Appendix G

Noise Impact Assessment Report Update

Noise Impact Assessment Report

Wanipigow Sand Extraction Project - Update

Canadian Premium Sand Inc.

Project number: 60663147

November 2022

Delivering a better world

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AECOM: 2015-04-13

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	December 2018	Initial issue	Yes	Atif Bokhari	Acoustic Engineer
1	November 2022	NoA update	Yes	Joseph Jo-Daria	Acoustic Specialist

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# Hard Copies	PDF Required	Association / Company Name
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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	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 2×10^{-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 – $L_{eq,T}$	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).
Frequency Weighting	A method used to account for changes in sensitivity as a function of frequency. A, B, and C, are most commonly used to account for different responses to sound pressure levels. Note: The absence of frequency weighting is referred to as linear weighting.
Hertz (Hz)	A unit of frequency, expressed as cycles per second.
Insertion Loss	The sound level reduction provided by a noise barrier or other noise mitigation measure.
International Organisation for Standardisation	An international body that provides scientific standards and guidelines related to various technical subjects and disciplines.
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.
Noise Barrier	Same as barrier.
Noise level	Same as sound level.
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.
Predictable Worst Case Operation	A planned and predictable mode of operation for stationary noise source(s) when the source generates the greatest noise impact at a point of reception, relative to the applicable limit.
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.
Sound Level Meter	An instrument used to measure noise and sound levels.
Sound Power Level	The total sound energy radiated by a source per unit time (i.e. rate of acoustical energy radiation) measured in Watts. The acoustic power radiated from a given sound source as related to a reference power level (i.e., typically $1E^{-12}$ watts, or 1 picowatt) and expressed as decibels. A sound power level of 1 watt = 120 decibels relative to a reference level of 1 picowatt.
Sound Pressure	The root-mean-square of the instantaneous sound pressures over a specified time interval “T” in the frequency band of interest.
Sound Pressure Level	Logarithmic ratio of the root mean square sound pressure to a reference sound pressure. The reference sound pressure of the threshold of human hearing (i.e., 20 micropascals) is used.

1. Introduction

Canadian Premium Sand Inc. (CPS) was issued an Environment Act Licence (EAL) No. 3285 on May 16, 2019, for the Wanipigow Sand Extraction Project (the Project). The EAL was issued based on Project description information provided in an Environment Act Proposal (EAP) submitted to Manitoba Sustainable Development (now Manitoba Environment, Climate and Parks [MECP]), Environmental Assessment Branch (EAB) on December 18, 2018, and subsequent additional information provided to the EAB throughout the EAP review process. Pertinent documentation regarding the review and licencing of this Project, including a copy of the EAP (AECOM 2018) and Noise Impact Assessment report (Appendix F of the EAP) is available in the Manitoba Sustainable Development[1] Public Registry.

CPS is proposing to revise the Project design for the purpose of providing silica sand to a proposed CPS Solar Glass Manufacturing Facility ('solar glass plant') in Selkirk, Manitoba. The solar glass plant project will be reviewed by the EAB under a separate Environment Act Licence application as a Class 2 manufacturing facility. Therefore, CPS is submitting a Notice of Alteration (NoA) to MECP to request approval from the EAB for the revised Project.

A component of the Project environmental assessment information required for the NoA includes a noise impact assessment to determine potential noise emission from the altered Project. This report provides the assessment during the operations phase. This report summarizes the methods, assumptions, technical data, and prediction results of the assessment. Key components of the revised Project will include (see **Figure 1-1**):

- The active sand quarry pit
- Quarry gravel haul road (1.16 km long) connecting the quarry and the working sand stockpile (or 'working pile')
- Working pile (close to slurry line feeder)
- Gravel access road (2.16 km) between quarry area and wet plant
- Final wet sand stockpile (pile with sand to be transported by truck to solar glass plant)
- Gravel Project access road (7 km long) from wet plant to intersect with the existing Hollow Water Main Road

The general production sequence can be summarized as follows:

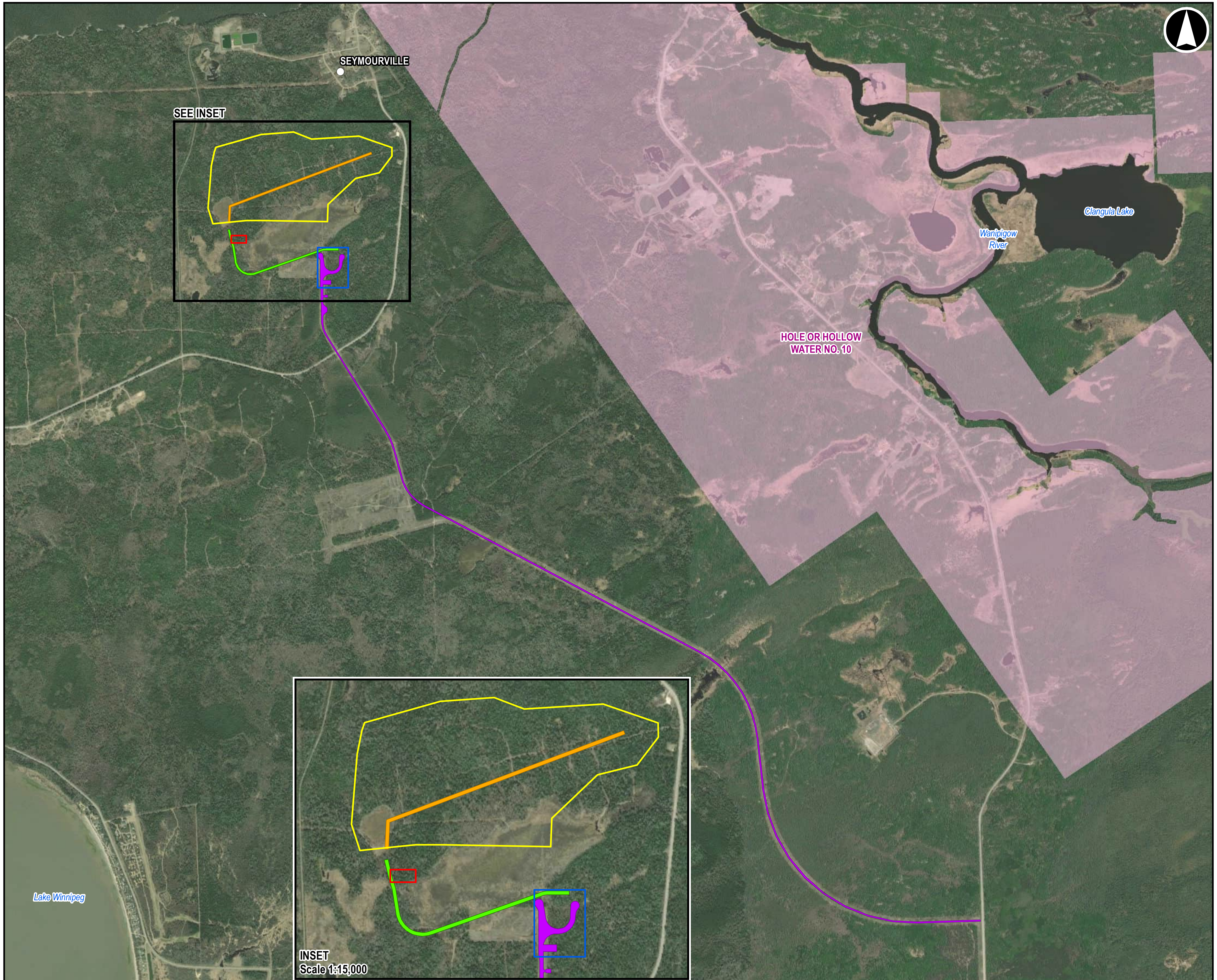
- Overburden and topsoil material will be stripped and stockpiled along the north side of the quarry area to form an approximate 6 ha, 15 m high berm; these stockpiles will also act as a noise barrier during quarry operations;
- Once the overburden material has been cleared, quarrying of the sand will begin;
- Extracted sand will be transported to the working pile;
- Sand will be blended and mixed with water to form slurry. The slurry will be pumped to the wet plant through a closed pipeline; and
- The sand will be processed at the wet plant to produce cleaned silica sand.

