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December 13, 2021

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Environmental Assessment Branch
Nova Scotia Environment
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PO Box 442, Halifax, NS B3J 2P8

Dear Ms. MacCarthy and Ms. Tutty,

Atlantic Mining NS Inc, a wholly owned subsidiary of St Barbara Limited, is pleased submit the Updated Information Request CEAA 2-31 Response as part of the Information Request, Round 2, for the Beaver Dam Mine Project. This response has been updated to include Health Canada's request of providing modeling results without mitigation. This response replaces the Information Request CEAA 2-31 Response that is included in the Information Request, Round 2, for the Beaver Dam Mine Project submission dated October 31, 2021.

The undersigned has signing authority and submits the documents as per the federal and provincial environmental assessment processes.

Any correspondence regarding the Environmental Assessment should be directed to the undersigned.

<Signature removed>

Craig Hudson
Head of Permitting and Projects
Atlantic Mining NS Inc

cc: Mike Atkinson, Impact Assessment Agency of Canada

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Attachment CEAA 2-31-A: Air Emissions Assessment Technical Report (GHD), December 10, 2021

Attachment CEAA 2-31-B: Updated Noise Assessment Technical Report (GHD), November 19, 2021

Beaver Dam Mine Project Environmental Impact Assessment
Information Request Responses, Round 2

Round 2 Information Request Number:	CEAA-2-31
Regulatory Agency/Indigenous Community:	HC
Topic/Discipline:	Air, Noise and Human Health
EIS Guideline Reference:	Section 3.2.2 Operation; 6.1.1 Atmospheric Environment; 6.2 Predicted Changes to the Physical Environment; 6.3.4 Aboriginal Peoples
Revised EIS (February 28, 2019) Reference:	Section 6.1.6, p214; 6.1.7.3, p218; Table 6.14-1, p808; Figure 2.1-2 Appendix B.1, Figures 3 and 4 Appendix B.1 Section 6.1; Section 6.1.3.2, p211 Appendix B.1 - Section 6.2 Section 6.2.6.4, p235

Context and Rationale

The locations of the nearest human receptors that were evaluated in the air and noise assessments are not clear. Several seasonal and permanent dwelling locations appear on the maps provided; however, it is not clear if all relevant receptors were identified. For example, the locations of traditional land use were not identified. Where traditional land use is practiced closer to the project site than the permanent/seasonal dwellings, these areas should also be evaluated for potential health impacts.

Noise

Given that the Nova Scotia (NSE) Noise Guidelines are intended not only for dwellings but also for recreational areas, any area used for recreational or traditional purposes by Indigenous peoples located closer to the project site should be included in the noise assessment. This is particularly relevant because of the predicted exceedances of the provincial noise guidelines at the Beaver Dam Mine site property boundary.

In terms of noise, section 6.1 of Appendix B.1 states that “the Nova Scotia Guidelines for Environmental Noise Measurement and Assessment state that their guideline limit values are intended to be applied where people normally live, work, or take part in recreation”. According to section 6.1.7.3 of the EIS, “activities in the project site area include recreational use (hunting, ATVs, etc)”. According to Table 6.14-1, “Mi’kmaq families also enjoy camps in the area for recreational purposes.”

Additionally, the EIS states that “the highest predicted noise levels at the property boundaries of the Beaver Dam Mine Site exceed the criteria NSE Pit and Quarry Guidelines (1999) for all time periods … . While the limits stated in these guidelines are clear and specific, they are not considered practical to meet for open pit mines with operations located close to property lines.”

However, according to section 6.2 of Appendix B, The NSEL document Pit and Quarry Guidelines, May 1999 specifies the following sound level limits at the property boundaries of pits and quarries.

Air Quality

In terms of air quality, it appears that the predicted air pollutant concentrations were screened against air quality criteria at the “sensitive receptor” locations throughout the EIS (e.g. Table 6.2- 12). However, it is not clear what these sensitive receptors represent and how they are selected and located.

In the vicinity of the Beaver Dam and Touquoy Mine sites and Haul Road operations area, Indigenous traditional land users may be exposed to higher concentrations of airborne contaminants than those at the identified 'sensitive receptor' locations. The proponent should screen and assess the exposure to air contaminants at the maximum point of impingement (MPOI) in addition to at the nearest permanent and seasonal dwellings.

The Proponent is Required to …

1. Provide all human receptor locations, including locations of traditional land use and recreational use which may be closer to the project area than seasonal and/or permanent dwellings (for both air quality and noise VCs) on maps and in summary tables.

2. Update the noise and air modelling and human health assessment as required.

3. Provide further justification for the conclusion that the noise limits in the NSE Pit and Quarry Guidelines (1999) are not valid at the property boundary of the Beaver Dam Mine Site .

4. Provide additional mitigation measures that reduce noise at the property boundary given the predicted exceedances.

5. Update any monitoring or follow up programs at the property boundary to verify predicted noise levels and evaluate the level of conservatism used in the modelling .

6. Provide the predicted exposure levels to air pollutants at the maximum point of impingement (MPOI).

7. Assess the health risks from air pollutants using the revised exposure levels at the MPOI .

8. Illustrate the predicted air and noise isopleths for the regional study area, in graphic/map format with all the human receptor locations identified above.

Response

1. CEAA 2-31 Part A.

Atlantic Mining NS Inc. (AMNS) has included all human receptors (i.e., seasonal and permanent dwellings) for noise and air quality Valued Components (VCs) in the summary tables and figures included in this IR2 response. Furthermore, AMNS has provided and referenced property boundary results in tabular and figure form to serve as a proxy for traditional and recreational land use areas present outside of the Project Area (PA). Traditional land use has been documented within the PA as well, however, these areas will have restricted access (e.g., fencing and signage) once the Project is constructed and thus, on-going traditional and recreational activities will be limited to areas outside of the operational footprint of the Project. Specific locations of Mi'kmaq traditional use are confidential, for the purposes of this IR2 response, AMNS has considered the property boundary conditions as a proxy for "worse case" conditions for traditional and recreation practices for air parameters and noise and have included these tables and figures within the technical reports and/or EIS sections, and in this response.

The air and noise assessment reports have been updated to include modelling results without mitigation and are provided as Attachments CEAA 2-31-A and CEAA 2-31-B to this IR2 response at the request of Health Canada through the conformity review from July 15, 2021 and October 8, 2021. AMNS is committed to and will apply mitigation measures for air and noise during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These controls, commitments, mitigation measures and monitoring are detailed in Section 6.1.8 (Noise – Mitigation Measures), Section 6.2.8 (Air – Mitigation Measures), Appendix 2 (draft Complaint Resolution Plan) of Appendix A.6 draft Engagement Plan, and Appendix C.3 draft Fugitive Dust Control Plan in the Updated 2021 EIS (AMNS 2021).

Air – with 80% Road Dust Mitigation

The modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10}, and $PM_{2.5}$) at the Project Area (PA) property boundaries with 80% road dust mitigation for Project only including background concentrations are detailed in Attachment CEAA-2-31-A (Air Emissions Assessment Technical Report [Dated December 10, 2021]), Table 7B (Haul Road), and Tables 9A2 (Beaver Dam Mine Site Option A – Crusher), 9B2 (Beaver Dam Mine Site Option B – Blasting) and 9C (Touquoy Mine Site). The maximum predicted concentrations at the PA property boundaries (Project only including background) with 80% mitigation are summarized in the Updated 2021 EIS Section 6.2.7, Table 6.2-8, page 6-85, Table 6.2-11, page 6-87 and Table 6.2-14, page 6-88 (AMNS 2021) and provided below in Tables CEAA-2-32-1 to CEAA-2-31-3 in response to this IR2 (CEAA-2-31).

The modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10} and $PM_{2.5}$) with 80% road dust mitigation at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are in compliance with the selected air quality criteria (Attachment CEAA-2-31-A, Table 6). The detailed modelling results are shown in Attachment CEAA-2-31-A, Table 8B and are provided below as Table CEAA 2-31-4. Worst case scenarios along the Haul Road for modelled particulate concentrations with 80% road dust mitigation considered for the air quality assessment are considered to be the cumulative effects from the Beaver Dam Mine Project, Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project, and the forestry industry. The worst case scenario at the Beaver Dam Mine Site is Option B (i.e., blasting) with mitigation. The maximum predicted concentrations for the worst case scenarios are summarized in Tables CEAA-2-31-1 to CEAA-2-31-3.

The worst case (i.e., cumulative effects) modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10} and $PM_{2.5}$) with 80% road dust mitigation at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are in compliance with the selected air quality criteria (Attachment CEAA-2-31-A, Table 6). The detailed modelling results are shown in Attachment CEAA-2-31-A, Table 8B and are provided below as Table CEAA 2-31-4.

As outlined in Attachment CEAA-2-31-A, Table 6 where Nova Scotia has air quality standards, these have been used as the assessment criteria. If there were no Nova Scotia criteria for compounds of interest, then Canada-wide standards have been assumed to applied.

Table CEAA 2-31-1: Maximum Predicted Concentrations from the Beaver Dam Mine Site during Operations – with 80% Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Cumulative Effect (%)
TSP	24-hour	120	55.4	46	17.1	72.5	60
	Annual	70	21.0	30	12.1	33.1	47
PM_{10}	24-hour	50	25.9	52	13.1	39.0	78
$PM_{2.5}$	24-hour	27	2.9	11	9.0	11.9	44
	Annual	8.8	1.2	14	5.7	6.9	79

Source: Adapted from Attachment CEAA-2-31-A, Table 9B2 and from AMNS 2021, Section 6.2.7, Table 6.2-8, page 6-85.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate.

Table CEAA 2-31-2: Maximum Predicted Concentrations along the Haul Road during Operations – with 80% Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
Project Only Truck Traffic							
TSP	24-hour	120	54.64	46	17.1	71.04	60
	Annual	70	17.46	25	12.1	29.56	42
PM_{10}	24-hour	50	23.59	47	13.1	36.69	73
$PM_{2.5}$	24-hour	27	2.52	9	9.0	11.52	43
	Annual	8.8	0.98	11	5.7	6.68	76
Cumulative Truck Traffic							
TSP	24-hour	120	82.63	68.9	17.1	99.73	83.1
	Annual	70	26.41	37.7	12.1	38.51	55
PM_{10}	24-hour	50	35.68	71.4	13.1	48.78	97.55
$PM_{2.5}$	24-hour	27	3.82	14.1	9.0	12.82	47.46
	Annual	8.8	1.48	16.8	5.7	7.18	81.61

Source: Adapted from Attachment CEAA-2-31-A, Table 7B and from AMNS 2021, Section 6.2.7, Table 6.2-11, page 6-87.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate.

Table CEAA 2-31-3: Maximum Predicted Concentrations from the Touquoy Mine Site during Operations – with 80% Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
TSP	24-hour	120	3.1	3	17.1	20.2	17
	Annual	70	1.1	2	12.1	13.2	19
PM_{10}	24-hour	50	3.1	6	13.1	16.2	32
$PM_{2.5}$	24-hour	27	1.3	5	9.0	10.3	38
	Annual	8.8	0.4	5	5.7	6.1	70

Source: Adapted from Attachment CEAA-2-31-A, Table 9C and from AMNS 2021, Section 6.2.7, Table 6.2-14, page 6-88.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate.

Table CEAA 2-31-4: Particulate Modelling Results at Sensitive Receptors – 80% Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
R1 – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)							
Project Only							
TSP	24-hour	120	9.1	8%	17.1	26.2	22%
	Annual	70	13.0	19%	12.1	25.1	36%
PM_{10}	24-hour	50	4.6	9%	13.1	17.7	35%
$PM_{2.5}$	24-hour	27	0.5	2%	9.0	9.5	35%
	Annual	8.8	0.2	2%	5.7	5.9	66%
Cumulative							
TSP	24-hour	120	13.8	11%	17.1	30.9	26%
	Annual	70	19.7	28%	12.1	31.8	45%
PM_{10}	24-hour	50	7.0	14%	13.1	20.1	40%
$PM_{2.5}$	24-hour	27	0.8	3%	9.0	9.8	36%
	Annual	8.8	0.2	3%	5.7	5.9	67%
R2 – 4112 Highway 224 (Beaver Lake IR 17)							
Project Only							
TSP	24-hour	120	0.6	<1%	17.1	17.7	15%
	Annual	70	0.1	<1%	12.1	12.2	17%
PM_{10}	24-hour	50	0.4	<1%	13.1	13.5	27%
$PM_{2.5}$	24-hour	27	0.0	<1%	9.0	9.0	33%
	Annual	8.8	0.0	<1%	5.7	5.7	65%

Table CEAA 2-31-4: Particulate Modelling Results at Sensitive Receptors – 80% Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
Cumulative							
TSP	24-hour	120	0.9	<1%	17.1	18.0	15%
	Annual	70	0.2	<1%	12.1	12.3	18%
PM_{10}	24-hour	50	0.6	<1%	13.1	13.7	27%
$PM_{2.5}$	24-hour	27	0.1	<1%	9.0	9.1	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
R3 – 4115 Highway 224 (Cottage on Crown Land)							
Project Only							
TSP	24-hour	120	1.1	<1%	17.1	18.2	15%
	Annual	70	0.4	<1%	12.1	12.5	18%
PM_{10}	24-hour	50	0.6	1%	13.1	13.7	27%
$PM_{2.5}$	24-hour	27	0.1	<1%	9.0	9.1	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
Cumulative							
TSP	24-hour	120	1.6	1%	17.1	18.7	16%
	Annual	70	0.6	<1%	12.1	12.7	18%
PM_{10}	24-hour	50	0.9	2%	13.1	14.0	28%
$PM_{2.5}$	24-hour	27	0.1	<1%	9.0	9.1	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
R4 – 3492 Highway 224 (Hobbs Property)							
Project Only							
TSP	24-hour	120	13.6	11%	17.1	30.7	26%
	Annual	70	20.9	30%	12.1	33.0	47%
PM_{10}	24-hour	50	7.1	14%	13.1	20.2	40%
$PM_{2.5}$	24-hour	27	0.8	3%	9.0	9.8	36%
	Annual	8.8	0.2	3%	5.7	5.9	67%
Cumulative							
TSP	24-hour	120	20.5	17%	17.1	37.6	31%
	Annual	70	31.5	45%	12.1	43.6	62%
PM_{10}	24-hour	50	10.7	21%	13.1	23.8	48%
$PM_{2.5}$	24-hour	27	1.1	4%	9.0	10.1	38%
	Annual	8.8	0.3	4%	5.7	6.0	69%

Table CEAA 2-31-4: Particulate Modelling Results at Sensitive Receptors – 80% Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
R5 – 3379 Highway 224 (McLeod Property)							
Project Only							
TSP	24-hour	120	2.7	2%	17.1	19.8	16%
	Annual	70	2,7	4%	12.1	14.8	21%
PM_{10}	24-hour	50	1.4	3%	13.1	14.5	29%
$PM_{2.5}$	24-hour	27	0.2	<1%	9.0	9.2	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
Cumulative							
TSP	24-hour	120	4.1	3%	17.1	21.2	18%
	Annual	70	4.1	6%	12.1	16.2	23%
PM_{10}	24-hour	50	2.2	4%	13.1	15.3	31%
$PM_{2.5}$	24-hour	27	0.2	<1%	9.0	9.2	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
R6 – 3373 Highway 224 (Smith Property)							
Project Only							
TSP	24-hour	120	2.3	2%	17.1	19.4	16%
	Annual	70	2.3	3%	12.1	14.4	21%
PM_{10}	24-hour	50	1.2	2%	13.1	14.3	29%
$PM_{2.5}$	24-hour	27	0.1	<1%	9.0	9.1	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
Cumulative							
TSP	24-hour	120	3.5	3%	17.1	20.6	17%
	Annual	70	3.4	5%	12.1	15.5	22%
PM_{10}	24-hour	50	1.9	4%	13.1	15.0	30%
$PM_{2.5}$	24-hour	27	0.2	<1%	9.0	9.2	34%
	Annual	8.8	0.0	<1%	5.7	5.7	65%
R7 – Tangier River (Deepwood Estates Property)[b]							
Project Only							
TSP	24-hour	120	24.3	20%	17.1	41.4	35%
	Annual	70	6.7	10%	12.1	18.8	27%
PM_{10}	24-hour	50	12.4	25%	13.1	25.5	51%
$PM_{2.5}$	24-hour	27	1.3	5%	9.0	10.3	38%
	Annual	8.8	0.4	5%	5.7	6.1	69%

Table CEAA 2-31-4: Particulate Modelling Results at Sensitive Receptors – 80% Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
Cumulative							
TSP	24-hour	120	36.8	31%	17.1	53.9	45%
	Annual	70	10.1	14%	12.1	22.2	32%
PM_{10}	24-hour	50	18.7	37%	13.1	31.8	64%
$PM_{2.5}$	24-hour	27	2.0	7%	9.0	11.0	41%
	Annual	8.8	0.6	7%	5.7	6.3	72%
R8 – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)							
Project Only							
TSP	24-hour	120	4.2	4%	17.1	21.3	18%
	Annual	70	1.0	1%	12.1	13.1	19%
PM_{10}	24-hour	50	2.4	5%	13.1	15.5	31%
$PM_{2.5}$	24-hour	27	0.3	<1%	9.0	9.3	34%
	Annual	8.8	0.1	<1%	5.7	5.8	66%
Cumulative							
TSP	24-hour	120	6.4	5%	17.1	23.5	20%
	Annual	70	1.5	2%	12.1	13.6	19%
PM_{10}	24-hour	50	3.6	7%	13.1	16.7	33%
$PM_{2.5}$	24-hour	27	0.4	1%	9.0	9.4	35%
	Annual	8.8	0.1	1%	5.7	5.8	66%
R9 – 5579 Mooseland Road (Lloy Property)							
Project Only							
TSP	24-hour	120	11.4	9%	17.1	28.5	24%
	Annual	70	3.0	4%	12.1	15.1	22%
PM_{10}	24-hour	50	6.1	12%	13.1	19.2	38%
$PM_{2.5}$	24-hour	27	0.7	2%	9.0	9.7	36%
	Annual	8.8	0.2	2%	5.7	5.9	67%
Cumulative							
TSP	24-hour	120	17.2	14%	17.1	34.3	29%
	Annual	70	4.6	7%	12.1	16.7	24%
PM_{10}	24-hour	50	9.2	18%	13.1	22.3	45%
$PM_{2.5}$	24-hour	27	1.0	4%	9.0	10.0	37%
	Annual	8.8	0.3	3%	5.7	6.0	68%

Source: Attachment CEAA-2-31-A, Table 8B.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration.

[b] The Deepwood Estate property, the most impacted, has been acquired by AMNS so there will be no permanent or seasonal resident at this property.
µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate; g/m²/yr = grams per square metre per year.

The following figures illustrate the worst case scenarios (i.e., cumulative effects – Beaver Dam Mine Project, Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project, and the forestry industry) with 80% road dust mitigation isopleths for the maximum predicated concentrations for air quality parameters (i.e., TSP, PM_{10}, and $PM_{2.5}$,) at the property boundaries and at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are summarized in Tables CEAA 2-31-1 to CEAA 2-31-4. These figure series are as follows:

- Figure series CEAA 2-31-1A to CEAA 2-31-1G – Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels – with 80% Road Dust Mitigation
- Figure series CEAA 2-31-2A to CEAA 2-31-2G – Beaver Dam Mine Project Air Contour Annual Total Suspended Particulate Matter – with 80% Road Dust Mitigation
- Figure series CEAA 2-31-3A to CEAA 2-31-3G – Beaver Dam Mine Project Air Contour PM_{10} 24-Hour Levels – with 80% Road Dust Mitigation
- Figure series CEAA 2-31-4A to CEAA 2-31-4G – Beaver Dam Mine Project Air Contour $PM_{2.5}$ 24-Hour Levels – with 80% Road Dust Mitigation
- Figure series CEAA 2-31-5A to CEAA 2-31-5G – Beaver Dam Mine Project Air Contour $PM_{2.5}$ Annual Levels – with 80% Road Dust Mitigation

Air – without Road Dust Mitigation

Additional air particulate concentration modelling without road dust mitigation has been completed in response to Health Canada's request (Conformity Review from July 15, 2021 and October 8, 2021). These results are provided below and in Attachment CEAA 2-31-A. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These controls, commitments, mitigation measures and monitoring are detailed in Section 6.2.8 (Air – Mitigation Measures), Appendix 2 (draft Complaint Resolution Plan) of Appendix A.6 draft Engagement Plan, and Appendix C.3 draft Fugitive Dust Control Plan in the Updated 2021 EIS (AMNS 2021).

The modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10}, and $PM_{2.5}$) at the Project Area (PA) property boundaries without road dust mitigation for Project only including background concentrations are detailed in Attachment CEAA-2-31-A (Air Emissions Assessment Technical Report [Dated December 10, 2021]), Table 7A (Haul Road), and Tables 9A1 (Beaver Dam Mine Option A – Crusher) and 9B1 (Beaver Dam Mine Option B – Blasting). The maximum predicted concentrations at the PA property boundaries (Project only including background) without road dust mitigation are summarized below in Tables CEAA-2-32-5 and CEAA-2-31-6 in response to this IR2 (CEAA-2-31).

The modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10} and $PM_{2.5}$) without road dust mitigation at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) exceed the selected air quality criteria (Attachment CEAA-2-31-A, Table 6) for the TSP 24-hour, TSP annual, and PM_{10} 24-hour at the following sensitive receptor locations:

- TSP 24-hour (Project only including background) – R7;
- TSP annual (Project only including background) – R1 and R4; and

- PM_{10} 24-hour (Project only including background) – R7.

The detailed modelling results are shown in Attachment CEAA-2-31-A, Table 8A and are provided below as Table CEAA 2-31-7. Worst case scenarios along the Haul Road for modelled particulate concentrations without road dust mitigation considered for the air quality assessment are considered to be the cumulative effects from the Beaver Dam Mine Project, Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project, and the forestry industry. The worst case scenario at the Beaver Dam Mine Site is Option B (i.e., blasting) without mitigation. The maximum predicted concentrations for the worst case scenarios are summarized in Tables CEAA-2-31-5 and CEAA-2-31-6.

The worst case (i.e., cumulative effects), as requested by Health Canada, modelled particulate concentrations for air quality parameters (i.e., TSP, PM_{10} and $PM_{2.5}$) without road dust mitigation at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) exceed the selected air quality criteria (Attachment CEAA-2-31-A, Table 6) for the TSP 24-hour, TSP annual, and PM_{10} 24-hour at the following sensitive receptor locations:

- TSP 24-hour (cumulative effects) – R7;
- TSP annual (cumulative effects) – R1 and R4; and
- PM_{10} 24-hour (cumulative effects) – R4, R7, and R9.

The detailed modelling results are shown in Attachment CEAA-2-31-A, Table 8A and provided below as Table CEAA 2-31-7. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These controls, commitments, mitigation measures and monitoring are detailed in Section 6.2.8 (Air – Mitigation Measures), Appendix 2 (draft Complaint Resolution Plan) of Appendix A.6 draft Engagement Plan, and Appendix C.3 draft Fugitive Dust Control Plan in the Updated 2021 EIS (AMNS 2021).

As outlined in Attachment CEAA-2-31-A, Table 6 where Nova Scotia has air quality standards, these have been used as the assessment criteria. If there were no Nova Scotia criteria for compounds of interest, then Canada-wide standards have been assumed to applied.

Without mitigation scenario was not applied for the Touquoy Mine as it is an approved active mine and includes its own site specific mitigations which are currently being implemented.

Table CEAA 2-31-5: Maximum Predicted Concentrations from the Beaver Dam Mine Site during Operations – without Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[(a)] (µg/m³)	Percentage of Assessment Criteria for Cumulative Effect (%)
TSP	24-hour	120	276.9	231%	17.10	294.0	245%
	Annual	70	105.1	150%	12.10	117.20	167%
PM_{10}	24-hour	50	128.8	258%	13.10	141.90	284%
$PM_{2.5}$	24-hour	27	14.5	54%	9.00	23.50	87%
	Annual	8.8	6.2	70%	5.70	11.90	135%

Source: Adapted from Attachment CEAA-2-31-A, Table 9B1.

Notes: As requested by Health Canada modelling has been completed for air particulate concentrations without mitigation. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices.

(a) "Combined Effect" equals predicted maximum concentration and background concentration. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate.

Table CEAA 2-31-6: Maximum Predicted Concentrations due to Haul Road during Operations – without Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[(a)] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
Project Only							
TSP	24-hour	120	273.21	227.68%	17.10	290.31	241.92%
	Annual	70	87.30	124.71%	12.10	99.40	142.01%
PM_{10}	24-hour	50	117.96	235.92%	13.10	131.06	262.12%
$PM_{2.5}$	24-hour	27	12.62	46.74%	9.00	21.62	80.06%
	Annual	8.8	4.90	55.68%	5.70	10.60	120.46%
Cumulative							
TSP	24-hour	120	413.17	344.30%	17.10	430.27	358.56%
	Annual	70	132.03	188.61%	12.10	144.13	205.90%
PM_{10}	24-hour	50	178.39	356.78%	13.10	191.49	382.97%
$PM_{2.5}$	24-hour	27	19.08	70.67%	9.00	28.08	103.99%
	Annual	8.8	7.41	84.20%	5.70	13.11	148.98%

Source: Adapted from Attachment CEAA-2-31-A, Table 7A.

Notes: As requested by Health Canada modelling has been completed for air particulate concentrations without mitigation. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices.

(a) "Combined Effect" equals predicted maximum concentration and background concentration. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate.

Table CEAA 2-31-7: Particulate Modelling Results at Sensitive Receptors – without Road Dust Mitigation

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
R1 – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)							
Project Only							
TSP	24-hour	120	45.6	38%	17.10	62.7	52%
	Annual	70	65.1	93%	12.10	77.2	110%
PM_{10}	24-hour	50	23.1	46%	13.10	36.2	72%
$PM_{2.5}$	24-hour	27	2.5	9%	9.00	11.5	43%
	Annual	8.8	0.8	9%	5.70	6.5	73%
Cumulative							
TSP	24-hour	120	69.0	57%	17.10	86.1	72%
	Annual	70	98.5	141%	12.10	110.6	158%
PM_{10}	24-hour	50	35.0	70%	13.10	48.1	96%
$PM_{2.5}$	24-hour	27	3.8	14%	9.00	12.8	47%
	Annual	8.8	1.1	13%	5.70	6.8	78%
R2 – 4112 Highway 224 (Beaver Lake IR 17)							
Project Only							
TSP	24-hour	120	3.1	3%	17.10	20.2	17%
	Annual	70	0.6	<1%	12.10	12.7	18%
PM_{10}	24-hour	50	2.0	4%	13.10	15.1	30%
$PM_{2.5}$	24-hour	27	0.2	<1%	9.00	9.2	34%
	Annual	8.8	0.0	<1%	5.70	5.7	65%
Cumulative							
TSP	24-hour	120	4.7	4%	17.10	21.8	18%
	Annual	70	0.8	1%	12.10	12.9	18%
PM_{10}	24-hour	50	3.0	6%	13.10	16.1	32%
$PM_{2.5}$	24-hour	27	0.3	1%	9.00	9.3	35%
	Annual	8.8	0.0	<1%	5.70	5.7	65%
R3 – 4115 Highway 224 (Cottage on Crown Land)							
Project Only							
TSP	24-hour	120	5.3	4%	17.10	22.4	19%
	Annual	70	1.8	3%	12.10	13.9	20%
PM_{10}	24-hour	50	3.0	6%	13.10	16.1	32%
$PM_{2.5}$	24-hour	27	0.3	1%	9.00	9.3	35%
	Annual	8.8	0.0	<1%	5.70	5.7	65%
Cumulative							

Table CEAA 2-31-7: Particulate Modelling Results at Sensitive Receptors – without Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
TSP	24-hour	120	8.1	7%	17.10	25.2	21%
	Annual	70	2.8	4%	12.10	14.9	21%
PM_{10}	24-hour	50	4.5	9%	13.10	17.6	35%
$PM_{2.5}$	24-hour	27	0.5	2%	9.00	9.5	35%
	Annual	8.8	0.1	<1%	5.70	5.8	65%
R4 – 3492 Highway 224 (Hobbs Property)							
Project Only							
TSP	24-hour	120	67.9	57%	17.10	85.0	71%
	Annual	70	104.3	149%	12.10	116.4	166%
PM_{10}	24-hour	50	35.3	71%	13.10	48.4	97%
$PM_{2.5}$	24-hour	27	3.8	14%	9.00	12.8	47%
	Annual	8.8	1.2	13%	5.70	6.9	78%
Cumulative							
TSP	24-hour	120	102.6	86%	17.10	119.7	100%
	Annual	70	157.7	225%	12.10	169.8	243%
PM_{10}	24-hour	50	53.4	107%	13.10	66.5	133%
$PM_{2.5}$	24-hour	27	5.7	21%	9.00	14.7	54%
	Annual	8.8	1.7	20%	5.70	7.4	85%
R5 – 3379 Highway 224 (McLeod Property)							
Project Only							
TSP	24-hour	120	13.4	11%	17.10	30.5	25%
	Annual	70	13.6	19%	12.10	25.7	37%
PM_{10}	24-hour	50	7.1	14%	13.10	20.2	40%
$PM_{2.5}$	24-hour	27	0.8	3%	9.00	9.8	36%
	Annual	8.8	0.2	2%	5.70	5.9	67%
Cumulative							
TSP	24-hour	120	20.3	17%	17.10	37.4	31%
	Annual	70	20.6	29%	12.10	32.7	47%
PM_{10}	24-hour	50	10.8	22%	13.10	23.9	48%
$PM_{2.5}$	24-hour	27	1.2	4%	9.00	10.2	38%
	Annual	8.8	0.2	3%	5.70	5.9	68%
R6 – 3373 Highway 224 (Smith Property)							
Project Only							

Table CEAA 2-31-7: Particulate Modelling Results at Sensitive Receptors – without Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
TSP	24-hour	120	11.6	10%	17.10	28.7	24%
	Annual	70	11.4	16%	12.10	23.5	34%
PM_{10}	24-hour	50	6.2	12%	13.10	19.3	39%
$PM_{2.5}$	24-hour	27	0.7	2%	9.00	9.7	36%
	Annual	8.8	0.1	2%	5.70	5.8	66%
Cumulative							
TSP	24-hour	120	17.5	15%	17.10	34.6	29%
	Annual	70	17.2	25%	12.10	29.3	42%
PM_{10}	24-hour	50	9.3	19%	13.10	22.4	45%
$PM_{2.5}$	24-hour	27	1.0	4%	9.00	10.0	37%
	Annual	8.8	0.2	2%	5.70	5.9	67%
R7 – Tangier River (Deepwood Estates Property)[b]							
Project Only							
TSP	24-hour	120	121.7	101%	17.10	138.8	116%
	Annual	70	33.4	48%	12.10	45.5	65%
PM_{10}	24-hour	50	61.8	124%	13.10	74.9	150%
$PM_{2.5}$	24-hour	27	6.6	24%	9.00	15.6	58%
	Annual	8.8	2.1	23%	5.70	7.8	88%
Cumulative							
TSP	24-hour	120	184.0	153%	17.10	201.1	168%
	Annual	70	50.4	72%	12.10	62.5	89%
PM_{10}	24-hour	50	93.4	187%	13.10	106.5	213%
$PM_{2.5}$	24-hour	27	9.9	37%	9.00	18.9	70%
	Annual	8.8	3.1	35%	5.70	8.8	100%
R8 – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)							
Project Only							
TSP	24-hour	120	21.0	18%	17.10	38.1	32%
	Annual	70	4.9	7%	12.10	17.0	24%
PM_{10}	24-hour	50	12.0	24%	13.10	25.1	50%
$PM_{2.5}$	24-hour	27	1.3	5%	9.00	10.3	38%
	Annual	8.8	0.3	4%	5.70	6.0	69%
Cumulative							
TSP	24-hour	120	21.0	18%	17.10	38.1	32%

Table CEAA 2-31-7: Particulate Modelling Results at Sensitive Receptors – without Road Dust Mitigation (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[(a)] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
	Annual	70	4.9	7%	12.10	17.0	24%
PM_{10}	24-hour	50	12.0	24%	13.10	25.1	50%
$PM_{2.5}$	24-hour	27	1.3	5%	9.00	10.3	38%
	Annual	8.8	0.3	4%	5.70	6.0	69%
R9 – 5579 Mooseland Road (Lloy Property)							
Project Only							
TSP	24-hour	120	56.8	47%	17.10	73.9	62%
	Annual	70	15.2	22%	12.10	27.3	39%
PM_{10}	24-hour	50	30.3	61%	13.10	43.4	87%
$PM_{2.5}$	24-hour	27	3.3	12%	9.00	12.3	45%
	Annual	8.8	1.0	11%	5.70	6.7	76%
Cumulative							
TSP	24-hour	120	85.9	72%	17.10	103.0	86%
	Annual	70	23.1	33%	12.10	35.2	50%
PM_{10}	24-hour	50	45.9	92%	13.10	59.0	118%
$PM_{2.5}$	24-hour	27	4.9	18%	9.00	13.9	52%
	Annual	8.8	1.5	17%	5.70	7.2	82%

Source: Attachment CEAA-2-31-A, Table 8A.

