APPENDIX M

ACOUSTIC ASSESSMENT REPORT

ACOUSTIC ASSESSMENT REPORT

TOUQUOY GOLD PROJECT
MOOSE RIVER, HALIFAX COUNTY, NOVA SCOTIA

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) was retained by DDV Gold Limited (DDV) to prepare an Acoustic Assessment Report (Assessment) for the Touquoy Gold Project at the Moose River Gold Mines development site in Halifax County, Nova Scotia. The mine facility (Facility) will be operated by DDV. The Assessment has been prepared in support of the Environmental Assessment approval process.

The mine is planned as a surface operation with drill-and-blast, load-and-haul, process-on-site mine development. Significant aspects of the mine processing operations will operate up to 24 hours per day, 7 days per week.

The Assessment presented herein provides an evaluation of the potential noise impacts from Facility noise emissions generated during normal operations on the sensitive receptors located nearest to the Facility based on continuous 24-hour operations.

The Assessment was prepared consistent with the following Ontario Ministry of the Environment (MOE) and Nova Scotia Department of Environment and Labour (NSDEL) guidance:

- "*Guidelines for Environmental Noise Measurement and Assessment, May 2005*", NSDEL;
- NPC-233, "*Information to be Submitted for Approval of Stationary Sources of Sound, October 1995*", MOE; and
- "*Appendix A – Supporting Information for an Acoustic Assessment Report or Vibration Assessment Report Required by a Basic Comprehensive C of A*" as specified in the MOE guidance entitled "*Basic Comprehensive Certificates of Approval (Air) – User Guide, April 2004*", MOE.

The proposed surface footprint of the site is approximately 300 ha and encompasses the settlement of Moose River Gold Mines, part of a small provincial park and undeveloped forest. It is bounded to the west by the Moose River and surrounded on all other sides by forested land in varying degrees of re-growth due to logging. A site plan identifying the surrounding land uses is provided in Appendix A.

A site plan and point-of-reception plan is provided as Figure 1. This plan identifies the location of the Facility structures, off-site points-of-reception subject of this assessment and major contour lines. The mine site is located within relatively flat topography with maximum relief of 25 m. Elevations within the catchments vary from approximately

160 metres above sea level (masl) in the headwater areas to approximately 110 masl at the outlet.

The Facility is located in a rural area that is dominated by natural sounds. Periodic road traffic noise from Mooseland Road during both the daytime and nighttime period affects the background ambient sound levels.

2.0 NOISE SOURCE SUMMARY

This Assessment focused on the sound emissions from the noise sources identified at the Facility with a potential to adversely impact the sensitive receptors. The Noise Source Summary is provided in Table 1 and the significant noise source locations are identified on Figure 2. Based on DDV provided site description, process equipment, and operating schedules, CRA identified the following significant noise sources identified by the Cadna modelling ID number:

- Truck - Haul Roads (S1, S3, and S4);
- Truck - Hopper Discharge (S2);
- Excavator (S5 and S17);
- Loader - Face Shovel (S6);
- Drill (S7);
- Dozer (S8 and S9);
- Grader (S10);
- Loader - Transport of Material (S18 and S20);
- Crane (S19);
- Generator (S21);
- Light Tower (S22 through S25);
- Jaw Crusher (S42);
- Heavy Duty Hopper (S43);
- Cone Crusher (S44 and S45);
- Heavy Duty Belt Feeder Hopper (S46);
- Twin Screen Plant (S47);
- Tunnel Conveyor (S48); and
- CIL Tank - Electric Motor (S49 through S54).

The other noise sources at the Facility have not been included since they are considered insignificant contributors to the overall Facility noise level at the sensitive receptors. A summary of insignificant noise sources and qualitative comments are provided in Table B.1 of Appendix B.

3.0 POINT-OF-RECEPTION SUMMARY

The identification of appropriate sensitive point(s)-of-reception is necessary to conduct the Assessment for the Facility. A "point-of-reception" is any point on the premises of a person where sound, originating from other than those premises, is received. The point-of-reception may be located on permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds, parks, schools, cemeteries or places of worship.

The objective of this Assessment is to determine the predictable worst-case 1-hour equivalent sound level (1-hour Leq) at the worst-case point(s)-of-reception. The worst-case point(s)-of-reception is defined as the sensitive receptor with the greatest potential exposure to the Facility noise sources due to proximity and direct line-of-sight exposure.

All existing residential buildings on the site have been purchased by DDV Gold Ltd. (DDVG), or are in the process of being acquired. Construction will not move forward until all of the lands are under the ownership of DDVG. At that time, the nearest receptor will be a children's overnight camp at a distance of approximately 4.2 km northwest from the open pit area point of reference. The nearest permanent residential receptor is approximately 5 km northwest from the open pit area point of reference. The northern most point of the open pit extraction area was used for the point of reference. An additional receptor has been considered to be at a point in Scraggy Lake, where a camper may experience noise impacts from the development.

A summary of the point(s)-of-reception (POR) modelling parameters are as follows:

- POR1 – two story residence located approximately 5 kilometres (km) northwest of the open pit area (4.5 metres [m] above grade [AG]);
- POR2 – children's campground located approximately 4.2 km northwest of the open pit area (1.5 m AG); and
- POR3 – receptor located on Scraggy Lake approximately 185 m south of the southern most polishing pond/dam berm (1.5 m AG).

The locations of the PORs are identified on Figure 1.

4.0 SOUND LEVEL DATA

4.1 NOISE SPECIFICATIONS

DDV provided CRA with the Department of Environment Food and Rural Affairs (DEFRA) "*Update of Noise Database for Prediction of Noise on Construction and Open Sites, 2005 and 2006*" for use in obtaining octave band sound levels and reference distances for equipment that would be considered representative of process equipment. CRA also used the United States Department of Transportation, Federal Highway Administration (FHWA) document "*FHWA Roadway Construction Noise Model User's Guide, 2006*" as a supplemental document to obtain sound level data for equipment not listed by DEFRA.

The noise specifications for the proposed equipment are summarized in Table C.1 of Appendix C.

4.2 AMBIENT SOUND LEVELS

CRA conducted long-term sound level monitoring for DDV at the Moose River site on January 9, 2007, through to January 12, 2007, in order to characterize the ambient background sound levels. The monitoring location chosen was just north of the proposed open pit area on Moose River Road and is identified on Figure 1. Measurements were conducted in accordance with NSDEL guidance.

The long-term sound level monitoring was conducted using a microphone and data logging system. The sound level measurements were taken using a Quest Sound Pro-DL Class 1 Precision Integrating SLM (Serial Number BIF030021). The system was calibrated at 114 decibels (dBA) before and after the measurement period using a Quest Acoustic Calibrator.

Continuous one-hour Leqs were taken with the detector in slow response. Meteorological weather conditions during the noise-monitoring period were obtained from the Environment Canada website to estimate adverse weather conditions that could have affected the sound measurements. The weather conditions were considered in validating the minimum background levels used in this Assessment.

The lowest measured one-hour Leq values for the monitoring program were:

- 7:00 – 19:00 - 40.3 dBA;
- 19:00 – 23:00 -40.0 dBA; and
- 23:00 – 7:00 -39.6 dBA.

Adverse weather conditions were not experienced during these select hours. The complete long-term data that was presented in the original Environmental Assessment submission is provided in Appendix D.

5.0 ASSESSMENT CRITERIA

Leq refers to an energy equivalent sound level. It is a time-averaged sound level; a single-number value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the time-varying level. A one-hour time averaged energy equivalent sound level is referred to as a one-hour Leq. Leq is expressed in decibel (dB). A-weighting is the filter used for measuring sound to approximate human hearing. Therefore, the Leq is expressed in A-weighted decibel (dBA) for purposes of environmental compliance assessment. CRA conservatively estimates the one-hour Leq based on a worst-case operating scenario, which is then compared to the appropriate limit.

As specified in the NSDEL guideline document, Leq values should be ≤65 dBA between the hours of 0700 and 1900 hours, ≤60 dBA between the hours 1900 and 2300 hours and ≤55 dBA between the hours of 2300 and 0700 hours. These Leq values define the minimum exclusionary sound level limits.

The minimum nighttime Leq of 55 dBA will be used to evaluate POR1 and POR2. However, since POR3 is a recreational receptor used to canoe predominantly during the daytime hours, the minimum daytime Leq of 65 dBA was used for assessment purposes at this receptor.

