4** based on the volumes illustrated in **Exhibit 4.3**.

**Table 4.4: 2044 Background Intersection Analysis**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	3	<5	<0.02	A	2	<5
	NWB	1	0.03	A	0	<5	0.02	A	0	<5
	SWB	1	<0.02	A	9	<5	<0.02	A	9	<5
	<i>Overall</i>		-	A	1.6	-	-	A	1.7	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.35	B	11	24	0.21	A	9	20
	WB	1	0.33	A	10	34	0.42	B	11	35
	NB	1	0.02	A	9	11	0.02	A	9	12
	SB	1	0.17	A	10	18	0.16	A	10	18
	<i>Overall</i>		-	A	9.7	-	-	A	9.8	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.03	B	12	<5	0.02	B	12	<5
	NB	1	0.20	A	0	<5	0.15	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.4	-	-	A	0.3	-
Highway 10 & Huidbay S Access <i>(EB Stop)</i>	EB	1	0.02	B	11	<5	<0.02	A	10	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.12	A	0	<5	0.06	A	0	<5
	<i>Overall</i>		-	A	0.8	-	-	A	0.6	-
Highway 10 & Parmigan Lodge Road <i>(EB Stop)</i>	EB	1	<0.02	A	9	<5	0.02	A	9	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.03	A	0	<5	0.02	A	0	<5
	<i>Overall</i>		-	A	1.4	-	-	A	1.6	-

**Background Analysis Summary**

Background intersection capacity analysis indicated that all study intersections are currently operating acceptably and are expected to continue operating within typical capacity thresholds with the addition of background traffic growth at the 2044 horizon.

4.4.2 After Development

Route Scenario 1

Scenario 1 intersection analysis is summarized in Table 4.5 and Table 4.6 based on the intersection configurations illustrated in Exhibit 4.1 and volumes illustrated in Exhibit 4.4 and Exhibit 4.7.

Table 4.5: 2024 After Development Intersection Analysis - Route Scenario 1

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	5	<5	<0.02	A	2	<5
	NWB	1	0.02	A	0	<5	<0.02	A	0	<5
	SWB	1	<0.02	A	10	<5	<0.02	A	10	<5
	<i>Overall</i>		-	A	2.2	-	-	A	2.3	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.24	A	9	20	0.14	A	9	18
	WB	1	0.22	A	9	27	0.29	A	9	30
	NB	1	0.02	A	8	11	0.02	A	8	11
	SB	1	0.11	A	9	16	0.11	A	9	15
	<i>Overall</i>		-	A	8.5	-	-	A	8.6	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.02	B	11	<5	<0.02	B	11	<5
	NB	1	0.14	A	0	<5	0.11	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.5	-	-	A	0.3	-
Highway 10 & Hudday S Access <i>(EB Stop)</i>	EB	1	0.02	A	10	<5	<0.02	A	10	<5
	NB	1	<0.02	A	2	<5	<0.02	A	1	<5
	SB	1	0.09	A	0	<5	0.04	A	0	<5
	<i>Overall</i>		-	A	1.0	-	-	A	0.7	-

Table 4.6: 2044 After Development Intersection Analysis - Route Scenario 1

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	4	<5	<0.02	A	2	<5
	NWB	1	0.03	A	0	<5	0.02	A	0	<5
	SWB	1	<0.02	A	10	<5	<0.02	A	10	<5
	<i>Overall</i>		-	A	1.7	-	-	A	1.9	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.35	B	11	24	0.21	A	9	20
	WB	1	0.33	A	10	34	0.42	B	11	35
	NB	1	0.02	A	9	11	0.02	A	9	12
	SB	1	0.17	A	10	18	0.16	A	10	18
	<i>Overall</i>		-	A	9.7	-	-	A	9.8	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.03	B	12	<5	0.02	B	12	<5
	NB	1	0.20	A	0	<5	0.15	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.4	-	-	A	0.3	-
Highway 10 & Hudday S Access <i>(EB Stop)</i>	EB	1	0.02	B	11	<5	<0.02	A	10	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.12	A	0	<5	0.06	A	0	<5
	<i>Overall</i>		-	A	0.8	-	-	A	0.6	-

**Route Scenario 2**

2044 After Development intersection analysis is summarized in **Table 4.7** and **Table 4.8** based on the volumes illustrated in **Exhibit 4.5** and **Exhibit 4.8**.

**Table 4.7: 2024 After Development Intersection Analysis - Route Scenario 2**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	4	<5	<0.02	A	2	<5
	NWB	1	0.03	A	0	<5	<0.02	A	0	<5
	SWB	1	<0.02	A	9	<5	<0.02	A	9	<5
	<i>Overall</i>		-	A	1.9	-	-	A	2.0	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.24	A	9	22	0.14	A	9	18
	WB	1	0.23	A	9	29	0.30	A	9	29
	NB	1	0.02	A	8	11	0.02	A	8	11
	SB	1	0.12	A	9	16	0.11	A	9	18
	<i>Overall</i>		-	A	8.6	-	-	A	8.6	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.03	B	12	<5	0.02	B	11	<5
	NB	1	0.14	A	0	<5	0.11	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.6	-	-	A	0.3	-
Highway 10 & Hudday S Access <i>(EB Stop)</i>	EB	1	0.02	A	10	<5	<0.02	A	10	<5
	NB	1	<0.02	A	2	<5	<0.02	A	1	<5
	SB	1	0.09	A	0	<5	0.04	A	0	<5
	<i>Overall</i>		-	A	1.0	-	-	A	0.7	-