Based on the planned equipment use and activities and the absence of regular blasting activity, the Project is not expected to be a source of significant vibration. Therefore, a vibration assessment is not required. Correspondingly, the assessment focuses on the noise effects during the predictable worst-case operation at the most affected point(s) of reception.

The primary sources of noise associated with the Project operations include articulated trucks, earth-moving equipment (e.g., dump trucks, dozer, grader, excavator), pumps, and aggregate processing equipment (e.g., stockpilers, scrubbers, hydro separators, dewatering cyclones/screens, conveyors).

[1] Manitoba Government websites are in the process of revision to reflect new government department names.

The Project site encompasses the land on which project components are located and the immediate surrounding area that will be directly affected**. Figure 1-1** provides a scaled area map showing the Project site. **Figure 1-2** illustrates the active quarry cell during the operations phase of the Project. **Figure 1-3** illustrates the Wet Plant process.



Legend

- Feeder Area
- Mine Area
- Wet Plant Area
- Quarry Access Road
- Wet Plant Access Road
- Mine Haul Road

General Features

- First Nation Reserve

NOISE IMPACT ASSESSMENT CANADIAN PREMIUM SANDS

PROJECT AREA

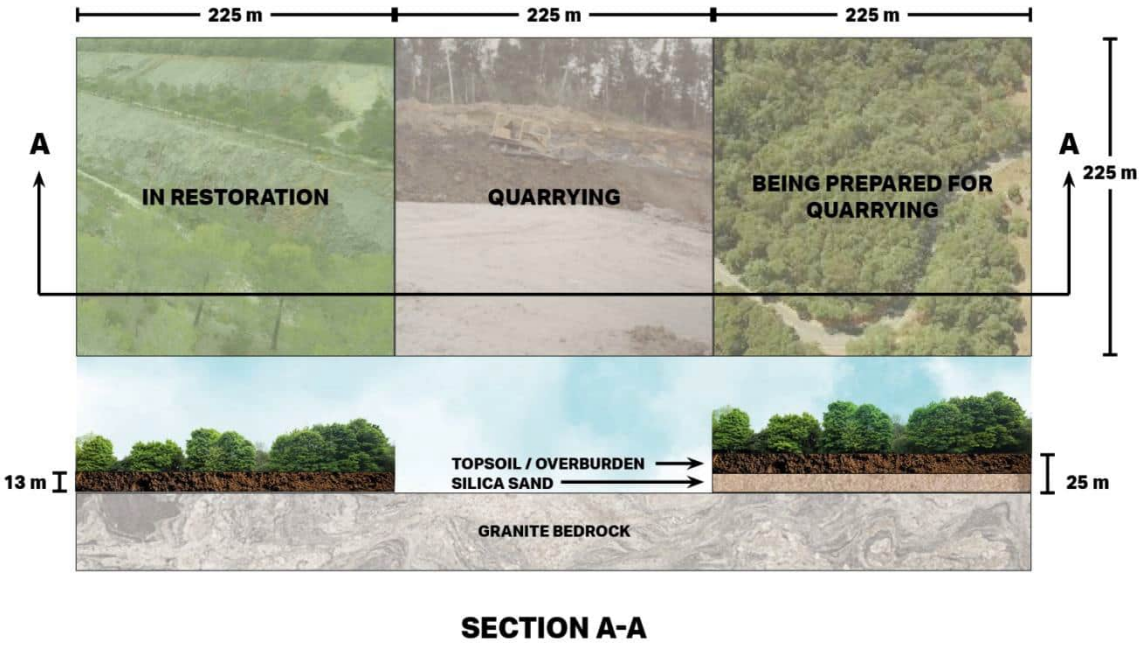
0 0.25 0.5 0.75 1
Kilometres

Datum: NAD 1983 UTM Zone 14N

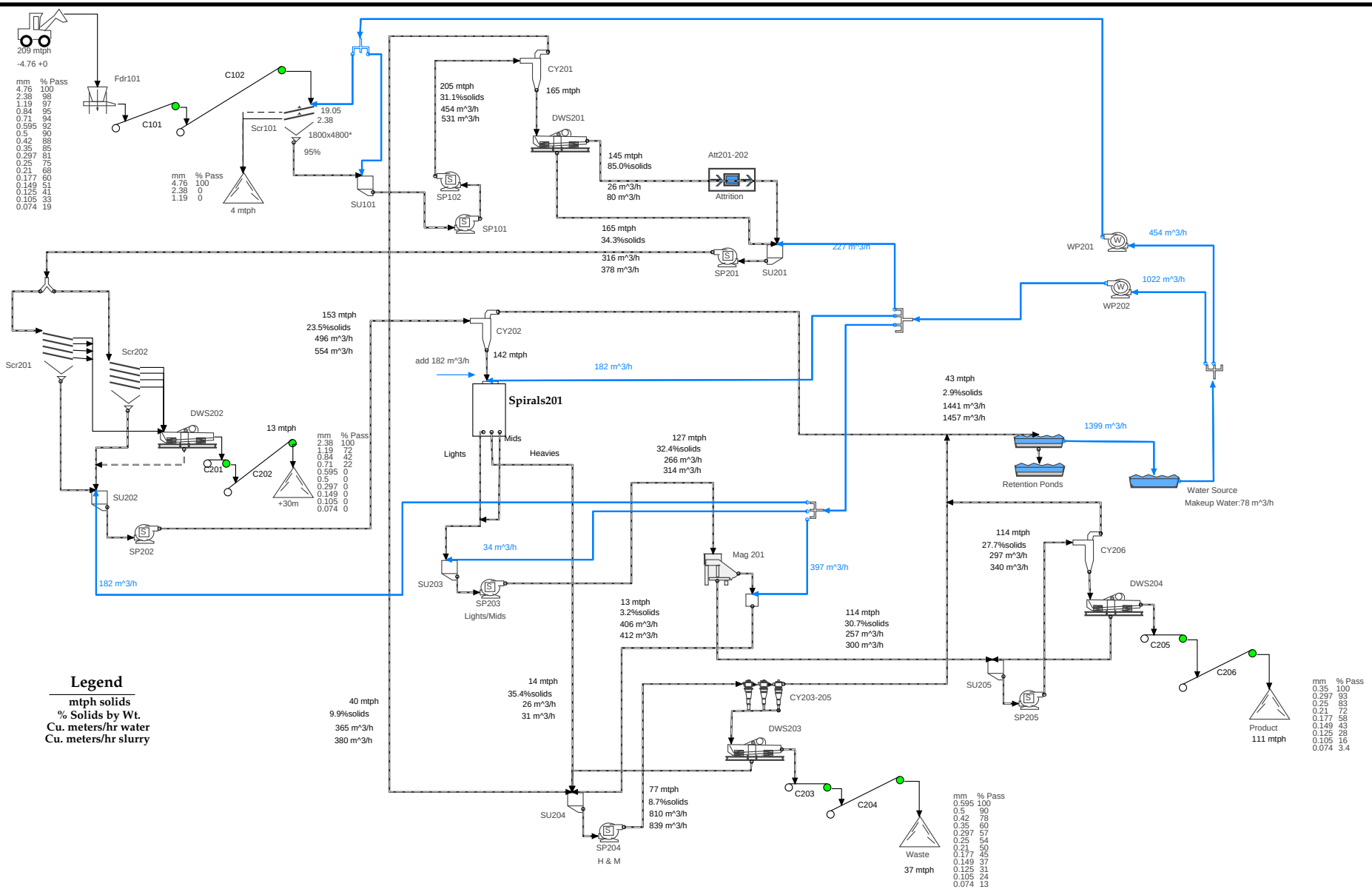
Jul, 2022	PN#: 60663147	1:25,000 * when printed 11"x17"	AECOM
Figure 1-1			

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

Figure 1-2: Typical Project Quarry Cell



SECTION A-A



NEPTUNE PROCESS

Calculation results may differ due to variations in operating conditions and application of crushing and screening equipment. This information does not constitute an express or implied warranty, but shows results of calculations based on information provided by customers or equipment manufacturers. Use this information for estimating purposes only.