6.0 IMPACT ASSESSMENT - STEADY-STATE SOUND LEVELS

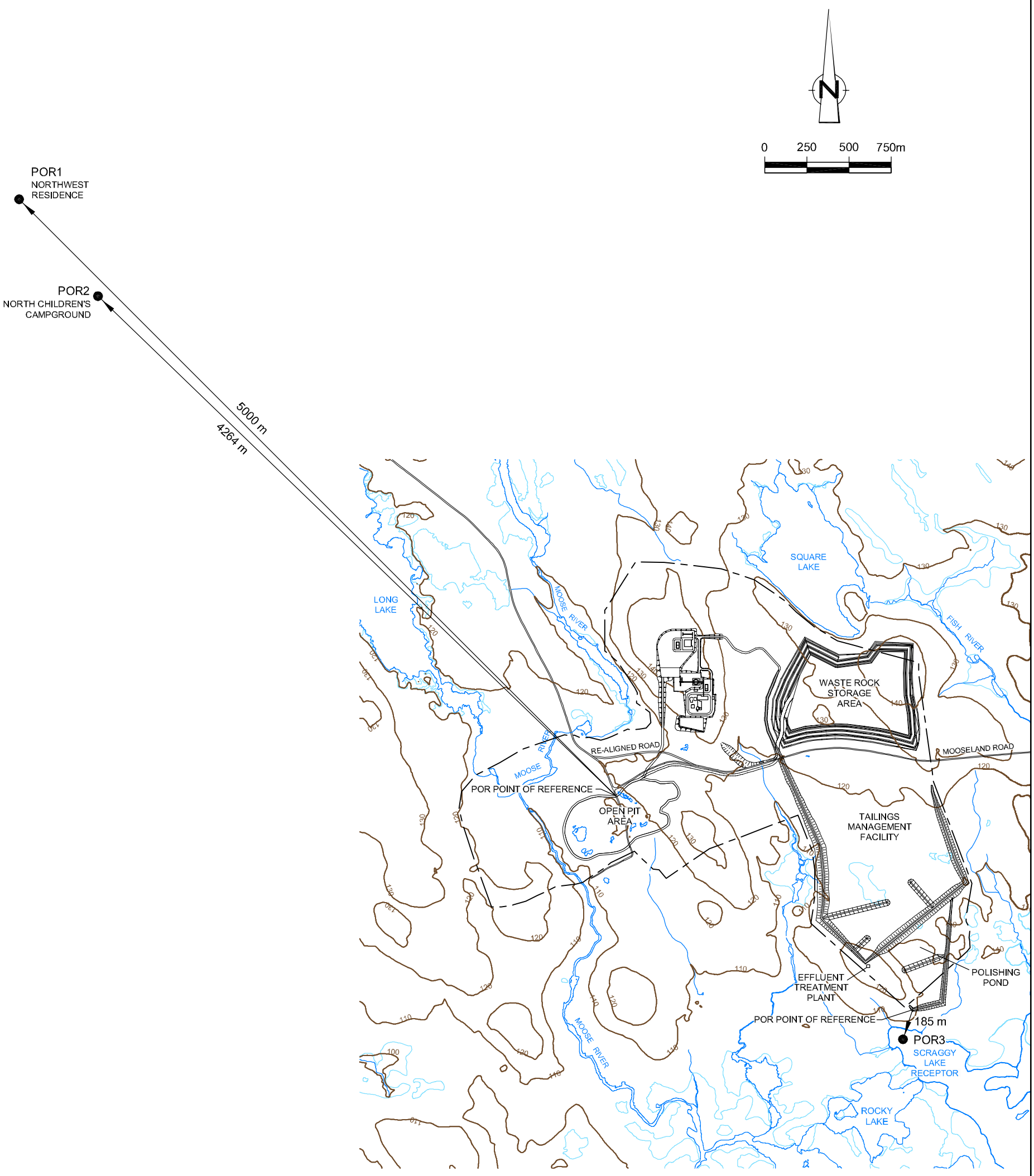
The worst-case assessment of unattenuated steady state noise sources at the selected point-of-reception was based on sound pressure level octave band data and reference distances. Cadna A was used to model the potential impact of the significant noise sources at the points-of-reception according to the ISO 9613-2 standard. The sound pressure levels are converted to A-weighted sound power levels for use in calculations. The unattenuated, worst-case, cumulative, facility-wide sound level estimated at the receptors included attenuation affects due to geometric divergence, atmospheric attenuation, barriers/berms, ground absorption for porous type ground, and directivity. Site-specific topography was modelled based on ground contour intervals of 10 m.

The Facility building structures were modelled as reflective surfaces and indirect line-of-sight noise impacts were evaluated. The assessment also conservatively assumed that all major sources would operate simultaneously and assumed continuous 24 hour unlimited operations.

The cumulative, worst-case, unattenuated sound levels (1-hour Leqs) estimated at the points-of-reception are summarized in Table 2.

7.0 CONCLUSIONS

The Facility-wide unattenuated steady-state sound levels estimated at the points-of-reception are below the respective sound level limits, as summarized in Table 3.



LEGEND

——— – ——— SITE BOUNDARY

● POR2 POINT OF RECEPTION

figure 1

SITE AND POINT OF RECEPTION PLAN
ACOUSTIC ASSESSMENT REPORT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

820933-B(004)GN-WA001 SEP 19/2007

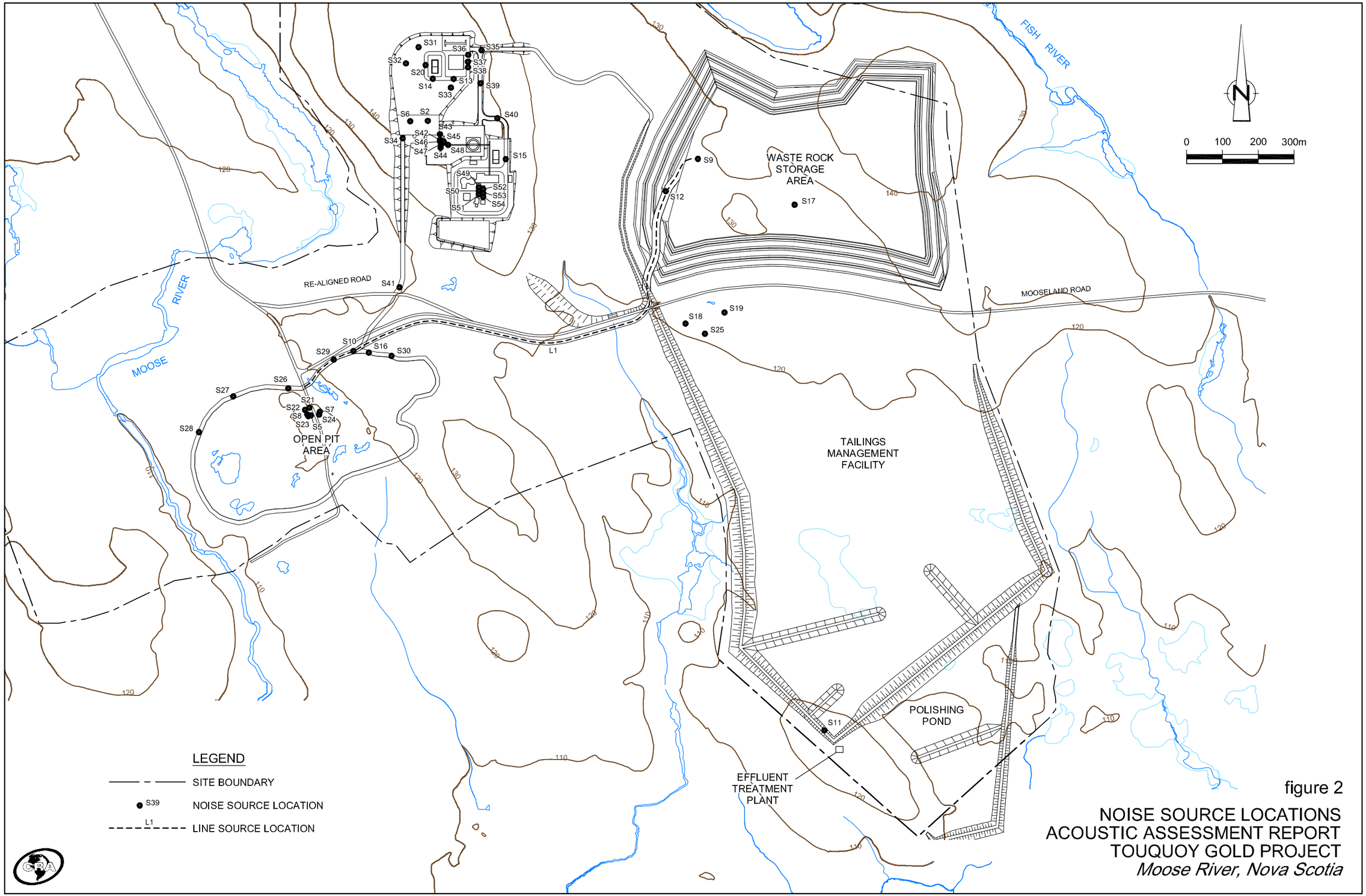


figure 2

NOISE SOURCE LOCATIONS
ACOUSTIC ASSESSMENT REPORT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

820933-B(004)GN-WA002 SEP 19/2007

TABLE 1

NOISE SOURCE SUMMARY
MOOSE RIVER GOLD MINES, DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

Cadna A ID	*Source Description*	*Type of Noise Source*	*Uncontrolled Sound Power Level (1) (dBA)*	*Source Location (2)*	*Sound Characteristics (3)*	*Noise Control Measures (4)*
L1	Truck - Haul Roads	Line Source	121.1	O	S	U
S2	Truck - Hopper Discharge	Point Source	115.5	O	S	U
S5 & S17	Excavator	Point Source	124.0	O	S	U
S6	Loader - Face Shovel	Point Source	120.9	O	S	U
S7	Drill	Point Source	123.7	O	S	U
S8 & S9	Dozer	Point Source	111.1	O	S	U
S10	Grader	Point Source	117.5	O	S	U
S18 & S20	Loader - Transport of Material	Point Source	116.0	O	S	U
S19	Crane	Point Source	97.6	O	S	U
S21	Generator	Point Source	115.5	O	S	U
S22 - S25	Light Tower	Point Source	96.5	O	S	U
S42	Jaw Crusher	Point Source	121.1	O	S	U
S43	Heavy Duty Hopper	Point Source	121.5	O	S	U
S44 & S45	Cone Crusher	Point Source	121.1	O	S	U
S46	Heavy Duty Belt Feeder Hopper	Point Source	100.2	O	S	U
S47	Twin Screen Plant	Point Source	112.1	O	S	U
S48	Tunnel Conveyor - Drive Motor	Point Source	107.8	O	S	U
S49 - S54	CIL Tank - Electric Motor	Point Source	97.4	O	S	U

Notes:

(1) Sound Power Level in dBA calculated from sound level and reference distance.