**Table 4.8: 2044 After Development Intersection Analysis - Route Scenario 2**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 106 & Creighton Creek N Access <i>(SWB Stop)</i>	SEB	1	<0.02	A	3	<5	<0.02	A	1	<5
	NWB	1	0.03	A	0	<5	0.02	A	0	<5
	SWB	1	<0.02	A	9	<5	<0.02	A	9	<5
	<i>Overall</i>		-	A	1.5	-	-	A	1.6	-
Highway 106 & Highway 167 <i>(All Way Stop)</i>	EB	1	0.35	B	11	28	0.21	A	9	20
	WB	1	0.33	A	10	35	0.43	B	11	39
	NB	1	0.02	A	9	10	0.02	A	9	10
	SB	1	0.17	A	10	18	0.17	A	10	19
	<i>Overall</i>		-	A	9.7	-	-	A	9.8	-
Highway 167 & Channing Drive <i>(WB Stop)</i>	WB	1	0.04	B	13	<5	0.02	B	13	<5
	NB	1	0.20	A	0	<5	0.15	A	0	<5
	SB	1	<0.02	A	1	<5	<0.02	A	1	<5
	<i>Overall</i>		-	A	0.5	-	-	A	0.3	-
Highway 10 & Hudday S Access <i>(EB Stop)</i>	EB	1	0.02	B	11	<5	<0.02	A	10	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.12	A	0	<5	0.06	A	0	<5
	<i>Overall</i>		-	A	0.8	-	-	A	0.6	-

### Route Scenario 3

2044 After Development intersection analysis is summarized in **Table 4.9** and **Table 4.10** based on the volumes illustrated in **Exhibit 4.6** and **Exhibit 4.9**. Route 3 intersection analysis was completed for the intersection of Highway 10 and Ptarmigan Lodge Road only as traffic volumes for the other intersections would be unchanged from Route 2. The analysis results for this intersection are shown in the tables below.

**Table 4.9: 2024 After Development Intersection Analysis – Route Scenario 3**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 10 & Ptarmigan Lodge Road (EB Stop)	EB	1	0.02	A	9	<5	0.02	A	9	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.02	A	0	<5	0.02	A	0	<5
	Overall		-	A	2.0	-	-	A	2.0	-

**Table 4.10: 2044 After Development Intersection Analysis – Route Scenario 3**

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
Highway 10 & Ptarmigan Lodge Road (EB Stop)	EB	1	0.02	A	9	<5	0.02	A	9	<5
	NB	1	<0.02	A	1	<5	<0.02	A	1	<5
	SB	1	0.03	A	0	<5	0.03	A	0	<5
	Overall		-	A	1.6	-	-	A	1.6	-

### After Development Analysis Summary

After Development intersection capacity analysis indicated that all study intersections can be expected to continue operating with typical capacity thresholds with the addition of background traffic growth and site traffic within all three routing scenarios through the 2044 horizon.

## 4.5 Daily Volumes

To review roadway classifications and capacities, daily vehicle traffic volumes were calculated and compared to environmental guidelines. Generally, as it relates to this specific study area, the paved 2-lane highways would be candidates for twinning once their daily volume exceeds 12,000 vehicles per day, while the unpaved roadways would be candidates for chip-sealing or paving once their daily volumes exceed 500 vehicles per day. Environmental guidelines represent the desired daily volume range for a roadway, whereas the actual physical capacity can be higher.

Daily volumes are determined by applying a factor of 10 to observed PM Peak hour volumes per standard industry practice, and rounded up to the next highest hundred. Based on the existing highway traffic data available, this factor is expected to be conservative in respect to estimating daily traffic in the context of the study area. The resulting daily volume analysis is summarized in **Table 4.11**.

**Table 4.11: Daily Volume Analysis**

ROADWAY	SECTION	CLASS.	DAILY VOLUMES				
			Guideline	Existing	2044 BG	2024 AD	2044 AD
Highway 106	North of Creighton Creek N Access	Rural Road Classification 2	<12,000	300	500	400 (Sc.1) 400 (Sc.2) 400 (Sc.3)	500 (Sc.1) 500 (Sc.2) 500 (Sc.3)
	South of Creighton Creek N Access			400	500	400 (Sc.1) 400 (Sc.2) 400 (Sc.3)	500 (Sc.1) 600 (Sc.2) 600 (Sc.3)
	North of Highway 167			1,700	2,400	1,700 (Sc.1) 1,800 (Sc.2) 1,800 (Sc.3)	2,400 (Sc.1) 2,500 (Sc.2) 2,500 (Sc.3)
Highway 167	West of Highway 106	Rural Road Classification 3	<12,000	2,600	3,600	2,600 (Sc.1) 2,600 (Sc.2) 2,600 (Sc.3)	2,600 (Sc.1) 3,600 (Sc.2) 3,600 (Sc.3)
	East of Highway 106			3,700	5,200	3,700 (Sc.1) 3,800 (Sc.2) 3,800 (Sc.3)	5,200 (Sc.1) 5,300 (Sc.2) 5,300 (Sc.3)
	Southwest of Channing Drive			4,200	5,800	4,200 (Sc.1) 4,200 (Sc.2) 4,200 (Sc.3)	5,800 (Sc.1) 5,900 (Sc.2) 5,900 (Sc.3)
	Northeast of Channing Drive			4,200	5,900	4,200 (Sc.1) 4,200 (Sc.2) 4,200 (Sc.3)	5,900 (Sc.1) 5,900 (Sc.2) 5,900 (Sc.3)
Highway 10	North of Hudbay N Access	Primary Arterial	>3,500	1,700	2,300	1,700 (Sc.1) 1,700 (Sc.2) 1,700 (Sc.3)	2,300 (Sc.1) 2,300 (Sc.2) 2,400 (Sc.3)
	Hudbay N Access to Hudbay S Access			1,700	2,300	1,700 (Sc.1) 1,700 (Sc.2) 1,700 (Sc.3)	2,300 (Sc.1) 2,300 (Sc.2) 2,400 (Sc.3)
	South of Hudbay S Access			1,700	2,400	1,700 (Sc.1) 1,700 (Sc.2) 1,800 (Sc.3)	2,400 (Sc.1) 2,400 (Sc.2) 2,400 (Sc.3)
	North of Pta. Ldg Rd			800	1,000	800 (Sc.3)	1,100 (Sc.3)
	South of Pta. Ldg Rd			600	900	600 (Sc.3)	900 (Sc.3)
Channing Drive	East of Highway 167	Rural Municipal Road	<500	100	100	100 (Sc.1) 100 (Sc.2) 100 (Sc.3)	100 (Sc.1) 100 (Sc.2) 100 (Sc.3)
Ptarmigan Lodge Road	West of Highway 10	Rural Road	<500	200	200	300 (Sc.3)	300 (Sc.3)

The analysis confirms that all roadways can be expected to continue carrying traffic volumes within their respective guidelines after the addition of site traffic in all truck routing scenarios and therefore no adjustments to roadway classifications are required to accommodate the development.