Notes: As requested by Health Canada modelling has been completed for air particulate concentrations without mitigation. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices.

(a) "Combined Effect" equals predicted maximum concentration and background concentration.

(b) The Deepwood Estate property, the most impacted, has been acquired by AMNS so there will be no permanent or seasonal resident at this property. µg/m³ = micrograms per cubic metre; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TSP = total suspended particulate; g/m²/yr = grams per square metre per year.

The following figures illustrate the worst case scenarios (i.e., cumulative effects – Beaver Dam Mine Project, Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project, and the forestry industry), as requested by Health Canada, without road dust mitigation isopleths for the maximum predicated concentrations for air quality parameters (i.e., TSP, PM_{10}, and $PM_{2.5}$) at the property boundaries and at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are summarized in Tables CEAA 2-31-5 to CEAA 2-31-7. AMNS is committed to and will apply mitigation measures for air during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These figures are as follows:

- Figure CEAA-2-31-6 – Beaver Dam Mine Site Air Contour 24-Hour Average Total Suspended Particulates UNMITIGATED
- Figure CEAA-2-31-7 – Beaver Dam Mine Site Air Contour Annual Average Total Suspended Particulates UNMITIGATED
- Figure CEAA-2-31-8 – Beaver Dam Mine Site Air Contour PM_{10} 24-Hour Levels UNMITIGATED
- Figure CEAA-2-31-9 – Beaver Dam Mine Site Air Contour $PM_{2.5}$ Annual Levels UNMITIGATED
- Figure series CEAA 2-31-10A to CEAA 2-31-10G – Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels UNMITIGATED
- Figure series CEAA 2-31-11A to CEAA 2-31-11G – Beaver Dam Mine Project Air Contour Annual Total Suspended Particulate Matter UNMITIGATED
- Figure series CEAA 2-31-12A to CEAA 2-31-12G – Beaver Dam Mine Project Air Contour PM_{10} 24-Hour Levels UNMITIGATED
- Figure series CEAA 2-31-13A to CEAA 2-31-13G – Beaver Dam Mine Project Air Contour $PM_{2.5}$ 24-Hour Levels UNMITIGATED
- Figure series CEAA 2-31-14A to CEAA 2-31-14G – Beaver Dam Mine Project Air Contour $PM_{2.5}$ Annual Levels UNMITIGATED

Air – Gaseous Species (NO_2, SO_2, and VOCs)

The predicted modelling results for gaseous compounds (i.e., NO_2, SO_2 and VOCs) did not exceed the selected air quality criteria for these parameters and are shown to be negligible at the property boundaries of the PA (i.e., Beaver Dam Mine Site, Haul Road, and Touquoy Mine Site) (Attachment CEAA-2-31-A, Tables 7C, 8C, and 9B2). The maximum predicted concentrations at the PA property boundaries for gaseous compounds are summarized in Tables CEAA-2-32-8 to CEAA-2-31-10 in response to this IR2 (CEAA-2-31).

The predicted modelling results for gaseous compounds (i.e., NO_2, SO_2 and VOC) at sensitive receptors (i.e., human receptors – seasonal and permanent dwellings) are in compliance with the selected air quality criteria Attachment CEAA 2031-A, Table 6). The detailed modelling results are shown in Attachment CEAA-2-31-A, Tables 8C and 8D and are provided below as Table CEAA 2-31-11.

Worst case scenarios for modelled gaseous compounds are considered to be the cumulative effects of truck traffic along the Haul Road from the Beaver Dam Mine Project, Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project, and the forestry industry. The maximum predicted concentrations for the worst case scenarios are summarized in Tables CEAA-2-31-9 and CEAA-2-31-11.

The worst case (i.e., cumulative effects) modelled gaseous compounds (i.e., NO_2, SO_2 and VOC) at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are in compliance with the selected air quality criteria (Attachment CEAA-2-31-A, Table 6). The detailed modelling results are shown in Attachment CEAA-2-31-A, Table 8D and are provided below as Table CEAA 2-31-11.

As outlined in Attachment CEAA-2-31-A, Table 6 where Nova Scotia has air quality standards, these have been used as the assessment criteria. If there were no Nova Scotia criteria for compounds of interest, then Canada-wide standards have been assumed to applied. There is no air quality criteria for total VOCs (Attachment CEAA 2-31-A, Table 6), and the predicted maximum concentrations of total VOCs presented in Attachment CEAA-2-31-A, Tables 7C, 8C, and 9B2 and are shown to be negligible.

There were no mitigation measures considered for gaseous compounds from the truck traffic along the Haul Road.

Table CEAA 2-31-8: Maximum Predicted Concentrations of the Gaseous Species from the Beaver Dam Mine Site Operations

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Cumulative Effect (%)
NO_2	1-hour	79.0	65.3	83%	9.4	74.7	95%
	24-hour	200	0.4	<1%	17.0	17.4	9%
	Annual	22.6	0.014	<1%	3.3	3.3	15%
SO_2	1-hour	170.1[b]	9.4	6%	7.9	17.3	10%
	24-hour	300	0.1	<1%	5.2	5.3	2%
	Annual	10.5[b]	0.0019	<1%	1.9	1.9	18%
VOC	1-hour	–	–	–	–	–	–
	24-hour	–	–	–	–	–	–
	Annual	–	–	–	–	–	–

Source: Adapted from Attachment CEAA-2-31-A, Table 9B2.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration.

[b] Assessment criteria has been updated in this IR2 response to reflect the 2025 Canadian Ambient Air Quality Standards (CAAQS). The assessment criteria in Attachment CEAA 2-31-A may differ for SO_2.

µg/m³ = micrograms per cubic metre; NO_2 = nitrogen dioxide; SO_2 = sulphur dioxide; VOC = volatile organic compounds.

Table CEAA 2-31-9: Maximum Predicted Concentrations of the Gaseous Species along the Haul Road during Operations

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
Project Only Truck Traffic							
NO_2	1-hour	79	14.2	18	9.4	23.6	30
	24-hour	200	6.7	3	17.0	23.7	12
	Annual	22.6	2.7	12	3.3	5.9	26
SO_2	1-hour	170.1[b]	0.0	0	7.9	7.9	5
	24-hour	300	0.0	0	5.2	5.2	2
	Annual	10.5[b]	0.0	0	1.9	1.9	18
VOC	1-hour	–	0.6	–	–	–	–
	24-hour	–	0.3	–	–	–	–
	Annual	–	0.1	–	–	–	–
Cumulative Truck Traffic							
NO_2	1-hour	79	21.5	27	9.4	30.9	39
	24-hour	200	10.2	5	17.0	27.2	14
	Annual	22.6	4.0	18	3.3	7.3	32
SO_2	1-hour	170.1[b]	0.0	0	7.9	7.9	5
	24-hour	300	0.0	0	5.2	5.2	2
	Annual	10.5[b]	0.0	0	1.9	1.9	18
VOC	1-hour	–	0.9	–	–	–	–
	24-hour	–	0.4	–	–	–	–
	Annual	–	0.2	–	–	–	–

Source: Adapted from Attachment CEAA 2-31-A, Table 7C.

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration.

[b] Assessment criteria has been updated in this IR2 response to reflect the 2025 Canadian Ambient Air Quality Standards (CAAQS). The assessment criteria in Attachment CEAA 2-31-A may differ for SO_2.

µg/m³ = micrograms per cubic metre; NO_2 = nitrogen dioxide; SO_2 = sulphur dioxide; VOC = volatile organic compounds.

Table CEAA 2-31-10: Maximum Predicted Concentrations of the Gaseous Species from the Touquoy Mine Site Operations

Parameter	Averaging Period	Assessment Criteria (Ambient Air Quality Standard) (µg/m³)	Maximum Predicted Concentration (µg/m³)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m³)	Combined Effect[a] (µg/m³)	Percentage of Assessment Criteria for Combined Effect (%)
NO_X	1-hour	79	58.2	74	9.4	67.9	86
	24-hour	200	23.3	12	17.0	40.3	20
	Annual	22.6	0.25	1	3.3	3.55	16
SO_2	1-hour	170.1[b]	17.9	11	7.9	25.8	15
	24-hour	300	1.06	<1	5.2	6.26	2
	Annual	10.5[b]	0.065	<1	1.9	1.96	19
VOC	1-hour	–	–	–	–	–	–
	24-hour	–	–	–	–	–	–
	Annual	–	–	–	–	–	–

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration.

[b] Assessment criteria has been updated in this IR2 response to reflect the 2025 Canadian Ambient Air Quality Standards (CAAQS). The assessment criteria in Attachment CEAA 2-31-A may differ for SO_2.

µg/m³ = micrograms per cubic metre; NO_2 = nitrogen dioxide; SO_2 = sulphur dioxide; VOC = volatile organic compounds.

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
R1 – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)							
Project Only							
NO_2	1-hour	79	6.37	8%	9.40	15.77	20%
	24-hour	200	1.03	1%	17.00	18.03	9%
	Annual	22.6	0.30	1%	3.30	3.60	16%
SO_2	1-hour	170.1[b]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[b]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.27	-	-	-	-
	24-hour	-	0.04	-	-	-	-
	Annual	-	0.01	-	-	-	-
Cumulative							
NO_2	1-hour	79	9.65	12%	9.40	19.05	24%
	24-hour	200	1.56	1%	17.00	18.56	9%
	Annual	22.6	0.45	2%	3.30	3.75	17%
SO_2	1-hour	170.1[b]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[b]	0.00	<1%	1.90	1.90	18%

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
VOCs	1-hour	-	0.41	-	-	-	-
	24-hour	-	0.06	-	-	-	-
	Annual	-	0.02	-	-	-	-
R2 – 4112 Highway 224 (Beaver Lake IR 17)							
Project Only							
NO_2	1-hour	79	6.17	8%	9.40	15.57	20%
	24-hour	200	0.46	0%	17.00	17.46	9%
	Annual	22.6	0.07	0%	3.30	3.37	15%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.02	-	-	-	-
	Annual	-	0.00	-	-	-	-
Cumulative							
NO_2	1-hour	79	9.35	12%	9.40	18.75	24%
	24-hour	200	0.7	0%	17.00	17.70	9%
	Annual	22.6	0.11	0%	3.30	3.41	15%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.00	-	-	-	-
R3 – 4115 Highway 224 (Cottage on Crown Land)							
Project Only							
NO_2	1-hour	79	3.99	5%	9.40	13.39	17%
	24-hour	200	0.41	0%	17.00	17.41	9%
	Annual	22.6	0.10	0%	3.30	3.40	15%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.17	-	-	-	-
	24-hour	-	0.02	-	-	-	-
	Annual	-	0.00	-	-	-	-
Cumulative							
NO_2	1-hour	79	6.05	8%	9.40	15.45	20%
	24-hour	200	0.62	0%	17.00	17.62	9%
	Annual	22.6	0.15	1%	3.30	3.45	15%

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.00	-	-	-	-
R4 – 3492 Highway 224 (Hobbs Property)							
Project Only							
NO_2	1-hour	79	11.93	15%	9.40	21.33	27%
	24-hour	200	2.74	1%	17.00	19.74	10%
	Annual	22.6	0.84	4%	3.30	4.14	18%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.50	-	-	-	-
	24-hour	-	0.11	-	-	-	-
	Annual	-	0.03	-	-	-	-
Cumulative							
NO_2	1-hour	79	18.08	23%	9.40	27.48	35%
	24-hour	200	4.15	2%	17.00	21.15	11%
	Annual	22.6	1.27	6%	3.30	4.57	20%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.76	-	-	-	-
	24-hour	-	0.17	-	-	-	-
	Annual	-	0.005	-	-	-	-
R5 – 3379 Highway 224 (McLeod Property)							
Project Only							
NO_2	1-hour	79	6.31	8%	9.40	15.71	20%
	24-hour	200	0.69	0%	17.00	17.69	9%
	Annual	22.6	0.18	1%	3.30	3.48	15%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.01	-	-	-	-

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
Cumulative							
NO_2	1-hour	79	9.56	12%	9.40	18.96	24%
	24-hour	200	1.05	1%	17.00	18.05	9%
	Annual	22.6	0.27	1%	3.30	3.57	16%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.02	-	-	-	-
R6 – 3373 Highway 224 (Smith Property)							
Project Only							
NO_2	1-hour	79	6.27	8%	9.40	15.67	20%
	24-hour	200	0.63	0%	17.00	17.63	9%
	Annual	22.6	0.16	1%	3.30	3.46	15%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.01	-	-	-	-
Cumulative							
NO_2	1-hour	79	9.50	12%	9.40	18.90	24%
	24-hour	200	0.95	0%	17.00	17.95	9%
	Annual	22.6	0.24	1%	3.30	3.54	16%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.02	-	-	-	-
R7 – Tangier River (Deepwood Estates Property)[(b)]							
Project Only							
NO_2	1-hour	79	13.29	17%	9.40	22.69	29%
	24-hour	200	4.43	2%	17.00	21.43	11%
	Annual	22.6	1.37	6%	3.30	4.67	21%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
VOCs	1-hour	-	0.55	-	-	-	-
	24-hour	-	0.18	-	-	-	-
	Annual	-	0.06	-	-	-	-
Cumulative							
NO_2	1-hour	79	20.14	26%	9.40	29.54	37%
	24-hour	200	6.71	3%	17.00	23.71	12%
	Annual	22.6	2.08	9%	3.30	5.38	24%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.83	-	-	-	-
	24-hour	-	0.27	-	-	-	-
	Annual	-	0.09	-	-	-	-
R8 – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)							
Project Only							
NO_2	1-hour	79	8.00	10%	9.40	17.40	22%
	24-hour	200	1.17	1%	17.00	18.17	9%
	Annual	22.6	0.30	1%	3.30	3.60	16%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.33	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.01	-	-	-	-
Cumulative							
NO_2	1-hour	79	12.12	15%	9.40	21.52	27%
	24-hour	200	1.77	1%	17.00	18.77	9%
	Annual	22.6	0.45	2%	3.30	3.75	17%
SO_2	1-hour	170.1[(b)]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[(b)]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.50	-	-	-	-
	24-hour	-	0.08	-	-	-	-
	Annual	-	0.02	-	-	-	-
R9 – 5579 Mooseland Road (Lloy Property)							
Project Only							
NO_2	1-hour	79	9.16	12%	9.40	18.56	24%
	24-hour	200	2.93	1%	17.00	19.93	10%
	Annual	22.6	0.87	4%	3.30	4.17	18%

Table CEAA 2-31-11: Gaseous Compounds Modelling Results at Sensitive Receptors during Operations (continued)

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) (µg/m3)	Maximum Predicted Concentration (µg/m3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m3)	Combined Effect(a) (µg/m3)	Percentage of Assessment Criteria for Combined Effect (%)
SO_2	1-hour	170.1[b]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[b]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.38	-	-	-	-
	24-hour	-	0.12	-	-	-	-
	Annual	-	0.03	-	-	-	-
Cumulative							
NO_2	1-hour	79	13.88	18%	9.40	23.28	29%
	24-hour	200	4.44	2%	17.00	21.44	11%
	Annual	22.56	1.32	6%	3.30	4.62	20%
SO_2	1-hour	170.1[b]	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.5[b]	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.58	-	-	-	-
	24-hour	-	0.18	-	-	-	-
	Annual	-	0.05	-	-	-	-

Source: Attachment CEAA-2-31-A, Tables 8C and 8D..

Notes: [a] "Combined Effect" equals predicted maximum concentration and background concentration.

[b] Assessment criteria has been updated in this IR2 response to reflect the 2025 Canadian Ambient Air Quality Standards (CAAQS). The assessment criteria in Attachment CEAA 2-31-A may differ for SO_2.

µg/m^3 = micrograms per cubic metre; NO_2 = nitrogen dioxide; SO_2 = sulphur dioxide; VOC = volatile organic compounds.

The following figures illustrate the worst case scenarios (i.e., cumulative effects) isopleths for the maximum predicated concentrations for modelled gaseous compounds (i.e., NO_2, SO_2 and VOC) at the property boundaries and at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) are summarized in Tables CEAA 2-31-9 to CEAA 2-31-11. These figure series are as follows:

- Figure series CEAA 2-31-15A to CEAA 2-31-15G – Beaver Dam Mine Project Air Contours NO_2 1-Hour Levels
- Figure series CEAA 2-31-16A to CEAA 2-31-16G – Beaver Dam Mine Project Air Contours NO_2 24-Hour Levels
- Figure series CEAA 2-31-17A to CEAA 2-31-17G – Beaver Dam Mine Project Air Contours NO_2 Averaged Annual Levels
- Figure series CEAA 2-31-18A to CEAA 2-31-18G – Beaver Dam Mine Project Air Contours SO_2 1-Hour Levels
- Figure series CEAA 2-31-19A to CEAA 2-31-19G – Beaver Dam Mine Project Air Contours SO_2 24-Hour Levels
- Figure series CEAA 2-31-20A to CEAA 2-31-20G – Beaver Dam Mine Project Air Contours SO_2 Averaged Annual Levels
- Figure series CEAA 2-31-21A to CEAA 2-31-21G – Beaver Dam Mine Project Air Contours VOC 1-Hour Levels
- Figure series CEAA 2-31-22A to CEAA 2-31-22G – Beaver Dam Mine Project Air Contours VOC 24-Hour Levels
- Figure series CEAA 2-31-23A to CEAA 2-31-23G – Beaver Dam Mine Project Air Contours VOC Averaged Annual Levels

Noise

Additional noise modelling without mitigation has been completed in response to Health Canada's request (Conformity Review from July 15, 2021 and October 8, 2021). These results are provided below and in Attachment CEAA 2-31-B. AMNS is committed to and will apply mitigation measures for noise during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These controls, commitments, mitigation measures and monitoring are detailed in Section 6.1.8 (Noise – Mitigation Measures), and Appendix 2 (draft Complaint Resolution Plan) of Appendix A.6 draft Engagement Plan in the Updated 2021 EIS (AMNS 2021).

The modelled maximum predicted noise levels during operations with mitigation at the property boundaries of the PA (i.e., Beaver Dam Mine Site, Haul Road and Touquoy Mine Site) are provided in the Updated 2021 EIS [AMNS 2021] in Section 6.1.7.3.2, Table 6.1-10, page 6-26 and Attachment CEAA 2-31-B, Section 3.2.2, Table 3.4 and included below as Table CEAA 2-31-12. The maximum predicted noise level at the property boundaries are in compliance with sound level limits with mitigation (Table CEAA 2-31-12). The noise level guideline includes the following criteria: daytime (7:00 AM to 7:00 PM), evening (7:00 PM to 11:00 PM), and nighttime (11:00 PM to 7:00 AM). As described in Section 3.2.2 in Attachment CEAA 2-31-B, Option A and Option B that are presented in Table CEAA 2-31-12 are reflective of the height of the safety berm that is required along the north boundary of the pit. The noise modelling includes the safety berms at both Beaver Dam Mine Site and Touquoy Site.

Table CEAA 2-31-12: Maximum Predicted Noise Levels at Property Boundaries during Operations – with Mitigation

Property Line Description	Maximum Noise Level (dBA) (Day/Evening/Night)	Sound Level Limit (dBA) (Day/Evening/Night)	Compliance
Beaver Dam Mine Site Property, Option A[(b)]	55 / 55 / 55	65 / 60 / 55	Yes
Beaver Dam Mine Site Property, Option B[(b)]	55 / 55 / 55	65 / 60 / 55	Yes
Haul Road[(a)] (30 m from centerline of road)	58 / 58 / -	65 / 60 / 55	Yes
Touquoy Mine Site Property[(b)]	55 / 55 / 54	65 / 60 / 55	Yes

Source: Attachment CEAA 2-31-B, Section 3.2.2, Table 3.4.
Notes: [(a)] Truck traffic used in the noise assessment and related modelling is considered to be a 16-hour shift between 7:00 AM to 11:00 PM (Guidelines for Environmental Noise Measurement and Assessment [NSEL 1990]).
[(b)] Nova Scotia Environment Pit and Quarry Guidelines (NSEL 1999) and Guidelines for Environmental Noise Measurement and Assessment. (NSEL 1990).
dBA = decibels; m = metre.

The modelled maximum predicted noise levels during operations without mitigation at the property boundaries of the PA (i.e., Beaver Dam Mine Site and Haul Road) are provided in Attachment CEAA 2-31-B, Section 3.2.1, Table 3.3 and included below as Table CEAA 2-31-13.

AMNS is committed to installing safety berms as a mitigation measure for noise reduction at the Beaver Dam Mine.

The predicted modelling results for noise levels at the sensitive receptors during operations (i.e., human receptors – seasonal and permanent dwellings) are in compliance with noise level limits. The detailed modelling results are provided in Attachment CEAA 2-31-B, Section 3.1, Table 3.2 and are included below as Table CEAA 2-31-14.

Without mitigation scenario was not applied for the Touquoy Mine as it is an approved active mine with safety berms currently in place. There are no mitigation measures applied to the noise modelling along the Haul Road.

Table CEAA 2-31-13: Maximum Predicted Noise Levels at Property Boundaries during Operations – without Mitigation

Property Line Description	Maximum Noise Level (dBA) (Day/Evening/Night)	Sound Level Limit (dBA) (Day/Evening/Night)	Compliance
Beaver Dam Mine Site Property, Option A[(b)]	60 / 60 / 60	65 / 60 / 55	No
Beaver Dam Mine Site Property, Option B[(b)]	62 / 62 / 62	65 / 60 / 55	No

Source: Attachment CEAA 2-31-B, Section 3.2.1, Table 3.3.
Notes: As requested by Health Canada modelling has been completed for noise without mitigation. AMNS is committed to and will apply mitigation measures for noise during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices.
(a) Truck traffic used in the noise assessment and related modelling is considered to be a 16-hour shift between 7:00 AM to 11:00 PM (Guidelines for Environmental Noise Measurement and Assessment [NSEL 1990]).
(b) Nova Scotia Environment Pit and Quarry Guidelines (NSEL 1999) and Guidelines for Environmental Noise Measurement and Assessment. (NSEL 1990).
dBA = decibels; m = metre.

Table CEAA 2-31-14: Predicted Noise Level at the Sensitive Receptors during Operations

Sensitive Receptor	Receptor Description	Noise Level (dBA) (Day/Evening/Night)	Sound Level Limit[(a)] (dBA) (Day/Evening/Night)	Compliance
R1	9 Beaver Dam Mine Road (Marlborough Property)	50 / 50 / 27	65 / 60 / 55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	31 / 31 / 28	65 / 60 / 55	Yes
R3	4115 Highway 224 (Cottage on Crown Land)	33 / 33 / 28	65 / 60 / 55	Yes
R4	3492 Highway 224 (Hobbs Property)	56 / 56 / 27	65 / 60 / 55	Yes
R5	3379 Highway 224 (McLeod Property)	51 / 51 / 27	65 / 60 / 55	Yes
R6	3373 Highway 224 (Smith Property)	51 / 51 / 27	65 / 60 / 55	Yes
R7	Tangier River (Deepwood Estates Property)	55 / 55 / 20	65 / 60 / 55	Yes
R8	Tanger River (Musqudoboit Lumber Co. Ltd. Property/John Dickson Lease)	44 / 44 / 20	65 / 60 / 55	Yes
R9	5579 Mooseland Road (Lloy Property)	51 / 51 / 26	65 / 60 / 55	Yes

Source: Attachment CEAA 2-31-B, Section. 3.1, Table 3.2.
Notes: (a) NSEL 1990.
dBA = decibels; m = metre.

Noise level predictions at the property boundaries of the PA (i.e., Beaver Dam Mine Site, Haul Road and Touquoy Mine Site) and at sensitive receptors locations (i.e., human receptors – seasonal and permanent dwellings) that are presented in Tables CEAA 2-31-12 to CEAA 2-31-14 are illustrated on Figure series CEAA 2-31-24A to CEAA 2-31-24E (Daytime/Evening) and Figure CEAA 2-31-25 (Nighttime).

The noise level predictions without mitigation are presented in Figures CEAA 2-31-26 (Beaver Dam Mine Site - Day/Evening) and CEAA-2-31-27 (Beaver Dam Mine Site - Nighttime).

Traditional Land and Resource Use

The traditional land and resource use areas were shared with AMNS by the Millbrook First Nation under confidential cover. The figures, predicted air parameters concentrations (i.e., TSP, PM_{10}, $PM_{2.5}$, NO_2, SO_2 and VOC) and the predicted noise levels during operations, that were created to include the traditional land and resource use areas have only been shared directly with Millbrook First Nation on May 31, 2021 (original IR2 response). On October 15, 2021, the update figures included in this IR2 response (CEAA 2-31) were shared with Millbrook First Nation, note the update figures provided on October 15, 2021 did not include the traditional land and resource use areas and will be provided at a later date. Given the confidential nature of the data (i.e., traditional land and resource use areas), Millbrook First Nation should be contacted directly to request a review of these figures.

It should be noted that the property boundary conditions along the haul road were applied to serve as a proxy to represent areas of traditional land and resource use (recreational practice areas) outside of the PA. As mentioned, inside the property boundaries, access will be limited along the haul road and restricted within the Beaver Dam Mine property boundary. There is no fixed sensitive receptor (i.e., human receptors – seasonal and permanent dwellings) location within the proposed Beaver Dam Mine site, therefore the property boundary serve as a proxy to represent areas of traditional land and resource use (recreational practice areas). Compliance is met at the property boundaries for all air and noise parameters, as shown in the tables and maps referenced above, and thus, by proxy, also met at all traditional land and resource use areas outside of the PA.

2. CEAA 2-31 Part B

Updates to the noise and air assessments are provided in Section 6.1, page 6-1 and Section 6.2, page 6-32, Appendix B.1 (Beaver Dam Mine Construction Noise Assessment – memo [AMNS 2021]) and attached to this IR2 response as Attachment CEAA 2-31-B (Updated Noise Impact Assessment Technical Report [Dated November 19, 2021]) and Attachment CEAA 2-31-A (Air Emissions Assessment Technical Report [Dated December 10, 2021]). The updated Human Health Risk Assessment is provided in the technical report "Evaluation of Potential Human Exposures and Risks related to Emissions from the Beaver Dam Mine Project (Dust deposition; Recreational water usage; and country foods) included as Appendix C.2 of the Updated 2021 EIS (AMNS 2021).

3. CEAA 2-31 Part C

Predicted noise levels at the property boundaries (i.e., Beaver Dam Mine Site, Haul Road and Touquoy Mine Site) are within the sound level limits specified in the NSEL Pit and Quarry Guidelines (NSEL 1999) provided that the recommended mitigation measures (e.g., safety berm/road around the open pit) are applied to attenuate noise levels (Section 6.1.7.3.2, page 6-25 in the Updated 2021 EIS [AMNS 2021] and attached to this IR2 response as Attachment CEAA 2-31-B, Section 3.2). The adjusted Project design has been updated in consideration of the Pit and Quarry Guidelines at the property boundaries.

4. CEAA 2-31 Part D

Mitigation measures include the provision of a safety berm/road to mitigate noise (Section 6.1.7.3.2, page 6-25, Section 6.1.8, Table 6.1-11, page 6-28 in the Updated 2021 EIS [AMNS 2021] and attached to this IR2 response as Attachment CEAA 2-31-B, Section 3.2) and predicted noise levels with updated Project design meet compliance at the property boundaries.

5. CEAA 2-31 Part E

Noise monitoring would be completed during each blasting event, as required by the NSEL Pit and Quarry Guidelines (NSEL 1999). Blast monitoring generally involves noise and vibration monitoring during each blasting event and includes monitoring at the nearest residence to the Beaver Dam Mine Site, which in this case would be at Beaver Lake IR 17 (R2). Monitoring and mitigations explicit to blasting will be described in the Explosive Management Plan that will be submitted as part of the permitting process (Section 6.1.8, page 6-28 of the Updated 2021 EIS [AMNS 2021]).

Under the existing Industrial Approval for the Touquoy Mine, maximum sound levels are prescribed at property boundaries for days, evenings and weekends, and monitoring is only required when requested by NSE in response to a complaint or concern. Mitigation measures will be implemented as necessary where sound levels are a concern, i.e., causing annoyance, and monitoring demonstrates exceedances. Mitigation of noise excesses at the property lines are not considered to be critical, as predicted noise levels at the worst-case points of reception are within the applicable noise limits. To date, no noise complaints have been received or are anticipated. A complaint from the public and/or a First Nation community member would be a trigger for consideration of mitigation, as described below (Section 6.1.8, page 6-28 of the Updated 2021 EIS [AMNS 2021]).

Noise monitoring will be completed as directed by regulators or as a result of a complaint or engagement. A draft Engagement Plan (Appendix A.6 of the Updated 2021 EIS [AMNS 2021]) will be implemented and based on feedback, additional mitigations will be considered (Section 6.1.8, page 6-28 of the Updated 2021 EIS [AMNS 2021]).

The existing community complaints process existing for the Touquoy Mine will be expanded to include the Beaver Dam Project. Complaints regarding noise will be documented and investigated immediately. AMNS will work with the local communities to understand specific concerns to determine if additional mitigation measures, adaptive management, will be necessary. This process will evolve through regulatory permitting, as well as public and Mi'kmaq of Nova Scotia engagement (Section 6.1.8, page 6-28 of the Updated 2021 EIS [AMNS 2021]).

Additional details regarding the complaint registry for the Beaver Dam Mine Project are included in IR2 response to CEAA 2-32.

6. CEAA 2-31 Part F

The modelled predicated concentrations for air parameters (i.e., TSP, PM_{10}, $PM_{2.5}$, NO_2, SO_2 and VOCs) at the property boundaries are detailed in Attachment CEAA 2-31-A (Air Emissions Assessment Technical Report [Dated December 10, 2121]), with the modelling results outlined in Tables 7B and 8B (Road Results Particulate with mitigation), Tables 7C, 8C, and 8D (NO_2, SO_2, and VOC), and Tables 9B2 and 9C (Beaver Dam Mine Site with mitigation and Touquoy Mine Site).

The summarized maximum predicted concentrations tables presented in the Updated 2021 EIS Air effects assessment (Section 6.2, page 6-32) discussed above are included in response to this IR2 (CEAA 2-31) as (Tables CEAA 2-31-1 to CEAA 2-31-4. These tables demonstrate compliance at the property boundaries of the PA (i.e., Beaver Dam Mine Site, Haul Road and Touquoy Mine Site) (Tables CEAA 2-31-1 to CEAA 2-31-4). To support the response to this IR2 gaseous species (i.e., NO_2, SO_2 and VOCs) have been added to Tables CEAA 2-31-11 to CEAA 2-31-14.

Deposition was modelled and the results are included in Attachment CEAA 2-31-A, Tables 7A, 7B, 8A, and 8B and were used in the Human Health Risk Assessment (Appendix C.2 of the Updated 2021 EIS [AMNS 2021]).

Site access will be restricted on the proposed Beaver Dam Mine site through a combination of signage, fencing, and security patrolling. The Haul Road will be restricted by have a bypass road for light truck and recreation vehicles, signage, security patrolling and public and Indigenous engagement to communicate the risk of ingesting country foods within 30 m from the centerline of the Haul Road.

7. CEAA 2-31 Part G

Updates to health risks from air pollutants using the revised exposure levels at the maximum point of impingement (MPOI) are provided in Appendix C.2 Evaluation of Potential Human Exposures and Risk Related to Emissions from the Beaver Dam Mine Project (Dust Deposition; Recreational Water Usage; Country Foods) in the Updated 2021 EIS (AMNS 2021).

8. CEAA 2-31 Part H

The air and noise assessment reports have been updated to include modelling results without mitigation and are provided as Attachments CEAA 2-31-A and CEAA 2-31-B to this IR2 response at the request of Health Canada through the conformity review from July 15, 2021 and October 8, 2021. AMNS is committed to and will apply mitigation measures for air and noise during all phases of the Beaver Dam Mine Project as required and implemented as part of the mining industry standard best management practices. These controls, commitments, mitigation measures and monitoring are detailed in Section 6.1.8 (Noise – Mitigation Measures), Section 6.2.8 (Air – Mitigation Measures), Appendix 2 (draft Complaint Resolution Plan) of Appendix A.6 draft Engagement Plan, and Appendix C.3 draft Fugitive Dust Control Plan in the Updated 2021 EIS (AMNS 2021).

Air and noise isopleths at the Regional Assessment Area (RAA) for both mitigated and unmitigated scenarios are illustrated on Figures CEAA 2-31-28 to CEAA 2-31-42. Due to the scale required to include the air and noise isopleths at the RAA level detailed contours are difficult to interpret. For detailed maps please refer to Figures CEAA 2-31-1A to CEAA 2-31-1G, Figure CEAA 2-31-6 to Figure CEAA 2-31-9, Figures CEAA 2-31-24A to CEAA 2-31-24E, and Figures CEAA 2-31-25 to CEAA 2-31-27.

It should be noted that the property boundary conditions serve as a proxy for traditional and recreational practice areas outside of the PA. Compliance is met at the property boundaries for all air and noise parameters, as shown in the tables and maps referenced in CEAA 2-31 Part A, and thus, by proxy, also met at all traditional land and resource use areas outside of the PA.