(2) Source Location:

- O - located / installed outside of building
- I - located / installed inside of building

(3) Sound Characteristics:

- S - Steady
- Q - Quasi Steady Impulsive
- I - Impulsive
- B - Buzzing
- T - Tonal
- C - Cyclic

(4) Noise Control Measures:

- S - silencer, acoustic louvre, muffler
- A - acoustic lining, plenum
- B - barrier, berm, screening
- L - lagging
- E - acoustic enclosure
- O - other
- U - uncontrolled
- AC - administrative control

TABLE 2

POINT-OF-RECEPTION NOISE IMPACT - UNATTENUATED SOUND LEVELS
MOOSE RIVER GOLD MINES, DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

Cadna A Source ID	*Significant Noise Source Description*	*Northwest Residence (POR1)*		*North Campground (POR2)*		*Scraggy Lake Receptor (POR3)*	
		Distance to Receptor (m)	*Sound Level at Receptor (1) (Leq)*	*Distance to Receptor (m)*	*Sound Level at Receptor (1) (Leq)*	*Distance to Receptor (m)*	*Sound Level at Receptor (1) (Leq)*
L1	Truck - Haul Roads	4,984.0	18.7 dBA	4,306.6	20.6 dBA	1,816.4	26.9 dBA
S2	Truck - Hopper Discharge	4,783.4	14.0 dBA	4,073.5	16.6 dBA	2,571.1	22.0 dBA
S5	Excavator	5,071.4	23.8 dBA	4,335.1	26.5 dBA	2,163.6	32.2 dBA
S6	Loader - Face Shovel	4,744.2	22.8 dBA	4,033.0	25.6 dBA	2,596.5	28.2 dBA
S7	Drill	5,081.6	26.5 dBA	4,345.7	29.0 dBA	2,150.9	33.9 dBA
S8	Dozer	5,062.1	17.1 dBA	4,325.6	19.1 dBA	2,173.5	21.1 dBA
S9	Dozer	5,467.6	13.9 dBA	4,773.1	15.5 dBA	2,165.0	21.1 dBA
S10	Grader	5,031.1	18.3 dBA	4,298.9	20.9 dBA	2,195.2	26.3 dBA
S17	Excavator	5,764.1	17.7 dBA	5,070.8	19.8 dBA	1,980.0	33.4 dBA
S18	Loader - Transport of Material	5,696.6	18.6 dBA	4,984.4	20.5 dBA	1,740.5	28.5 dBA
S19	Crane	5,766.8	-2.8 dBA	5,057.9	-1.0 dBA	1,733.5	11.2 dBA
S20	Loader - Transport of Material	4,689.0	22.4 dBA	3,985.4	24.4 dBA	2,707.8	27.4 dBA
S21	Generator	5,052.9	18.5 dBA	4,316.7	21.3 dBA	2,180.8	26.3 dBA
S22	Light Tower	5,048.8	2.9 dBA	4,312.4	4.8 dBA	2,186.2	5.9 dBA
S23	Light Tower	5,067.9	2.9 dBA	4,331.4	4.8 dBA	2,167.9	6.0 dBA
S24	Light Tower	5,085.8	2.8 dBA	4,349.7	4.8 dBA	2,147.5	6.1 dBA
S25	Light Tower	5,757.0	-3.2 dBA	5,045.0	-1.5 dBA	1,694.9	8.9 dBA
S42	Jaw Crusher	4,841.3	20.7 dBA	4,130.3	23.1 dBA	2,508.7	28.1 dBA
S43	Heavy Duty Hopper	4,832.3	11.5 dBA	4,121.9	12.8 dBA	2,521.7	28.9 dBA
S44	Cone Crusher	4,855.8	20.7 dBA	4,143.9	23.0 dBA	2,488.9	26.8 dBA
S45	Cone Crusher	4,853.1	20.7 dBA	4,142.2	23.0 dBA	2,498.6	26.0 dBA
S46	Heavy Duty Belt Feeder Hopper	4,844.1	-2.8 dBA	4,132.9	-0.2 dBA	2,504.8	4.2 dBA
S47	Twin Screen Plant	4,852.2	12.0 dBA	4,140.7	14.4 dBA	2,494.9	18.3 dBA
S48	Tunnel Conveyor - Drive Motor	4,868.5	3.6 dBA	4,157.5	6.6 dBA	2,484.2	7.3 dBA
S49	CIL Tank - Electric Motor	5,007.3	-3.0 dBA	4,294.2	-0.3 dBA	2,339.3	6.4 dBA
S50	CIL Tank - Electric Motor	5,013.3	-3.0 dBA	4,299.8	-0.3 dBA	2,330.6	6.4 dBA
S51	CIL Tank - Electric Motor	5,018.7	-3.0 dBA	4,305.0	-0.3 dBA	2,322.8	4.4 dBA
S52	CIL Tank - Electric Motor	5,020.6	-3.1 dBA	4,307.7	-0.4 dBA	2,328.1	4.4 dBA
S53	CIL Tank - Electric Motor	5,027.1	-3.2 dBA	4,313.8	-0.4 dBA	2,318.7	4.4 dBA
S54	CIL Tank - Electric Motor	5,032.5	-3.2 dBA	4,318.9	-0.4 dBA	2,310.9	4.5 dBA
	Worst-case Total Facility Sound Level (1-hour Leq):		**32.8 dBA**		**35.2 dBA**		**40.9 dBA**

Note:
(1) Sound Level at the Receptor was calculated using Cadna A Acoustical Modelling Software.

TABLE 3

ACOUSTIC ASSESSMENT SUMMARY - STEADY STATE SOUND LEVELS
MOOSE RIVER GOLD MINES, DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

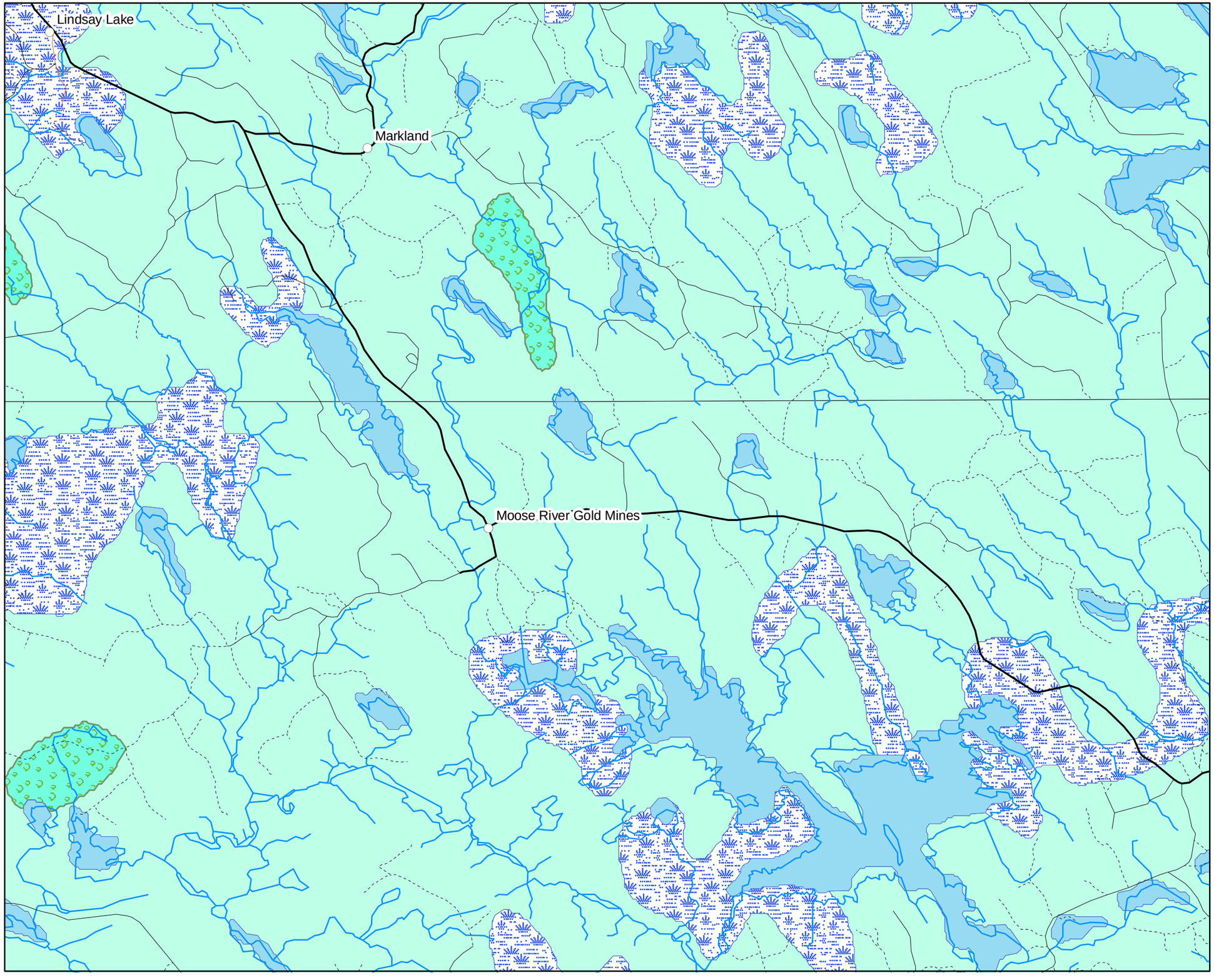
Point-of-Reception ID	*Point-of-Reception Description*	*Attenuated Sound Level at Point-of-Reception*	*Verified by Acoustic Audit (Yes/No)*	*Performance Limit (1) (Leq)*	*Compliance with Performance Limit (Yes/No)*
		Predicted (Leq)			
POR1	Northwest Residence	32.8 dBA	No	55 dBA	Yes
POR2	North Campground	35.2 dBA	No	55 dBA	Yes
POR3	Scraggy Lake Receptor	40.9 dBA	No	65 dBA	Yes

Note:

(1) Minimum NSDEL Leq sound level limits.