## 4.6 Warrants

### 4.6.1 Intersection Improvement Warrants

An intersection improvement warrant analysis was completed at the study intersections for the following warrants based on the Saskatchewan Supplement to the TAC Geometric Design Guide<sup>3</sup> and on Manitoba's Warrants and Standards for Intersection Treatments of Rural Two-Lane Highways<sup>4</sup> per the following Standard Plans (SP) and Figures listed in the respective documents:

- Saskatchewan Supplement to the TAC Geometric Design Guide:
  - SP20610 – Warrants for Left Turn Lanes
  - SP20611 – Warrants for Channelized Intersections
  - SP20612 – Warrants for Bypass Lane Intersections
  - SP20613 – Warrants for Flared Intersections
  - SP20614 – Warrants for Right Turn Lanes
  - DM2621-1 – Delineation Lighting Warrants
  - DM2621-2 – Area Lighting Warrants
- Manitoba Warrants and Standards for Intersection Treatments of Rural Two-Lane Highways:
  - Figure 1.2 – Warrants for Left-Turn Lanes (Channelized & Bypass Intersections)
  - Figure 1.3 – Right-Turn Level of Service Warrant
  - Figure 1.4 – Right-Turn Conflict Warrant

It is noted that the PCE (Passenger Car Equivalent) volumes were used in the warrant analysis, per MoH guidelines. It is also noted that the improvement warrants were completed for all traffic horizons and scenarios contemplated in this study. Where improvements were found to be warranted, the horizon(s) and scenario(s) were identified within the tables. The detailed warrant analysis for each route scenario is included in **Appendix D**.

Note that the intersection treatment warrants specific to each province were undertaken based on the location of the intersections; those in Saskatchewan were subjected to the Saskatchewan warrant process while the intersection in Manitoba was subjected to the Manitoba warrant process. Note also that TAC illumination warrants were used for the intersection of Highway 10 and Ptarmigan Lodge Road per Canadian standards, while the Saskatchewan MoH specific illumination warrants were completed for the Saskatchewan highway intersections.

The findings of the warrant analysis are summarized below.

<sup>3</sup> Saskatchewan Supplement to the Geometric Design Guide for Canadian Roads (SKS), Saskatchewan Ministry of Highways, 2009 - 2025

<sup>4</sup> Warrants and Standards for Intersection Treatments of Rural Two-Lane Highways, Second Edition, Manitoba Transportation & Government Services Planning and Design, May 2001

**Table 4.12: SP20610 – Warrants for Left Turn Lanes**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted - advancing and opposing volumes is under 400 vph for all legs
Highway 167 & Channing Drive	Not warranted - advancing and opposing volumes is under 400 vph for all legs
Highway 1 & Hudbay S Access	Not warranted - advancing and opposing volumes is under 400 vph for all legs

**Table 4.13: SP20611 – Warrants for Channelized Intersections**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted - opposing volumes is under 100 vph for all legs
Highway 167 & Channing Drive	Not warranted - opposing volumes is under 100 vph or L <0.05 for all legs
Highway 1 & Hudbay S Access	Not warranted - opposing volumes is under 100 vph or L <0.05 for all legs

**Table 4.14: SP20612 – Warrants for Bypass Lane Intersections**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted - opposing volumes is under 100 vph for all legs
Highway 167 & Channing Drive	Not warranted - opposing volumes is under 100 vph or L <0.05 for all legs
Highway 1 & Hudbay S Access	Not warranted - opposing volumes is under 100 vph or L <0.05 for all legs

**Table 4.15: SP20613 – Warrants for Flared Intersections**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted - (4) Left Turn AADT is under 25 vpd for all legs
Highway 167 & Channing Drive	Not warranted - (5) Left Turn AADT is under 50 vpd for all legs
Highway 1 & Hudbay S Access	Not warranted - (4) Left Turn AADT is under 25 vpd for all legs

**Table 4.16: SP20614 – Warrants for Right Turn Lanes**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted
Highway 167 & Channing Drive	Northbound right turn lane warranted at 2044 Background
Highway 1 & Hudbay S Access	Not warranted

**Table 4.17: DM2621-1 – Delineation Lighting Warrants**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted
Highway 167 & Channing Drive	Delineation Lighting installed already
Highway 1 & Hudbay S Access	Delineation Lighting installed already

**Table 4.18: DM2621-2 – Area Lighting Warrants**

INTERSECTION	WARRANT DETAIL
Highway 106 & Creighton Creek N Access	Not warranted
Highway 167 & Channing Drive	Not warranted
Highway 1 & Huidbay S Access	Not warranted

**Table 4.19: Manitoba Warrant a) – Channelized Intersection**

INTERSECTION	WARRANT DETAIL
Highway 10 & Ptarmigan Lodge Road	Not warranted

**Table 4.20: Manitoba Warrant b) – Bypass Intersection**

INTERSECTION	WARRANT DETAIL
Highway 10 & Ptarmigan Lodge Road	Not warranted

**Table 4.21: Manitoba Warrant – Right-Turn Level of Service Warrant**

INTERSECTION	WARRANT DETAIL
Highway 10 & Ptarmigan Lodge Road	Not warranted

**Table 4.22: Manitoba Warrant – Right-Turn Conflict Warrant**

INTERSECTION	WARRANT DETAIL
Highway 10 & Ptarmigan Lodge Road	Not warranted

**Table 4.23: TAC Illumination Warrant**

INTERSECTION	WARRANT DETAIL
Highway 10 & Ptarmigan Lodge Road	No illumination warranted

**Warrant Analysis Summary:**

The review of the various warrants confirmed that improvements would be warranted at the Highway 167 / Channing Drive Intersection.