References

AMNS (Atlantic Mining NS Inc.). 2021. Updated Environmental Impact Statement. Beaver Dam Mine Project. Submitted to the Impact Assessment Agency of Canada and Nova Scotia Environment. October 2021. Middle Musquodoboit, NS.

NSEL (Nova Scotia Environment and Labour). 1990. Guidelines for Environmental Noise Measurement and Assessment. http://www.noise-ordinances.com/wpcontent/uploads/2015/09/EnvironmentalNoiseMeasurement.pdf, accessed September 2017.

NSEL. 1999. Pit and Quarry Guidelines. https://novascotia.ca/nse/issues/docs/Pit_and_Quarry_Guidelines.pdf, accessed November 2017.

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FIGURE CEAA 2-31-1A

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

17.1 ug/m3 TSP 24 hr Background Level Concentration

Proposed Property Boundary

Mine Site concentrations reach background within boundary

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65

Local Road

Dry Weather / Seasonal Road

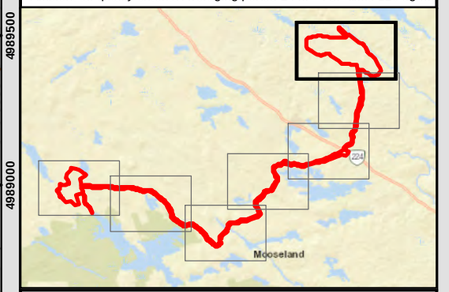
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

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FIGURE CEAA 2-31-1B

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

17.1 ug/m3 TSP 24 hr Background Level Concentration

Proposed Property Boundary

Mine Site concentrations reach background within boundary

Local Road

Dry Weather / Seasonal Road

Track

NSTDB Mapped Watercourses

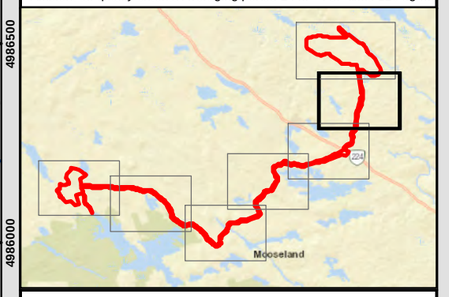
Lakes

Planned Infrastructure

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

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Tent Lake
Cope Pond
McGregor Lake
Kent Lake
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

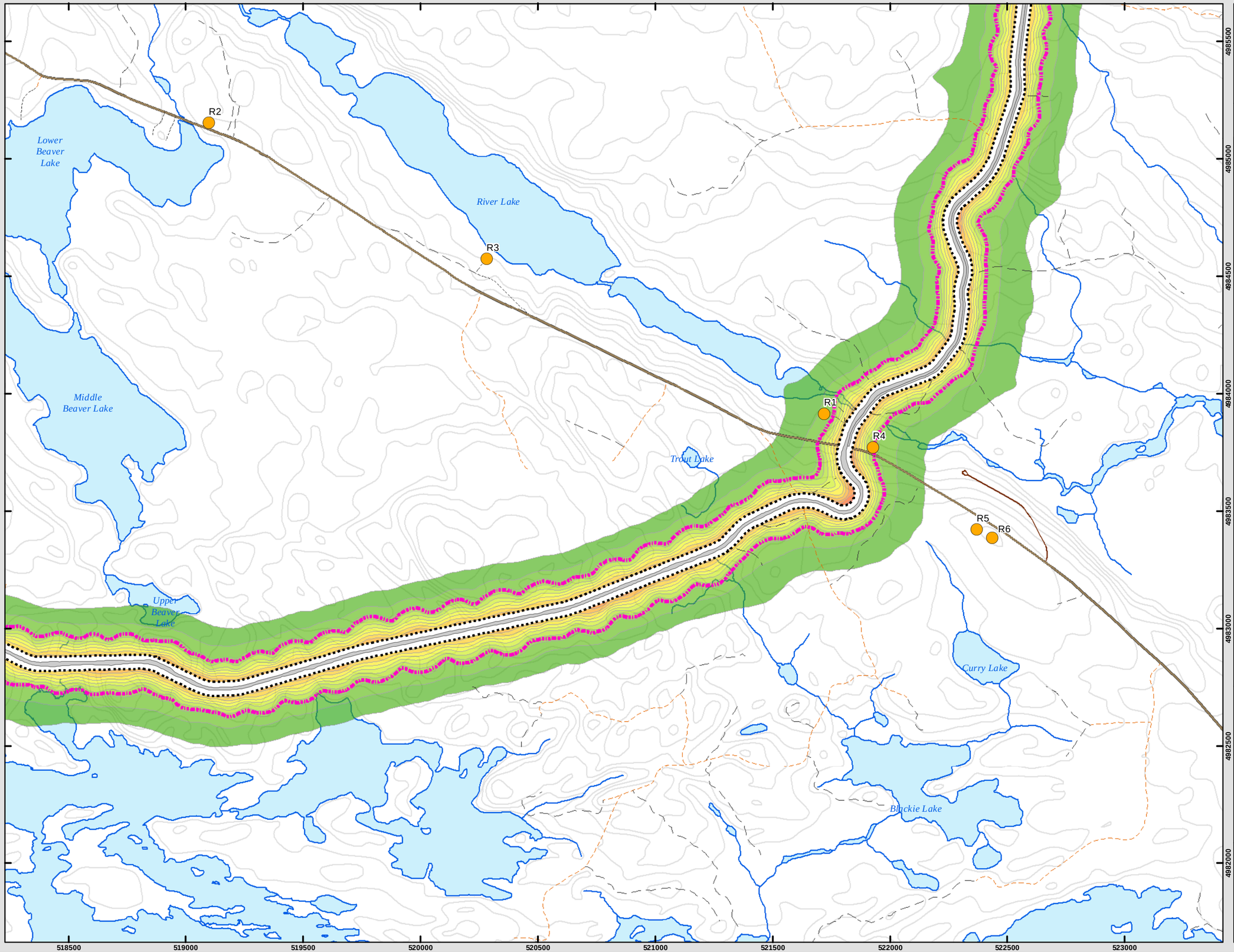
520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

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FIGURE CEAA 2-31-1C

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation



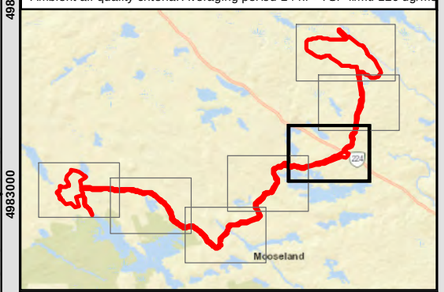
- Receptor
- 17.1 ug/m3 TSP 24 hr Background Level Concentration
- Proposed Property Boundary

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

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FIGURE CEAA 2-31-1D

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

17.1 ug/m3 TSP 24 hr Background Level Concentration

Proposed Property Boundary

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55

Dry Weather / Seasonal Road

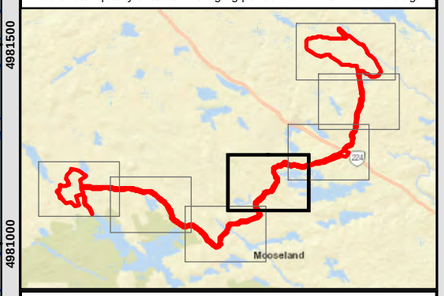
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

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FIGURE CEAA 2-31-1E

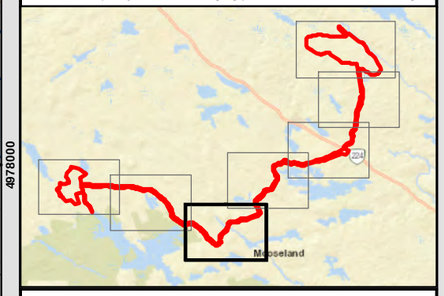
Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

Receptor
17.1 ug/m3 TSP 24 hr Background Level Concentration
Proposed Property Boundary
Mooseland_Road 30m Buffer
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

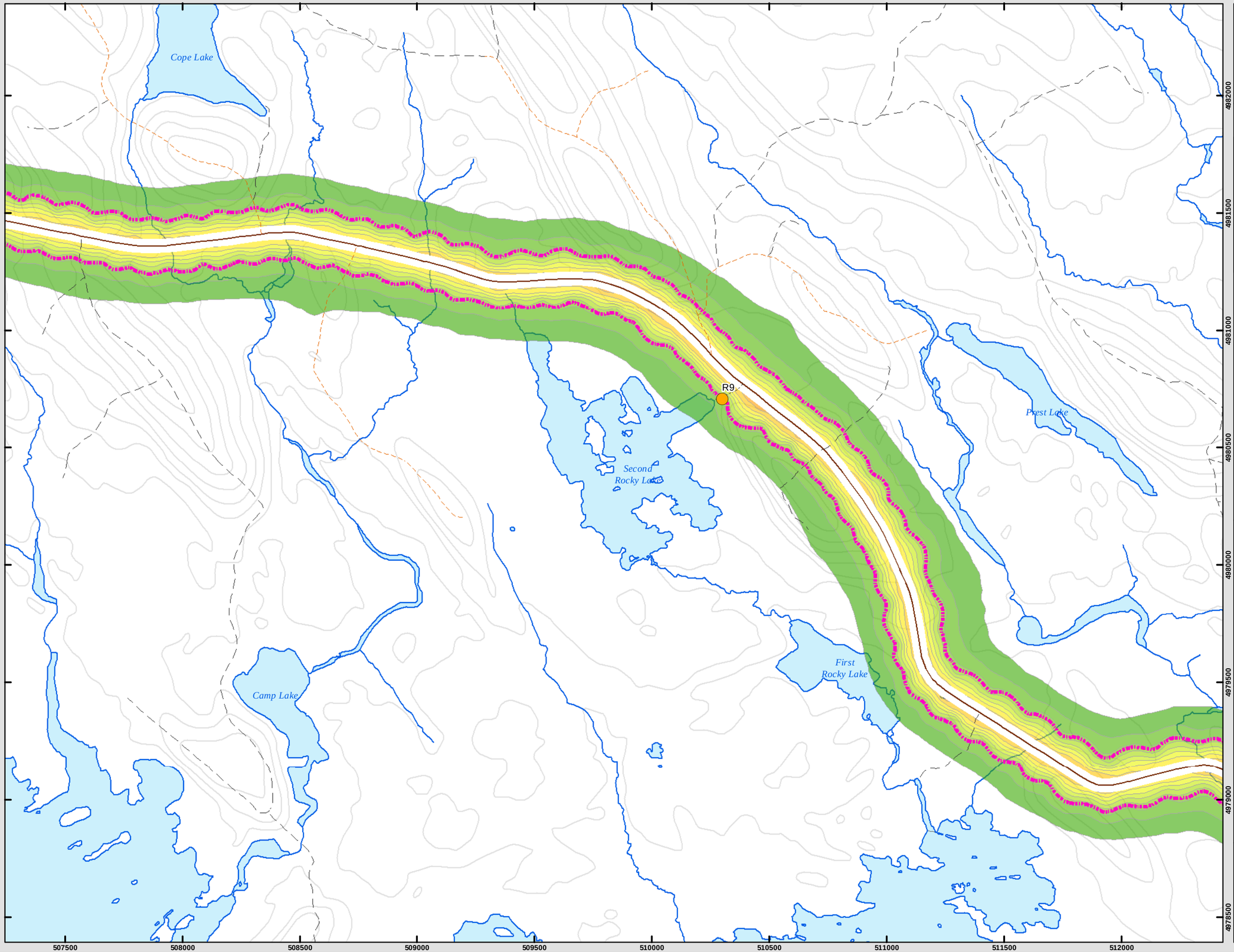
McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-4_Air 24hr TSP

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-1F

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

Receptor

17.1 ug/m3 TSP 24 hr Background Level Concentration

Mooseland_Road 30m Buffer

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

NSTDB Mapped Watercourses

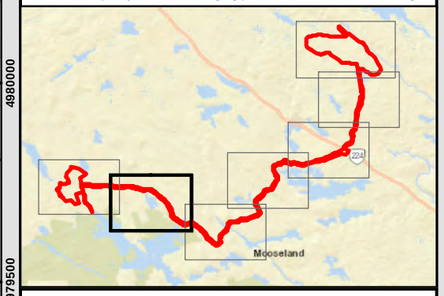
Lakes

Planned Infrastructure

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-4_Air 24hr TSP

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FIGURE CEAA 2-31-1G

Beaver Dam Mine Project Air Contour Total Suspended Particulate Matter 24-Hour Levels - with 80% Road Dust Mitigation

Square Lake

New Dam Flowage

Existing Touquoy Property Boundary

17.1 ug/m3 TSP 24 hr Background Level Concentration

Mooseland_Road 30m Buffer

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

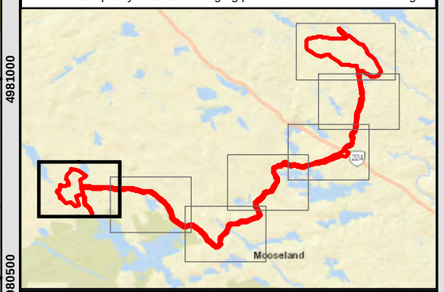
NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Touquoy Infrastructure Layout

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-4_Air 24hr TSP

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

4983000 4982500 4982000 4981500 4981000 4980500 4980000 4979500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2A

Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

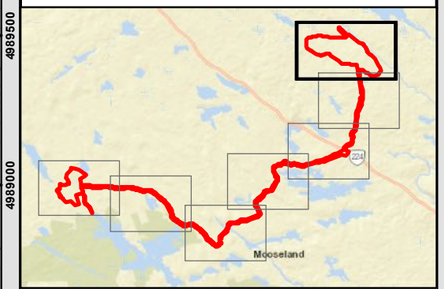
- Proposed Property Boundary
- 12.1 ug/m3 TSP Annual Background Level Concentration
- Mine Site concentrations reach background within boundary

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1
- 12.1 - 14
- 14 - 16
- 16 - 18
- 18 - 20

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2B

Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

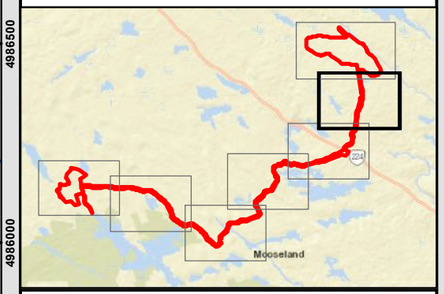
- Proposed Property Boundary
- 12.1 ug/m3 TSP Annual Background Level Concentration
- Mine Site concentrations reach background within boundary

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1
- 12.1 - 14
- 14 - 16
- 16 - 18
- 18 - 20

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2C

Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

R1
R2
R3
R4
R5
R6

Lower Beaver Lake
Middle Beaver Lake
Upper Beaver Lake
River Lake
Trout Lake
Curry Lake
Blackie Lake

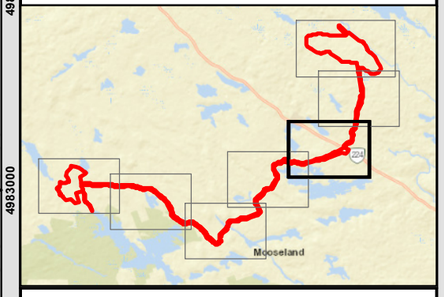
Proposed Property Boundary
Receptor
12.1 ug/m3 TSP Annual Background Level Concentration

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1
- 12.1 - 14
- 14 - 16
- 16 - 18

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

4985500
4985000
4984500
4984000
4983500
4983000
4982500
4982000

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2D

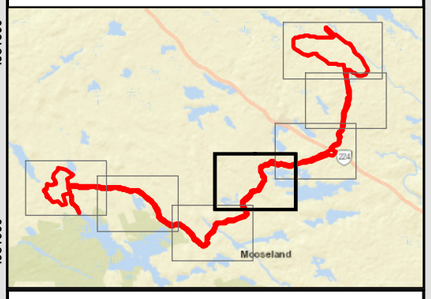
Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

Proposed Property Boundary
12.1 ug/m3 TSP Annual Background Level Concentration
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1
- 12.1 - 14
- 14 - 16

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2E

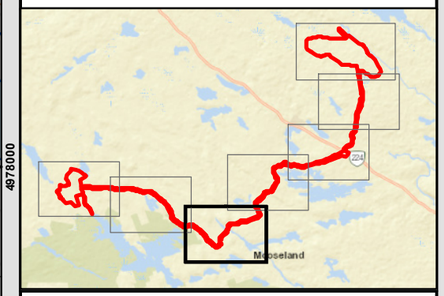
Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

Mooseland_Road 30m Buffer
Proposed Property Boundary
Receptor
12.1 ug/m3 TSP Annual Background Level Concentration

TSP Ranges (ug/m3)
- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1
- 12.1 - 14
- 14 - 16
- 16 - 18

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

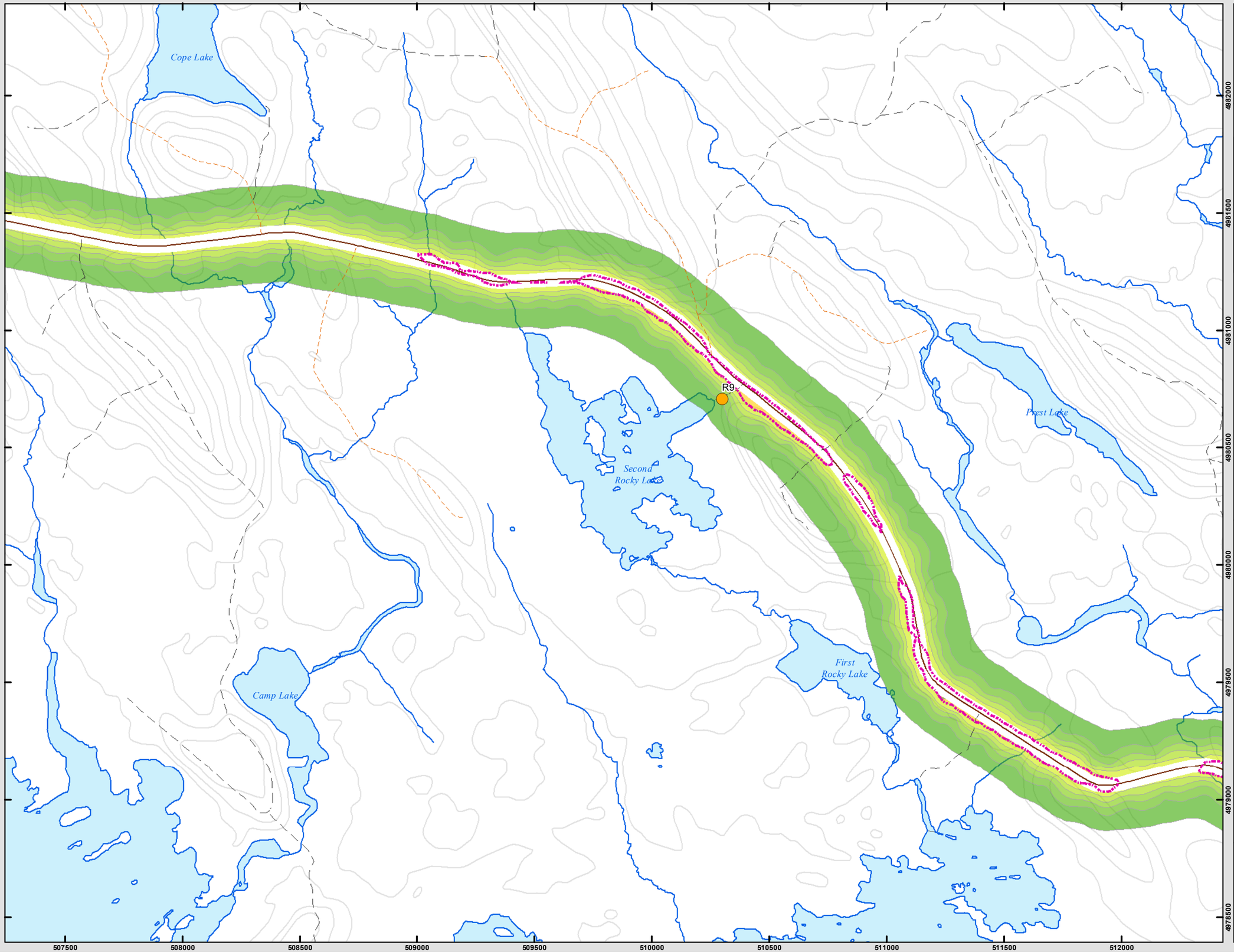
Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-2F

Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation



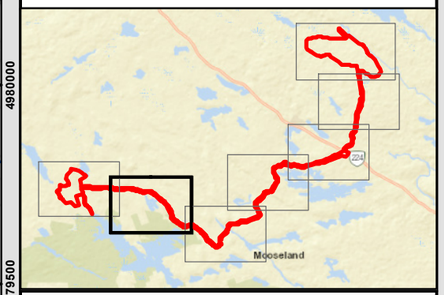
Mooseland_Road 30m Buffer
Receptor
12.1 ug/m3 TSP Annual Background Level Concentration

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 12.1

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

Prepared For:

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FIGURE CEAA 2-31-2G

Beaver Dam Mine Project Air Contour Annual Average Total Particulate Matter - with 80% Road Dust Mitigation

Square Lake

New Dam Flowage

Mooseland_Road 30m Buffer

Existing Touquoy Property Boundary

TSP Ranges (ug/m3)

- 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

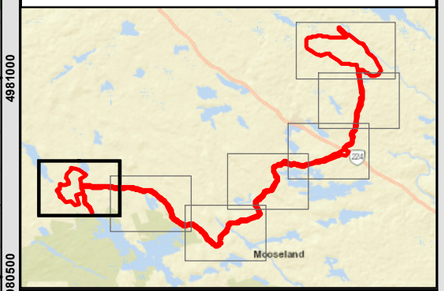
NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Touquoy Infrastructure Layout

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-7_Air Annual TSP

4983000
4982500
4982000
4981500
4981000
4980500
4980000
4979500

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3A

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

Como Lake

Mill Lake

Cameron Flowage

Fifty Lakes

210128 BDProperty Boundary_HR

13.1 ug/m3 PM10 24 hr Background Level Concentration

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

Track

NSTDB Mapped Watercourses

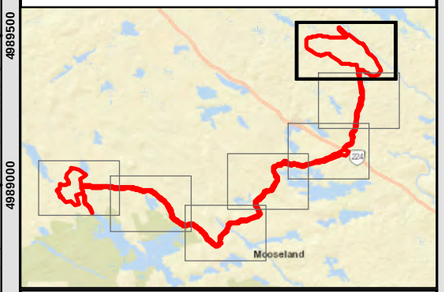
Lakes

Planned Infrastructure

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3B

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

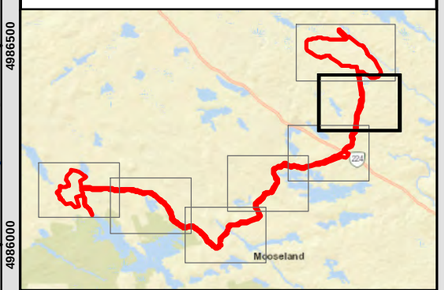
210128 BDProperty Boundary_HR
13.1 ug/m3 PM10 24 hr Background Level Concentration
Mine Site concentrations reach background within boundary
Proposed Property Boundary

Local Road
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

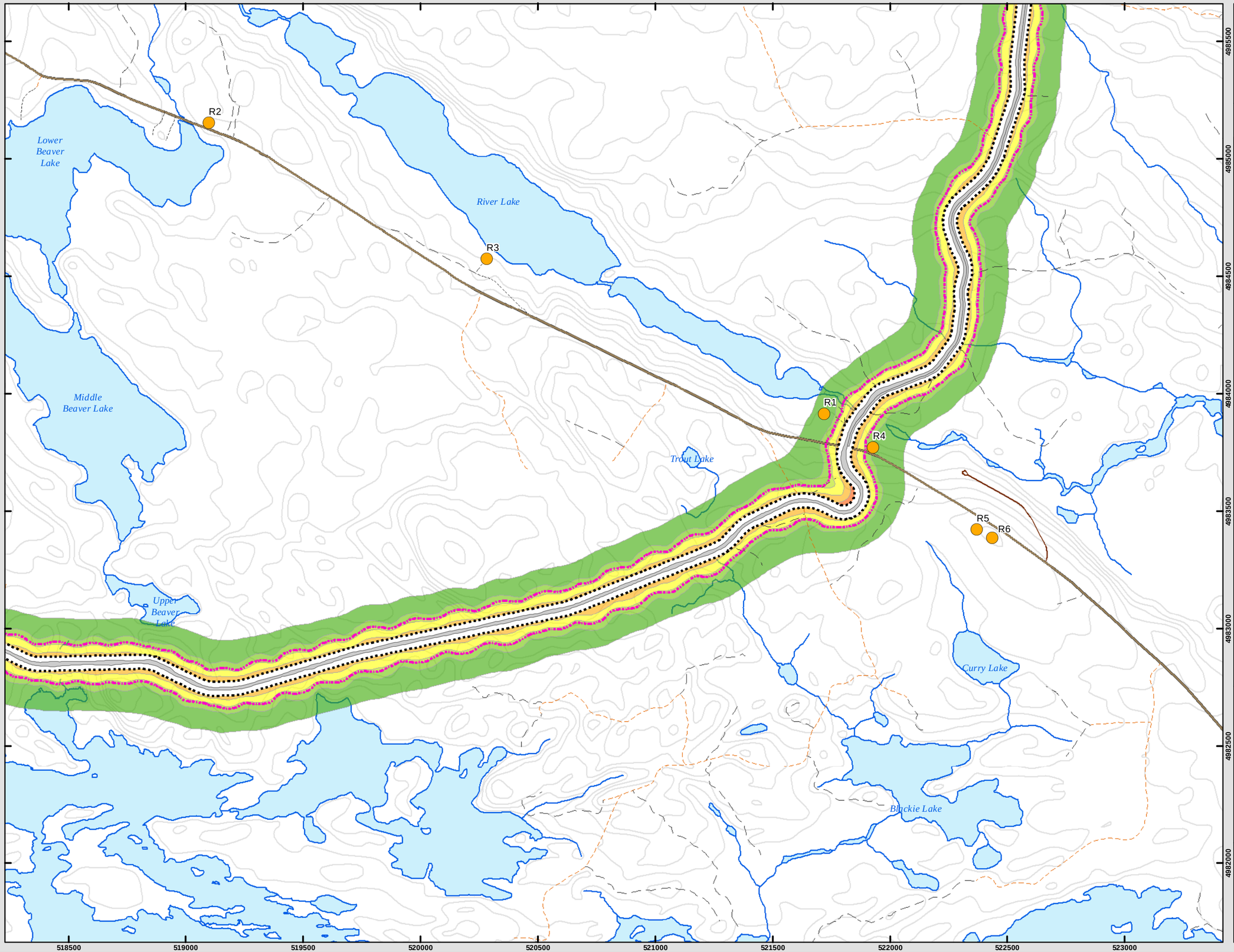
Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3C

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation



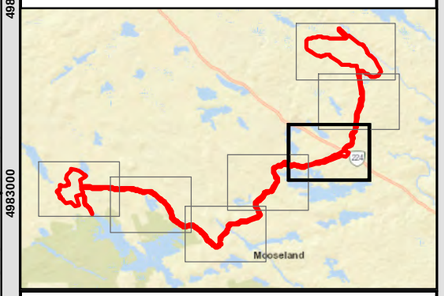
- Receptor
- 210128 BDProperty Boundary_HR
- 13.1 ug/m3 PM10 24 hr Background Level Concentration
- Proposed Property Boundary

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3D

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

210128 BDProperty Boundary_HR

13.1 ug/m3 PM10 24 hr Background Level Concentration

Proposed Property Boundary

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25

Dry Weather / Seasonal Road

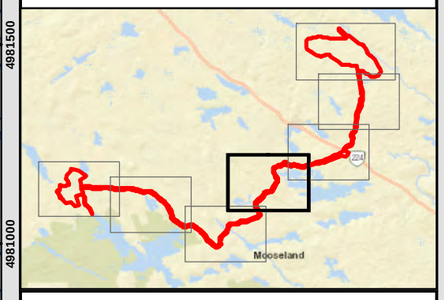
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3E

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

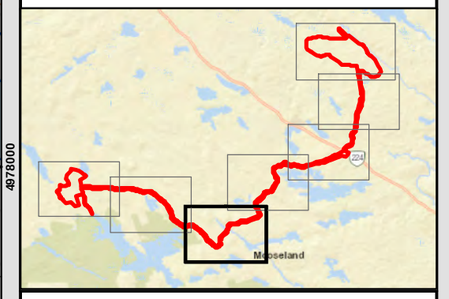
Receptor
210128 BDProperty Boundary_HR
Mooseland_Road 30m Buffer
13.1 ug/m3 PM10 24 hr Background Level Concentration
Proposed Property Boundary

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25
- 25 - 30

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3F

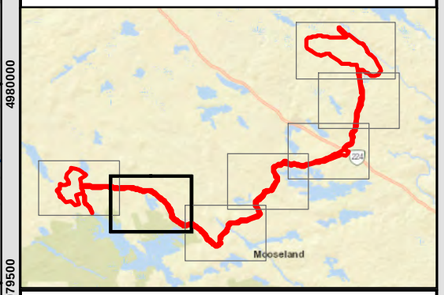
Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

Receptor
Mooseland_Road 30m Buffer
13.1 ug/m3 PM10 24 hr Background Level Concentration

PM10 Ranges (um/m3)
- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

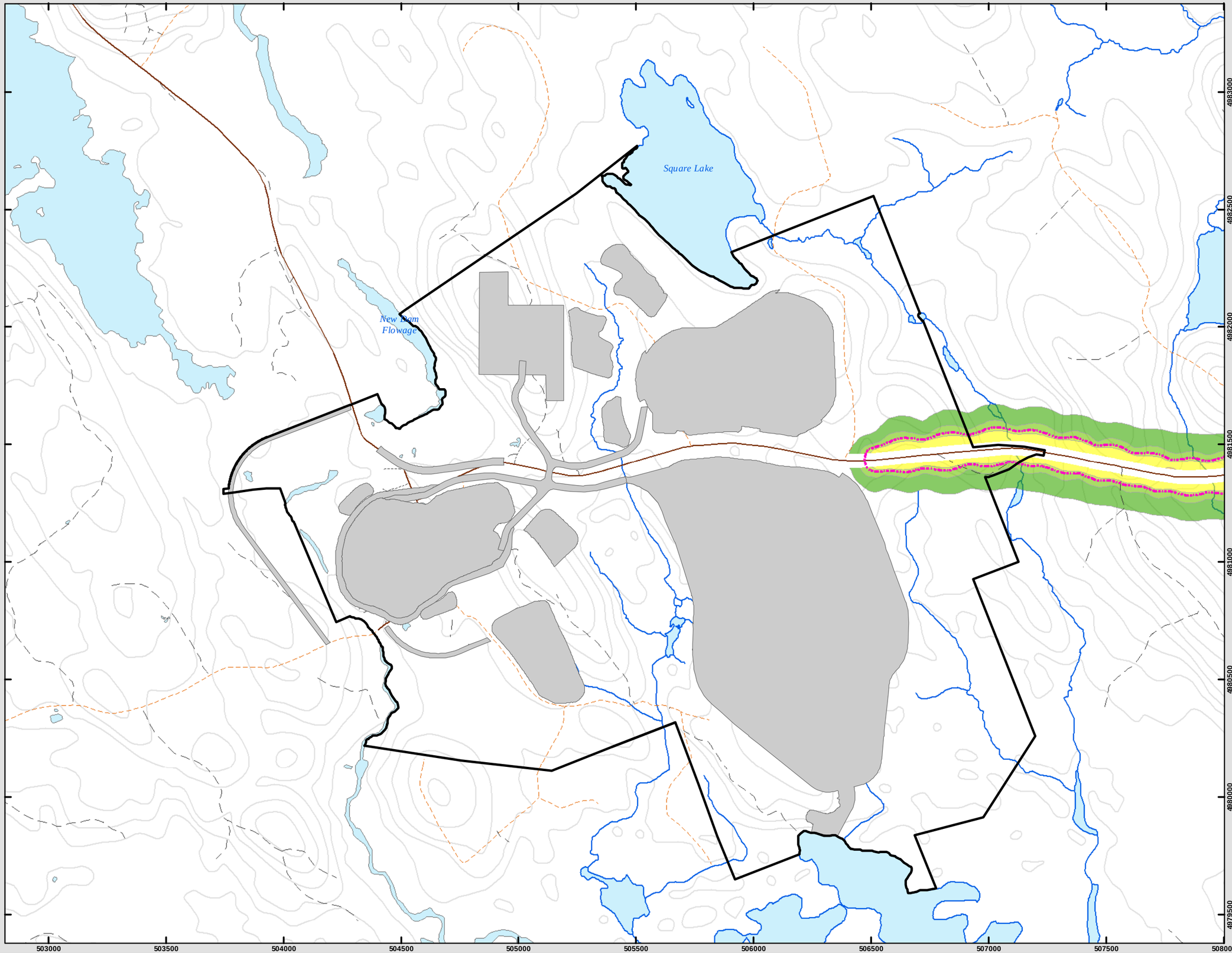
1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-3G