APPENDIX A

ZONING MAP AND DEFINITIONS



Moose River Gold Mines

Legend

- Populated_Places

CLI Land USe

USE_A

- Built up areas
- Mines Pits Quarries
- Rough Grazing
- Rock and Unvegetated
- Swamp
- Outdoor Recreation
- Improved Pasture
- Productive Woodland
- Non Productive Woodland
- water

N

0 0.35 0.7 1.4 2.1 2.8

Kilometres

APPENDIX B

INSIGNIFICANT NOISE SOURCE SUMMARY

TABLE B.1

SUMMARY OF INSIGNIFICANT NOISE SOURCES
MOOSE RIVER GOLD MINES, DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

Source Identifier	*Source Description*	*Client Provided Comments*
S11 - S16, S26 - S41	Pick-up Truck/Van	Light Vehicles with Limited On-site Use.
NA	Grinding Mill	Located inside bilding - Insignificant
NA	Hydro Cyclones	Located inside bilding - Insignificant
NA	All Inside Equipment	Not Audible Outside Building (Efluent Treatment Facility [ET], Tailings Management Facility [TM])
NA	Ore stockpile/reclaim	Enclosed

APPENDIX C

SOUND LEVEL DATA

TABLE C.1

NOISE SOURCE SUMMARY
MOOSE RIVER GOLD MINES, DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

Cadna ID	Noise Source Description	Make	Model	Specification	Quantity	Location	Annual Usage (hours/year/unit)	Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Mining Fleet																			
S1, S3, S4	1A - Truck - Haul Roads	Caterpillar	773D	50t	3	Various	4,860	96	97	90	84	84	84	74	76		3	10	DEFRA, 60 t Rigid Trucks, 517kW, - HAUL ROADS	2006
						Sample Calculation:	PW (dB)	127.0	128.0	121.0	115.0	115.0	115.0	105.0	107.0	131.3				
							A-weighted correction	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1					
							PW (dBA)	100.8	111.9	112.4	111.8	115.0	116.2	106.0	105.9	**121.1**				
S2	1B - Truck - Hopper	Caterpillar	773D	50t	1	ROM Pad		88	82	77	79	80	79	73	67	**115.5**	3	10	DEFRA, 60 t Rigid Trucks, 544kW, - Discharge to Hopper	2006
Not Used	5A - Excavator Loading Trucks	Caterpillar	365B	4 m3	NA	Various	NA	95	93	89	89	86	82	76	74	NA	3	10	DEFRA, 47t, Tracked Hydraulic Excavator, 235 kW - Face Shovel Loading Trucks	2006
S5	5B - Excavator Rock Breaker	Caterpillar	365B	4 m3	1	Various	7,680	91	89	85	89	87	87	84	80	**124.0**	3	10	DEFRA, 29t, Tracked Hydraulic Excavator, 125 kW - Excavator mounted Rock Breaker	2006
S6	Loader	Caterpillar	980G	4.5m3	1	Various	3,860	88	88	87	85	86	83	77	70	**120.9**	3	10	DEFRA, 94t, Wheeled Loader, 597 kW - Face Shovel Loading Trucks	2006
S7	Drill	Driltec	D25K	150mm	1	Various	5,330	94	95	90	91	87	85	80	73	**123.7**	3	10	DEFRA, 23t, Tracked Mobile Drill Rig, 270kW - Drilling Blast Holes	2006
S8, S9	Dozer	Caterpillar	D8R	200 kW	2	Various	3,940	89	90	81	73	74	70	68	64	**111.1**	3	10	DEFRA, 41t, Dozer, 239 kW - Ground Excavation	2005
S10	Grader	Caterpillar	14H	160 kW	1	Various	3,940	88	87	83	79	84	78	74	65	**117.5**	3	10	DEFRA, 25t, Grader, 205 kW - Levelling Haul Road	2005
	Location: Pit: Excavator, Drill, Dozer, Gen Set, Truck ROM Pad: Loader, Truck Dump or Dam: Dozer, Truck Roads: Truck, Grader																			

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Mine Mobile Service Vehicles																			
S11	Truck	Ford	F750	Water	1	Site-wide	500				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
						Sample Calculation:	PW (dBA)	34.5	34.5	34.5	109.5	34.5	34.5	34.5	34.5	**109.5**				
S12	Truck	Ford	F750	Dump	1	Site-wide	500				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S13	Truck	Ford	F350	Service	1	Site-wide	4,000				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S14	Truck	Ford	F750	Lube/Fuel	1	Site-wide	1,000				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S15	Truck	Ford	F750	Bulk AN	1	Site-wide	2,000				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S16	Truck	Ford	F350	Explosive	1	Site-wide	3,000				75						1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Plant Mobile Equipment																			
S17	Excavator	Caterpillar	320B	20t	1	Site-wide	1,000	91	89	85	89	87	87	84	80	**124.0**	3	10	DEFRA, 47t, Tracked Hydraulic Excavator, 235 kW - Face Shovel Loading Trucks	2006
S18	Loader	Caterpillar	IT28	1.5 m3	1	Site-wide	1,000	83	89	92	80	71	69	64	58	**116.0**	3	10	DEFRA, 31t, Wheeled Loader, 193 kW - Transport of Material	2006
S19	Crane	Grove	RT40	45t	1	Site-wide	3,250	78	69	67	64	62	57	49	40	**97.6**	3	10	DEFRA, 50t, Mobile Telescopic Crane, 240kW - Lifting	2005
S20	Loader	Caterpillar	262B	skid-steer	1	Site-wide	1,000	83	89	92	80	71	69	64	58	**116.0**	3	10	DEFRA, 31t, Wheeled Loader, 193 kW - Transport of Material	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG	Reference Distance (m)	Reference/Comments	Year
S21	Generator	Caterpillar	150 kW	portable	1	Pit	8,000				81					**115.5**	2	15	"Generator" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG	Reference Distance (m)	Reference/Comments	Year
S22 - S25	Light	Tower	diesel	towed	4	Site-wide	4,000	78	71	66	62	59	55	56	49	**96.5**	2	10	DEFRA, Diesel Generator, 15kW - Power for Lighting	2005

								Sound Pressure Level Octave Band Data (dBA) 63	125	250	500	1K	2K	4K	8K	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Light Vehicles																		
S26 - S30	Pick-up	Ford	F150	Mine	5	Site-wide	1200				75					1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S31 - S35	Pick-up	Ford	F150	Mill	5	Site-wide	500				75					1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S36 - S40	Pick-up	Ford	F150	Admin	5	Site-wide	1000				75					1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006
S41	Van	Ford	E350	Admin	1	Site-wide	1000				75					1.5	15	"Pick-up" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Crushing Circuit																			
S42	Primary Jaw Crusher	ATCON	C110	Unknown	1	Crushing Plant	8,000	91	91	88	87	85	83	78	69	**121.1**	5	10	DEFRA, 38t, Tracked Semi-Mobile Crusher, 250 kW - Breaking Boulders / Oversized Material	2006

								Sound Pressure Level Octave Band Data (dBA) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
S43	Heavy Duty Hopper	Unknown	Unknown	Unknown	1	Crushing Plant	8,000				87					**121.5**	4	15	"Vibrating Hopper" - US Department of Transportation, Federal Highway Administration (FHWA), Published in, "FHWA Roadway Construction Noise Model User's Guide", January 2006.	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
S44, S45	Wide Swing METSO Cone Crusher	Unknown	IOC	HP400	2	Crushing Plant	8,000	91	91	88	87	85	83	78	69	**121.1**	4	10	DEFRA, 38t, Tracked Semi-Mobile Crusher, 250 kW - Breaking Boulders / Oversized Material	2006
S46	Heavy Duty Belt Feeder Hopper	Unknown	Unknown	Unknown	1	Crushing Plant	8,000	71	68	62	63	66	62	58	51	**100.2**	4	10	DEFRA, Feed Hopper Conveyor Drive Unit, 6 kW - Field Conveyor System	2006
S47	Twin Screen Plant	Unknown	Unknown	Unknown	1	Crushing Plant	8,000	84	82	79	79	74	74	71	64	**112.1**	4	10	DEFRA, 17t, Screen Stockpiler, 51 kW - Semi-Mobile Screen / Stockpiler	2006
S48	Tunnel Conveyor	Unknown	Unknown	Unknown	1	Crushing Plant	8,000	71	69	68	71	75	67	63	57	**107.8**	2	10	DEFRA, Conveyor Drive Unit, 42 kW - Field Conveyor System	2006

								Sound Pressure Level Octave Band Data (dB) 63	125	250	500	1K	2K	4K	8K	Total Sound Power Level (dBA)	HAG (m)	Reference Distance (m)	Reference/Comments	Year
	Wet Plant Building																			
S49 - S54	CIL Tanks - Electric Motors	Unknown	Drives Agitator	15hp	6	Top of Wet Plant	8,000	70	73	75	84	78	84	72	64	**97.4**	25.5	0.9	Hoover & Keith Inc. "Noise Control for Buildings and Manufacturing Plants" Section 7-17 "Electric Motors".	NA

APPENDIX D

AMBIENT MONITORING DATA

6.0 NOISE

6.1 EXISTING ENVIRONMENT

CRA conducted longterm sound level monitoring for DDVG on January 9, 2007 through January 12, in order to determine the ambient background sound levels. The monitoring location chosen was just north of the proposed open pit area on Moose River Road (Figure 5.1).

Noise measurements at the Moose River site were obtained for the period of January 9, 2007 through to January 12, 2007. As specified in the Noise Measurement and Assessment Guidelines , Leq values should be ≤ 65 dBA between the hours of 0700 and 1900 hours, ≤ 60dBA between the hours 1900 and 2300 hours and ≤ 55 dBA between the hours of 2300 and 0700 hours. The guidelines specify a minimum of two consecutive hours in each interval to be monitored.

Continuous, one-hour Leq values were observed throughout the above specified time intervals. The lowest measured one-hour Leq values for the monitoring program were:

- 7:00 – 19:00 40.3 dBA
- 19:00 – 23:00 40.0 dBA
- 23:00 – 7:00 39.6 dBA

Adverse weather conditions were not experienced during each of these hours. The complete long-term sound level monitoring data set outlining the lowest measured Leq values is provided in Table 6.1.