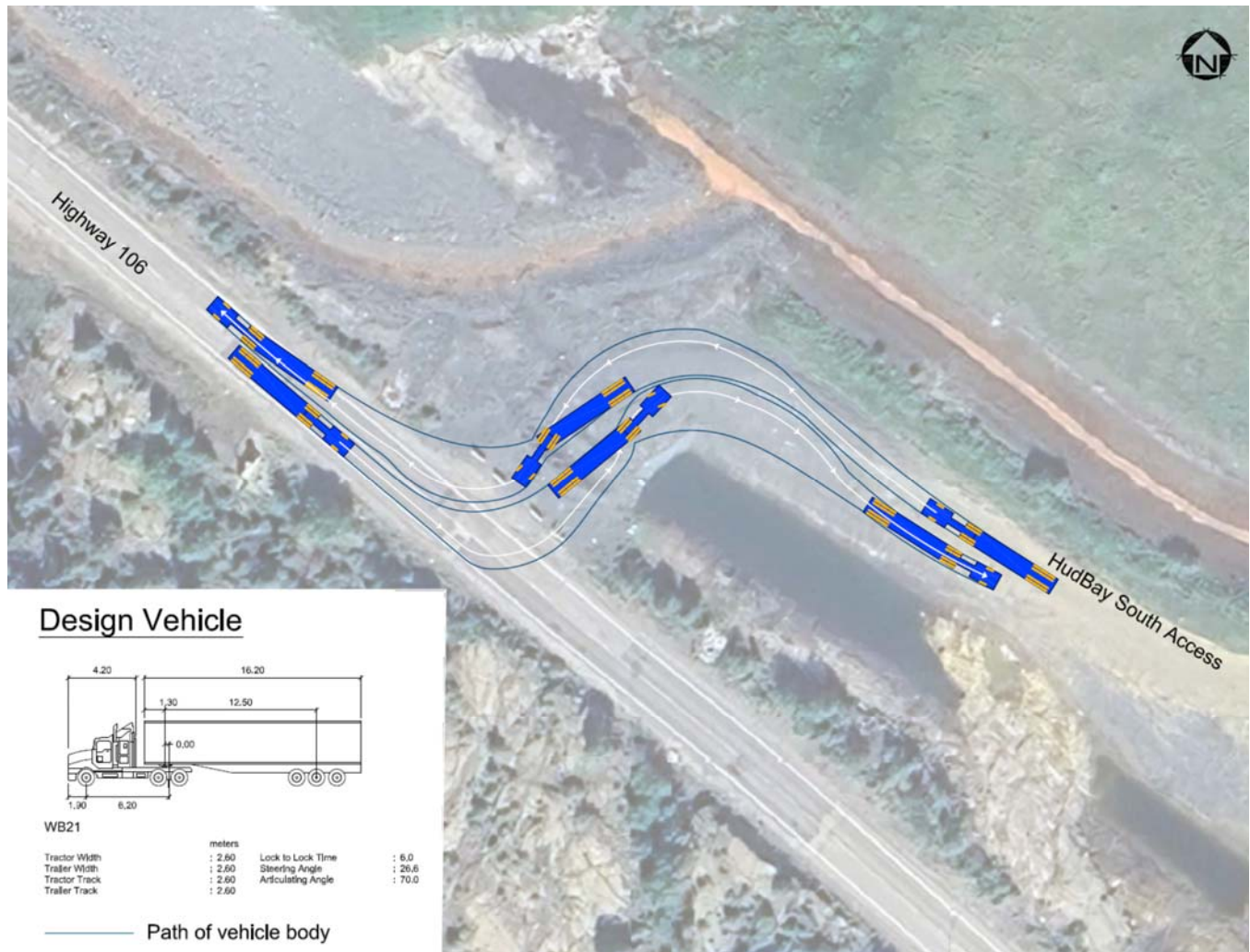
Specifically, a northbound right turn lane is expected to be warranted by 2044 due to Background traffic volumes. This turn lane is not warranted under existing conditions in 2024 nor in any of the After Development 2024 horizons in any of the routing scenarios, but is triggered by the 2044 horizon due to the growth of background through traffic on the highway.

No other improvements were found to be warranted at other study intersections.

## 5. ACCESS GEOMETRY REVIEW

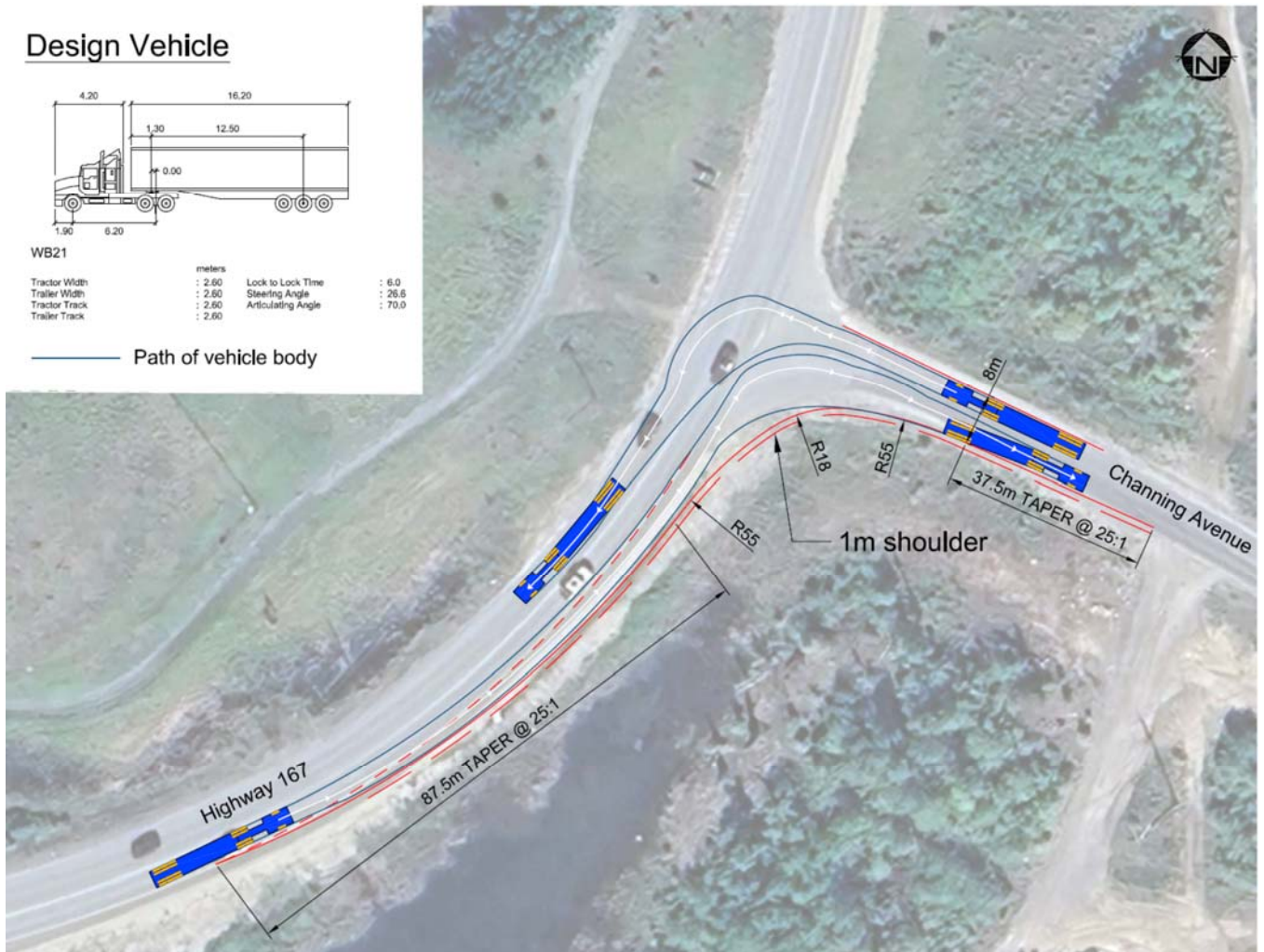
Vehicle swept path analysis was completed for the inbound and outbound truck movements at the Highway connections for the three truck routing options. This review and resulting recommendations to accommodate heavy vehicle maneuvering to/from the Highway is summarized below and shown in **Figure 5.1, Figure 5.2, & Figure 5.3.**