All calculations performed by AggFlow. http://www.AggFlow.com

Turnkey Processing Solutions

21316 TPS - Canadian Premium Sands
Chuck Baxter
Plant Stage #1:
Project #: 122637 Revision #: 627430 Date: May/4/2022

2. Regulatory and Policy Framework

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

The Manitoba Guideline provides target sound level 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 acceptable sound levels and vary depending on the type of areas including designated residential, commercial, and industrial. **Table 2-1** presents the Manitoba Guideline sound level objectives for residential areas.

Table 2-1: Manitoba Guideline Sound Level Objectives for Residential Areas – Continuous or Intermittent Sounds

	$L_{eq(24)}$ (dBA)	L_{dn} (dBA)	$L_{eq,(1HR)}$ (day) 07:00 – 22:00 (dBA)	$L_{eq,(1HR)}$ (night) 22:00 – 07:00 (dBA)
a) Maximum Desirable Sound Level	-	55	55	45
b) Maximum Acceptable Sound Level				
i) Summer or year-round operations	-	60	60	50
ii) Predominant discrete tone(s) or appreciable impulsive/ impact character	-	55	55	45
iii) Winter operations only or temporary operations	-	65	65	55

The Maximum Desirable Sound Level limits provided above were adopted as the limits for this assessment.

3. Assessment Locations

The nearest points of reception (PORs) were identified using satellite imagery and land use plans to locate existing dwellings based on the planned Project activities and were included in the assessment. These locations are representative of the most exposed noise sensitive properties surrounding the Project area. These PORs are summarized in **Table 3-1** and **Figure 3-1**.

Table 3-1: Point of Reception Summary Table

POR ID	Description	UTM Coordinates[1]	
		Easting	Northing
POR_north	Detached dwelling	686766	5673564
POR_northwest	Recreational vehicle (RV) / mobile dwelling	684268	5673129

Notes:
1. Reference UTM Zone 14.