Beaver Dam Mine Project Air Contour PM10 24-Hour Levels - with 80% Road Dust Mitigation

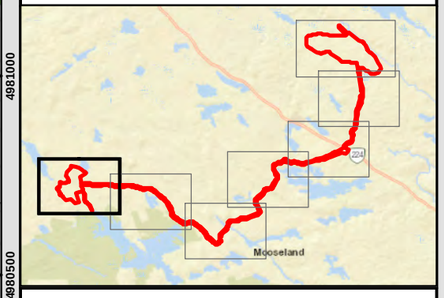
Mooseland_Road 30m Buffer
13.1 ug/m3 PM10 24 hr Background Level Concentration
Existing Touquoy Property Boundary

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust Mitigation
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-5_Air 24hr PM10

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-4A

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

Como Lake

Mill Lake

Cameron Flowage

Grant Lake

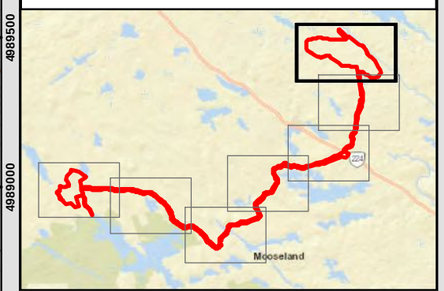
Proposed Property Boundary
Mine Site concentrations reach background within boundary

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3

Local Road
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-4B

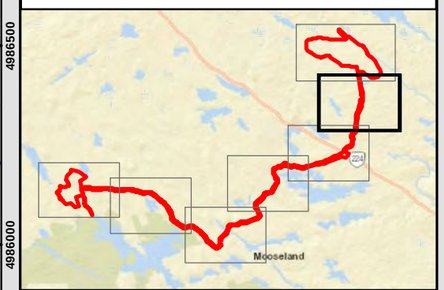
Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

Proposed Property Boundary
Mine Site concentrations reach background within boundary

PM 2.5 Ranges (ug/m3)
- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3

Local Road
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

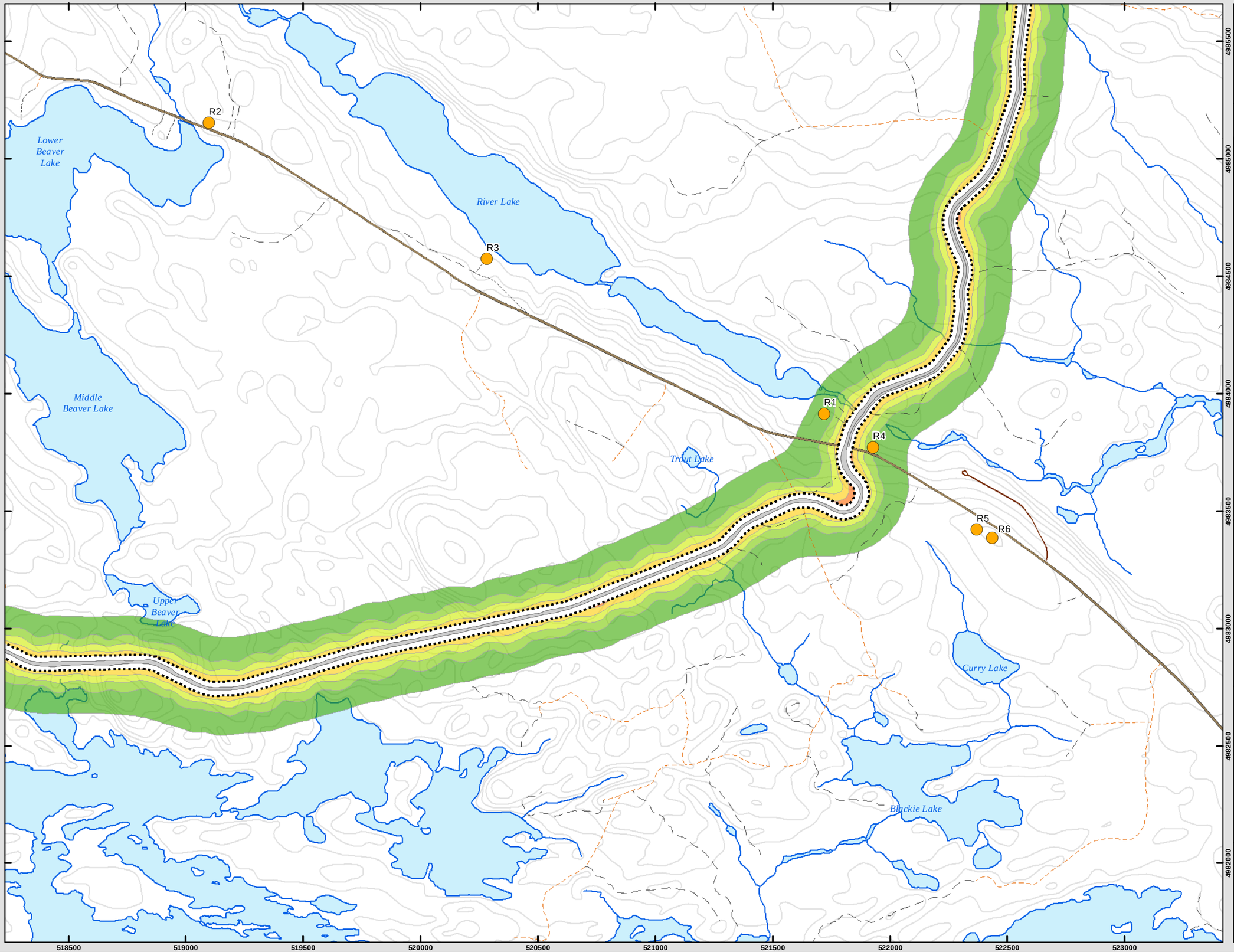
Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-4C

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation



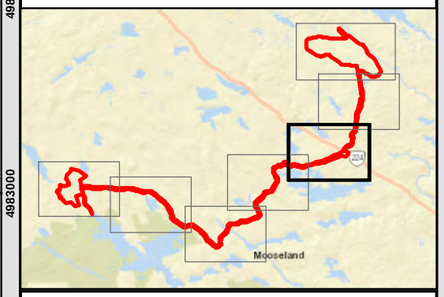
Proposed Property Boundary
Receptor

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

Prepared For:

Atlantic Gold

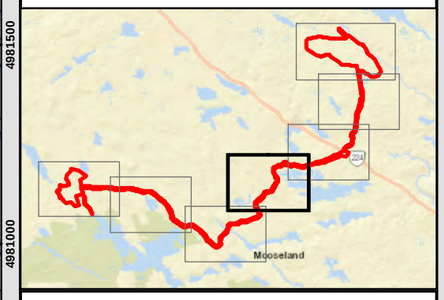
FIGURE CEAA 2-31-4D

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

Proposed Property Boundary
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

PM 2.5 Ranges (ug/m3)
- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

Prepared For:

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FIGURE CEAA 2-31-4E

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

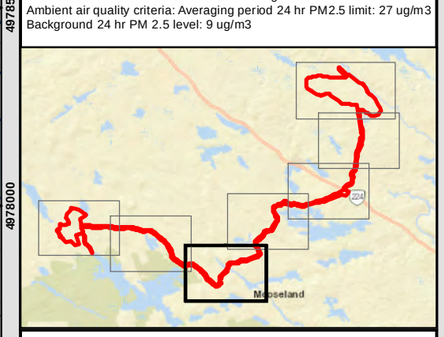
Proposed Property Boundary
Receptor

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-4F

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

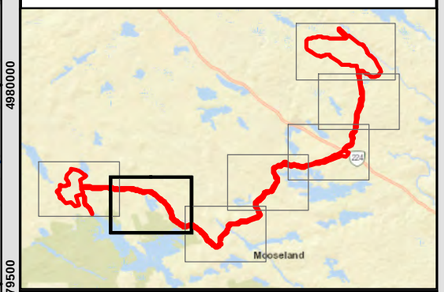
Receptor

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5

Prepared For:

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FIGURE CEAA 2-31-4G

Beaver Dam Mine Project Air Contour PM2.5 24-Hour Levels - with 80% Road Dust Mitigation

Square Lake

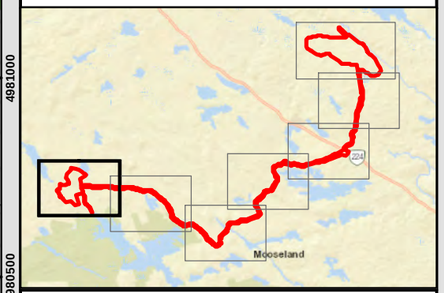
New Dam
Flowage

4983000
4982500
4982000
4981500
4981000
4980500
4980000
4979500

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

Existing Touquoy Property Boundary
Local Road
PM 2.5 Ranges (ug/m3)
Dry Weather / Seasonal Road
0.5
Diveways (>300 m)
0.5 - 1
Track
1- 1.5
NSTDB Mapped Watercourses
1.5 - 2
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3
Background 24 hr PM 2.5 level: 9 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

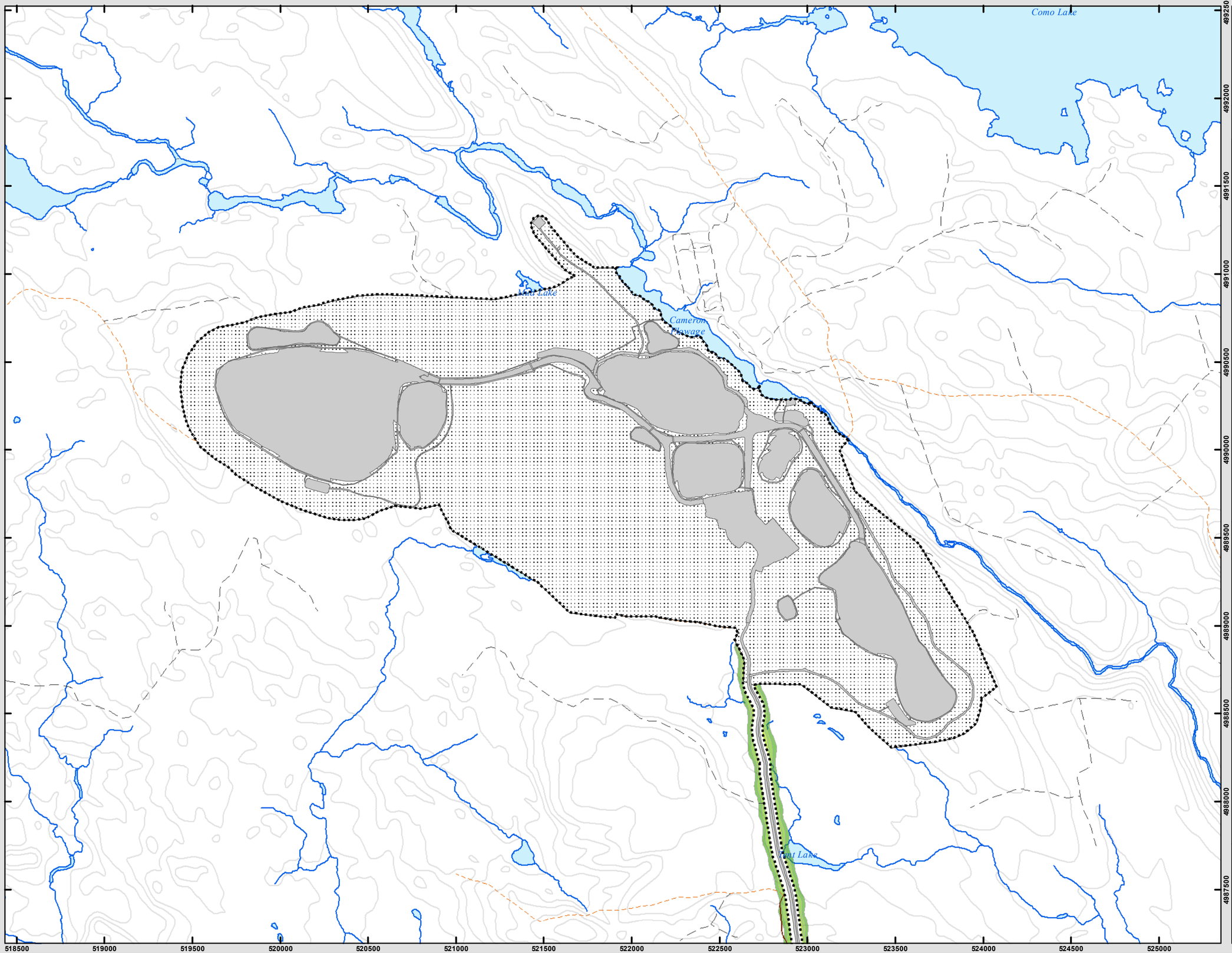
Drawn By: EP
Reviewed By: LP

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-6_Air 24hr PM2.5



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FIGURE CEAA 2-31-5A

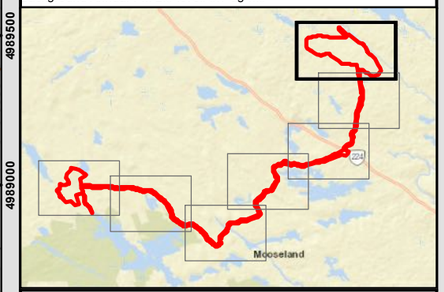
Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

Proposed Property Boundary
Mine Site concentrations reach background within boundary

PM 2.5 Ranges (ug/m3)
- 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.75 - 0.8
- 0.85 - 0.9
- 0.9 - 1

Local Road
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

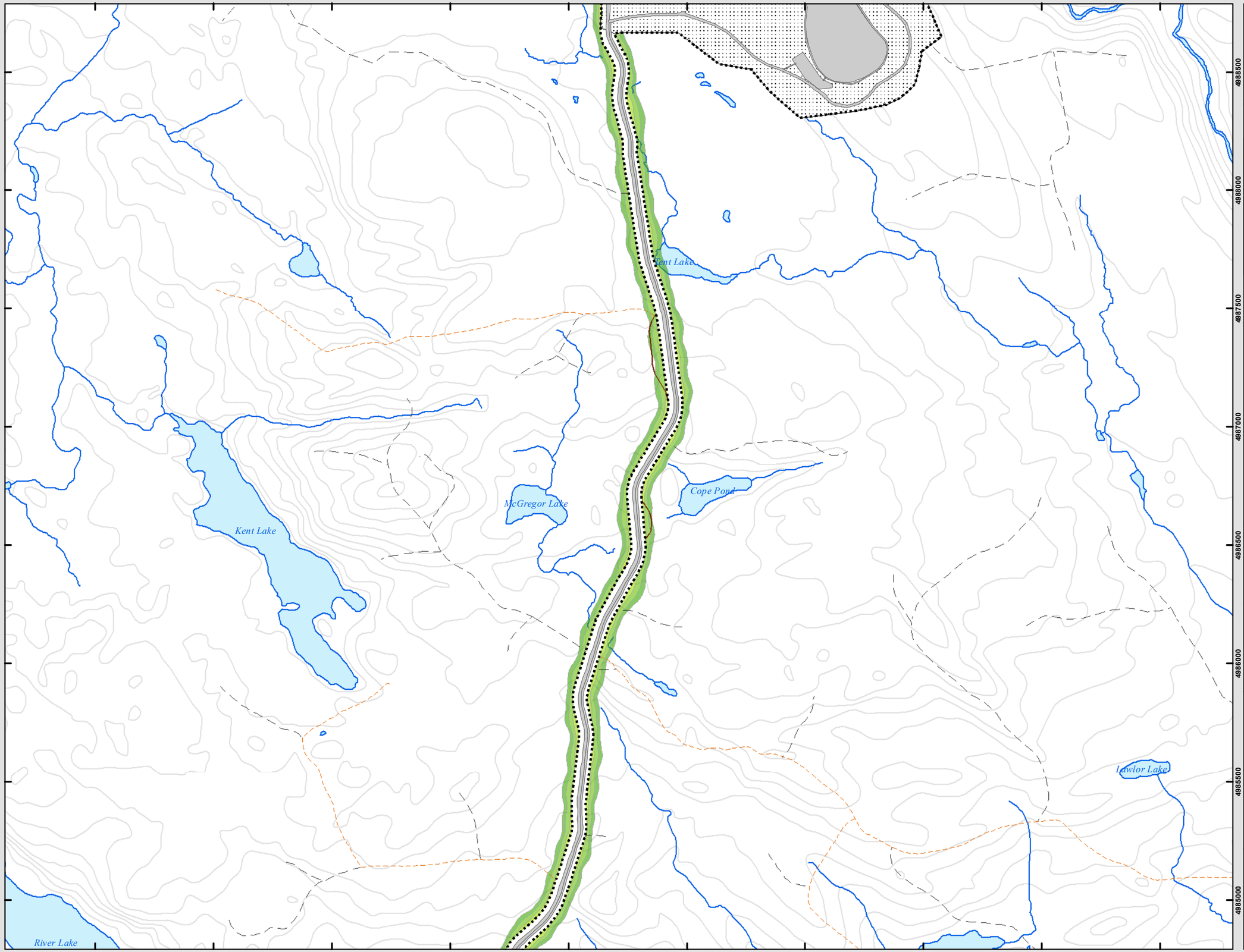
Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-5B

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

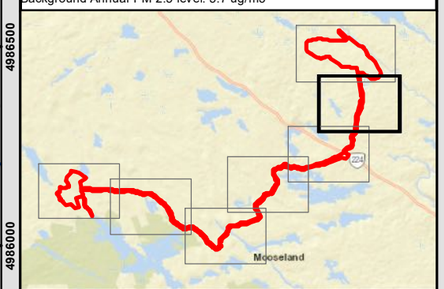


Proposed Property Boundary
Mine Site concentrations reach background within boundary

PM 2.5 Ranges (ug/m3)
- 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.75 - 0.8
- 0.8 - 0.85
- 0.85 - 0.9
- 0.9 - 1

Local Road
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Prepared For:

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FIGURE CEAA 2-31-5C

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

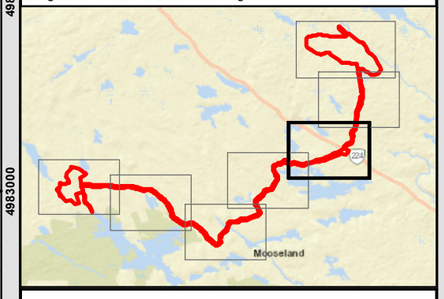
Proposed Property Boundary
Receptor

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.75 - 0.8
- 0.8 - 0.85
- 0.85 - 0.9
- 0.9 - 1

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Prepared For:

Atlantic Gold

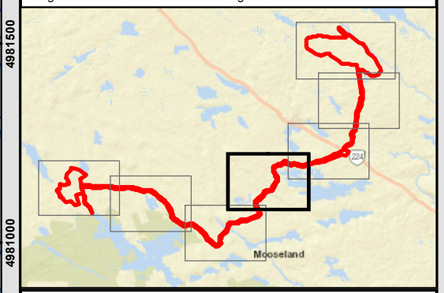
FIGURE CEAA 2-31-5D

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

Proposed Property Boundary
Dry Weather / Seasonal Road
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

PM 2.5 Ranges (ug/m3)
- 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.75 - 0.8
- 0.8 - 0.85

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-5E

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

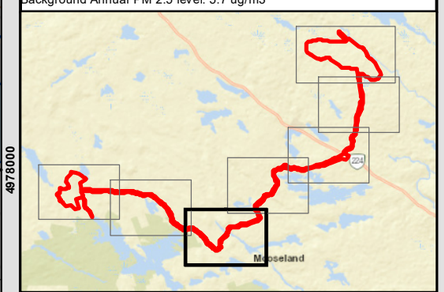
Proposed Property Boundary
Mooseland_Road 30m Buffer
Receptor

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.75 - 0.8
- 0.8 - 0.85
- 0.85 - 0.9
- 0.9 - 1

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000

Prepared For:

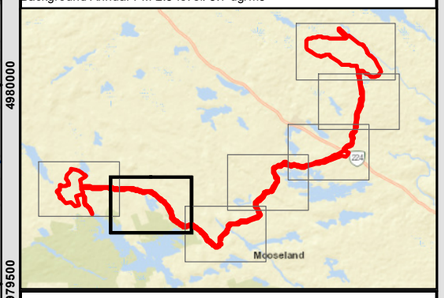
Atlantic Gold

FIGURE CEAA 2-31-5F

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

Mooseland_Road 30m Buffer
Receptor
PM 2.5 Ranges (ug/m3)
0.5
0.5 - 0.6
0.6 - 0.7
0.7 - 0.75
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP
Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-5G

Beaver Dam Mine Project Air Contour PM2.5 Annual Levels - with 80% Road Dust Mitigation

Square Lake

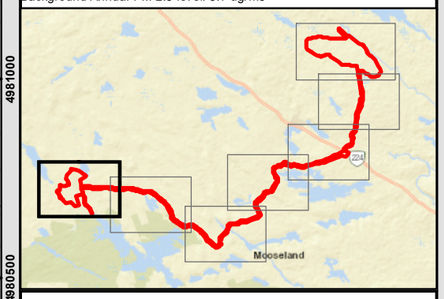
New Dam
Flowage

Existing Touquoy Property Boundary
Mooseland_Road 30m Buffer

PM 2.5 Ranges (ug/m3)
0.5
0.5 - 0.6

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: Based on 80% Road Dust mitigation
All contours shown well below limits or background values
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
Background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: EP
Reviewed By: LP

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-8_Air Annual 2.5

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

4983000 4982500 4982000 4981500 4981000 4980500 4980000 4979500

Prepared For:

Atlantic Gold

FIGURE CEAA-2-31-6

Beaver Dam Mine Project
Beaver Dam Mine Site
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED

17.1 ug/m3 TSP 24 hr Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 - 10
- 10 - 30
- 30 - 50
- 50 - 70
- 70 - 100
- 100 - 120
- 120

Proposed Property Boundary

Mine Site

Local Road

Dry Weather / Seasonal Road

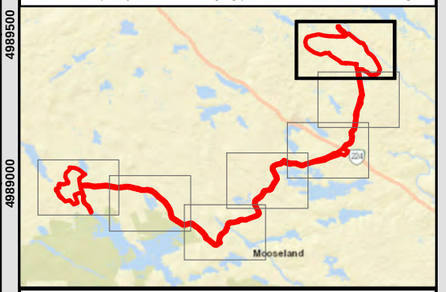
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-09

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_BD

Como Lake

Mill Lake

Cameron Flowage

Tent Lake

4992500
4992000
4991500
4991000
4990500
4990000
4989500
4989000
4988500
4988000
4987500

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA-2-31-7

Beaver Dam Mine Project
Beaver Dam Mine Site
Air Contour Annual Average Total Suspended Particulates UNMITIGATED

12.1 ug/m3 TSP Annual Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50 - 70
- 70

Proposed Property Boundary

Mine Site

Local Road

Dry Weather / Seasonal Road

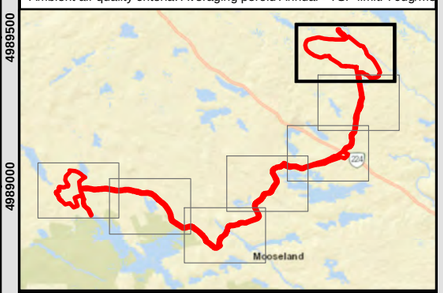
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_BD

Como Lake

Mill Lake

Cameron Flowage

Tent Lake

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

Prepared For:

Atlantic Gold

FIGURE CEAA-2-31-8

Beaver Dam Mine Project
Beaver Dam Mine Site

Air Contour PM 10 24-Hour Levels
UNMITIGATED

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM 10 Ranges (ug/m3)

- <5
- 5 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 50

Proposed Property Boundary

Mine Site

Local Road

Dry Weather / Seasonal Road

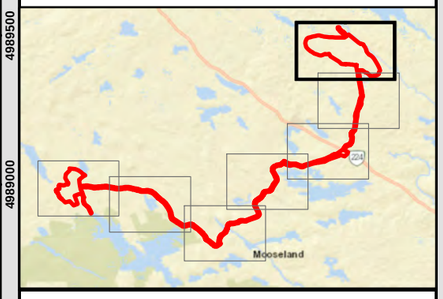
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Como Lake

Mill Lake

Cameron Flowage

Unt Lake

4992500
4992000
4991500
4991000
4990500
4990000
4989500
4989000
4988500
4988000
4987500

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA-2-31-9

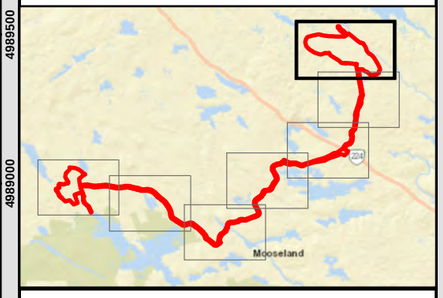
Beaver Dam Mine Project
Beaver Dam Mine Site

Air Contour PM 2.5 Annual Levels
UNMITIGATED

Unmitigated PM 2.5 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4
- Proposed Property Boundary
- Mine Site

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

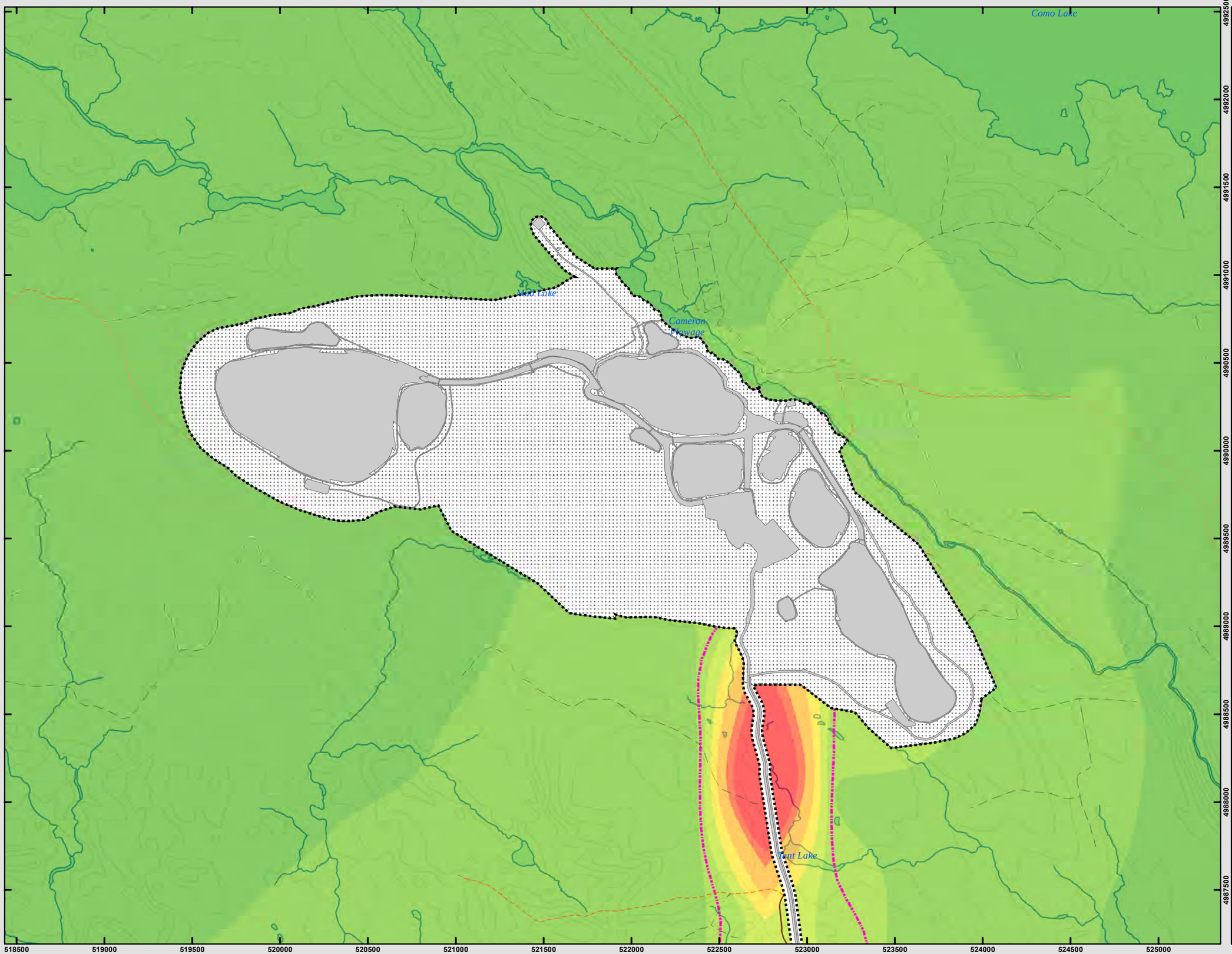
McCallum Environmental Ltd.