**Figure 5.1: Access Geometry Review - Route 1 - Highway 106/HudBay South Access**



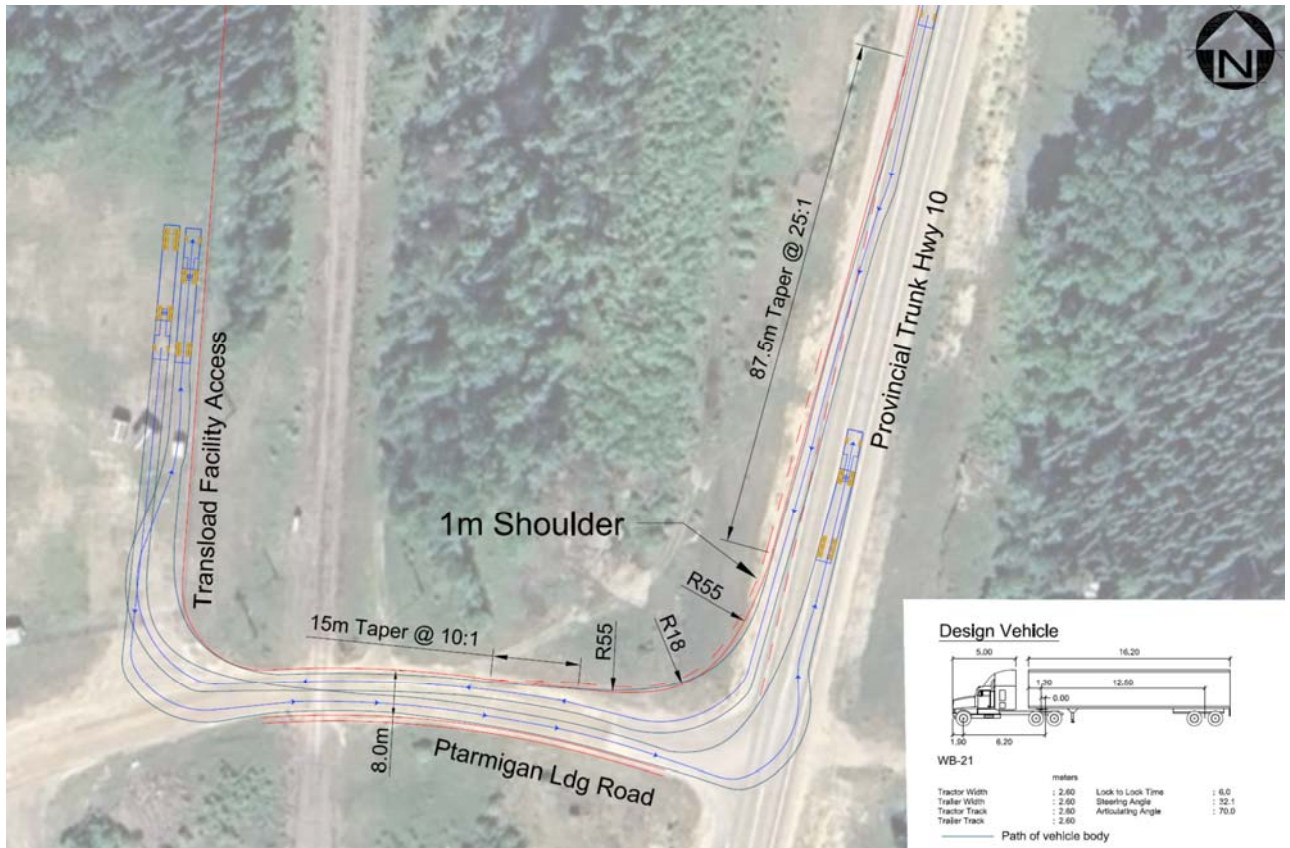
As shown in the above figure, the Route Option 1 which uses the HudBay South Access with Highway 106 can accommodate the heavy vehicle movements without the need for road geometry revisions given the existing oversized design of the access. That said, based on an onsite review of the access conditions completed on April 23, 2024, regrading of the access may be required when it is reopened to truck traffic as driveway condition was observed to have an uneven surface with large rocks protruding from the driving area.