Legend

- Points of Reception
- Feeder Area
- Quarry Area
- Wet Plant Area

General Features

- Highway
- First Nation Reserve

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

PROJECT POINTS OF RECEPTION

0 1 2 3 4
Kilometres
Datum: NAD 1983 UTM Zone 14N

Jul, 2022	PN#: 60663147	1:60,000 * when printed 11"x17"

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Figure 3-1

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

4. Modelling and Data Analysis

Sound propagation calculations were conducted in accordance with International Organisation for Standardisation (ISO) publication Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO, 1996).

Sound propagation predictions were performed using Cadna/A modelling software, authored by DataKustik, which implements the ISO prediction algorithms. Sources that emit noise from a stationary position were represented as a point source (e.g., idling trucks). Equipment and activities that emit noise along a defined path (e.g., moving trucks and heavy equipment) were included as line sources in the acoustic model. **Table 4-1** summarizes the Cadna/A acoustic modelling parameters.

Table 4-1: Modelling Parameters

Item	Model Parameter	Model Setting
1	Temperature	10ºC
2	Relative Humidity	70%
3	Propagation Standard	ISO 9613-2
4	Ground Conditions and Attenuation Factor	Ground Absorption (G): • 1.0 (e.g. porous ground covered by grass, trees or other vegetation) outside of Project Area • 0 (e.g. hard/acoustically reflective ground) within Project Area
5	Receptor Height	1.5 m
6	Topography	Ground contours obtained using Lidar information
7	Foliage Attenuation	None
8	Operating Conditions	All equipment operating during day and night-time periods

Overburden Stripping and Stockpiling

The equipment and activities anticipated during the overburden stripping and stockpiling phase were identified, and the significant noise sources were included in the acoustic model predictions. The dimensions of the overburden stripping and stockpiling work area were assumed to be relatively small compared to the separation distance to the nearest POR. Accordingly, the noise sources associated with overburden stripping and stockpiling were combined and modelled as a single point source and incorporated the following assumptions:

- Activities will occur 10 hours per day, 7 days per week during the daytime.
- One (1) track dozer operating no more than 75% of each hour.
- One (1) excavator operating no more than 75% of each hour.
- Three (3) dump trucks, each operating no more than 50% of each hour.
- One (1) auger operating no more than 25% of each hour.
- Sand will not be extracted from areas outside of the Project Area.
- Sources modelled as a single combined point source operating within Project Area near the closest POR, at a source height of 2 m above grade.

Quarrying and Wet Plant Processing

The equipment and activities anticipated during the quarrying and processing phase were identified, and the non-negligible noise sources were included in the acoustic model predictions. The noise modelling of the quarrying and processing operations incorporated the following assumptions:

Quarry Sites

- Activities will occur 10 hours per day, 7 days per week during the daytime.

- During the initial stages of quarrying, the north side of the quarry extraction cell will include a 200 m long, 3 m high overburden stockpile/berm.
- Three (3) dump trucks per hour will enter/exit the quarry undergoing reclamation to transport excavated sand to the working pile and deliver waste sand from wet plant to use as quarry backfill. These trucks have been modelled as a line source at a source height of 2 m above grade; These trucks will be loaded outdoors and loading will take five minutes per truck; the trucks will remain idling for this five minute period.
- Mobile equipment at the quarry will operate as follows:
    - One (1) 36 tonne excavator operating no more than 75% of each hour;
    - One (1) track dozer operating no more than 75% of each hour;
    - One (1) water truck (moving) operating no more than 10% of each hour; and
    - One (1) grader operating no more than 25% of each hour.
- Stationary equipment at the quarry will operate as follows:
    - One (1) truck idling no more than 10% of each hour;
    - One (1) water truck (discharging) operating no more than 10% of each hour; and
    - One (1) auger operating no more than 5% of each hour.
- Mobile sources may operate within an excavation area that is a maximum 5 ha in size and have been modelled using a corresponding area source at a source height of 2 m above grade.
- Stationary sources modelled as a single combined point source operating at the centre of the 5 ha excavation area, at a source height of 2 m above grade.
- Equipment at the working pile will operate as follows:
    - One (1) loader operating no more than 75% of each hour;
    - One (1) hopper/feeder operating no more than 75% of each hour;
    - One (1) pump box operating no more than 75% of each hour; and
    - One (1) idling truck operating no more than 10% of each hour.

Wet Plant

- Activities will occur 20 hours per day, 7 days per week.
- Wet Plant equipment will not be housed in a building.
- Three (3) truck per hour will enter/exit the plant site to retrieve material from the waste stockpile and haul them back to the quarry. These trucks will be loaded outdoors, and loading will take five minutes per truck; trucks will remain idling for this 5-minute period.
- Approximately three (3) trucks per hour will enter and exit the site for transfer of final product (silica sand).
- The following equipment will be operated in the Wet Plant:
    - Attrition scrubbers;
    - Pumps;
    - Hydro separators;
    - hydro cyclones;
    - Dewatering screens;
    - Hydrosizers; and
    - Conveyors.
- Hydro cyclones are partially shielded by adjacent tanks.

5. Noise Source Summary

Modelled noise source emissions were established using a combination of past measurements of similar equipment and industry-accepted reference sound level data for construction equipment. **Table 5-1** summarizes the noise emission sources included in the acoustic modelling.