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10A

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED



17.1 ug/m3 TSP 24 hr Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Proposed Property Boundary

Mine Site concentrations reach background within boundary

Local Road

Dry Weather / Seasonal Road

Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3

Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR

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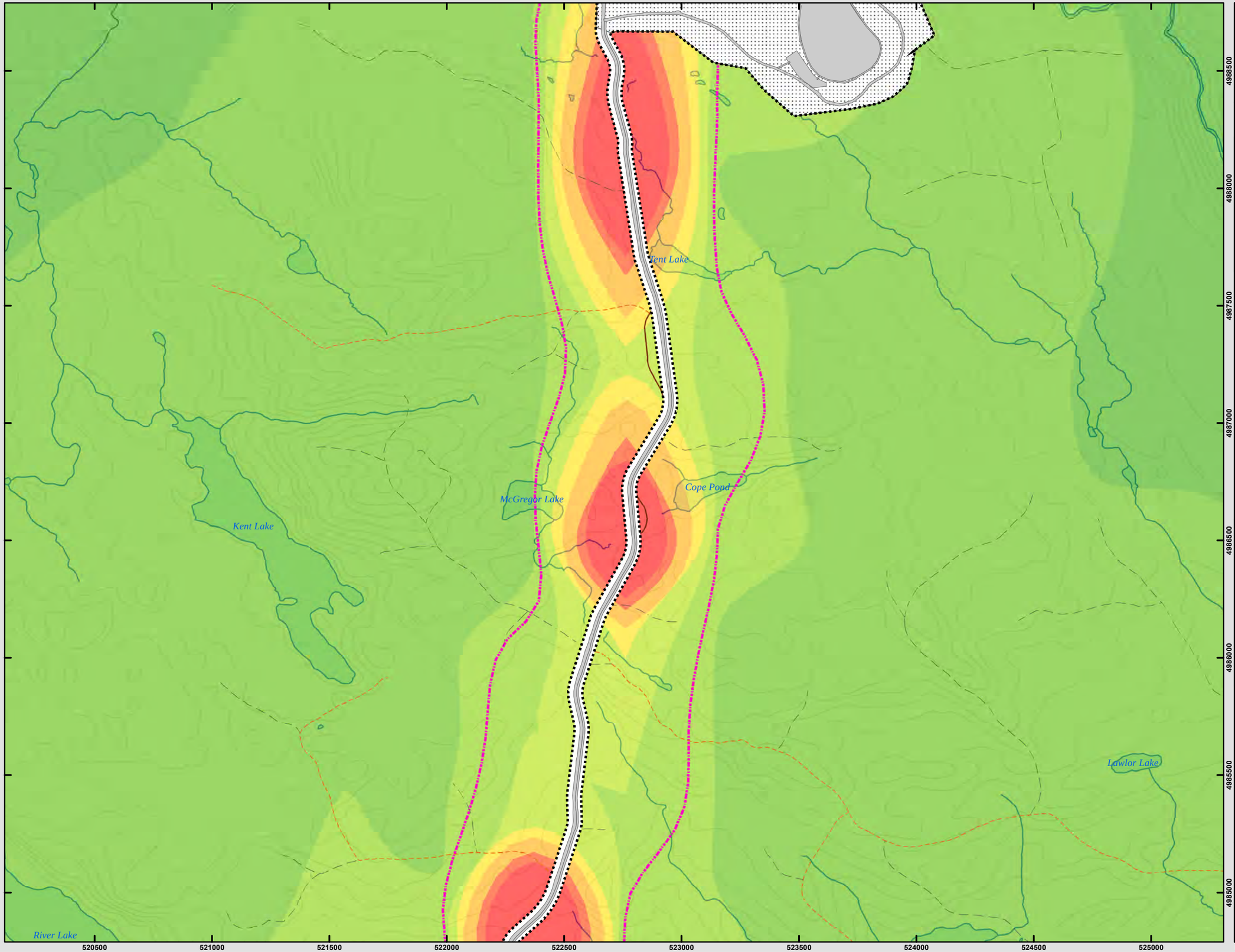
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Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10B

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED



17.1 ug/m3 TSP 24 hr Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Proposed Property Boundary

Mine Site concentrations reach background within boundary

Local Road

Dry Weather / Seasonal Road

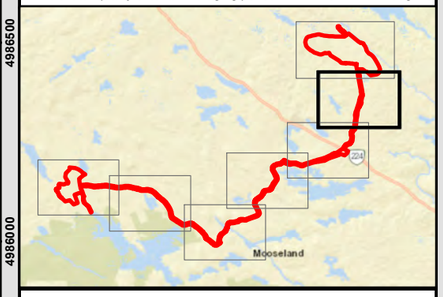
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

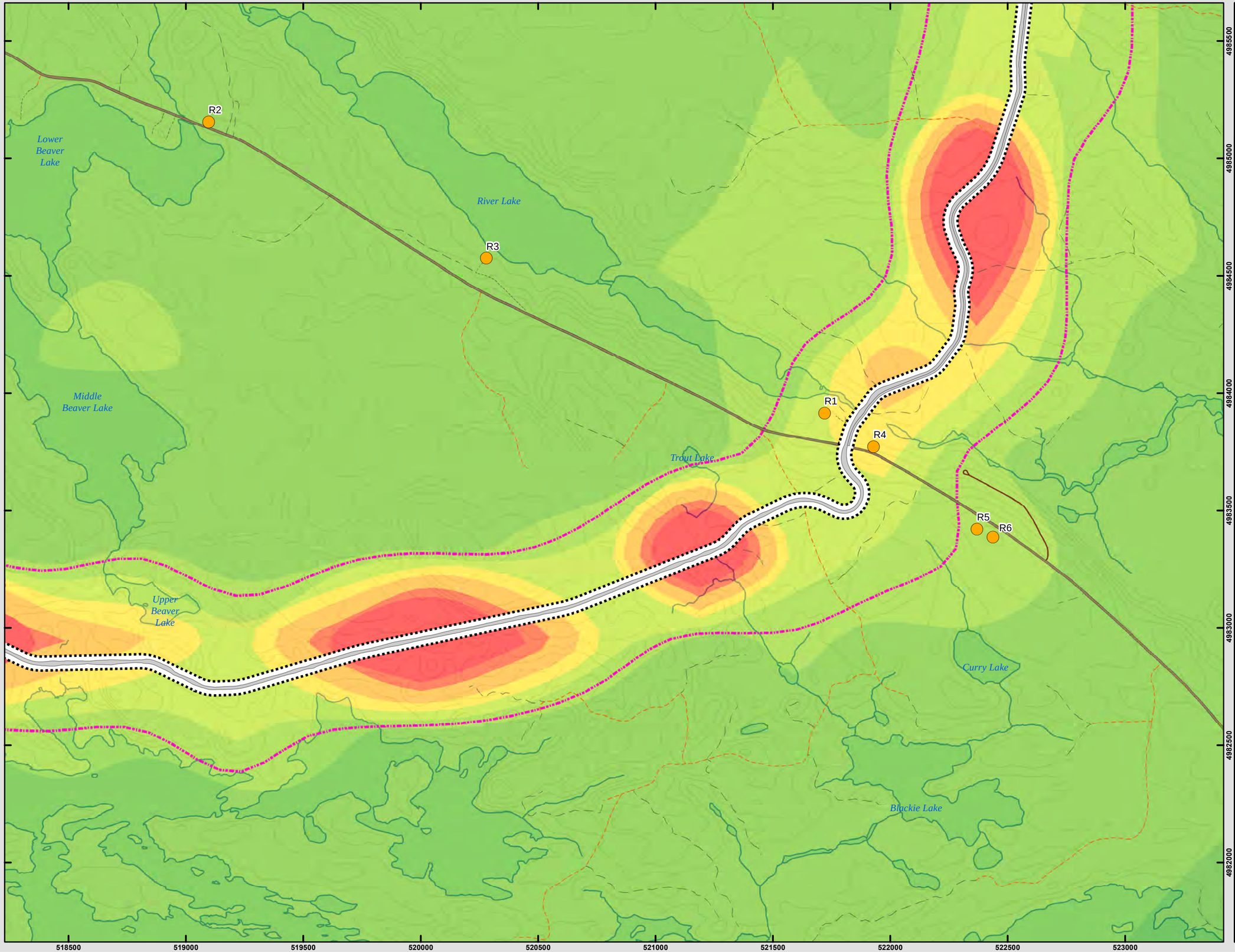
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10C

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED

17.1 ug/m3 TSP 24 hr Background Level Concentration

Receptor

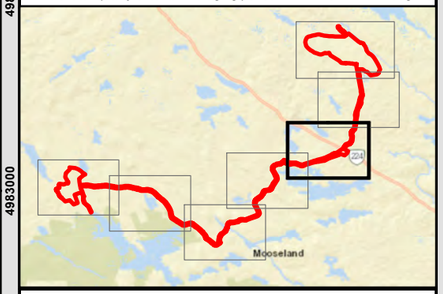
Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Proposed Property Boundary

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

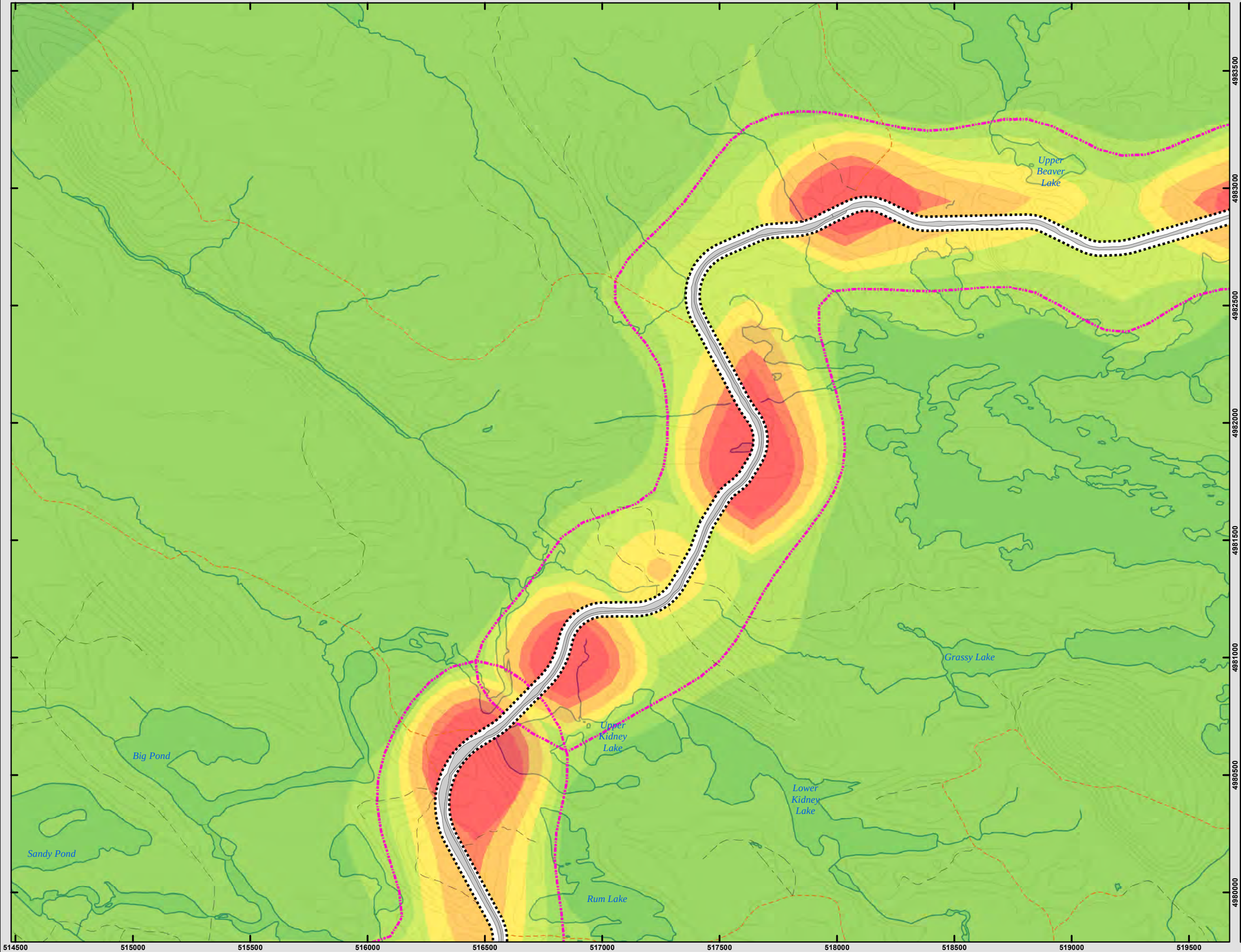
Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10D

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED



17.1 ug/m3 TSP 24 hr Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Proposed Property Boundary

Dry Weather / Seasonal Road

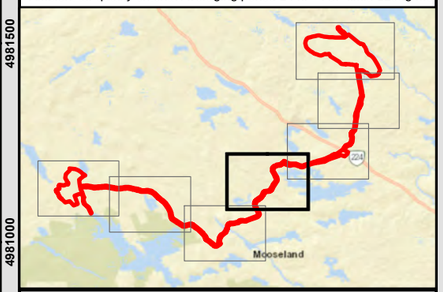
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

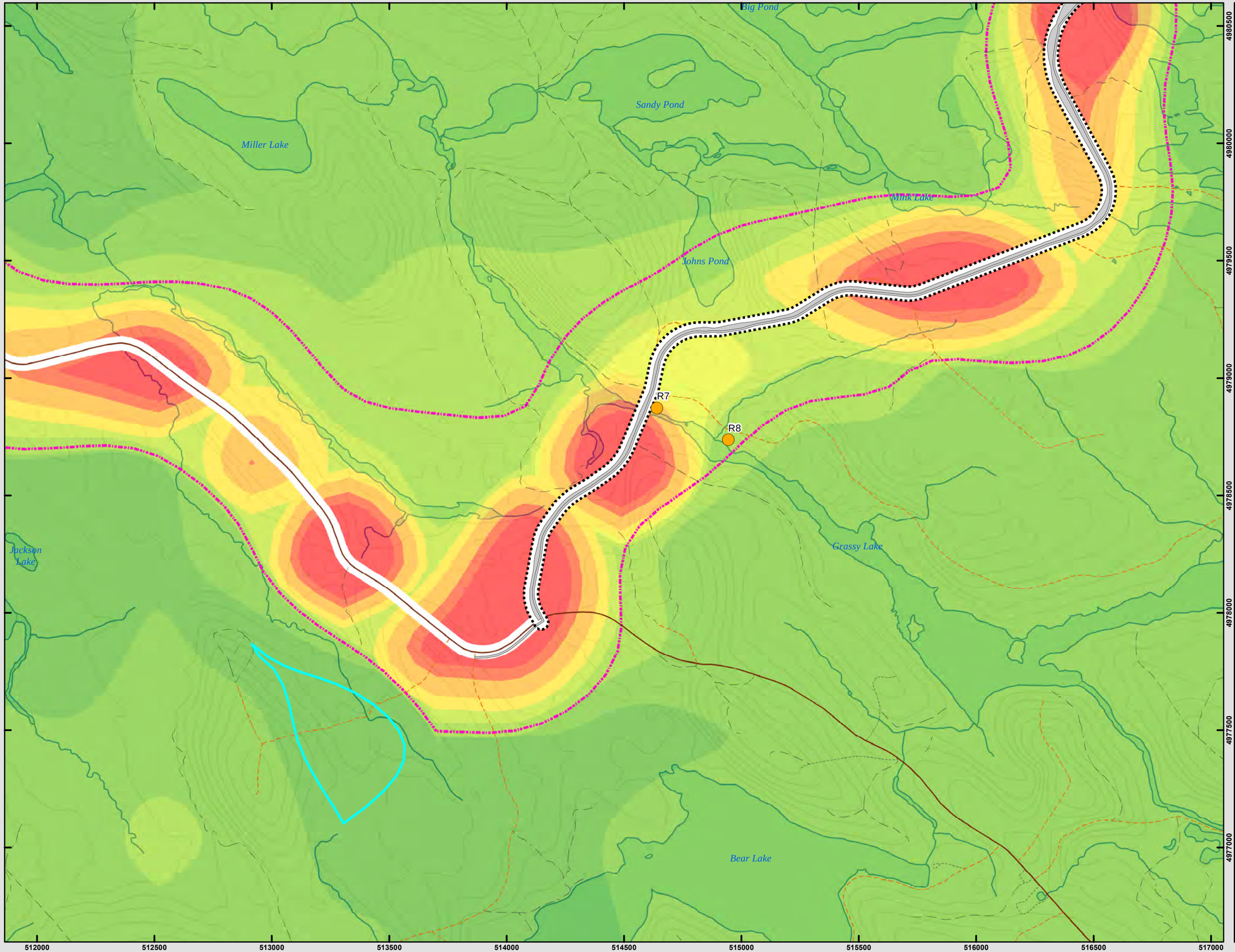
Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10E

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED



17.1 ug/m3 TSP 24 hr Background Level Concentration

Receptor

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 40 - 50
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

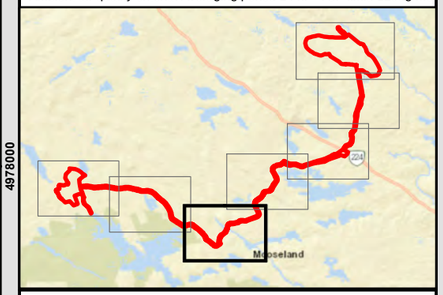
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

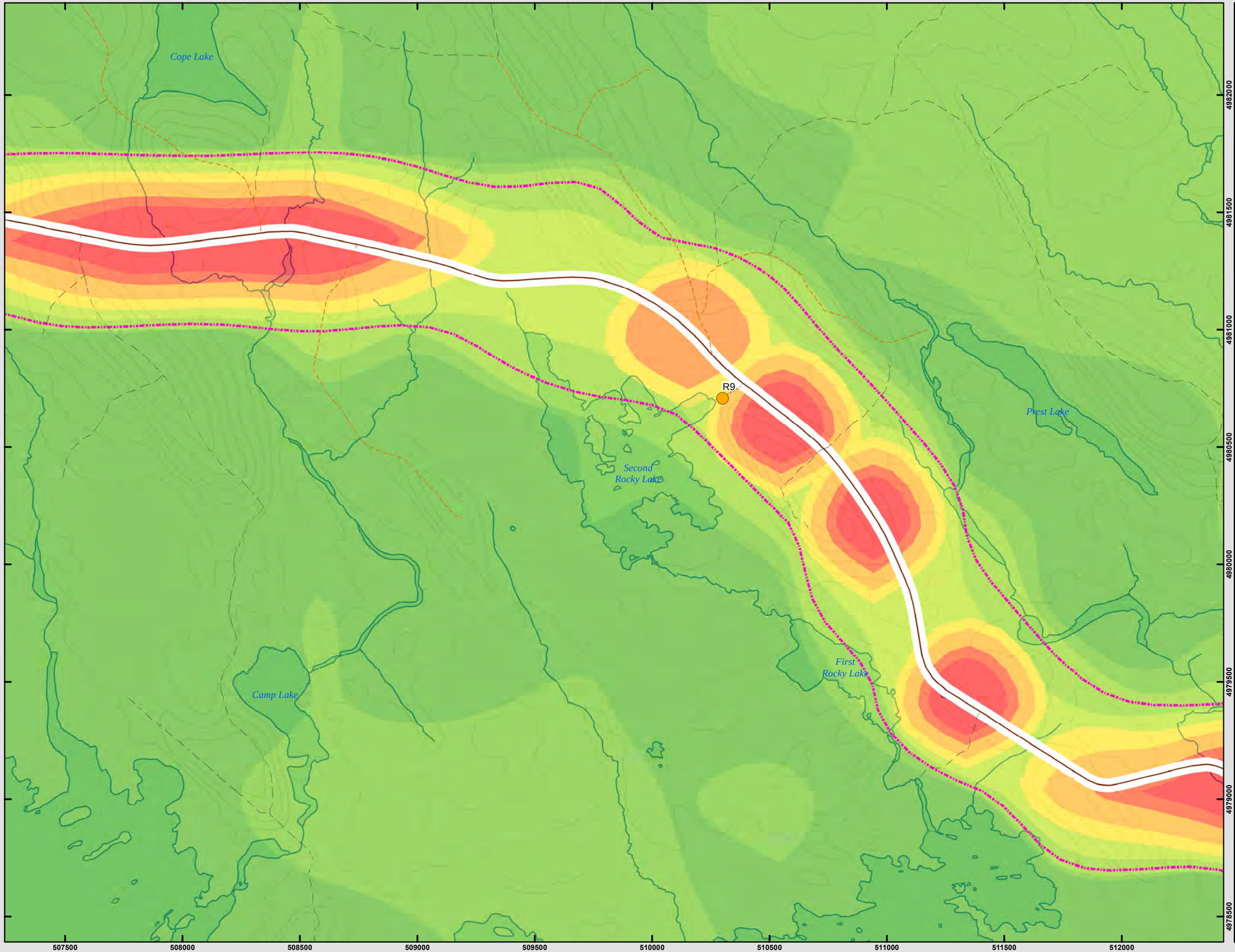
Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10F

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED



17.1 ug/m3 TSP 24 hr Background Level Concentration

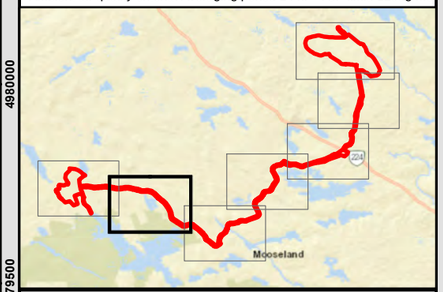
Receptor

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 90 - 100
- 100 - 120
- 120

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

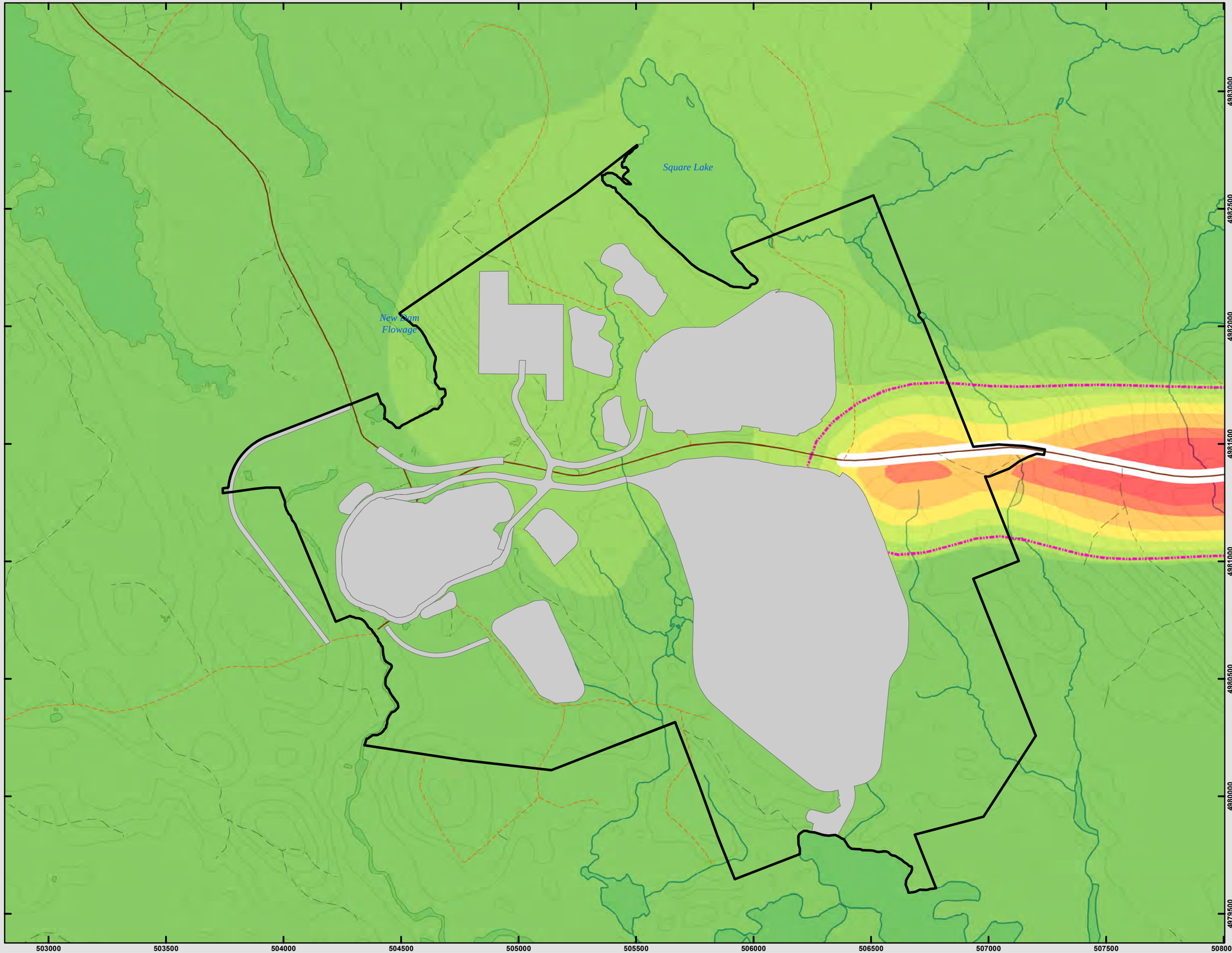
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-10G

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
UNMITIGATED

17.1 ug/m3 TSP 24 hr Background Level Concentration

Existing Touquoy Property Boundary

Unmitigated TSP Ranges (ug/m3)

- <5
- 5 -10
- 10 - 30
- 30 - 40
- 50 - 70
- 70 - 90
- 100 - 120
- 120

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

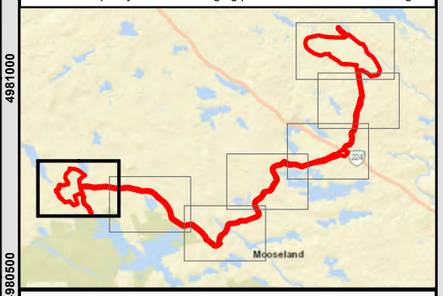
NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Touquoy Infrastructure Layout

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - TSP limit: 120ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr TSP_Unmitigated_HR

Como Lake

Mill Lake

Cameron Flowage

nt Lake

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

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Atlantic Gold

FIGURE CEAA 2-31-11A

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

12.1 ug/m3 TSP Annual Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

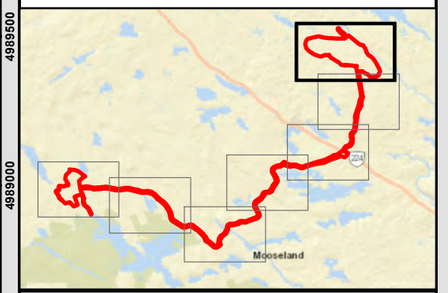
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_HR

Prepared For:

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FIGURE CEAA 2-31-11B

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

12.1 ug/m3 TSP Annual Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

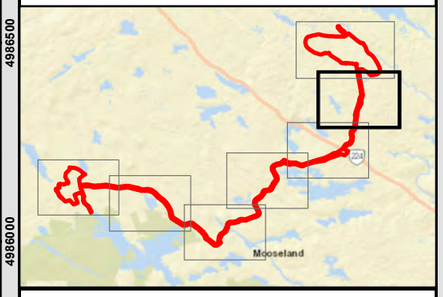
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

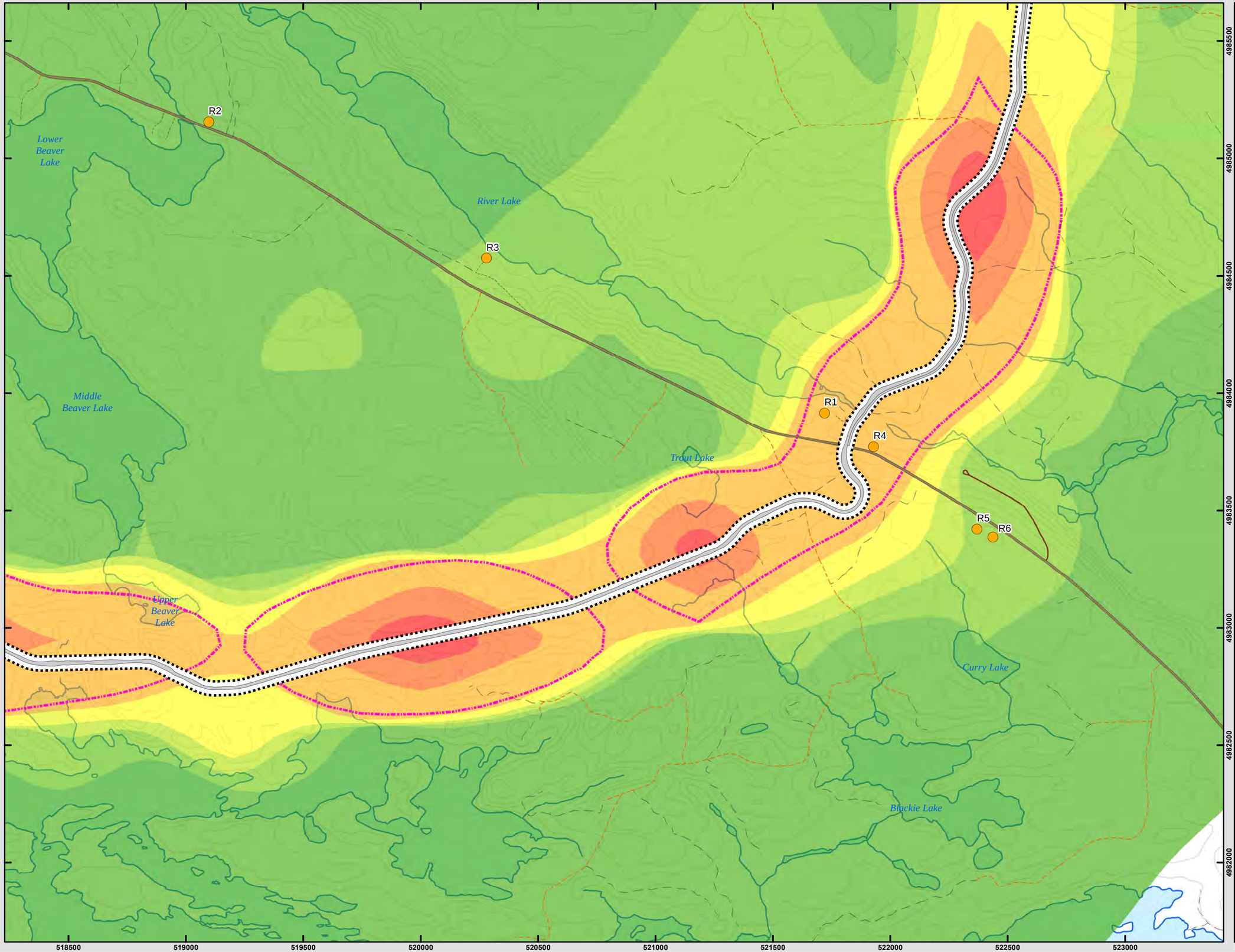
McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_HR

Tent Lake
Cope Pond
McGregor Lake
Kent Lake
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

520500 521000 521500 522000 522500 523000 523500 524000 524500 525000



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-11C

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

12.1 ug/m3 TSP Annual Background Level Concentration

Receptor

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Proposed Property Boundary

Collector Road

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

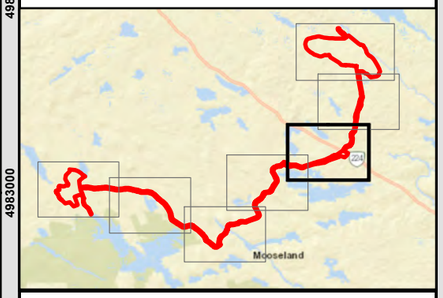
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

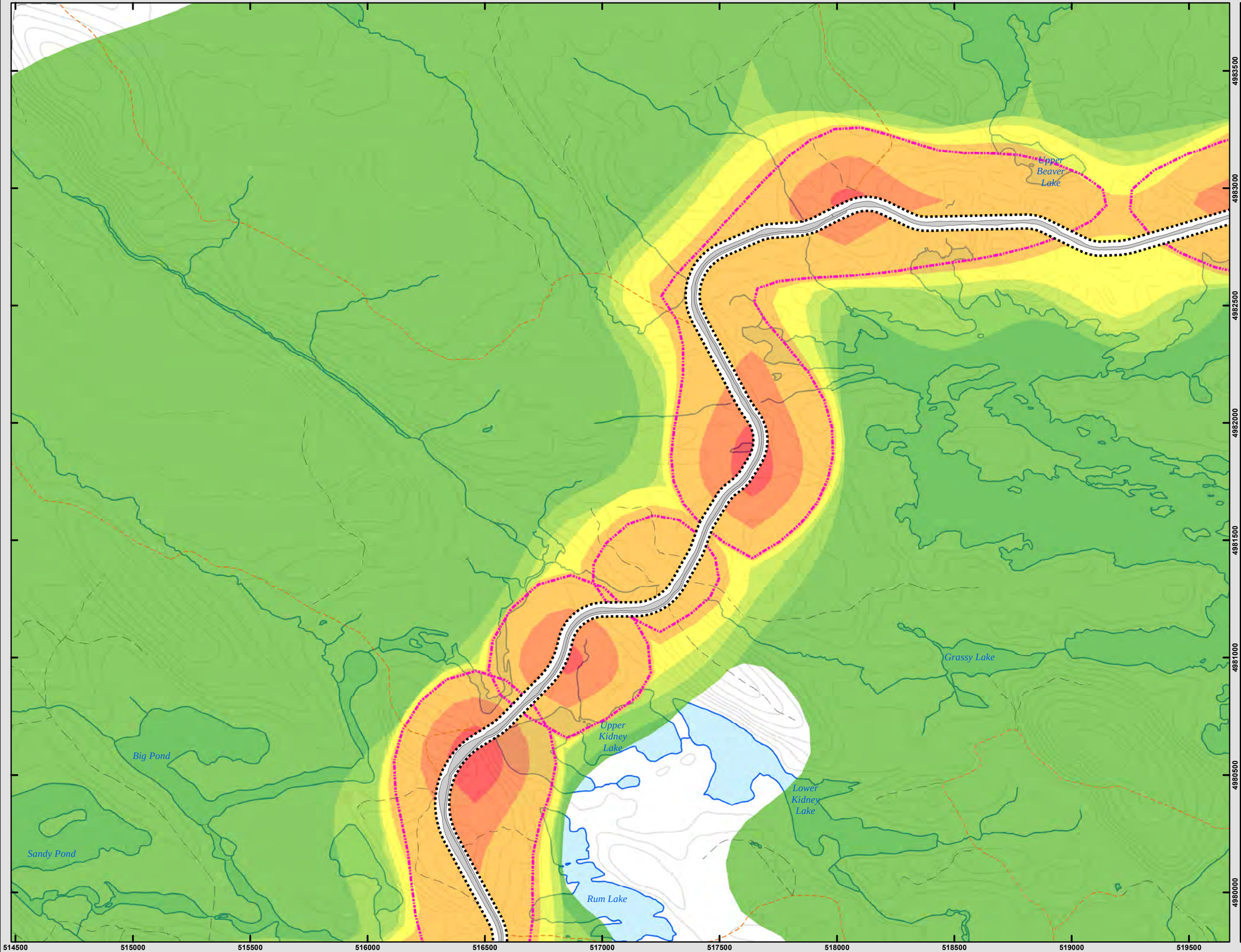
Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_HR

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-11D

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED



12.1 ug/m3 TSP Annual Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Proposed Property Boundary

Dry Weather / Seasonal Road

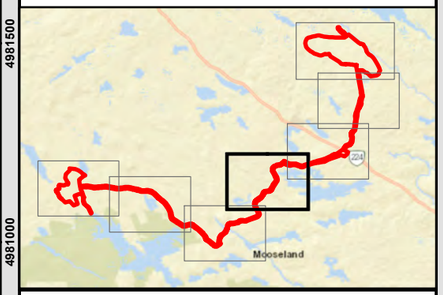
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