Figure 5.2: Access Geometry Review - Route 2 - Highway 167/Channing Avenue



As shown in the above figure, revision to the existing Highway 167 & Channing Avenue geometry is recommended if the truck Route Option 2 is used by the project, and if it is necessary to ensure that inbound and outbound vehicles can concurrently manoeuvre through the intersection without crossing the centreline or interfering with each other. Improvement to the northbound right turn corner radii plus a taper leading to the intersection is recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. These revisions are shown in concept within the above figure.

Figure 5.3: Access Geometry Review - Route 3 - Highway 10/Ptarmigan Lodge Road



As shown in the above figure, revisions to the existing Highway 10 & Ptarmigan Lodge Road geometry are recommended if the truck Route Option 3 is used by the project. Improvement to the southbound right turn corner radii plus a taper leading to the intersection is recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. As with the previous option, this ensures that inbound and outbound vehicles can be present concurrently without crossing the centreline or interfering with each other. These revisions are shown in concept within the above figure based on typical design applications within the Manitoba Transportation and Government Services Highway Planning and Design Guide.

## 6. FINDINGS & RECOMMENDATIONS

**Table 6.1: Findings & Recommendations**

SECTION		FINDINGS
Intersection Analysis	Existing	All study intersections are currently operating acceptably.
	2024 Post Development	All study intersections continue to operate acceptably with the addition of site traffic in all routing scenarios.
	2044 Background	All study intersections continue to operate acceptably with the addition of background traffic growth.
	2044 Post Development	All study intersections continue to operate acceptably with the addition of background traffic growth and site traffic in all routing scenarios.
Roadway Analysis	Existing	All roadways currently carry daily traffic volumes within their respective guidelines.
	2024 Post Development	All roadways remain within their daily volume guidelines with the addition of site traffic in all routing scenarios.
	2044 Background	All roadways remain within their daily volume guidelines with the addition of background traffic growth.
	2044 Post Development	All roadways remain within their daily volume guidelines with the addition of background traffic growth and site traffic in all routing scenarios.
Warrants	Intersection Treatments	<p>Highway 167 / Channing Drive Intersection</p> <ul style="list-style-type: none"> <li>A northbound right turn lane is warranted by 2044 Background traffic volumes. This turn lane is not warranted at the existing (2024) nor Opening Day after development (2024) horizons in either routing scenarios but is triggered by the 2044 horizon due to the growth of background through traffic on the highway.</li> </ul>
	Illumination	No new street light illumination is warranted at study intersections throughout the study horizons and all site traffic routing scenarios.
Access Geometry Review	Route 1 – Highway 106 & HudBay South Access	Route Option 1 which uses the HudBay South Access with Highway 106 can accommodate the heavy vehicle movements without the need for road geometry revisions given the existing oversized design of the access. Based on an onsite review of the access conditions, regrading of the access may be required when it is reopened to truck traffic.
	Route 2 – Highway 167 & Channing Avenue	Revisions to the existing Highway 167 & Channing Avenue geometry is recommended if Route Option 2 is used by the project. Improvement to the northbound right turn corner radii plus a taper leading to the intersection are recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. These revisions are shown in concept within Section 5 of this report.
	Route 3 – Highway 10 & Ptarmigan Lodge Road	Revisions to the existing Highway 10 & Ptarmigan Lodge Road geometry is recommended if Route Option 3 is used by the project. Improvement to the southbound right turn corner radii plus a taper leading to the intersection are recommended to accommodate inbound movements of trucks while maintaining space for waiting outbound vehicles. These revisions are shown in concept within Section 5 of this report.

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# Appendix F

## CDC Data Search



T (306) 975-0401  
F (306) 975-1076

[saskatoon@clifton.ca](mailto:saskatoon@clifton.ca)  
[www.mistyventures.ca](http://www.mistyventures.ca)



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## D S Coyston Clifton 250502 Mcllvenna Concent Load Fac

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**From** Murray, Colin <Colin.Murray@gov.mb.ca>

**Date** Wed 5/21/2025 11:20 AM

**To** Sonya Coyston <sonya\_coyston@clifton.ca>

 2 attachments (32 KB)

D S Coyston Clifton 250502 Mcllvenna Concent Load Fac.xlsx; c31\_064\_26W1\_ab.zip;

Hi Sonya

Thank you for your information request. I completed a search of the Manitoba Conservation Data Centre's (CDC) rare species database for your area of interest. This includes the primary location: 31-064-26W1; and 2km, 5km, and 10km radius buffers from the footprint boundary.

I am attaching a Microsoft Excel spreadsheet summarizing these occurrences. The spreadsheet includes scientific and common names, the provincial (SRank) rank for each species as well as the Manitoba Endangered Species and Ecosystem Act, and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species at Risk Act (SARA) designations. I'm also including the GIS files used to fulfill this request.

Further information on this ranking system can be found on our website at:

<https://www.natureserve.org/conservation-status-assessment>.

These designations can be found at:

<http://web2.gov.mb.ca/laws/statutes/ccsm/e111e.php>,

<https://www.cosewic.ca/index.php/en-ca/> and

<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>.

Manitoba's recommended setback distances can be found at:

<https://www.gov.mb.ca/nrnd/fish-wildlife/cdc/pubs/mbcdc-bird-setbacks-nov2021.pdf>

The information provided in this letter is based on existing data known to the Manitoba Conservation Data Centre of the Wildlife Branch at the time of the request. These data are dependent on the research and observations of CDC staff and others who have shared their data, and reflect our current state of knowledge. An absence of data does not confirm the absence of any rare or endangered species. Many areas of the province have never been thoroughly surveyed, therefore, the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. The information should not be regarded as a final statement on the occurrence of any species of concern, nor should it substitute for on-site surveys for species or environmental assessments. Also, because our Biotics database is continually updated and because information requests are evaluated by type of action, any given response is only appropriate for its respective request.

Please contact the Manitoba CDC for an update on this natural heritage information if more than six months passes before it is utilized.