TABLE 6.1: AVERAGE HOURLY NOISE MEASUREMENTS/TEMPERATURES/WIND SPEED

Average Hourly Interval	Average Hourly Noise Measurement(dBA)	Noise Measurement Criteria (Leq dBA)	Average Hourly Temperature (°C)	Average Hourly Wind Speed(km/hr)
1/9/2007 19:00-19:59	44.6	Leq ≤ 60	4.1	28.2
1/9/2007 20:00-20:59	44.9		4.8	29.1
1/9/2007 21:00-21:59	44.7		4.3	39.1
1/9/2007 22:00-22:59	45.1		4.1	41.5
1/10/2007 07:00-07:59	46.8	Leq ≤ 65	2.6	23.4
1/10/2007 08:00-08:59	46.2		2.6	20.2
1/10/2007 09:00-09:59	45.4		2.9	19.6
1/10/2007 10:00-10:59	45.5		3.3	22.2
1/10/2007 11:00-11:59	44.2		3.2	17.5
1/10/2007 12:00-12:59	43.3		2.4	12.4

TABLE 6.1: AVERAGE HOURLY NOISE MEASUREMENTS/TEMPERATURES/WIND SPEED

Average Hourly Interval	Average Hourly Noise Measurement(dBA)	Noise Measurement Criteria (Leq dBA)	Average Hourly Temperature (°C)	Average Hourly Wind Speed(km/hr)
1/10/2007 13:00-13:59	43.6		2.2	4.8
1/10/2007 14:00-14:59	44.4		1.7	10.2
1/10/2007 15:00-15:16	43.6	Leq ≤ 60	2.2	8.8
1/10/2007 19:00-19:59	40.4		2.8	9.4
1/10/2007 20:00-20:59	40.7		2.7	5.5
1/10/2007 21:00-21:59	40.2		2.6	7.7
1/10/2007 22:00-22:59	40.0		2.3	8.5
1/10/2007 23:00-23:59	40.2		1.9	7.3
1/11/2007 0.00- 0:59	40.3	Leq ≤ 55	1.8	9.9
1/11/2007 01:00-1:59	39.8		0.8	19.5
1/11/2007 02:00-02:59	40.4		0.0	18.6
1/11/2007 03:00-03:59	39.6		0.4	15.6
1/11/2007 04:00-04:59	39.7		0.0	21.3
1/11/2007 05:00-05:59	39.9		0.0	20.1
1/11/2007 06:00-06:59	41.4		-1.0	28.1
1/11/2007 07:00-07:59	41.7	Leq ≤ 65	-1.4	32.8
1/11/2007 08:00-08:59	40.3		-1.7	32.8
1/11/2007 09:00-09:59	42.3		-1.8	27.4
1/11/2007 10:00-10:59	43.6		-2.4	26.4
1/11/2007 11:00-11:59	43.0		-4.3	25.2
1/11/200712:00-12:59	43.9		-4.4	35.2
1/11/200713:00-13:59	44.4		-4.5	34.7
1/11/2007 14:00-14:59	43.1		-5.0	35.2
1/11/2007 15:00-15:59	43.7		-4.1	34.7
1/11/2007 16:00-16:59	43.8		-4.0	27.9
1/11/2007 17:00-17:59	42.6		-3.3	29.7
1/11/2007 18:00-18:59	42.2		-3.1	29.1
1/11/2007 19:00-19:59	42.0	Leq ≤ 60	-3.1	30.0
1/11/2007 20:00-20:59	41.3		-3.8	27.8
1/11/2007 21:00-21:59	41.0		-4.6	28.0
1/11/2007 22:00-22:59	41.3		-4.8	30.9
1/11/2007 23:00-23:59	40.9	Leq ≤ 55	-4.5	20.8
11/12/2007 0.00-0:59	40.5		-4.1	20.2
1/12/2007 01:00-01:59	40.1		-3.8	26.6
1/12/2007 01:00-01:59	40.3		-3.7	30.6
1/12/2007 03:00-03:59	40.7		-3.1	28.9
1/12/2007 04:00-04:59	40.8		-2.6	29.0
1/12/2007 05:00-05:59	40.6		-2.1	28.3
1/12/2007 06:00-06:59	41.8		-0.3	25.1

The long-term sound level monitoring was conducted using a microphone and data logging system. The sound level measurements were taken using a Quest Sound Pro-DL Class 1 Precision Integrating Sound Level Monitor (Serial Number BIF030021). The system was calibrated at 114 decibels (dBA) before and after the measurement period using a Quest Acoustic Calibrator. The meteorological conditions during the monitoring periods consisted of low winds (> 20km/hour), temperatures between 3-4 degrees Celsius, rain showers and light flurries. Careful precautions were taken to ensure measurements were obtained between periods of flurries and showers. Meteorological conditions were obtained from Environment Canada's Halifax International Airport station and used to assess adverse weather conditions that could have affected the noise measurements. The weather conditions were considered in order to validate the minimum background sound levels. Continuous 1-hour sound level measurements were taken with the detector in slow response using the A-weighting (dBA).

6.2 POTENTIAL EFFECTS, PROPOSED MITIGATION, AND FOLLOW-UP MONITORING

The Project will create pit, blasting, and processing noise. Noise is defined as any unwanted sound which may be hazardous to health, interfere with speech and verbal communications or is otherwise disturbing, irritating or annoying. Noise is measured as sound pressure levels (SPL) in decibels (dB). This scale is "A" weighted to approximate the way the human ear hears. Noise measurements are therefore represented as dBA units. In general an increase in noise levels from 1 to 3 dBA will not be noticeable, 3 to 5 dBA will be noticeable by most people, 5 to 7 dBA will be easily heard and an increase of 7 to 10 dBA will be considered by most to be twice as loud (USEPA Reference-1974). Because the decibel scale is logarithmic, doubling of the number of noise sources will increase noise levels by 3 dBA. A tenfold increase in the number of noise sources will add 10 dBA to the noise level.

Sources of Project related noise may include blasting, rock crushing, onsite heavy truck traffic and operation of other heavy machinery. Typical short term maximum noise levels for trucks and heavy equipment are up to 85 dBA at 15 m from the source. Noise levels for stationary construction equipment will decrease by approximately 6 dBA at a doubling of the distance from the source.

Should the Project be completed as described the nearest dwelling will be approximately six kilometres from the site and buffered by forest. The likelihood of any dwellings in this rural area being occasionally impacted by sound from the site, as well as by

vehicular traffic to and from the site is very low. The majority of mining operations will occur in the pit well below ground surface thereby provide excellent noise shielding.

DDVG will control operations and equipment to ensure noise levels are kept within recommended limits for surface mining operations. Mine site noise will be periodically measured at the property boundaries to ensure regulation levels are not exceeded. A sampling program to collect representative noise level data will be undertaken when surface clearing and construction begins.

Noise from the equipment and lack of effective mufflers is a source of noise. Regular maintenance of the equipment will reduce noise levels. This combination of measures will adequately mitigate potential noise impacts. Noise monitoring will be conducted and the results submitted to regulators as requested. The mitigation procedures may vary as long as noise levels are in accordance with the regulatory approval.

6.3 SUMMARY

All noise emissions will meet the specifications outlined in the NSDEL Pit and Quarry Guidelines, 1999, as well as the Guidelines for Environmental Noise Measurement and Assessment, 1990. In consideration that there are no nearby residents or commercial facilities, and appropriate mitigation to minimise noise levels to reasonable levels will be made, no significant Project-related effects on noise are likely to occur during construction, operation and decommissioning phases. Additional noise level monitoring would be required to measure the effects once mine operations begin. Monitoring stations will be set up along the property line as directed by NSEL at the Industrial Approval stage.

APPENDIX N

LIGHT ASSESSMENT REPORT

LIGHT IMPACT ASSESSMENT

TOUQUOY GOLD PROJECT
MOOSE RIVER, HALIFAX COUNTY, NOVA SCOTIA

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SEPTEMBER 2007
REF. NO. 820933 (5)

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1.0 LIGHT IMPACT ASSESSMENT

Conestoga-Rovers & Associates has undertaken an analysis of the proposed lighting installations for the Touquoy Gold Project at the Moose River Gold Mines development (Site) in Halifax County, Nova Scotia. The mine will be operated by DDV Gold Limited (DDV). The mine site is in a rural, mostly wooded area. The impacts of the proposed lighting installations on nearby sensitive receptors were quantified and compared with the guidelines published by The Institution of Lighting Engineers (ILE) in the document entitled "Guidance Notes for the Reduction of Obtrusive Light".

Definitions

Light trespass is defined as the spilling of light beyond the boundary of the property or area being lit, and is primarily a concern at night. Excess obtrusive light can be a nuisance to others, wastes electricity, and indirectly results in unnecessary emissions of greenhouse gases. Light trespass, or light pollution, can also negatively impact the surrounding ecosystem by disrupting the habits of native species. As such, it is important to understand the potential light impacts from this development, and to endeavor to minimize them.

Luminous flux is the quantity of the energy of the light emitted per second in all directions. The unit of luminous flux is lumen (lm).

Illuminance refers to the amount of light that covers a surface. If ϕ is the luminous flux and S is the area of the given surface then the illuminance E is determined by $E=\phi/S$ with units lm/m^2. Illumination is quantified in terms of lux. One lux is the illuminance of a 1 m^2 surface uniformly lit by 1 lm of luminous flux.

A residence that may experience an objectionable encroachment of light over the property line is referred to as a *residential receptor*. This undesirable light spill may include the entry of unwanted light through windows, or direct line of sight to bright light sources.

1.1 BASELINE CONDITIONS

The site of the proposed development is currently a small residential community with a permanent population of eight. The ILE has developed an Environmental Zone classification system whereby the existing ambient light levels at a site are used to determine the recommended maximum amount of light trespass to nearby receptors.