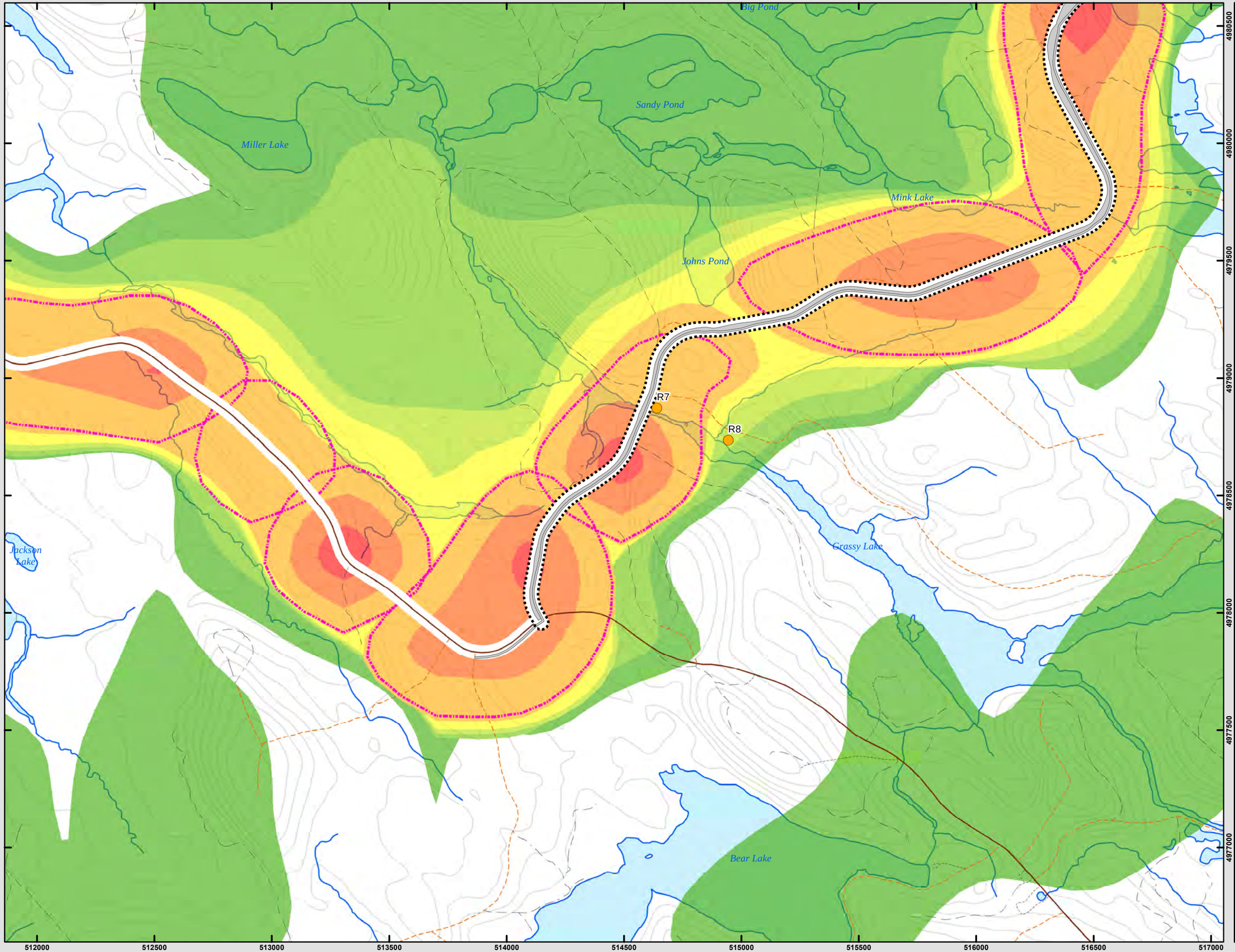
1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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FIGURE CEAA 2-31-11E

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

12.1 ug/m3 TSP Annual Background Level Concentration

Receptor

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

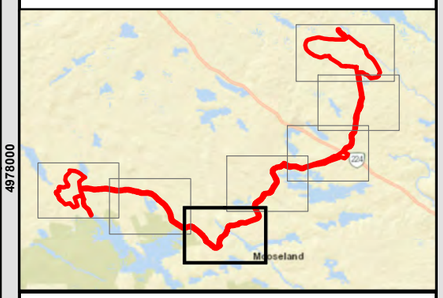
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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FIGURE CEAA 2-31-11F

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

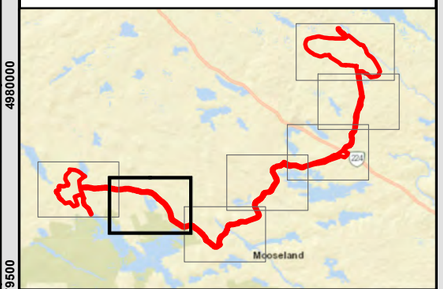
Cope Lake
Camp Lake
Second Rocky Lake
First Rocky Lake
Prest Lake
R9

12.1 ug/m3 TSP Annual Background Level Concentration
Receptor

Unmitigated TSP Ranges (ug/m3)
- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD
Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_HR

4982000
4981500
4981000
4980500
4980000
4979500
4979000
4978500

507500 508000 508500 509000 509500 510000 510500 511000 511500 512000

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FIGURE CEAA 2-31-11G

Beaver Dam Mine Project
Haul Road
Air Contour Annual Average Total Suspended Particulates
UNMITIGATED

Square Lake

New Dam Flowage

12.1 ug/m3 TSP Annual Background Level Concentration

Unmitigated TSP Ranges (ug/m3)

- <2
- 2 - 4
- 4 - 6
- 6 - 10
- 10 - 30
- 30 - 50
- 50

Existing Touquoy Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

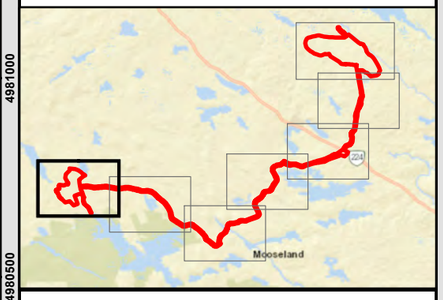
NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Touquoy Infrastructure Layout

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging peroid Annual - TSP limit: 70ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual TSP_Unmitigated_HR

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

4983000 4982500 4982000 4981500 4981000 4980500 4980000 4979500

Como Lake

Mill Lake

Cameron Flowage

Tent Lake

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12A

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

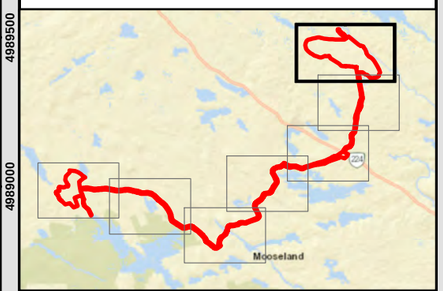
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 165 330 660 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12B

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

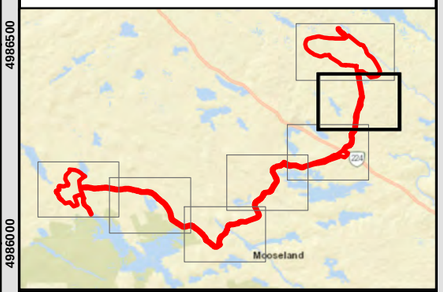
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR

Tent Lake
Cope Pond
McGregor Lake
Kent Lake
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

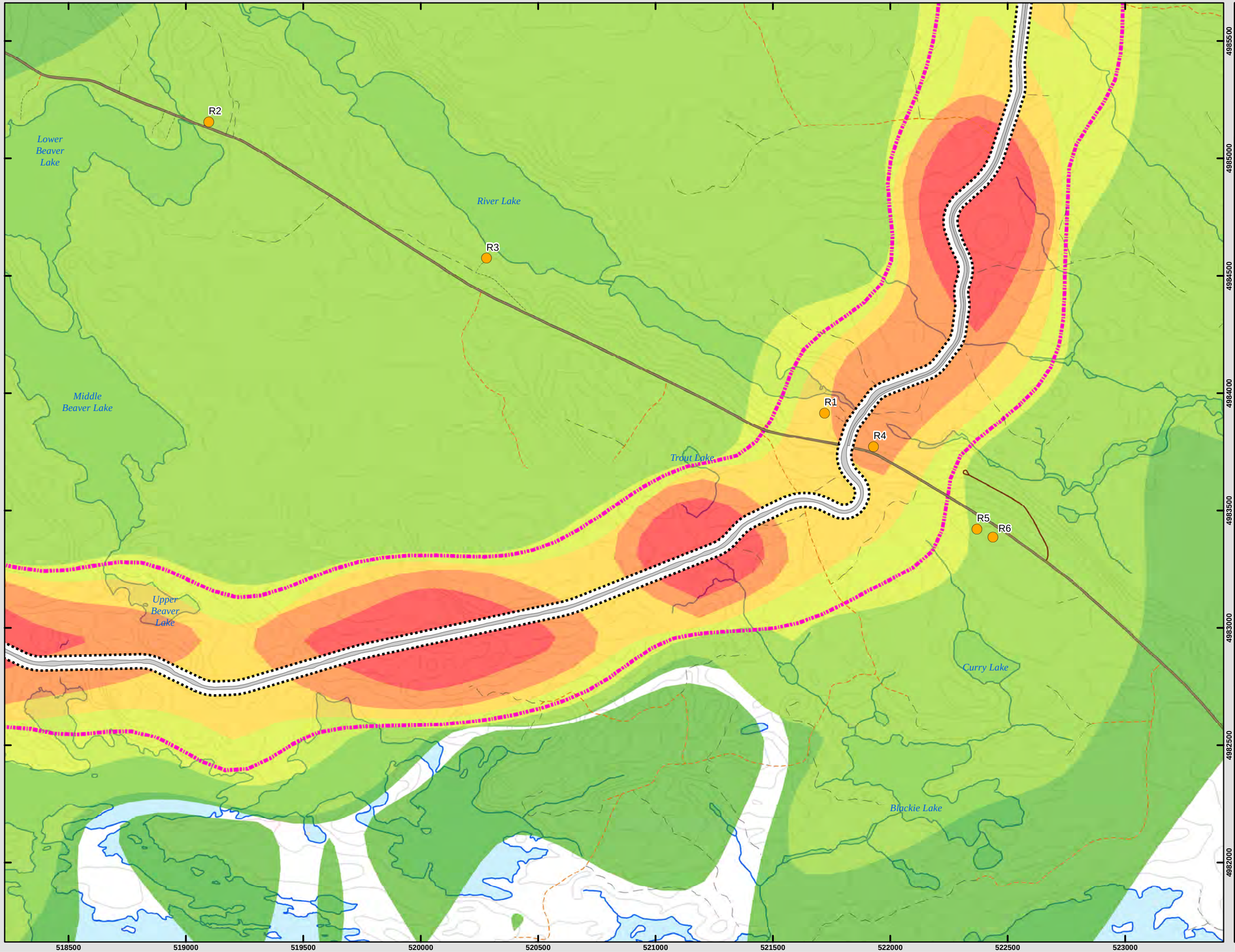
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12C

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED



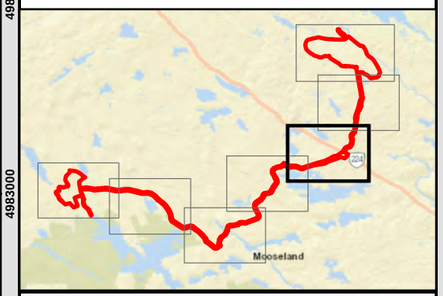
Receptor
13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)
- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Proposed Property Boundary

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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FIGURE CEAA 2-31-12D

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Proposed Property Boundary

Dry Weather / Seasonal Road

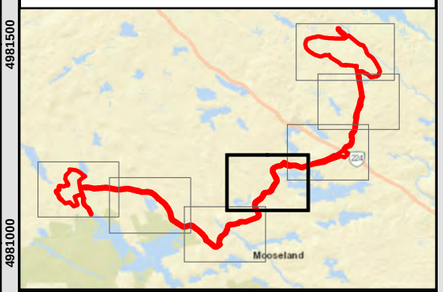
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12E

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED

Receptor

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

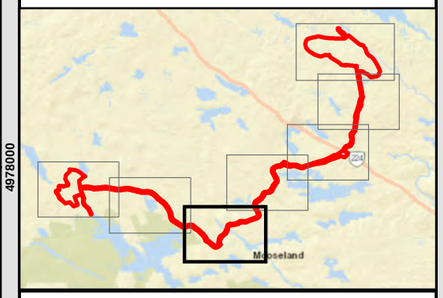
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

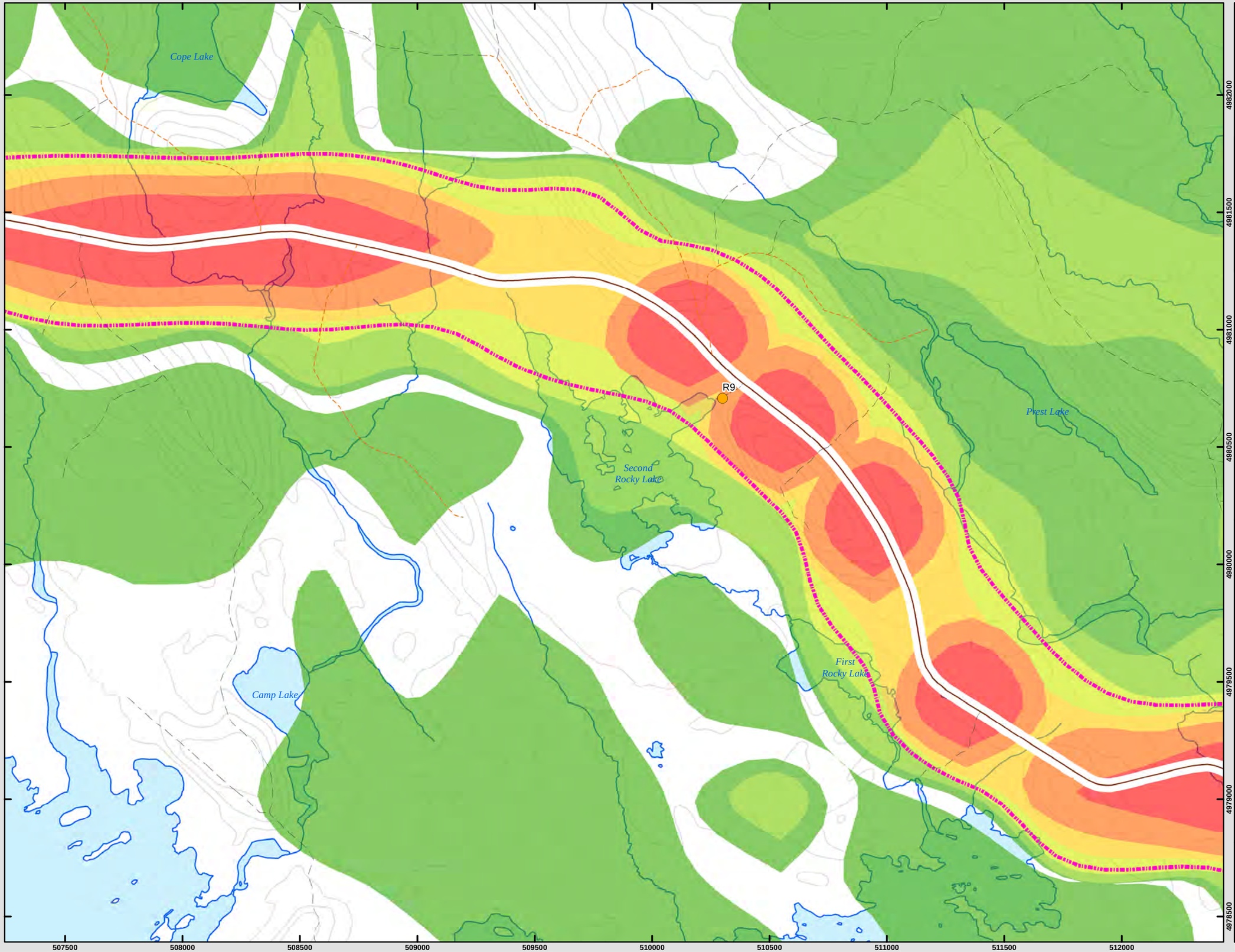
McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12F

Beaver Dam Mine Project Haul Road

Air Contour PM10 24-Hour Levels UNMITIGATED

Receptor

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

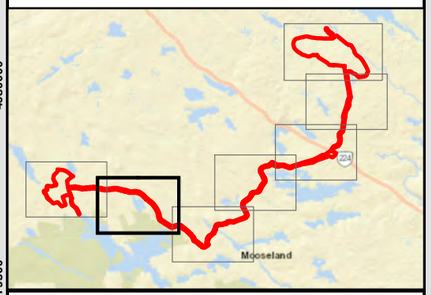
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

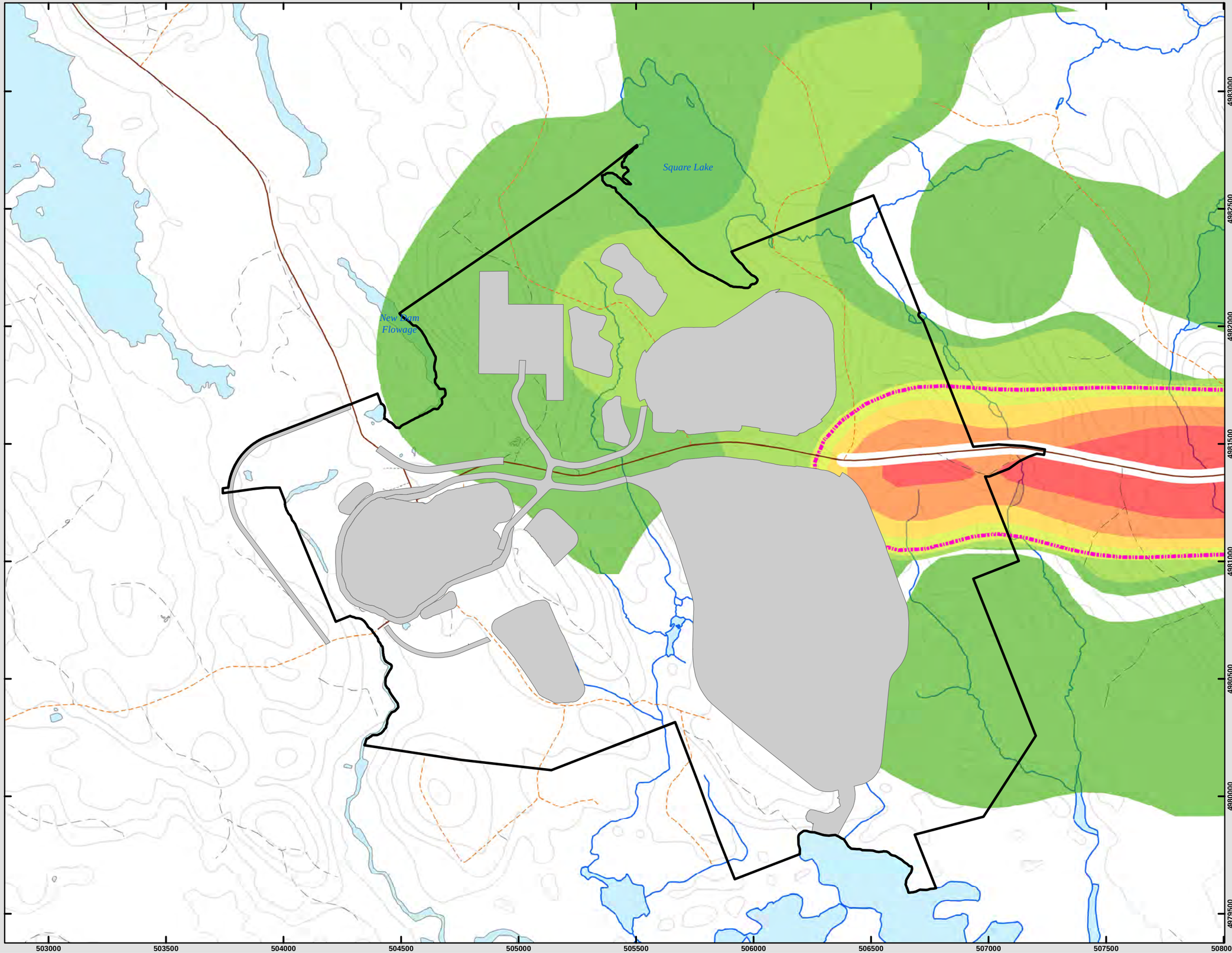
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-12G

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
UNMITIGATED

13.1 ug/m3 PM10 24 hr Background Level Concentration

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50

Existing Touquoy Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

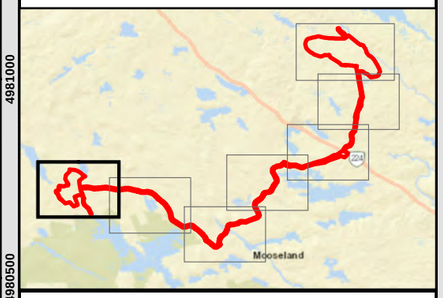
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr - PM10 limit: 50ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

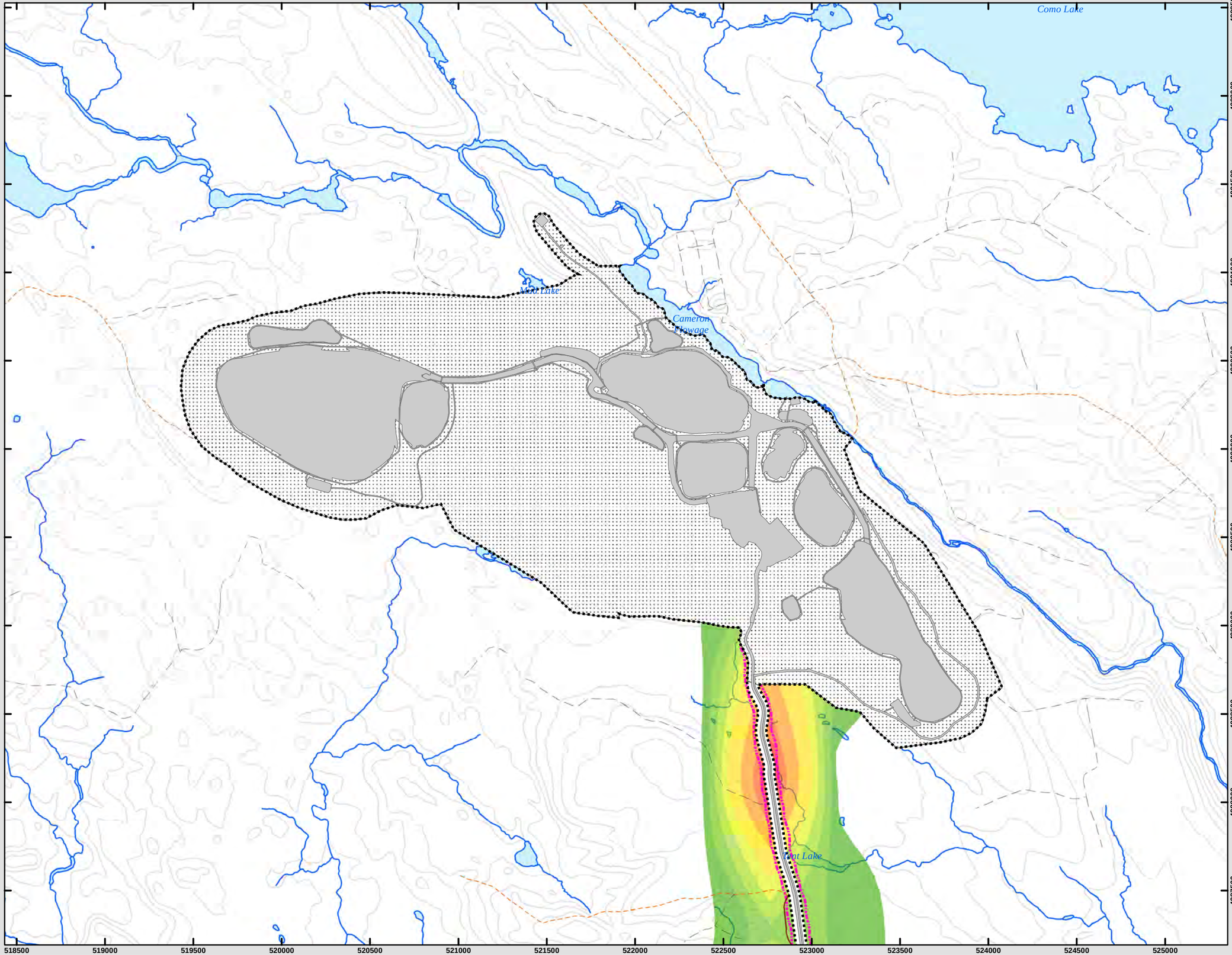
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM10_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-13A

Beaver Dam Mine Project Haul Road

Air Contour PM2.5 24-Hour Levels UNMITIGATED

9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

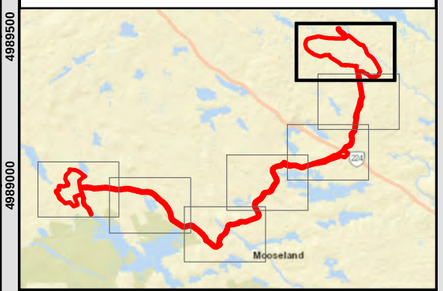
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR

Prepared For:

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FIGURE CEAA 2-31-13B

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 24-Hour Levels
UNMITIGATED

9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

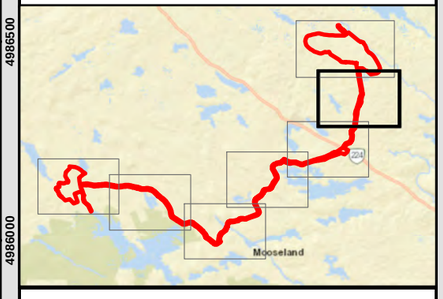
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

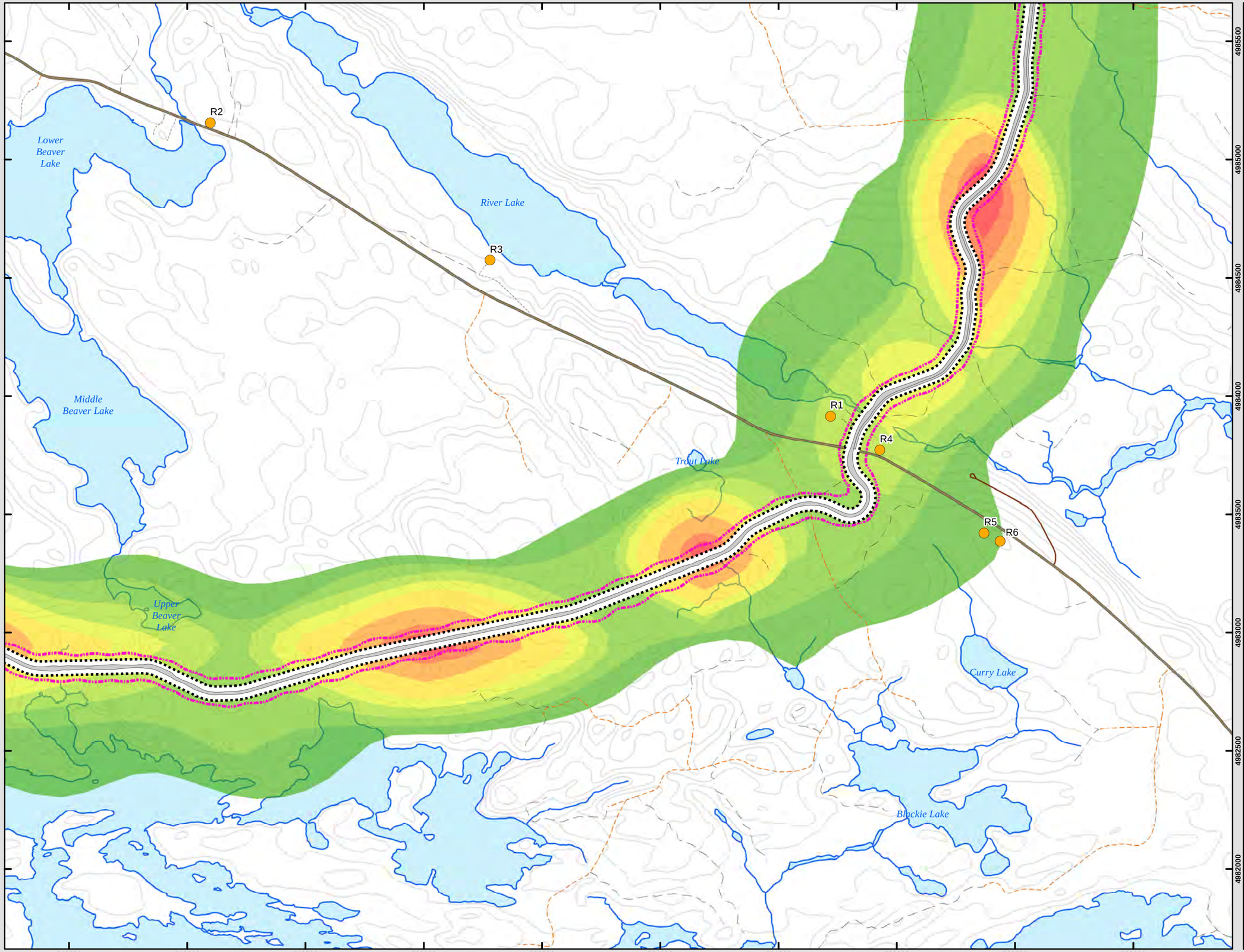
McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR

Kent Lake
McGregor Lake
Cope Pond
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

520500 521000 521500 522000 522500 523000 523500 524000 524500 525000



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FIGURE CEAA 2-31-13C

Beaver Dam Mine Project
Haul Road

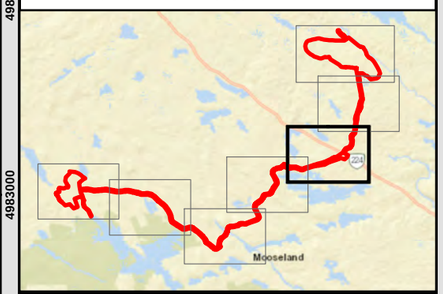
Air Contour PM2.5 24-Hour Levels
UNMITIGATED

- Receptor
- 9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10
- Proposed Property Boundary
- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR

Prepared For:

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FIGURE CEAA 2-31-13D

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 24-Hour Levels
UNMITIGATED

9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10

Proposed Property Boundary

Dry Weather / Seasonal Road

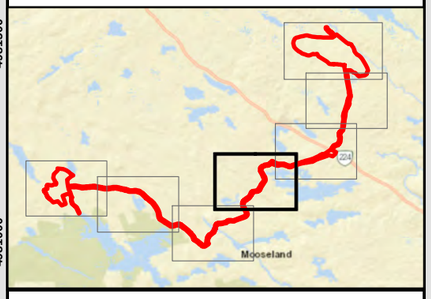
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

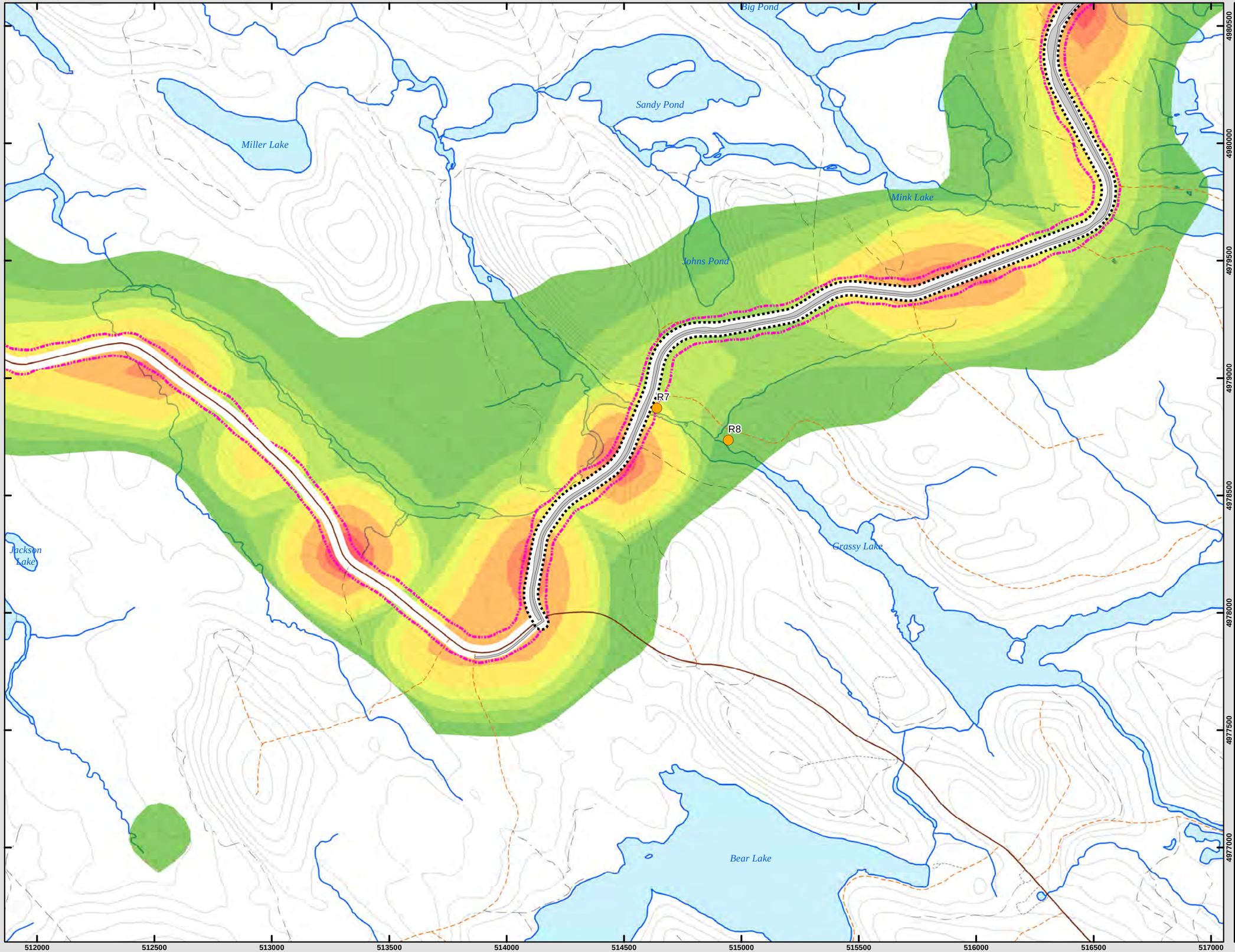
McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-13E