Third party requests for products wholly or partially derived from our Biotics database must be approved by the Manitoba CDC before information is released. Once approved, the primary user will identify the Manitoba CDC as data contributors on any map or publication using data from our database, as the Manitoba Conservation Data Centre; Wildlife Branch, Manitoba Natural Resources and Northern Development.

This letter is for information purposes only - it does not constitute consent or approval of the proposed project or activity, nor does it negate the need for any permits or approvals required by the Province of Manitoba.

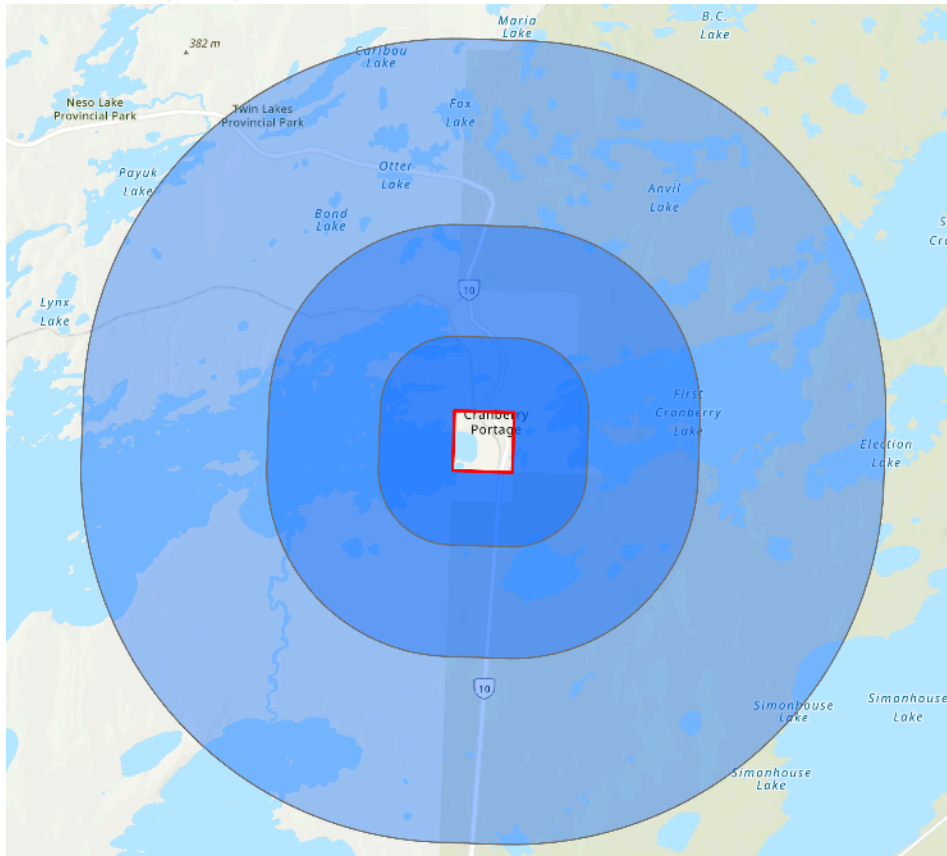
We would be interested in receiving a copy of the results of any field surveys that you may undertake, to update our database with the most current knowledge of the area.

If you have any questions or require further information contact me directly at [colin.murray@gov.mb.ca](mailto:colin.murray@gov.mb.ca) or 204-914-2849.

Colin

Reference screen clip:

Site with 2km, 5km, and 10km radius buffers:



Colin Murray  
 Information Manager- Manitoba Conservation Data Centre  
 Wildlife Branch, Natural Resources and Indigenous Futures  
 14 Fultz Boulevard, Winnipeg, MB R3Y0L6  
 E: [colin.murray@gov.mb.ca](mailto:colin.murray@gov.mb.ca) T: 204-914-2849

-----Original Message-----

From: Form Submissions <[noreply@gov.mb.ca](mailto:noreply@gov.mb.ca)>  
 Sent: May 2, 2025 9:48 AM  
 To: Murray, Colin <[Colin.Murray@gov.mb.ca](mailto:Colin.Murray@gov.mb.ca)>  
 Subject: WWW Form Submission

Below is the result of your feedback form. It was submitted by CDC Information Request ( ) on Friday, May 2, 2025 at 09:48:04

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DocumentID: Manitoba\_Sustainable\_Development

Project Title: Mcllvenna Bay Concentrate Loading Facility

Date Needed: 20250510

Name: Sonya Coyston

Company/Organization: Clifton Engineering Group

Phone: 1 (403) 304-4443

Email: [sonya\\_coyston@clifton.ca](mailto:sonya_coyston@clifton.ca)

Project Description: Mcllvenna Bay Operating Ltd., A Subsidiary of Foran Mining Corporation (MBO), is proposing to construct a concentrate loading facility in the Rural Municipality of Kelsey, Manitoba. The facility will be used to transport copper and zinc concentrate from their Mcllvenna Bay Mine in Saskatchewan to rail for shipping to a Canadian refinery. MBO is preparing a Class 1 Environment Act Proposal for submission to the Environmental Approvals Branch to obtain an Environment Act Licence for the Project.

The project will be located on private land in the RM of Kelsey (Parcel 40160). It will consist of a fully enclosed storage building for both dumping and loading. Concentrates would be delivered via truck from Mcllvenna Bay to Cranberry Portage at a frequency of approximately 10 trucks per day. Up to five rail spurs will be established to enable rail car loading and storage/switching. Rail cars would be loaded 2-3 times per week for shipment to Canadian smelters.