Table 5-1: Project Noise Sources

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)								Overall (dBA)	Quantity per hour	Percent Usage (%)	Notes
	63	125	250	500	1000	2000	4000	8000				
Overburden Stripping and Stockpiling – point sources												
Track dozer	102	106	104	104	101	98	92	84	106	1	75	1,2,6
Excavator	112	105	104	104	100	98	95	90	106	1	75	1,2,6
Dump trucks idling	96	87	78	78	83	79	73	66	86	3	10	1,2
Dump trucks - dumping load	118	114	105	103	105	102	98	90	109	3	5	1,2
Dump trucks - full	112	114	104	102	103	100	96	89	107	3	25	1,2,6
Dump trucks - empty	113	106	106	106	106	111	96	87	113	3	25	1,2,6
Auger	109	99	94	95	93	91	87	79	98	1	50	1,2
Combined noise emissions	121	118	111	111	110	112	103	95	116	-	-	-
Quarrying – area sources												
Excavator	112	105	104	104	100	98	95	90	106	1	75	1,2,6
Track dozer	102	106	104	104	101	98	92	84	106	1	75	1,2,6
Water Truck (moving)	96	104	102	96	96	95	88	87	101	1	10	1,2,6
Grader	110	109	105	101	106	100	96	87	108	1	25	1,2,6
Auger	102	92	87	88	86	84	80	72	102	1	5	1,2,6
Combined noise emissions	115	112	110	108	108	104	100	93	115	-	-	-
Quarrying – point sources												
Water truck (Discharging)	98	99	93	97	91	92	88	83	99	1	10	1,2
Dump truck idling	96	87	*78*	78	83	79	73	66	86	3	10	1,2
Dump trucks - dumping load	111	107	98	96	98	95	91	83	102	3	10	1,2
Dump trucks being loaded	115	107	107	103	102	101	98	95	108	3	10	1,2
Combined noise emissions	116	110	107	104	103	102	99	95	116	-	-	-
Working Pile												
Sump pump	106	108	102	100	101	100	94	88	106	1	50	1,2
Hopper/feed breaker	96	93	87	88	91	87	83	76	94	1	50	1,2
Trucks idling	94	85	76	76	81	77	71	64	84	3	10	1,2

Equipment	Sound Power Level (dB) in Octave Band Centre Frequency (Hz)								Overall (dBA)	Quantity per hour	Percent Usage (%)	Notes
	63	125	250	500	1000	2000	4000	8000				
Wheeled loader	109	109	98	100	96	94	93	85	102	1	75	1,2,6
Wet Plant												
Haul trucks entering site	125	113	109	111	104	99	97	92	111	1	10	3,2,6
Haul trucks exiting site	124	110	102	101	105	100	99	92	109	1	10	3,2,6
Idling haul truck	101	92	83	83	88	84	78	71	91	1	10	1,2
Haul truck loading	120	112	111	105	104	102	99	90	110	1	10	1,2
Finished product haul trucks entering site	125	113	109	111	104	99	97	92	111	3	10	3,2,6
Finished product haul trucks exiting site	124	110	102	101	105	100	99	92	109	3	10	3,2,6
Pumps	81	83	77	75	76	75	69	63	81	8	100	3,4
Attrition Scrubbers	112	102	102	101	101	103	93	87	107	-	100	3,4
Hydrocyclone	118	120	117	113	108	104	101	100	113	6	100	3,4
Dewatering Screen	121	114	107	106	103	99	97	90	81	4	100	3,4
Open conveyor	70	79	80	90	91	88	80	69	94	-	100	3,4,7,8
Radial Stacker	121	114	107	106	103	99	97	92	111	1	100	3,4

Notes:

1. Sound power level includes quantity and estimated utilization adjustments.
2. Based on measurement data published in British Standards BS 5228-1: 2009.
3. Single unit sound power level, unadjusted for quantity.
4. Based on past measurement data of similar equipment.
5. Sound power level per square metre.
6. Pass-by sound power level.
7. Sound power level per metre.
8. Based on measurement data published in Proceedings of ACOUSTICS 2004 (Conveyor Noise Specification and Control, Brown, S.C.).

6. Mitigation Measures

Based on the assumptions and equipment noise emissions described in **Section 4** and **Section 5**, no noise mitigation measures are required during the overburden stripping and quarrying phases. The requirement for mitigation measures should be re-examined during detailed design to maintain the Project's compliance with the applicable sound level limits.

7. Results

Table 7-1 presents the acoustic model prediction results at the identified receptors, during the overburden and stripping phase of the Project. Note that the operation of this phase only occurs during the daytime period, therefore, the predicted daytime equivalent sound levels are listed in the table.

Table 7-2 presents the acoustic model prediction results at the identified receptors, during the quarrying and processing phase of the Project. The daytime, and nighttime 1-hour, and day-night, equivalent sound levels were predicted and compared to the guideline sound level limits. Noise modelling contours are provided in **Figures 7-1** to **7-6**.

In summary, acoustic modeling results predicted that no sound level guideline limits at nearest PORs will be exceeded during either overburden stripping and stockpiling, or quarry operations.

Table 7-1: Predicted Noise Levels – Overburden Stripping and Stockpiling

POR ID	Noise Contribution from Project Operation (dBA)			Sound Level Limit (dBA)			Meets Sound Level Limit Criteria? (Y/N)[1]		
	Daytime ($L_{eq,1HR}$)	Nighttime ($L_{eq,1HR}$)	Day-Night Equivalent (L_{dn})	Daytime ($L_{eq,1HR}$)	Nighttime ($L_{eq,1HR}$)	Day-Night Equivalent (L_{dn})	Daytime	Nighttime	Day-Night Equivalent
POR_north	49	-	-	55	45	55	Y	Y	Y
POR_northwest	31	-	-	55	45	55	Y	Y	Y

Notes:

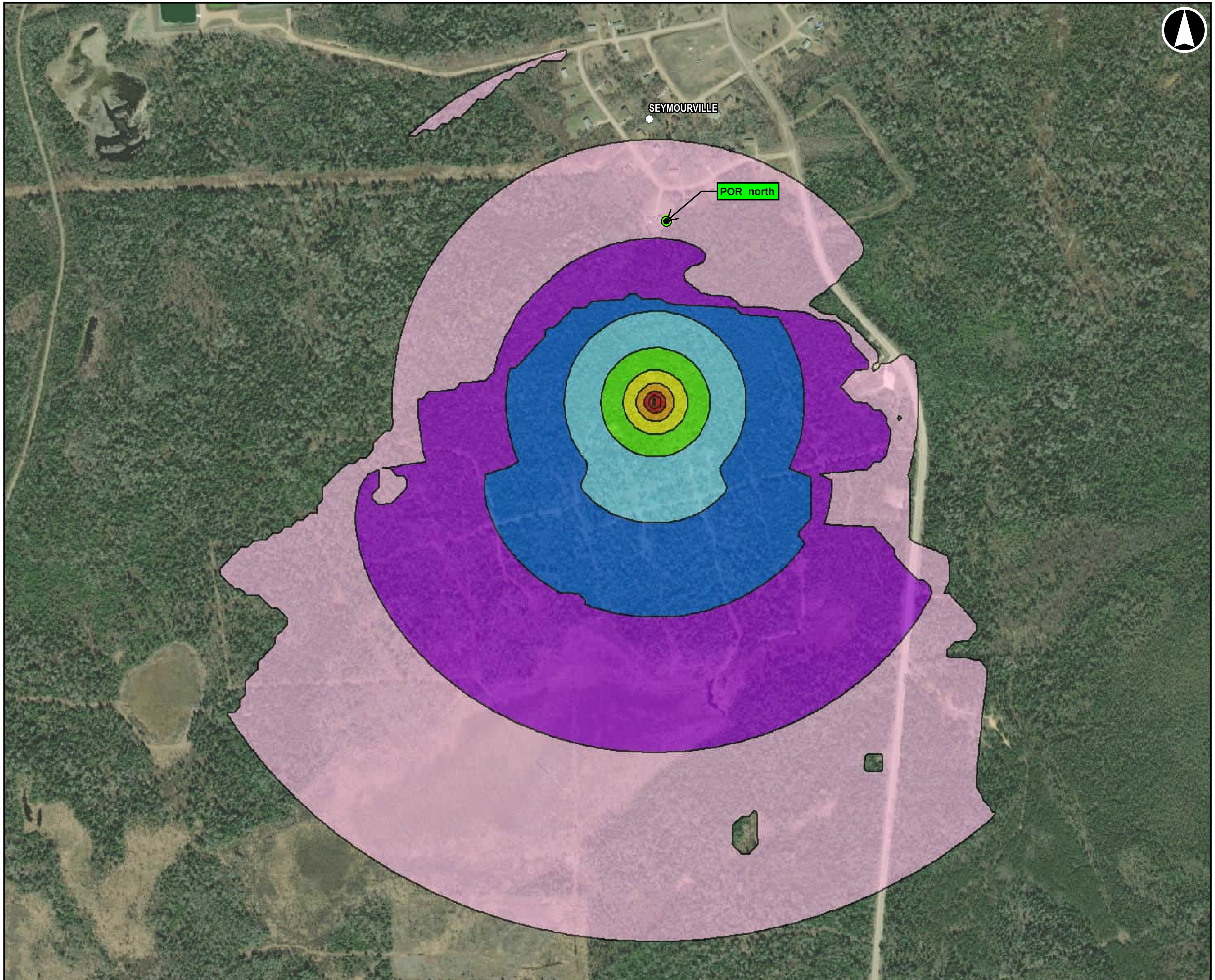
1. Compliance with the sound level limit is determined by comparing the predicted daytime, nighttime and day-night equivalent sound level with the sound level limit criteria.

Table 7-2: Predicted Noise Levels – Quarrying and Processing

POR ID	Noise Contribution from Project Operation (dBA)			Sound Level Limit (dBA)			Meets Sound Level Limit Criteria? (Y/N)[1]		
	Daytime ($L_{eq,1HR}$)	Nighttime ($L_{eq,1HR}$)	Day-Night Equivalent (L_{dn})	Daytime ($L_{eq,1HR}$)	Nighttime ($L_{eq,1HR}$)	Day-Night Equivalent (L_{dn})	Daytime	Nighttime	Day-Night Equivalent
POR_north	46	45	51	55	45	55	Y	Y	Y
POR_northwest	37	35	41	55	45	55	Y	Y	Y

Notes:

1. Compliance with the sound level limit is determined by comparing the predicted daytime, nighttime and day-night equivalent sound level with the sound level limit criteria.



Legend

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

Points of Reception

NOISE IMPACT ASSESSMENT CANADIAN PREMIUM SANDS

POR_NORTH NOISE LEVEL CONTOURS – OVERBURDEN STRIPPING AND STOCKPILING OPERATIONS

0 50 100 150 200
Metres

Datum: NAD 1983 UTM Zone 14N

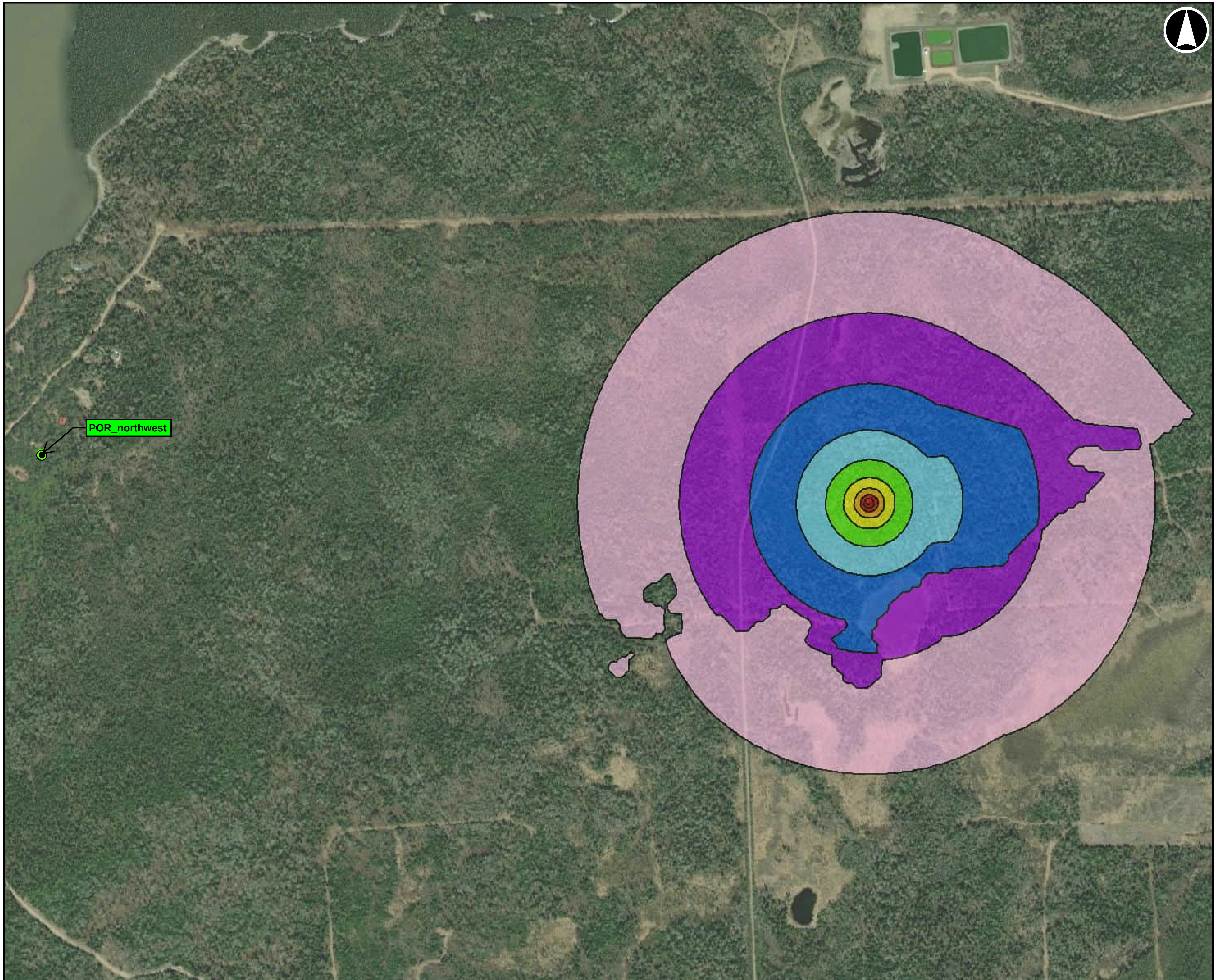
Jul, 2022	PN#: 60663147	1:6,000 * when printed 11"x17"