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 24-Hour Levels
UNMITIGATED

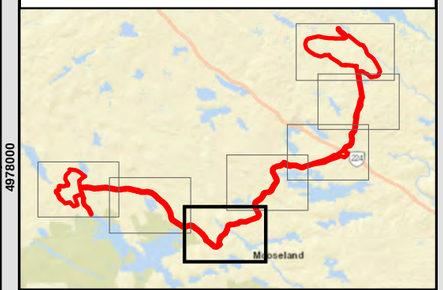
- Receptor
- 9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10
- Proposed Property Boundary

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

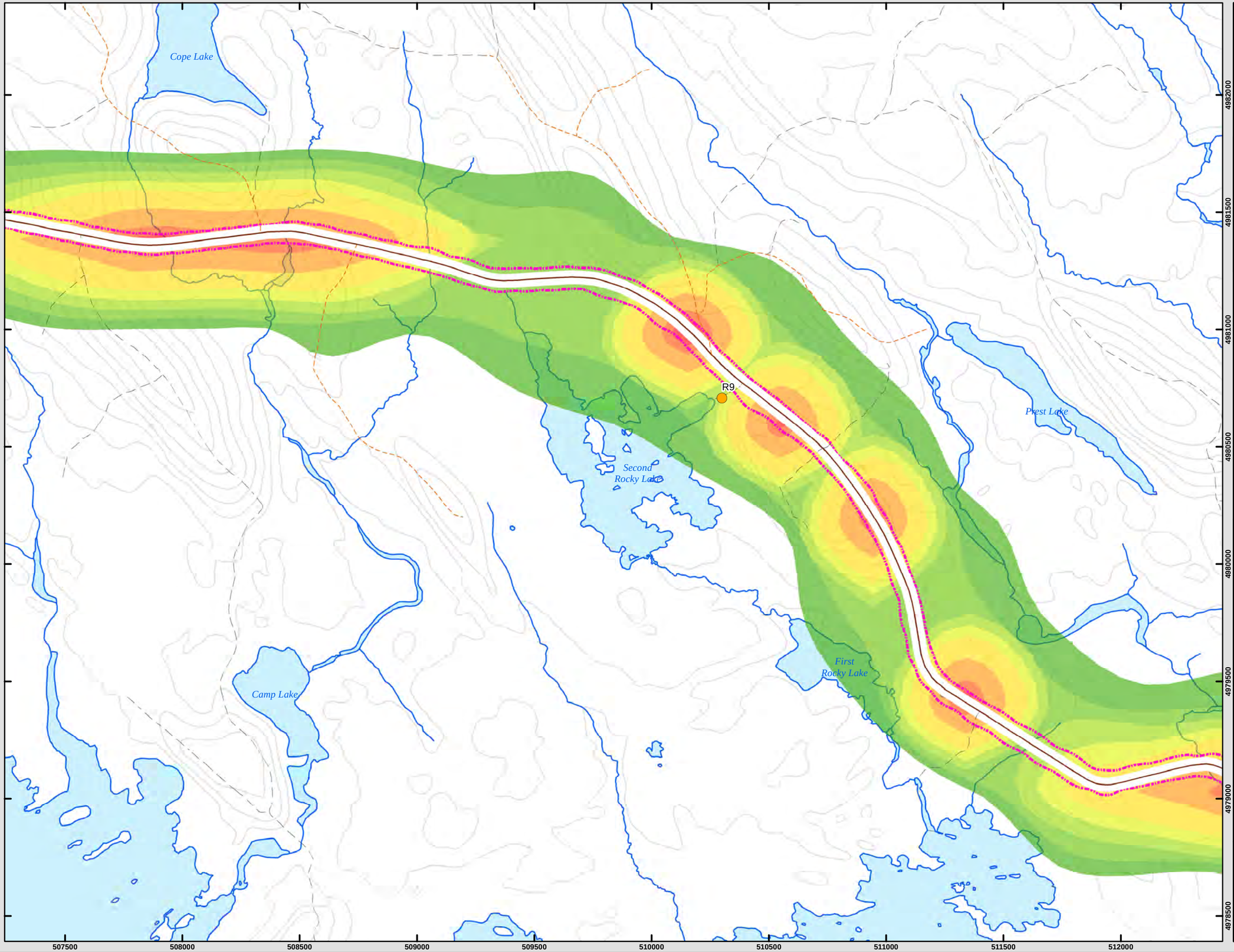
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-13F

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 24-Hour Levels
UNMITIGATED



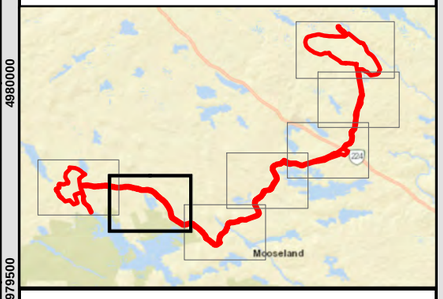
- Receptor
- 9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

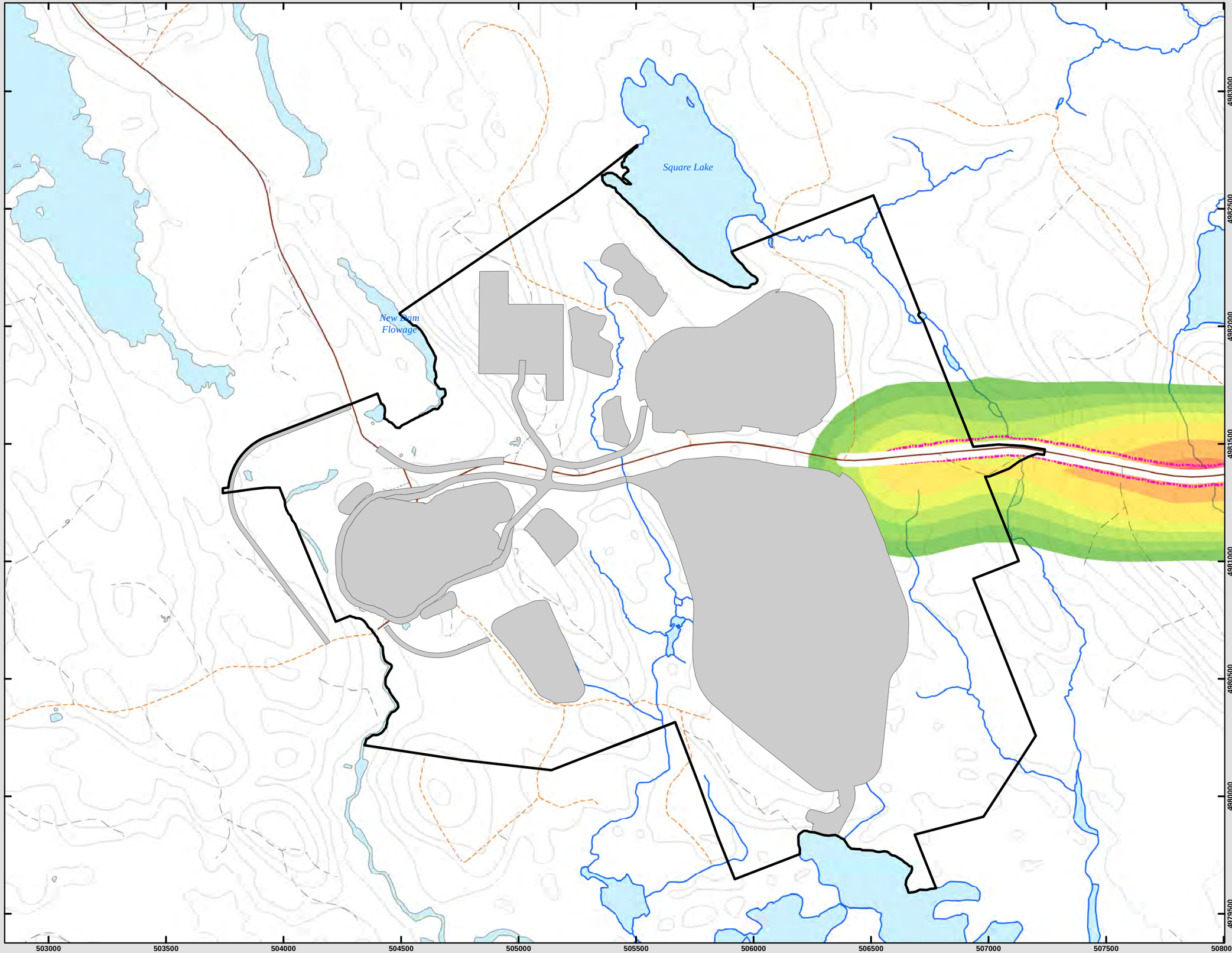
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-13G

Beaver Dam Mine Project Haul Road

Air Contour PM2.5 24-Hour Levels UNMITIGATED

9.0 ug/m3 PM2.5 24hr Background Level Concentration

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10

Existing Touquoy Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

Track

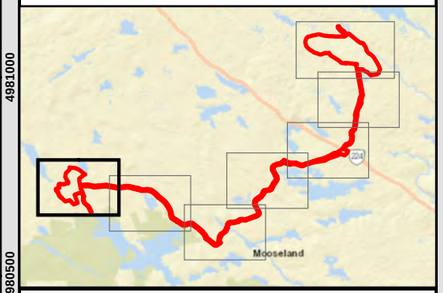
NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Touquoy Infrastructure Layout

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period 24 hr PM2.5 limit: 27 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

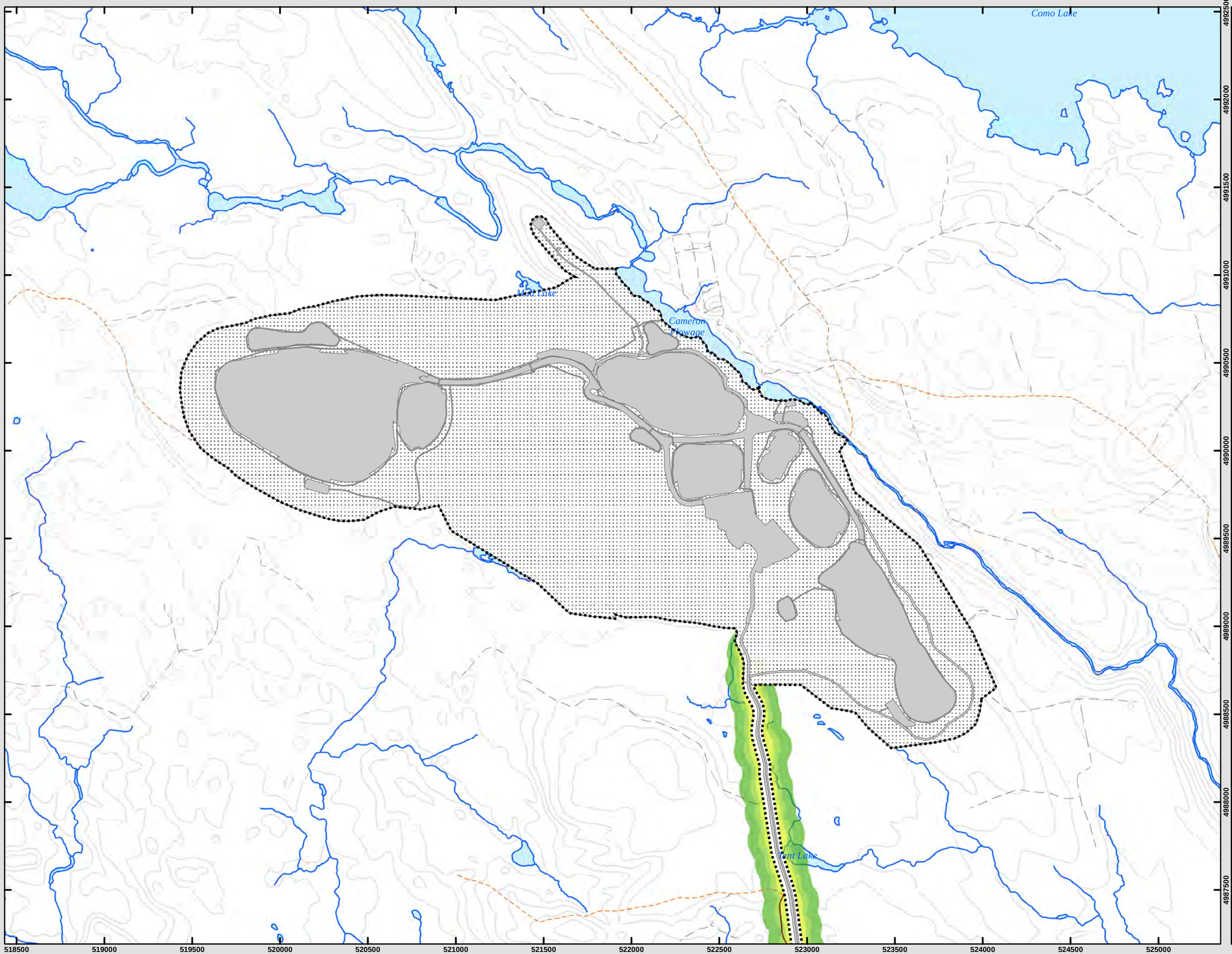
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air 24hr PM2.5_Unmitigated_HR



Prepared For:

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FIGURE CEAA 2-31-14A

Beaver Dam Mine Project Haul Road

Air Contour PM2.5 Annual Levels UNMITIGATED

Unmitigated PM2.5 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

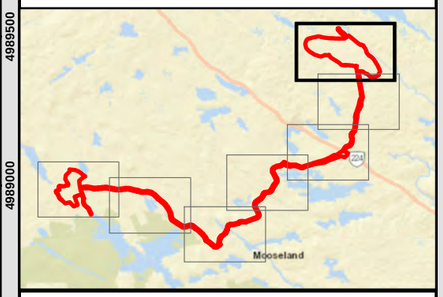
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

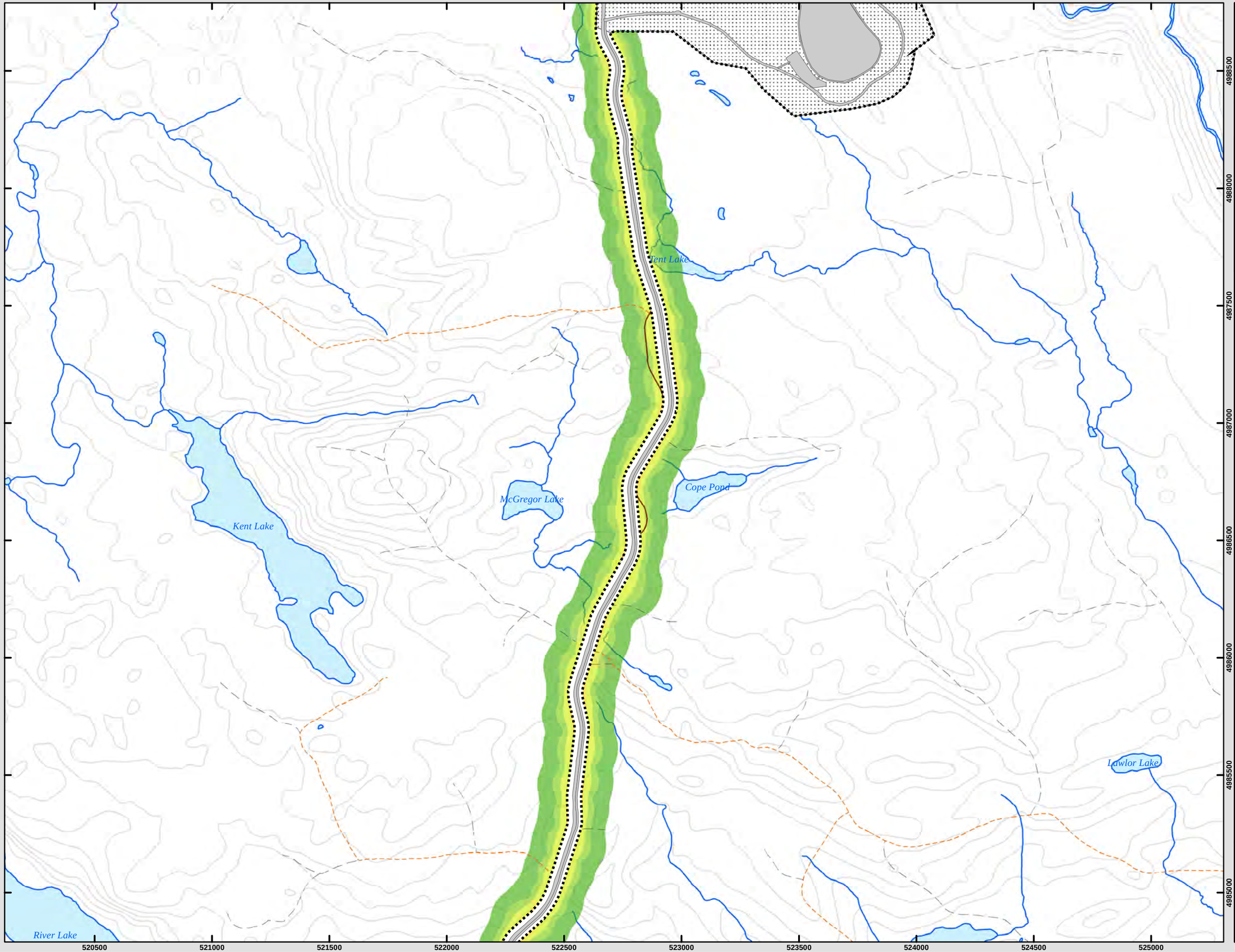
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-14B

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 Annual Levels
UNMITIGATED



Unmitigated PM2.5 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4

Mine Site concentrations reach background within boundary

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

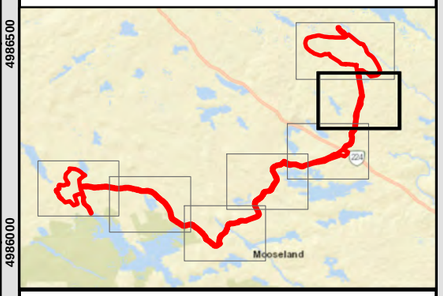
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

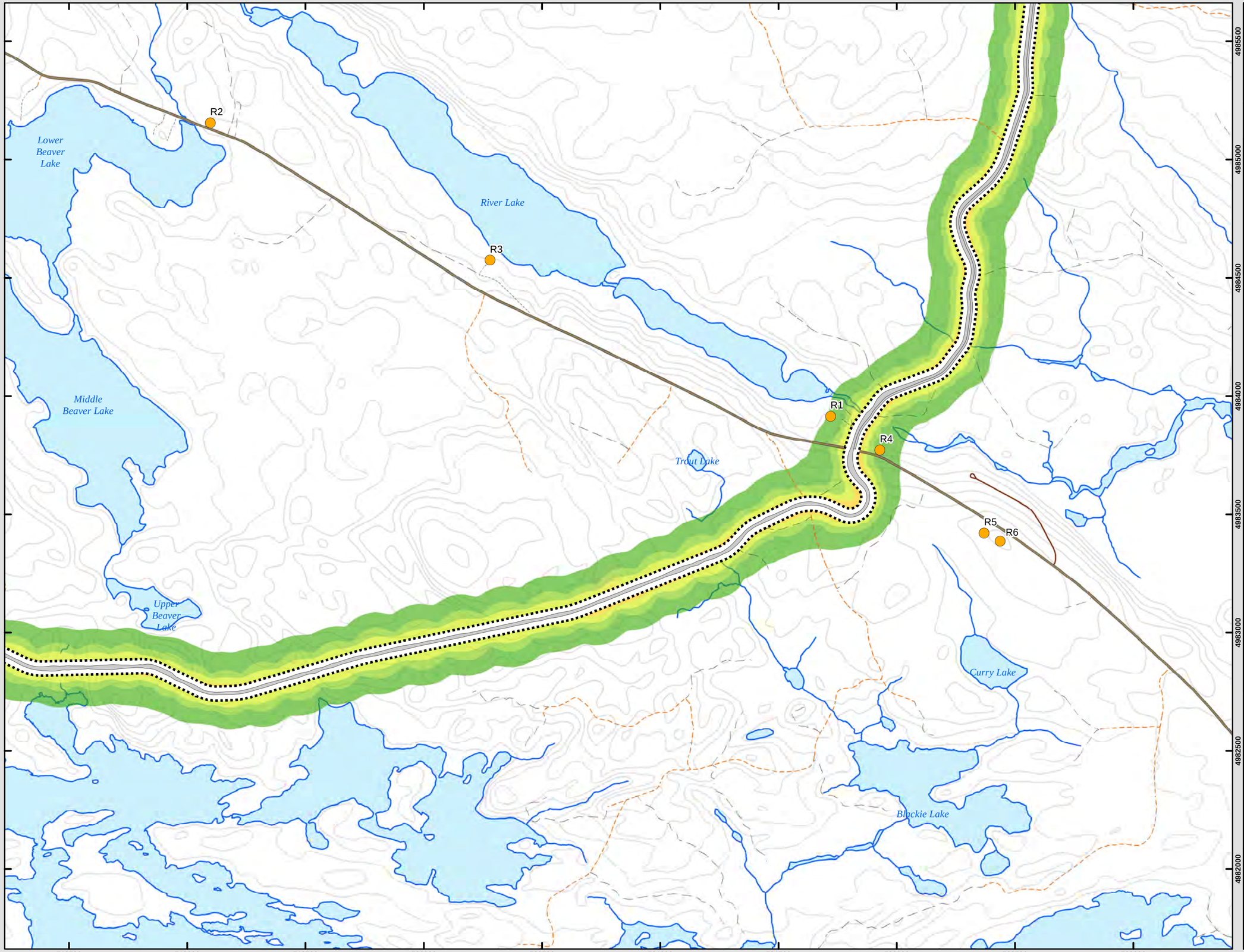
Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-14C

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 Annual Levels
UNMITIGATED

Receptor

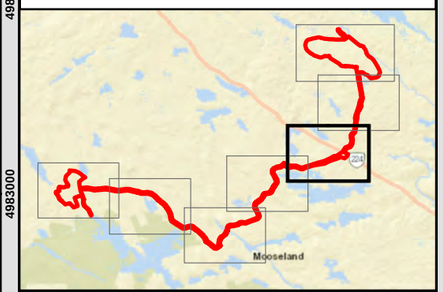
Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4

Proposed Property Boundary

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR

Prepared For:

Atlantic Gold

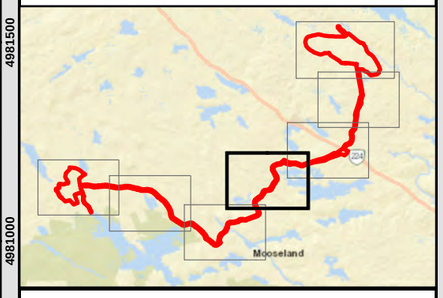
FIGURE CEAA 2-31-14D

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 Annual Levels
UNMITIGATED

Unmitigated PM2.5 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4
- Proposed Property Boundary
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

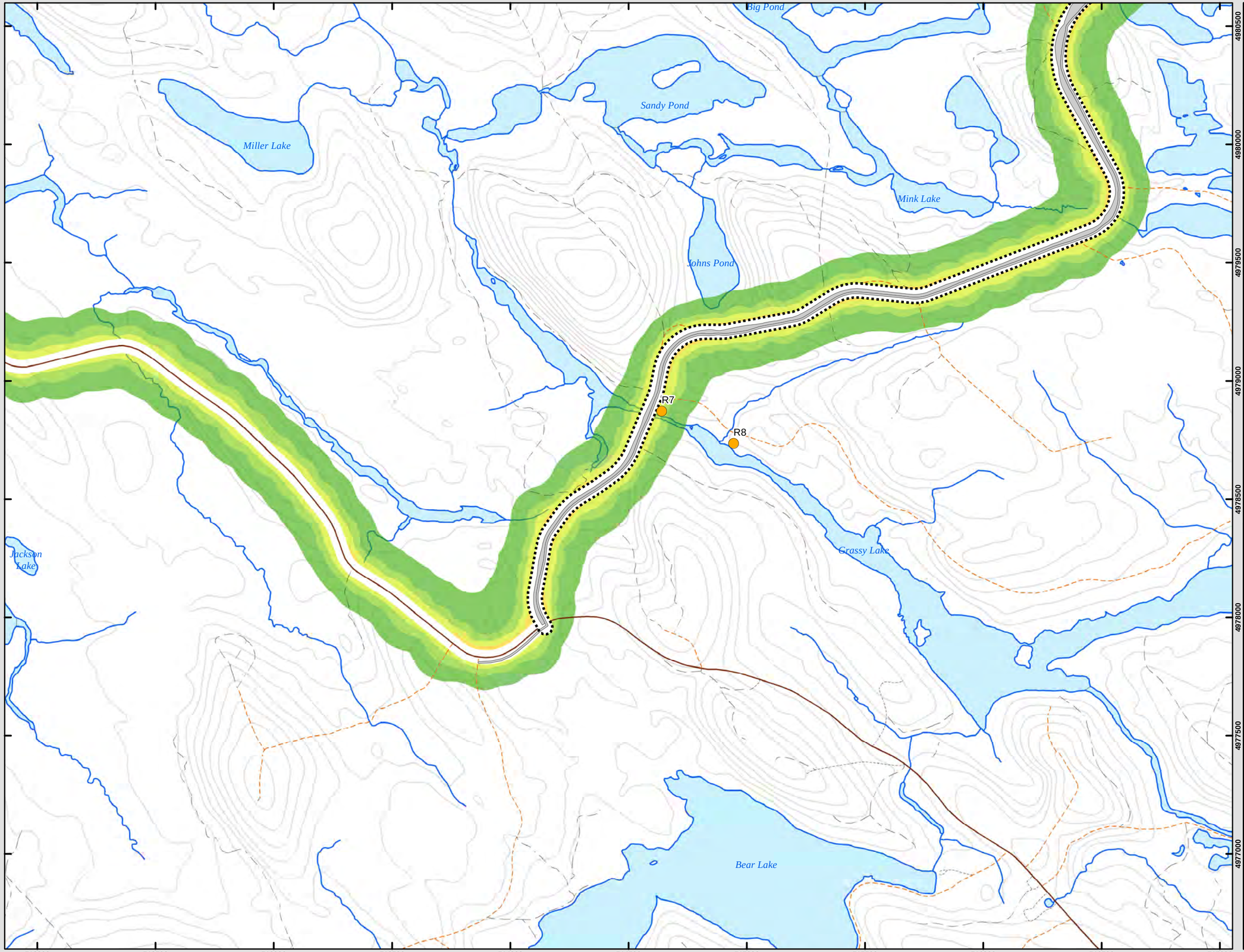
McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-14E

Beaver Dam Mine Project Haul Road

Air Contour PM2.5 Annual Levels UNMITIGATED

Receptor

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4

Proposed Property Boundary

Local Road

Dry Weather / Seasonal Road

Diveways (>300 m)

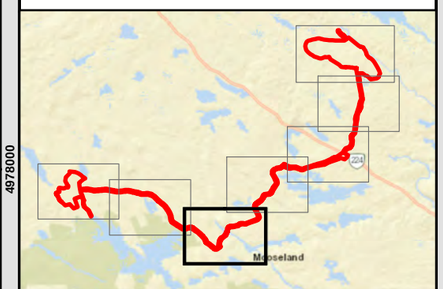
Track

NSTDB Mapped Watercourses

Lakes

Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR

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FIGURE CEAA 2-31-14F

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 Annual Levels
UNMITIGATED

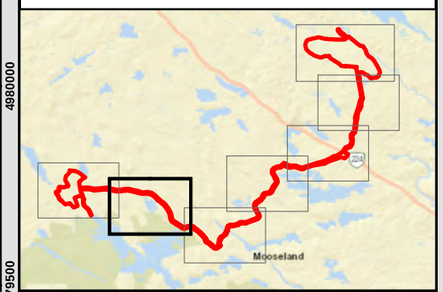
Receptor

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR

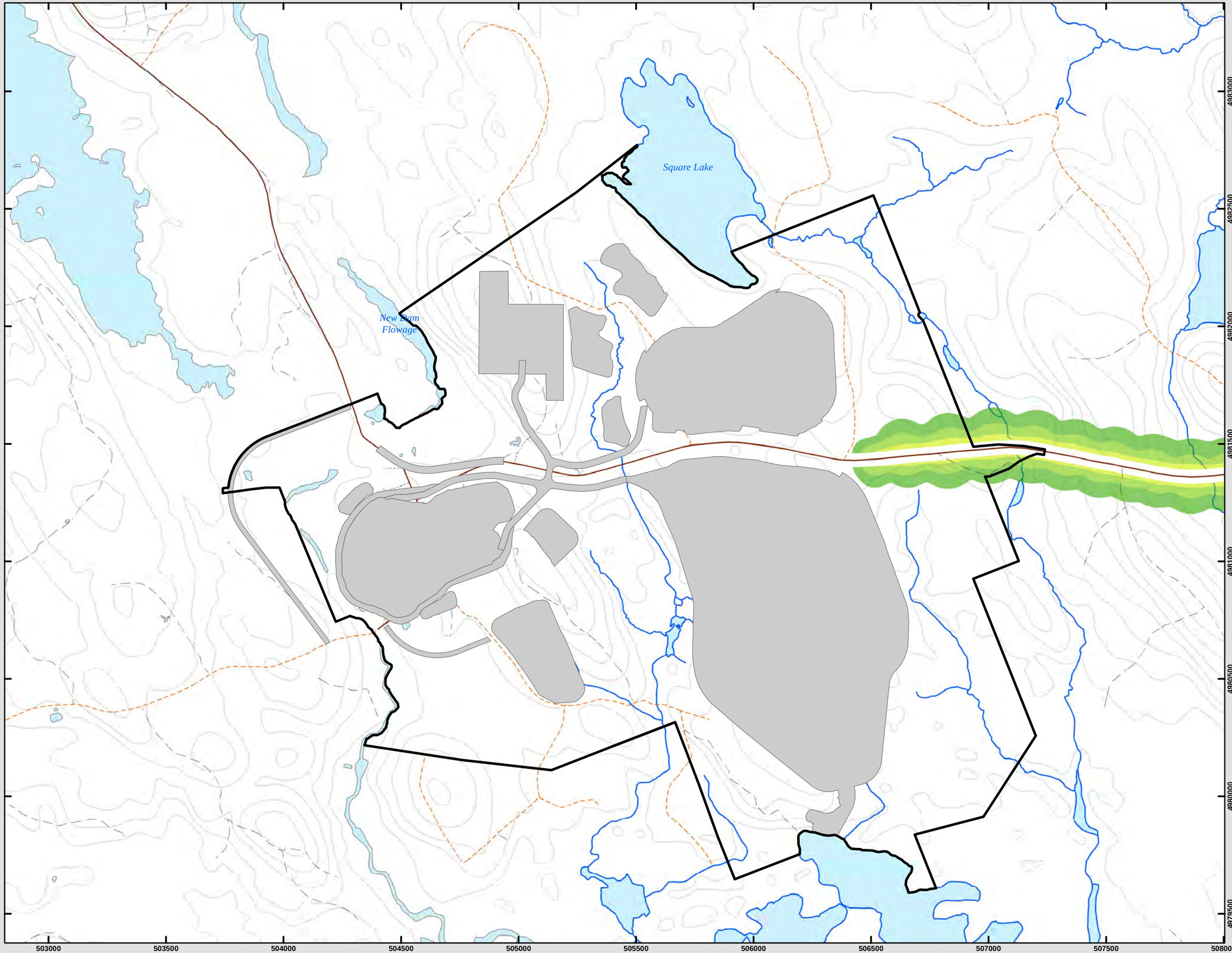
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-14G

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 Annual Levels
UNMITIGATED

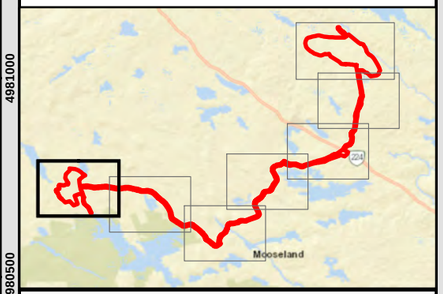


Unmitigated PM2.5 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4

Existing Touquoy Property Boundary

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Planned Infrastructure
- Touquoy Infrastructure Layout

Note: No road dust mitigation applied. Model results shown beyond proposed Project property boundary only.
Ambient air quality criteria: Averaging period Annual PM2.5 limit: 8.8 ug/m3
All levels below background Annual PM 2.5 level: 5.7 ug/m3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX_Air Annual PM2.5_Unmitigated_HR