The classification for rural areas, small villages, or relatively dark urban locations is "E2-Low district brightness areas". Based upon this classification, the light trespass limit at an offsite receptor after curfew (typically considered to be 11:00 p.m.) is 1 lux, which is the accepted equivalent to moonlight.

1.2 PROPOSED LIGHTING

Table 1 provides a complete listing of the proposed light sources to be installed at the Site. The floodlights located at various points around the Site will be mounted on the face of buildings, structures, or 8 metre poles. The lights illuminating the walkways and access stairways will be positioned on 3 metre poles approximately every 4 metres. Since the exact locations of the lights are unknown at this stage, estimates were used.

1.3 SENSITIVE RECEPTORS

All existing residential buildings on the site have been purchased by DDV Gold Ltd. (DDVG), or are in the process of being acquired. Construction will not move forward until all of the lands are under the ownership of DDVG. At that time, the nearest receptor will be a children's overnight camp at a distance of approximately 3 km North from the open pit area. The nearest permanent residential receptor is approximately 5 km from the open pit area. An additional receptor has been considered to be at a point in Scraggy Lake, where a camper may experience visual impacts from the development. These three receptors were used in the analysis of the impacts of potential light trespass from the Site.

1.4 METHOD OF ASSESSMENT

DDVG provided CRA with a listing of proposed lighting and locations, as indicated in Section 1.2 of this report. From known information about the power output of the installations and typical efficiencies, the luminous flux of each light source was calculated:

Luminous flux (lm) = power output (watts) x efficiency (lumens/watt)

The power output of the proposed lighting was known from manufacturer information, and the efficiency was based on typical industry published values, as presented in the following table.

Published Efficiencies of Light Types	
Type of Light	***Typical Efficiency (lumens/watt)***
High Pressure Sodium bulbs (HPS)	100
LED Traffic Lights	24
Incandescent bulbs	17-20
Halogen bulbs	10-20% more than incandescent
Fluorescent bulbs	90

Sample Calculation

There are 4 trucks to be operated around the open pit area, each with 6 mounted lights having a power output of 65 watts each and with average efficiencies of 25 lumens/watt (as obtained from Caterpillar specifications). The luminous flux of the trucks can be calculated as follows:

Power output = 4 trucks x 6 lights/truck x 65 watts/light = 1560 watts

Luminous flux = 1560 watts x 25 lumens/watt = 39,000 lumens

After determining luminous flux estimates for each light source, the impacts of the incident light at the identified sensitive receptors can be determined. There are six main areas across the Site where lighting is to be installed:

1) Open pit area;
2) Process Plant;
3) Effluent Treatment Plant;
4) Traffic light at Tailings Management Facility/waste dump junction;
5) Traffic light at ore haul crossing; and
6) Services Complex and Parking Lot.

Table 1 indicates the estimated distance to the sensitive receptors from each of these areas. The illuminance level at a receptor is equal to the combined total from each light source. It has been conservatively assumed that 50% of the incident light will not reach the receptors due to the thick tree cover separating them from the Site. The following equation was used to estimate the illuminance contribution from each light source:

$$E = \frac{\phi}{d^2} \times 50\%$$

Where,

E = illuminance (lux);

ϕ = luminous flux (lm); and

d = distance to the receptor (m).

Sample Calculation:

The luminous flux from the 4 trucks to be in use at the open pit is an estimated 39,000 lumens. Based on available Site maps, the distance to the Scraggy Lake receptor from the open pit is approximately 2,300 m. The illuminance contribution from the trucks at the Scraggy Lake receptor can be estimated as follows:

$$\text{Illuminance} = \frac{39{,}000 \text{ lumens}}{(2300 \text{ metres})^2} \times 50\% = 3.69\text{E-}3 \text{ lux}$$

This method was used to determine the estimated illuminance at each receptor from each of the light sources. The sum of all contributions for each receptor represents the total estimated level of light that will be present at the receptor.

Table 1 provides a summary of the light sources at the Site, and the expected impacts from each source on the receptors. The combined effects of all the sources at each receptor were summed and compared to the illuminance limits recommended by the ILE, as shown in Table 2.

1.5 SIGNIFICANCE OF RESULTS

The calculated light levels at the identified sensitive receptors are significantly below the limits recommended by the ILE guidelines. The areas surrounding the Site are wooded and inhibit the spread of light. It was conservatively assumed for screening purposes that 50% of the light will not reach the receptors due to this blockage of line-of-sight. In reality the amount of light blocked by the surrounding woodland will likely be much greater than this (>90%), especially during the seasons when trees are in full bloom. The predicted illuminance levels represent the worst-case operating condition, when all of the mobile equipment would be in use at the same time. Glare from lighting fixtures is increased during conditions of overcast skies, sleet, rain, snow and fog. Because the determined light levels during ambient weather conditions are predicted to be well

below the limits, these potential seasonal and meteorological fluctuations are not expected to cause an exceedance of the allowable light trespass levels.

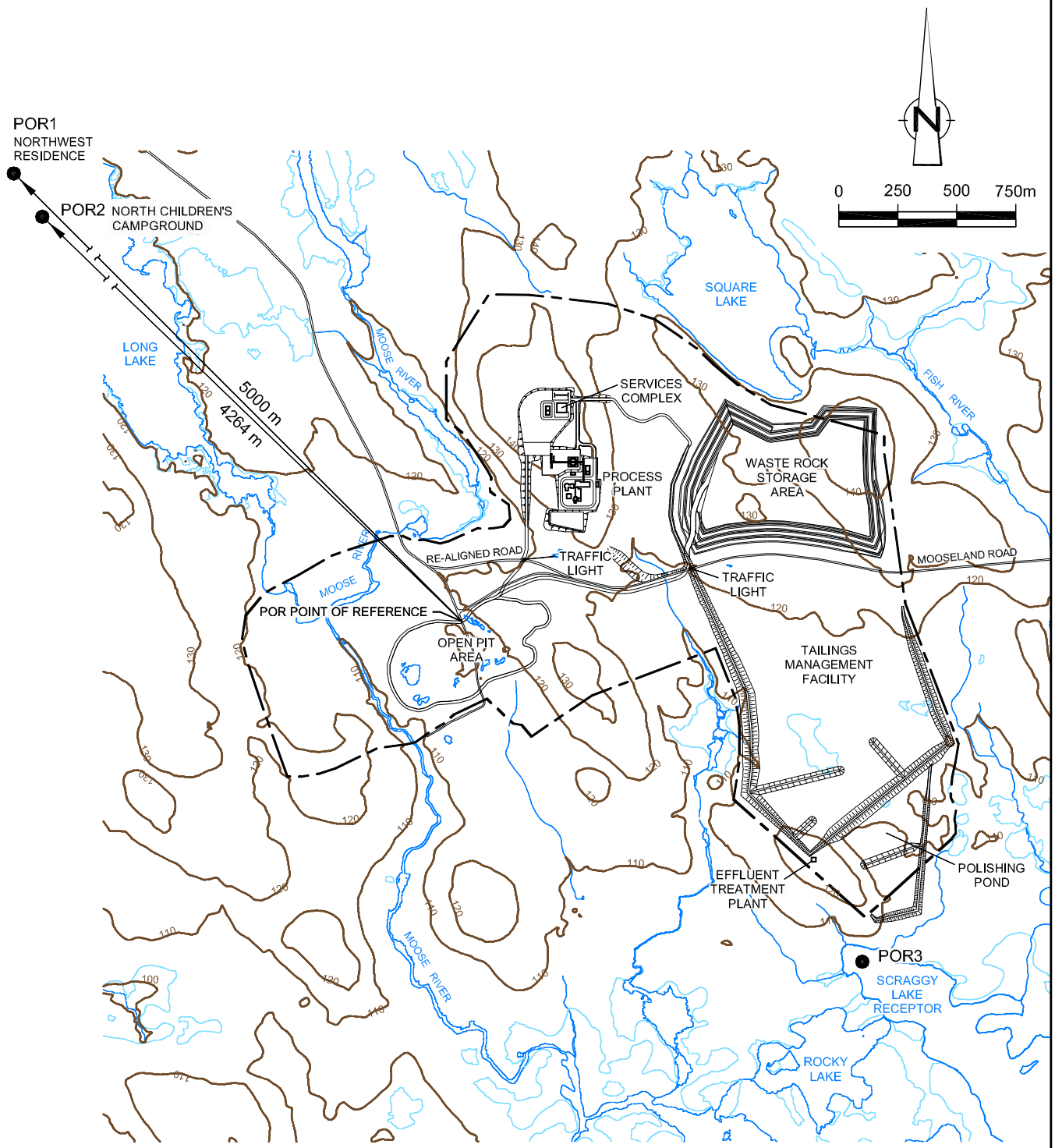
Sensitivity testing was performed to determine the significance of a greater percentage of incident light reaching the nearest sensitive receptor. If it were assumed that none of the light will be filtered out by the tree cover, the post-curfew impact at the overnight camp 3 km away remains less than 12% of the ILE standard, and the receptor on Scraggy Lake remains less than 60% of the ILE standard.

1.6 BEST MANAGEMENT PRACTICES

Best management practices can minimize the light pollution incurred during the daily operation of a facility. DDV Gold has indicated that all of the floodlights on site will employ a "full horizontal cut-off". A full horizontal cut-off allows no direct light emissions above a horizontal plane through the luminaire's lowest light emitting part. This practice has been shown to significantly reduce light trespass in other applications.

The majority of the light fixtures to be used on-site utilize high-pressure sodium bulbs (HPS). This is one of the more energy efficient types of light, yielding significantly more lumens per watt than traditional halogen, incandescent and fluorescent bulbs. The two sets of traffic lights to be used on the public road through the site will be light emitting diodes (LEDs), which are energy efficient due to their high efficiency and long lifespan.