Figure 7-1

AECOM

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

Map location: \\na.aecomnet.com\LFS\AMER\Winnipeg-CAWPG1\DCS\Projects\ENV\60663147_Float_Glass_Plant_Permit\900_CAD_GIS\920_929_GIS_Graphics\02_MXDs\Noise Impact Assessment\H007-1_60663147_NoiseImpactAssessment_NorthStrip.mxd
Date Saved: 7/28/2022 User Name: Stephanie.Clark



Legend

- Points of Reception

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

POR_NORTHWEST NOISE LEVEL CONTOURS - OVERBURDEN STRIPPING AND STOCKPILING OPERATIONS

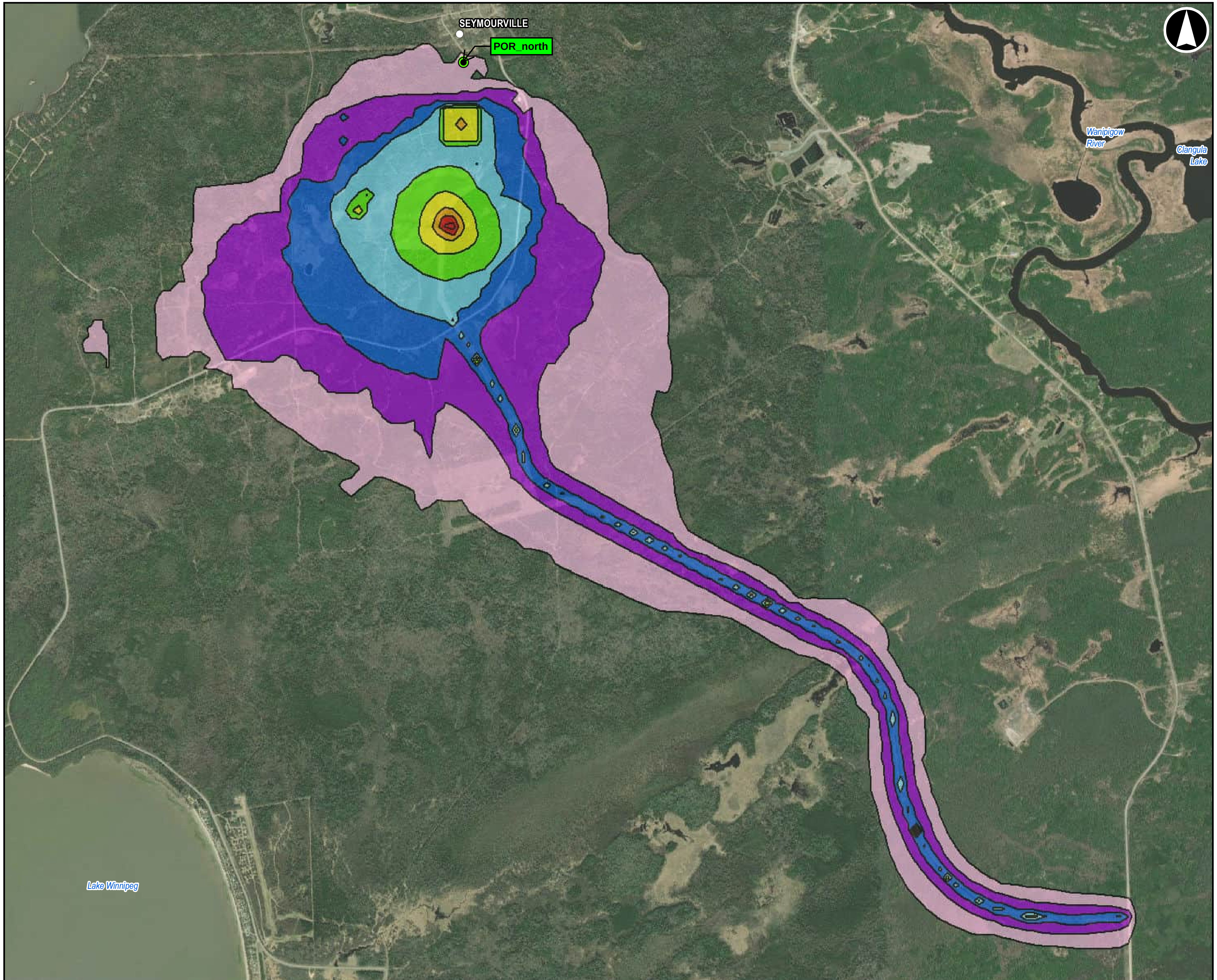
0 100 200 300 400
Metres
Datum: NAD 1983 UTM Zone 14N

Aug, 2022	PN#: 60663147	1:7,500 * when printed 11"x17"