Information Requested: S-ranked species, rare species/SAR

Format Requested: Microsoft Excel and a shape file is appropriate

Location: LSD: 31-64-26 W1

Located within the land parcels 12800, 40160, and 40155 within the RM of Kelsey (approximately centered on UTM 14U 346534E 6050545N)

action: Submit

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**[EXTERNAL EMAIL]** Do not click links, reply, or open attachments unless you recognize the sender and know the content to be safe

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# Appendix G

## Conditional Heritage Approval



T (306) 975-0401  
F (306) 975-1076

[saskatoon@clifton.ca](mailto:saskatoon@clifton.ca)  
[www.mistyventures.ca](http://www.mistyventures.ca)

**DATE:** 2025-05-16

**TO:** Sonya Coyston  
Wildlife Biologist  
Clifton

**FROM:** Archaeological Assessment Services Unit  
Historic Resources Branch  
Manitoba Sport, Culture, Heritage and Tourism  
Main Floor – 213 Notre Dame Avenue  
Winnipeg, MB  
R3B 1N3

**FOR:** Foran Mining Corporation

T: (204) 945-2118 F: (204) 948-2384  
e: HRB.archaeology@gov.mb.ca

**SUBJECT:** Concentrate Loading Facility – 12800, 40160, 40155  
AAS File AAS-25-23471

**Conditional Approval – Implement a heritage resource protection plan (HRPP)**

Further to your e-mail regarding the above noted application, Manitoba’s Historic Resources Branch (HRB) has examined the location in conjunction with Branch records for areas of potential concern. The potential to impact heritage resources is believed to be low based on analysis of current data, **provided that the project footprint is limited to the industrial zoned area as indicated on the following map (Figure 1).**

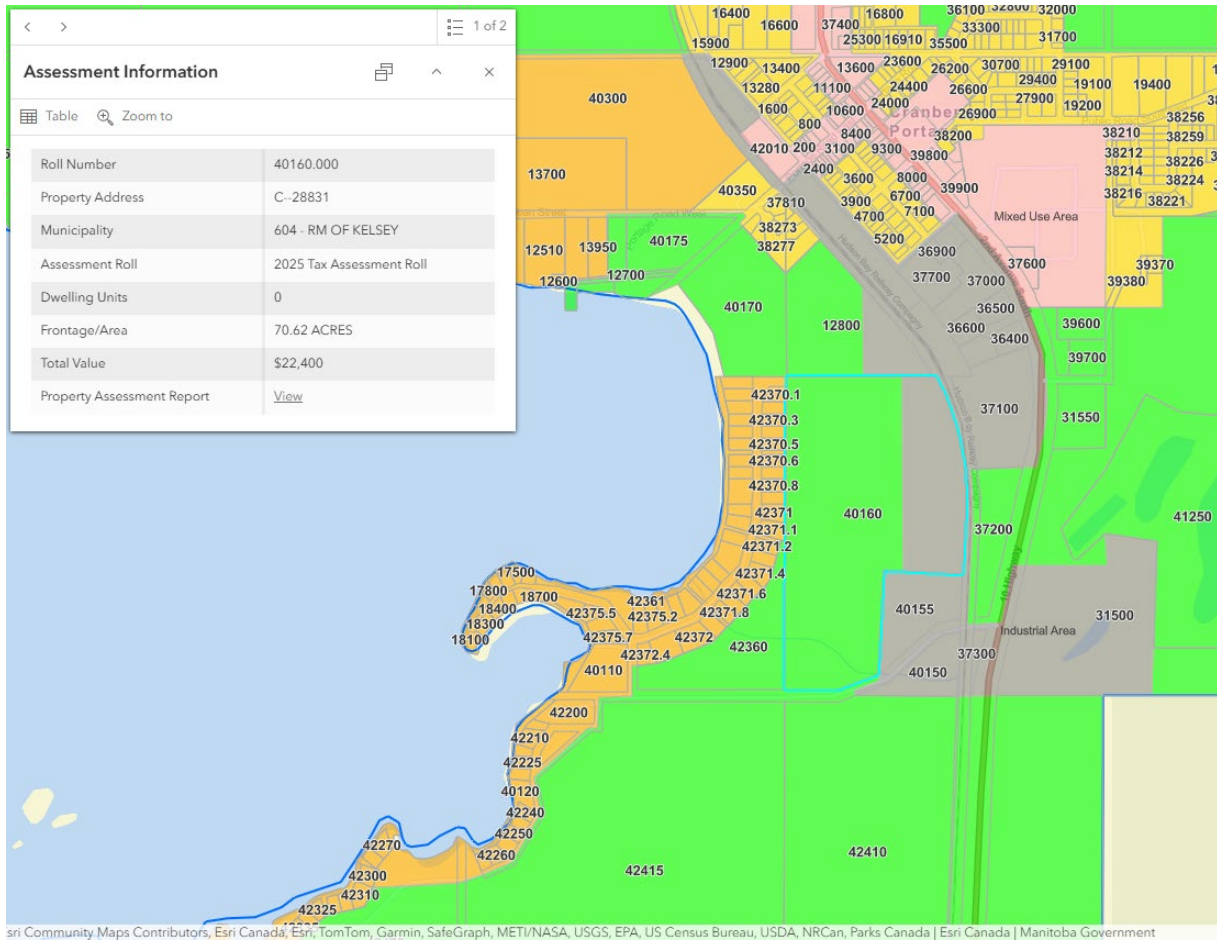


Figure 1: Industrial Zone area marked in grey

If the project footprint does not extend outside the industrial zoned area, the Historic Resources Branch would have no concerns with the proposed project at this time. HRB requires a HRPP be included in planning, development, and operations, in the event heritage resources (including human remains and palaeontological resources) are accidentally encountered.

If any project component within Lots 12800 and 40160 extends into the green areas as indicated on the map, then further heritage screening is required. A heritage resource impact assessment may be required in these areas.

### **Legislation**

Under Section 46 and 51 of [the Heritage Resources Act](#) (the Act), if at any time, heritage resources are encountered in association with these lands during testing and development, there is an obligation to report any heritage resources and a prohibition on destruction, damage or alteration of said resources. HRB may require that an acceptable heritage resource management strategy be implemented by the proponent/developer to mitigate the effects of their activity on the heritage resources.

Under Section 12(2) of the Act, the minister may require such other plans, documents, material and information, with respect to the work, activity, development or project, prior to commencement.

### **Heritage Resource Protection Plan**

The HRPP consists of operational procedures to limit damage or destruction of heritage resources. This document assists proponents, landowners, managers, employees, and/or contractors etc. on what to do and whom to call should heritage resources accidentally be encountered when testing and development is underway on site.

If you have any questions, please contact as above for proper assignment and queueing.

*Historic Resources Branch  
Archaeological Assessment Services Unit*

Enclosure: Heritage Resources Protection Plan (HRPP)