Routine monitoring of the light levels at the Site, once constructed and operational, using a light meter will provide an opportunity to compare actual light levels with theoretical. More refined light level measurements could assist in further quantifying the effects of light sources on the sensitive receptors.



LEGEND

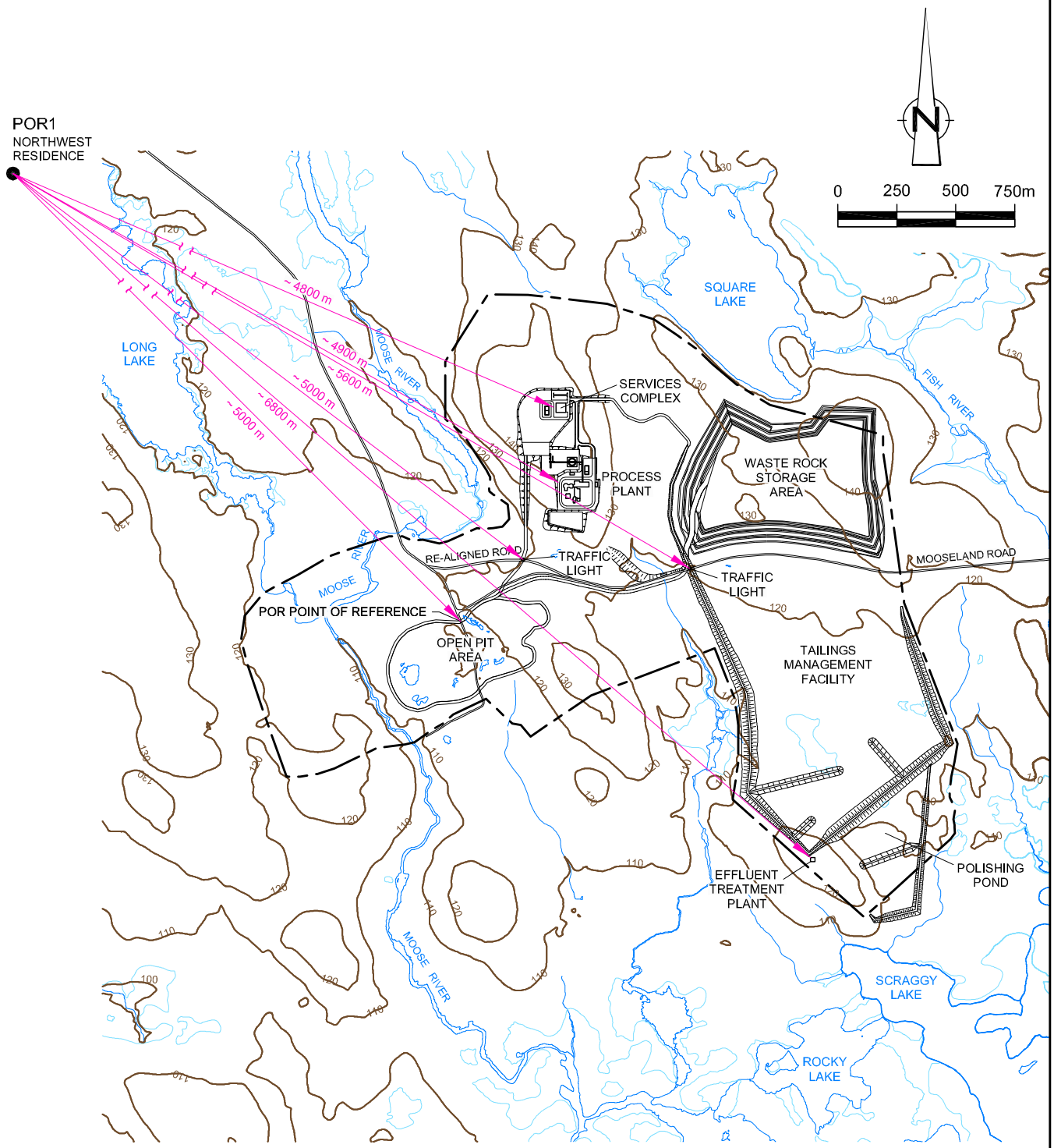
SITE BOUNDARY

POR2 POINT OF RECEPTION

figure 1

SITE AND POINT OF RECEPTION PLAN
LIGHT IMPACT ASSESSMENT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

820933-D(005)GN-WA001 SEP 21/2007



LEGEND

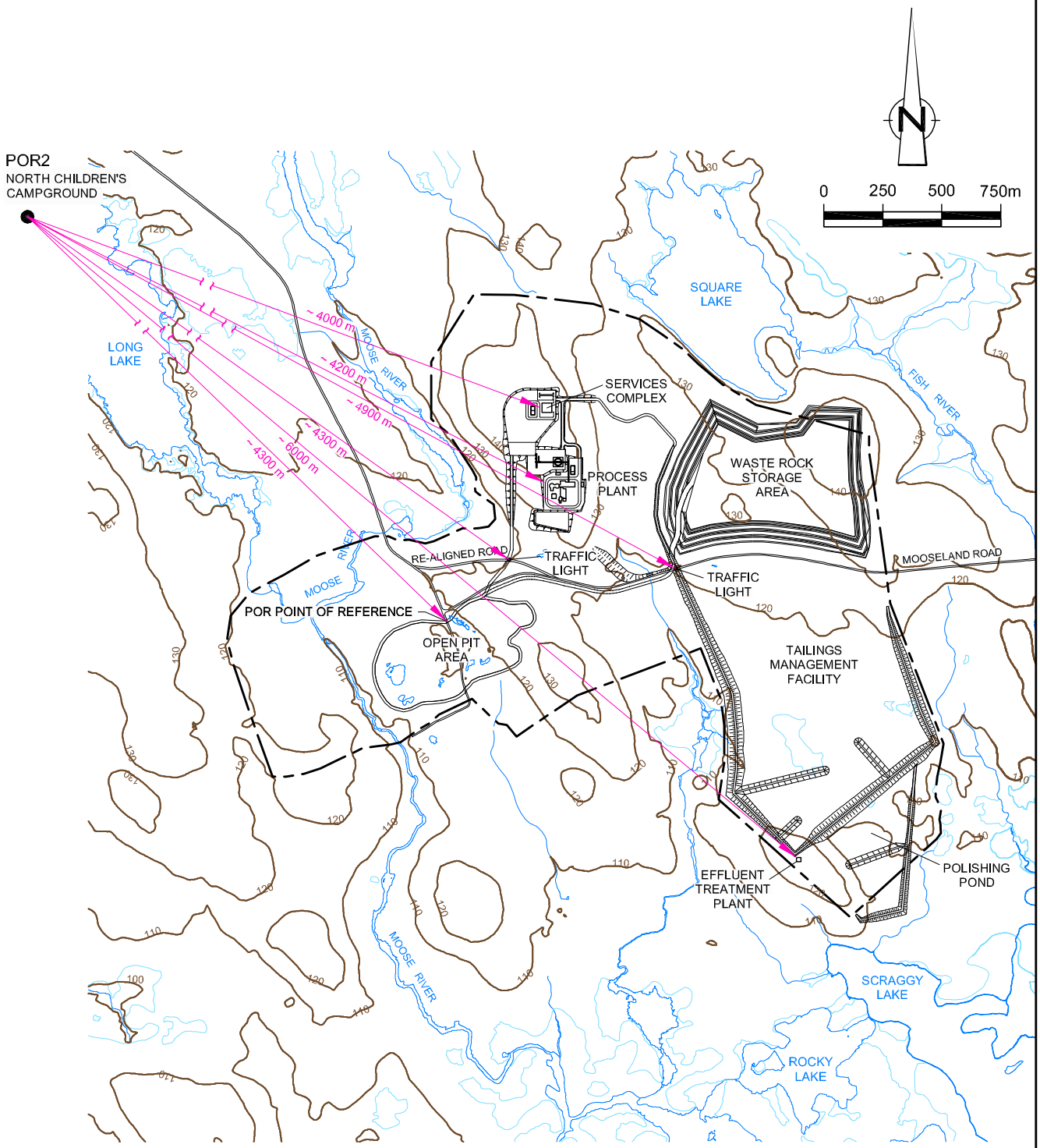
SITE BOUNDARY

POR1 POINT OF RECEPTION

figure 2

LIGHT SOURCE AND RECEPTOR SEPARATION DISTANCE - POR1
LIGHT IMPACT ASSESSMENT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