Figure 7-2

AECOM

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map



Legend

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

Points of Reception

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

POR_NORTH NOISE LEVEL CONTOURS - QUARRYING AND PROCESSING DAYTIME OPERATIONS

0 250 500 750 1,000
Metres

Datum: NAD 1983 UTM Zone 14N

Jul, 2022	PN#: 60663147	1:24,000 * when printed 11"x17"

Figure 7-3

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

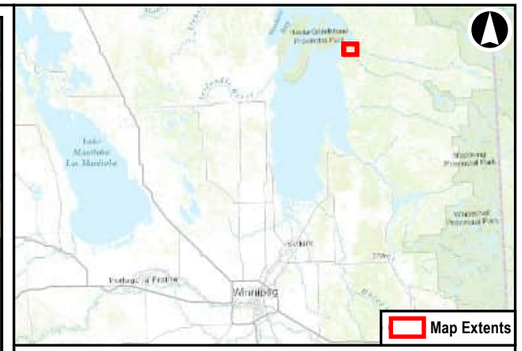
SEYMOURVILLE

POR_northwest

Clangula Lake

Waniplgow River

Lake Winnipeg



Legend

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

Points of Reception

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

POR_NORTHWEST NOISE LEVEL CONTOURS - QUARRYING AND PROCESSING DAYTIME OPERATIONS

0 250 500 750 1,000

Metres

Datum: NAD 1983 UTM Zone 14N

Jul, 2022	PN#: 60663147	1:24,000 * when printed 11"x17"	AECOM

Figure 7-4

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

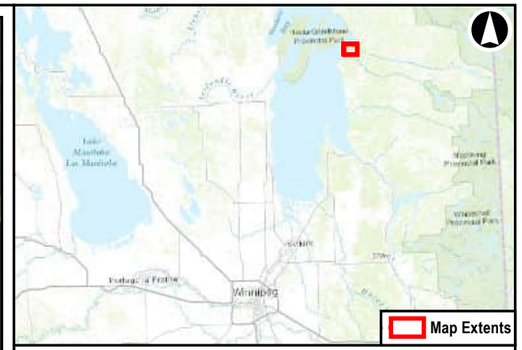
SEYMOURVILLE

POR_north

Wanipigow River

Clangula Lake

Lake Winnipeg



Legend

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

Points of Reception

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

POR_NORTH NOISE LEVEL CONTOURS - QUARRYING AND PROCESSING NIGHTTIME OPERATIONS

0 250 500 750 1,000

Metres

Datum: NAD 1983 UTM Zone 14N

Jul, 2022	PN#: 60663147	1:24,000 * when printed 11"x17"	AECOM

Figure 7-5

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

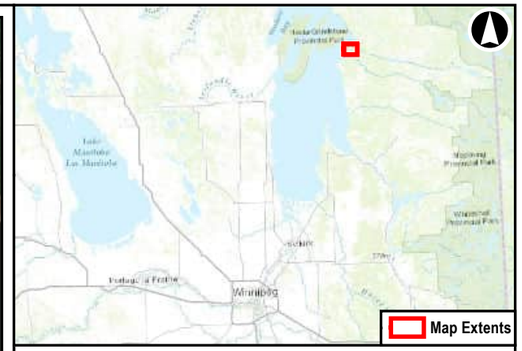
SEYMOURVILLE

POR_northwest

Wanipigow River

Clangula Lake

Lake Winnipeg



Legend

Sound Level (dBA)

- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- 70-75
- 75-80
- > 80

Points of Reception

NOISE IMPACT ASSESSMENT
CANADIAN PREMIUM SANDS

POR_NORTHWEST NOISE LEVEL CONTOURS - QUARRYING AND PROCESSING NIGHTTIME OPERATIONS

0 250 500 750 1,000

Metres

Datum: NAD 1983 UTM Zone 14N

Jul, 2022	PN#: 60663147	1:24,000 * when printed 11"x17"	AECOM

Figure 7-6

Data Sources: Canvec, MLI
Imagery: Esri World Imagery Basemap
Key Map: Esri World Topographic Map

8. Construction Noise

Construction activities have the potential to generate noise impacts at receptor locations. Noise from construction activities can be controlled in numerous ways, including operational restrictions, source mitigation measures, as well as receptor-based mitigation measures. The following measures may be implemented throughout construction to reduce the noise impacts at sensitive receptors:

- Operate in accordance with local by-laws whenever possible;
- 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;
- Ensure vehicles employed continuously on site for extended periods of time (two to four weeks) are fitted with visual warning systems or sound reducing back-up (reversing) alarms;
- Avoid unnecessary revving of engines and switch off equipment when not required (do not idle); and
- Minimize drop heights of materials.

The following additional mitigation measures may be considered and implemented to further reduce noise effects during construction, if required:

- Offset usage of active heavy equipment (schedule non-concurrent use);
- Reroute construction and truck traffic, when possible;
- Co-ordinate ‘noisy’ operations such that they will not occur simultaneously, where possible;
- Where possible, investigate and implement the use of alternative construction equipment or methods to reduce noise emissions from construction. Utilize alternative equipment that generates lower noise levels or optimize silencer/muffler/enclosure performance;
- Line chutes and dumpers to reduce impact noise, where needed;
- Investigate enclosures, noise shrouds or noise curtains around noisy equipment, where needed; and
- Investigate temporary noise barriers/solid construction hoarding on site boundary to screen affected locations, where needed.

9. Summary

Provided that the Project activities and equipment operate within the assumptions described in this assessment, the noise impacts during the overburden stripping and quarrying phases (i.e., Project operations) are predicted to meet the Manitoba Guidelines for Sound Pollution limits.

The results of the noise impact assessment incorporate the most recent Project information available for Project operations, as of November 2022. Should changes to any of the Project assumptions occur (e.g., new equipment, facility layout, equipment usage), the affected Project components and activities should be reassessed to verify that the guidance sound level limits are not exceeded; and develop a revised suite of noise mitigation measures, if necessary.

10. References

ISO (International Organization for Standardization). 1996. Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. Geneva, Switzerland.

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BSI (British Standards). 2008. Standard 5228-1: 2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. Great Britain.

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

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