820933-D(005)GN-WA002 SEP 24/2007



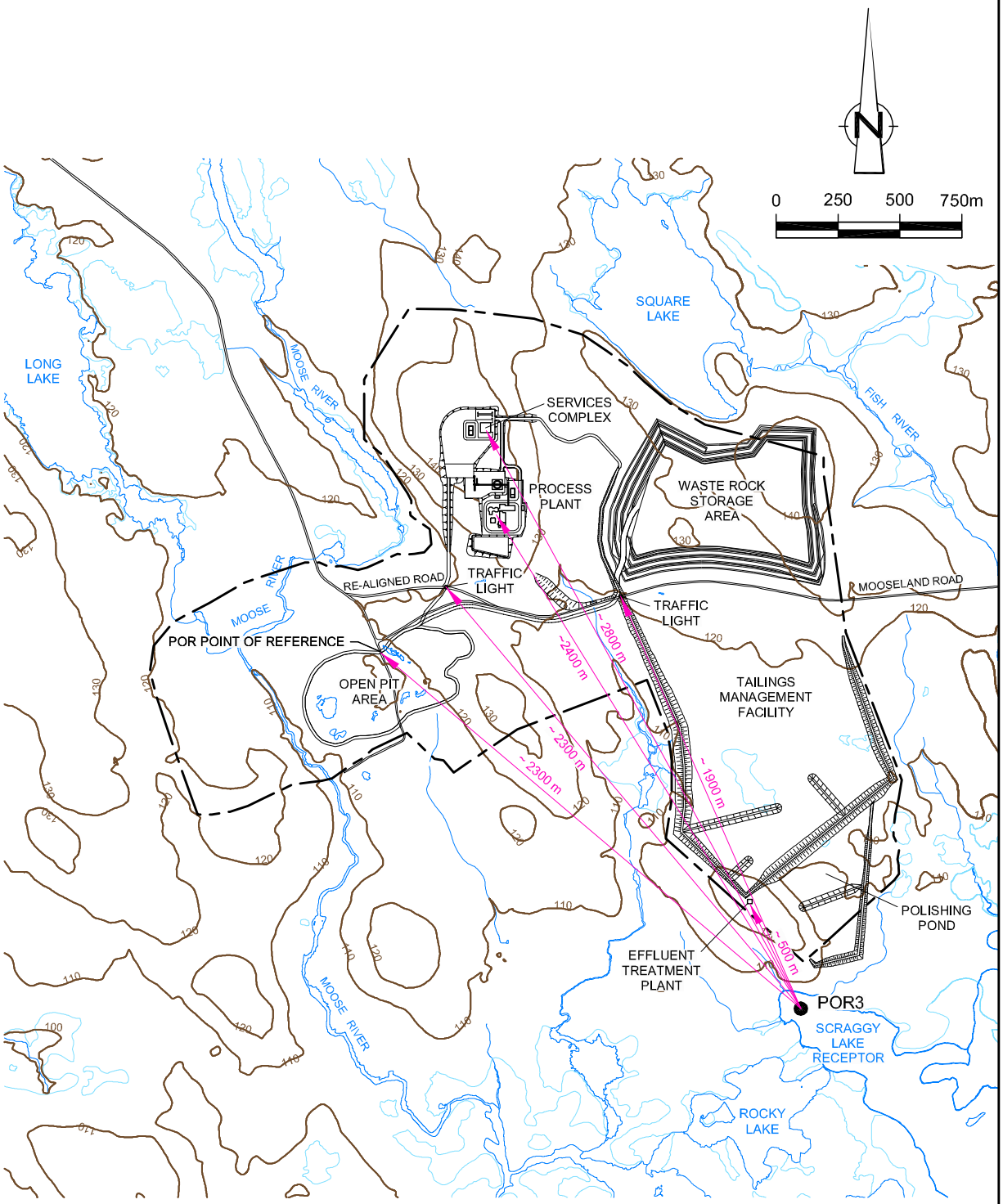
LEGEND

SITE BOUNDARY

POR2 POINT OF RECEPTION

figure 3

LIGHT SOURCE AND RECEPTOR SEPARATION DISTANCE - POR2
LIGHT IMPACT ASSESSMENT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia



LEGEND

SITE BOUNDARY

POR3 POINT OF RECEPTION

figure 4

LIGHT SOURCE AND RECEPTOR SEPARATION DISTANCE - POR3
LIGHT IMPACT ASSESSMENT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

TABLE 1

LIGHT SOURCE SUMMARY TABLES
TOUQUOY GOLD PROJECT
DDV GOLD LIMITED
MOOSE RIVER, NOVA SCOTIA

Percentage of incident lumens assumed to reach the receptor considering obstructions from trees: **50%**

							Receptor #1- Residence		***Receptor #2 - Children's Campground***		***Receptor #3- Scraggy Lake Receptor***	
Area	***Source***		***Power***	***Qty***	***Total Power***	***Luminous Intensity (2)***	***Approx. Distance***	***Illuminance (4)***	***Approx. Distance***	***Illuminance***	***Approx. Distance***	***Illuminance***
Open Pit			(watts)		(watts)	(lumens)	(m)	(lux)	(m)	(lux)	(m)	(lux)
	Mobile Equipment (3)											
	Truck	6 mounted lights	390	4	1560	39000	5000	7.80E-04	4300	1.05E-03	2300	3.69E-03
	Excavator	6 mounted lights	390	2	780	19500	5000	3.90E-04	4300	5.27E-04	2300	1.84E-03
	Loader	6 mounted lights	390	3	1170	29250	5000	5.85E-04	4300	7.91E-04	2300	2.76E-03
	Drill	6 mounted lights	390	1	390	9750	5000	1.95E-04	4300	2.64E-04	2300	9.22E-04
	Dozer	6 mounted lights	390	2	780	19500	5000	3.90E-04	4300	5.27E-04	2300	1.84E-03
	Grader	6 mounted lights	390	1	390	9750	5000	1.95E-04	4300	2.64E-04	2300	9.22E-04
	In-pit sump	portable light tower	400	1	400	40000	5000	8.00E-04	4300	1.08E-03	2300	3.78E-03
	waste dump point	portable light tower	400	1	400	40000	5000	8.00E-04	4300	1.08E-03	2300	3.78E-03
Process Plant												
	ROM Pad	floodlight	400	2	800	80000	4900	1.67E-03	4200	2.27E-03	2800	5.10E-03
	Crusher	floodlight	400	6	2400	240000	4900	5.00E-03	4200	6.80E-03	2800	1.53E-02
		walkways lights	70	50	3500	350000	4900	7.29E-03	4200	9.92E-03	2800	2.23E-02
	Mill Building	floodlight	400	6	2400	240000	4900	5.00E-03	4200	6.80E-03	2800	1.53E-02
	Thickener	floodlight	400	1	400	40000	4900	8.33E-04	4200	1.13E-03	2800	2.55E-03
		walkways lights	70	5	350	35000	4900	7.29E-04	4200	9.92E-04	2800	2.23E-03
	CIL Tanks	floodlight	400	6	2400	240000	4900	5.00E-03	4200	6.80E-03	2800	1.53E-02
		walkways lights	70	10	700	70000	4900	1.46E-03	4200	1.98E-03	2800	4.46E-03
	Detox	floodlight	400	2	800	80000	4900	1.67E-03	4200	2.27E-03	2800	5.10E-03
		walkways lights	70	5	350	35000	4900	7.29E-04	4200	9.92E-04	2800	2.23E-03
	Services	walkways lights	70	10	700	70000	4900	1.46E-03	4200	1.98E-03	2800	4.46E-03
Infrastructure												
	Effluent treatment plant	floodlights	400	2	800	80000	6800	8.65E-04	6000	1.11E-03	500	1.60E-01
	Traffic lights	TMF and Waste junct.	12	1	12	288	5600	4.59E-06	4900	6.00E-06	1900	3.99E-05
		Ore Haul and main junct.	12	1	12	288	5000	5.76E-06	4300	7.79E-06	2300	2.72E-05
Service Complex												
	maintenance workshop	floodlights	400	2	800	80000	4800	1.74E-03	4000	2.50E-03	2800	5.10E-03
	fuel storage area	floodlights	400	2	800	80000	4800	1.74E-03	4000	2.50E-03	2800	5.10E-03
	parking area	floodlights	400	4	1600	160000	4800	3.47E-03	4000	5.00E-03	2800	1.02E-02
							Total, R1:	3.93E-02	**Total, R2:**	5.87E-02	**Total, R3:**	2.94E-01

Assumptions

(1) Floodlights and walkway lights are High Pressure Sodium (HPS) lights, as provided by DDVG.

(2) Average Lumens / Watt : HPS lights typically are 100 lumens / per watt.
LED 12 Watt Traffic lights are typically 24 lumens / watt.
Incandescant bulbs- typically 17-20 lumens / watt.
Halogen bulbs- typically 10-20% more efficient than incandescent.
Fluorescent bulbs- typically up to 90 lumens / watt.

Sources: Louisiana Dept of Natural Resources- http: / / dnr.louisiana.gov / sec / execdiv / TECHASMT / about_us / brochures / handout_lighting_and_appliances.pdf
International Association for Energy Efficient Lighting Newsletter- http: / / www.iaeel.org / IAEEL / NEWSL / 1995 / trefyra1995 / LiTech_d_3_4_95.html
Pacific Energy Centre Factsheet- http: / / www.pge.com / 003_save_energy / 003c_edu_train / pec / info_resource / pdf / High_Pressure_Sodium_Lamps.pdf

(3) Mobile equipment with headlights was assumed to be stationary for simplicity. Specs from Caterpillar were used to assume that each piece of equipment has 6 mounted lights, 65 watts each.

(4) Illuminance = Luminous Intensity / square of distance travelled; therefore 1 Lux = 1 lumen / m2.

Source : Lighting Design Glossary - http: / / www.schorsch.com / kbase / glossary / illuminance.html

TABLE 2

COMPARISON OF LIGHT LEVELS AT RECEPTORS WITH PUBLISHED GUIDELINES
DDV GOLD LIMITED
TOUQUOY GOLD PROJECT
MOOSE RIVER, NOVA SCOTIA

			ILE Guidance Limit (1)		*Percentage of Criteria (3)*	
Receptor	***Description***	***Illuminance***	***Pre-Curfew (2)***	***Post-Curfew***	***Pre-Curfew***	***Post-Curfew***
		(lux)	(lux)	(lux)	(%)	(%)
1	Residence	3.93E-02	5	1	0.79%	3.93%
2	Children's Camp	5.87E-02	5	1	1.17%	5.87%
3	Scraggy Lake Receptor	2.94E-01	5	1	5.89%	29.44%

Assumptions

(1) Based on an assumed classification of the area as Environmental Zone E2- Low district brightness areas.
Source: Guidance Notes for the Reduction of Obstrusive Light, The Institute of Lighting Engineers (2005).

(2) Curfew = the time after which stricter requirements for the control of obtrusive light will apply. If not defined by the local planning authority, the ILE suggests 11:00 p.m.
Source: Guidance Notes for the Reduction of Obstrusive Light, "Table 1-Obtrusive Light Limitations for Exterior Lighting Installations", The Institute of Lighting Engineers (2005).

(3) Based on conservative assumption of 50% light blockage due to surrounding woodland.