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FIGURE CEAA 2-31-15A

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

Como Lake

Mary Lake

Cameron Pit Lake

Trout Lake

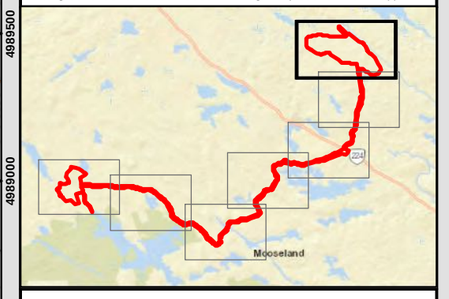
Beaver Dam Mine Site (concentrations beyond property boundary shown)

NO2 Ranges (ug/m3)

- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15
- 15 - 18
- 18

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,190 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

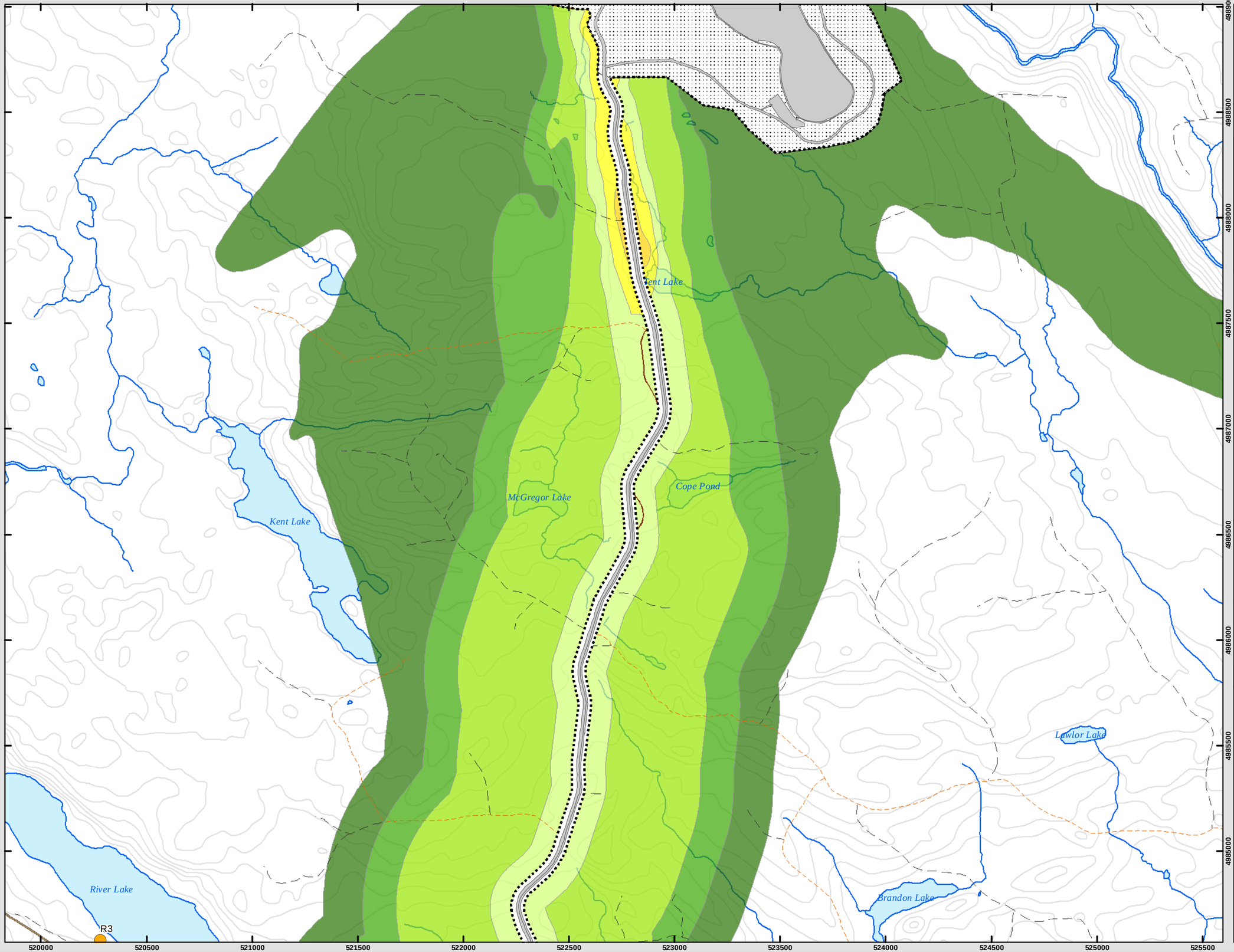
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500



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FIGURE CEAA 2-31-15B

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

Receptor

Beaver Dam Mine Site (concentrations beyond property boundary shown)

NO2 Ranges (ug/m3)

- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15
- 15 - 18
- 18

Collector Road

Local Road

Dry Weather / Seasonal Road

Track

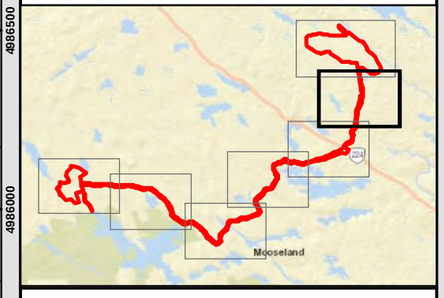
NSTDB Mapped Watercourses

Lakes

Proposed Project Infrastructure

Proposed Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

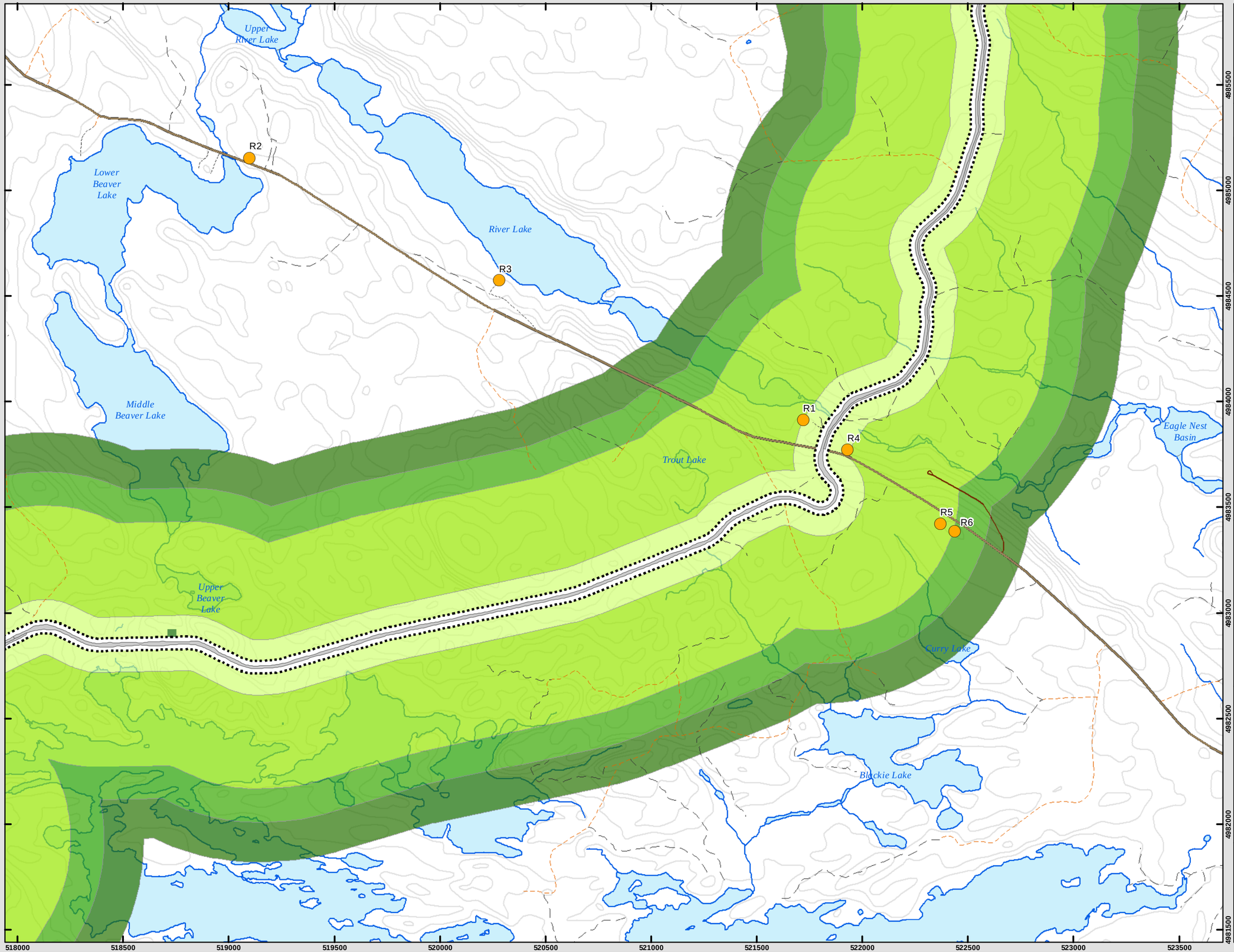
Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-15C

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels



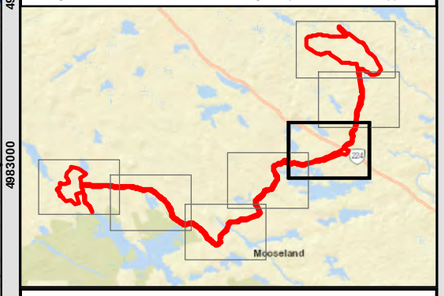
Receptor

NO2 Ranges (ug/m3)

- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Middle Beaver Lake
Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake
Mink Lake
Brandy Lake

4984000
4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

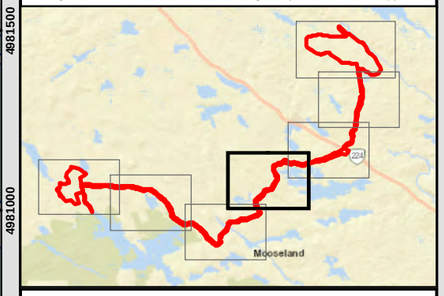
FIGURE CEAA 2-31-15D

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

NO2 Ranges (ug/m3)
- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

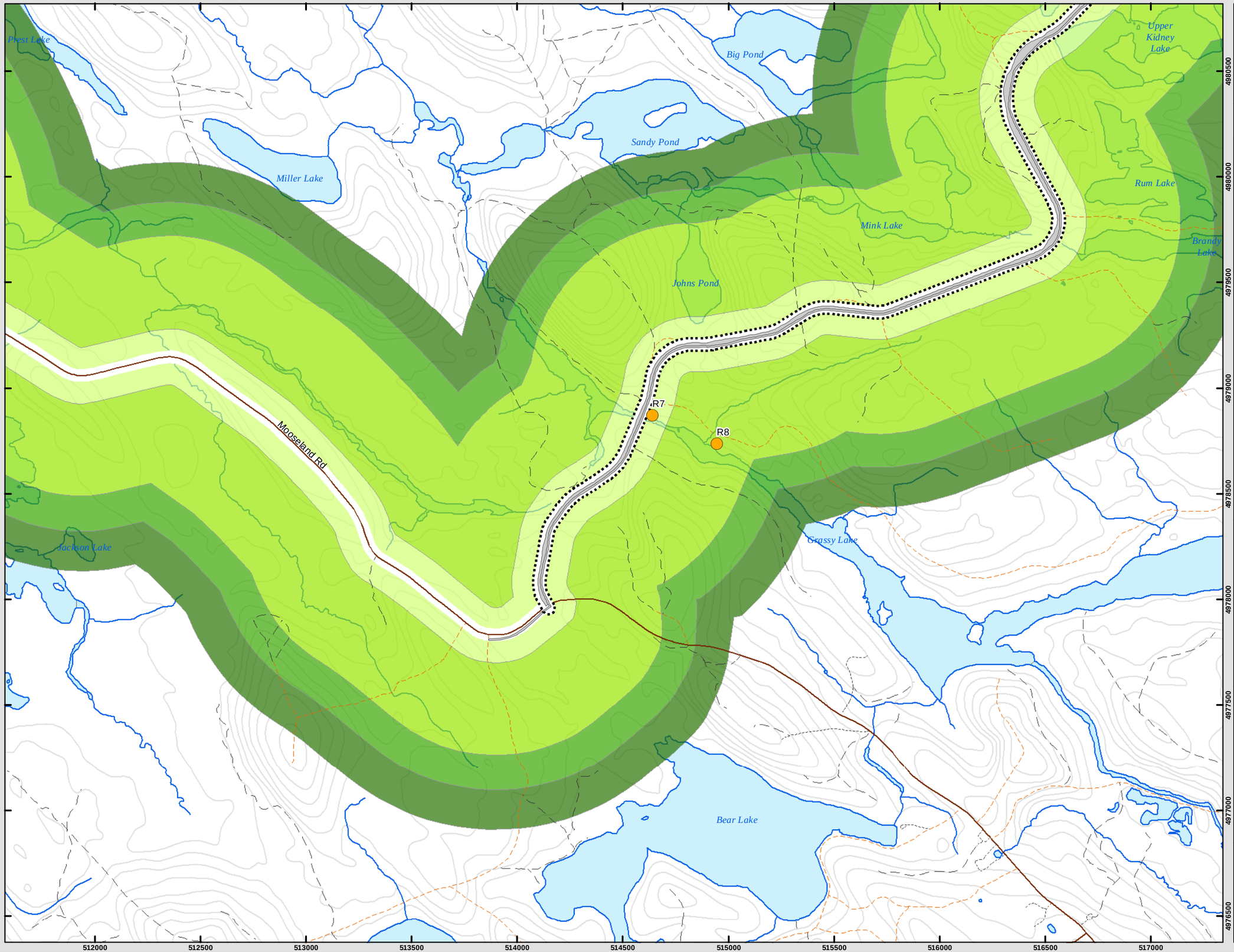
Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-15E

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

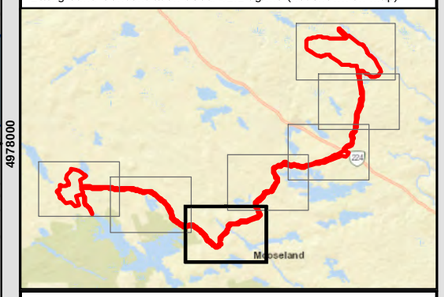


Receptor

NO2 Ranges (ug/m3)
- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-15F

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

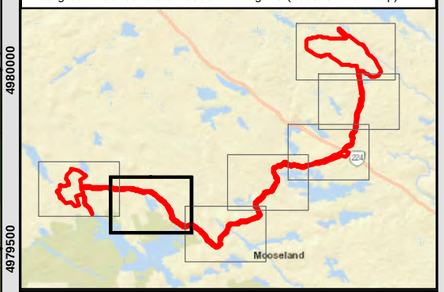
Receptor

NO2 Ranges (ug/m3)

- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

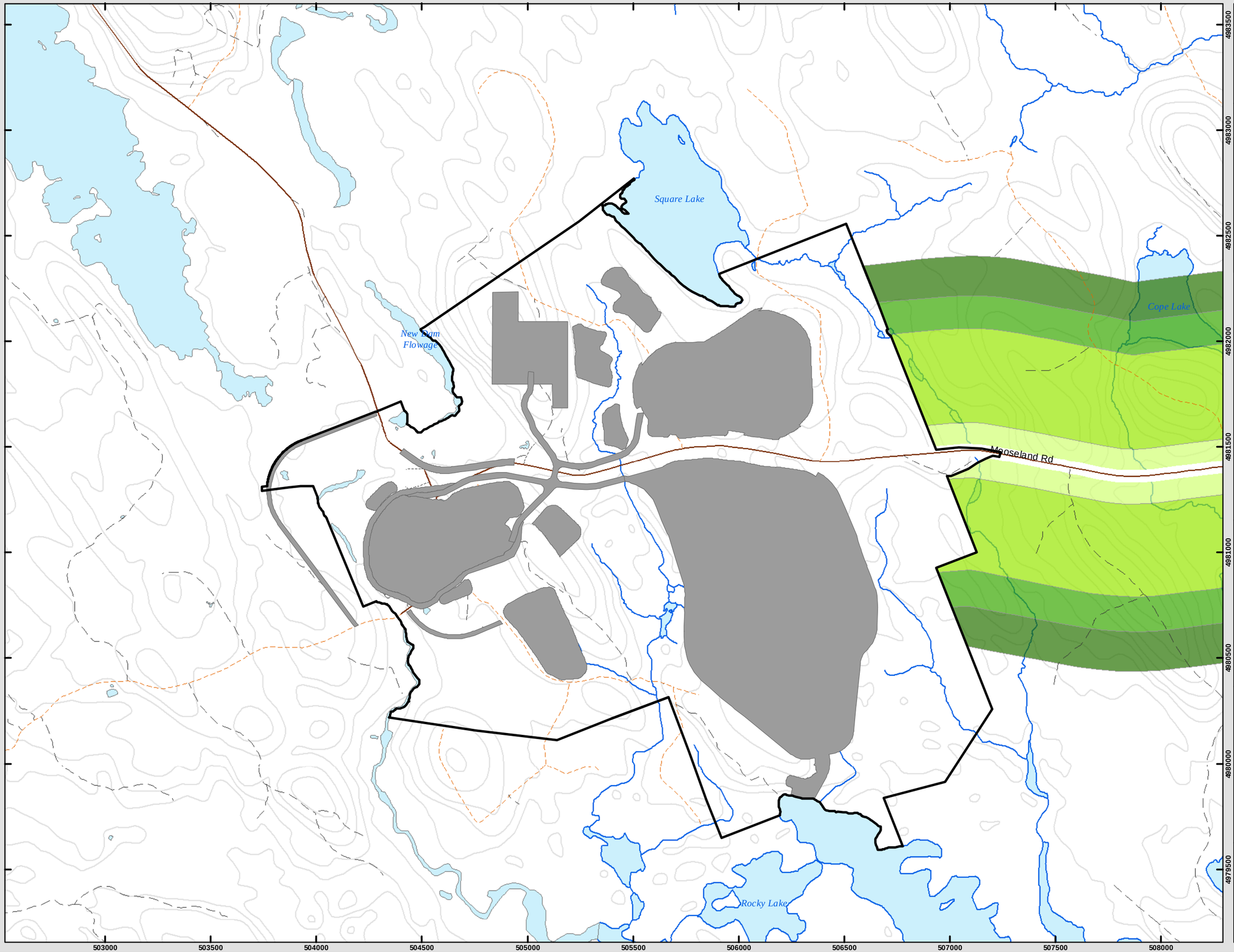
Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-15G

Beaver Dam Mine Project
Air Contours
NO2 1-Hour Levels

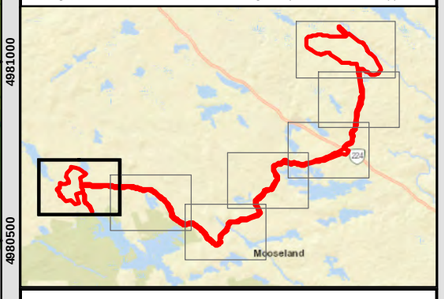


NO2 Ranges (ug/m3)

- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

NO2 1 Hour Guideline: 400 ug/m3 (not shown on map)
Background Concentration Used: 41.1 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 140 280 560 m

1:16,670 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

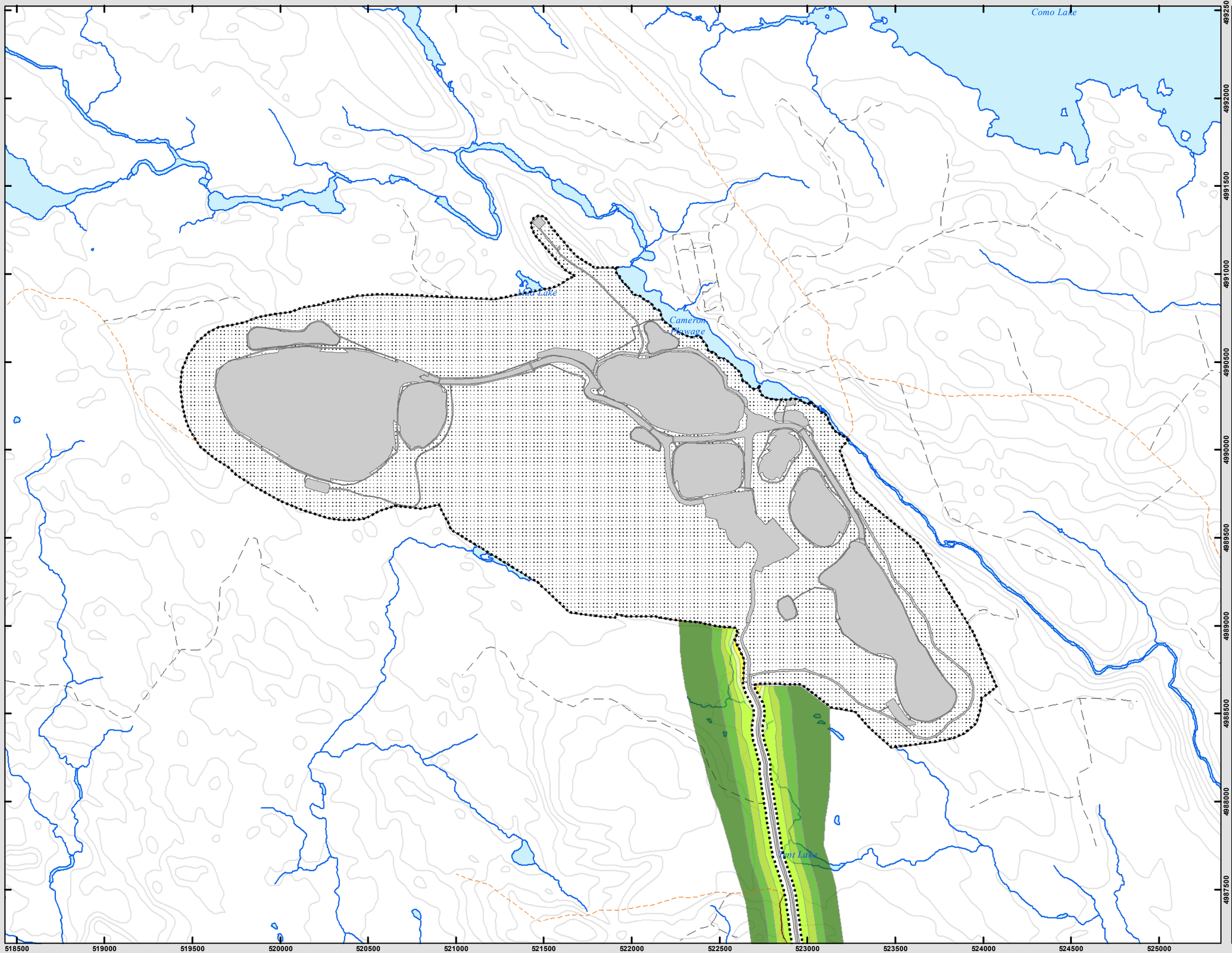
Document Name: BD_EIS_Figure6-2-X_Air_NO2_1hr_2

Prepared For:

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FIGURE CEAA 2-31-16A

Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels



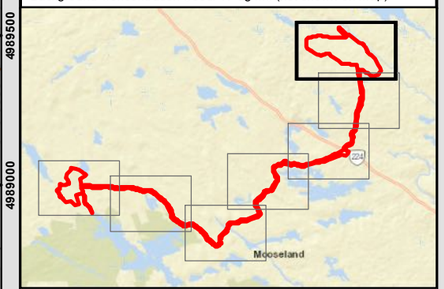
Beaver Dam Mine Site (concentrations reach background within boundary)

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_24hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-16B

Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels

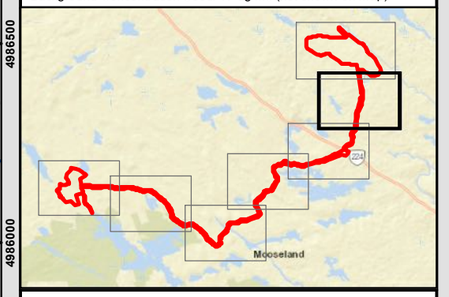
Beaver Dam Mine Site (concentrations reach background within boundary)

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

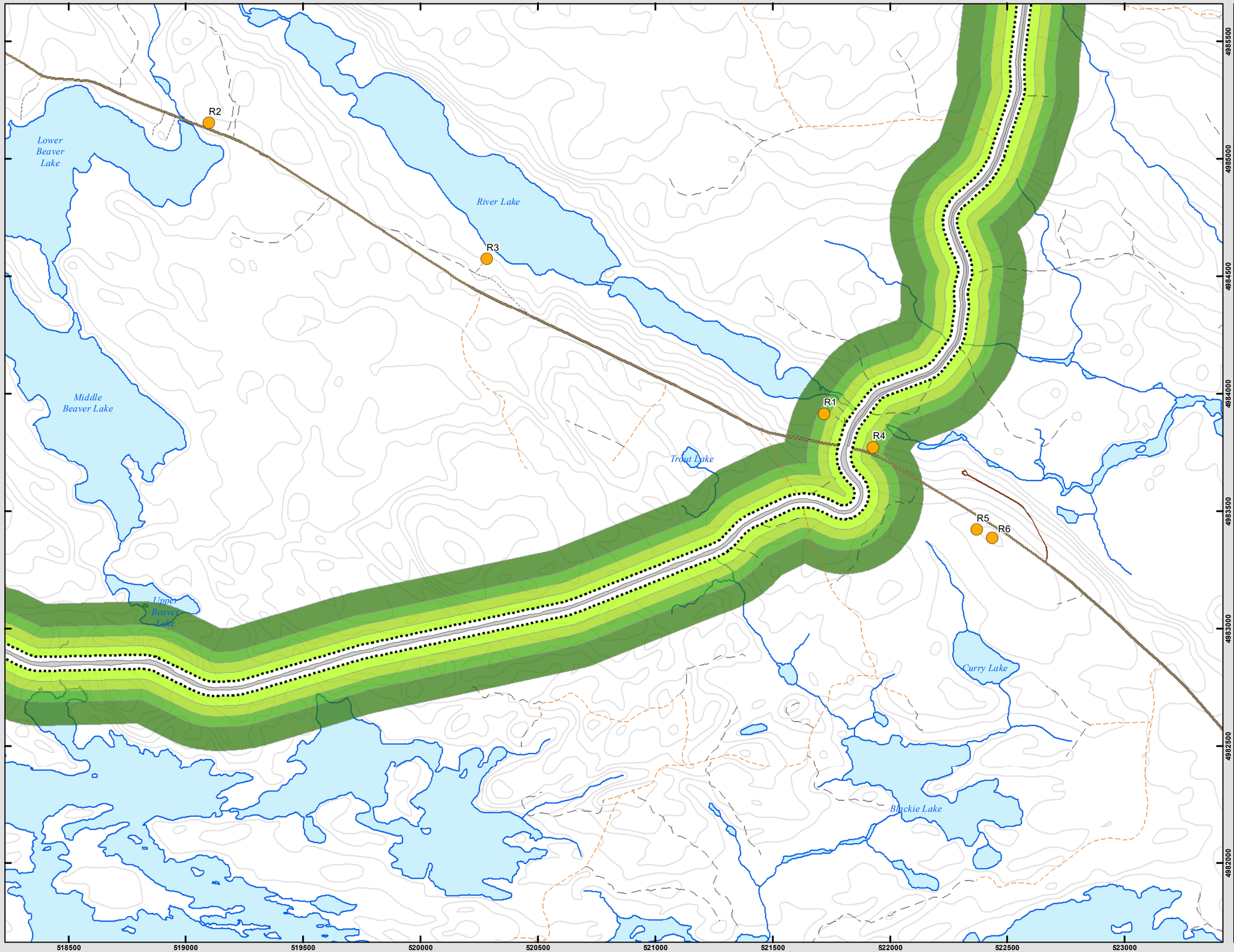
Document Name: BD_EIS_Figure6-2-X_Air_NO2_24hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-16C

Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels



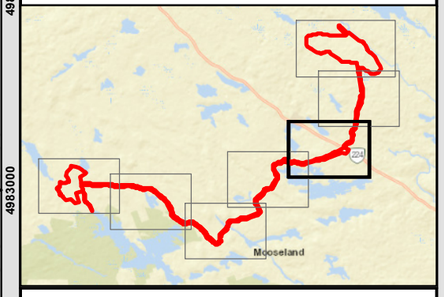
Receptor

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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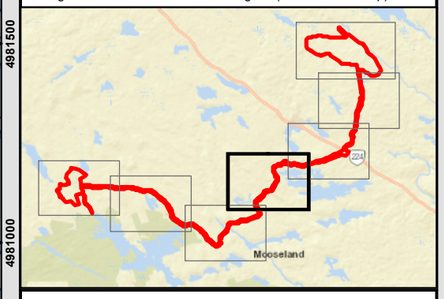
FIGURE CEAA 2-31-16D

Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels

NO2 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_24hr

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-16E

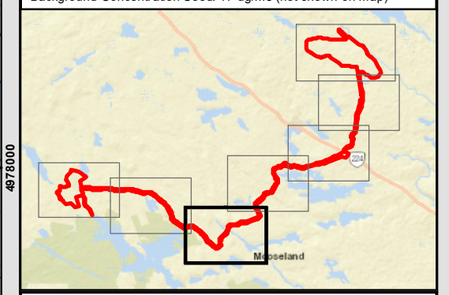
Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels

Receptor

NO2 Ranges (ug/m3)
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-16F

Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels

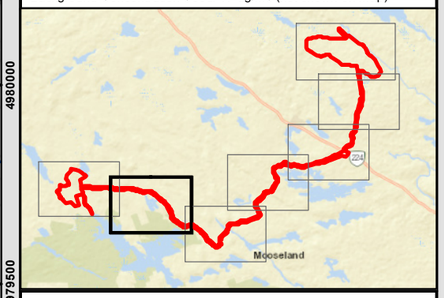
Receptor

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_24hr

Cope Lake
Mooseland Rd
R9
Second Rocky Lake
Priest Lake
Camp Lake
First Rocky Lake

507500 508000 508500 509000 509500 510000 510500 511000 511500 512000

4982000 4981500 4981000 4980500 4980000 4979500 4979000 4978500

Square Lake

New Dam Flowage

Mooseland Rd

4983000
4982500
4982000
4981500
4981000
4980500
4980000
4979500

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-16G

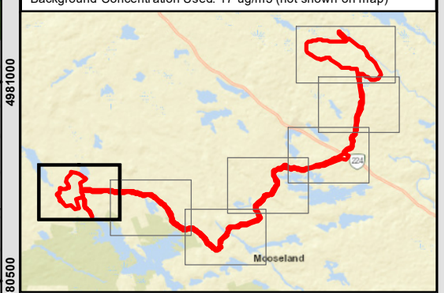
Beaver Dam Mine Project
Air Contours
NO2 24-Hour Levels

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

NO2 24 Hour Guideline: 200 ug/m3 (not shown on map)
Background Concentration Used: 17 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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FIGURE CEAA 2-31-17A

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

Como Lake

Mill Lake

Cameron Chiwage

Unnamed Lake

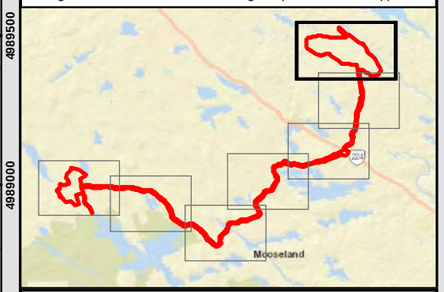
Beaver Dam Mine Site (concentrations reach background within boundary)

NO2 Ranges (ug/m3)

- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

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FIGURE CEAA 2-31-17B

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

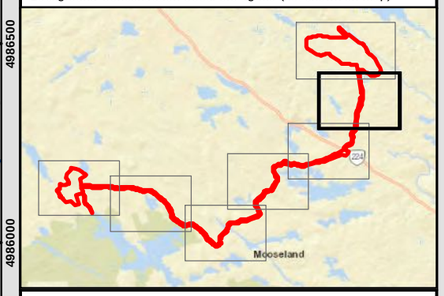
Beaver Dam Mine Site (concentrations reach background within boundary)

NO2 Ranges (ug/m3)

- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

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FIGURE CEAA 2-31-17C

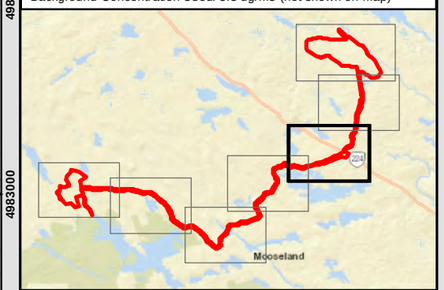
Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

Receptor

NO2 Ranges (ug/m3)
- 0.5 - 1
- 1 - 1.5

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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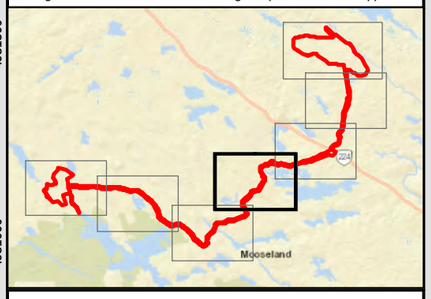
FIGURE CEAA 2-31-17D

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

NO2 Ranges (ug/m3)
- 0.5 - 1
- 1 - 1.5

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-17E

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

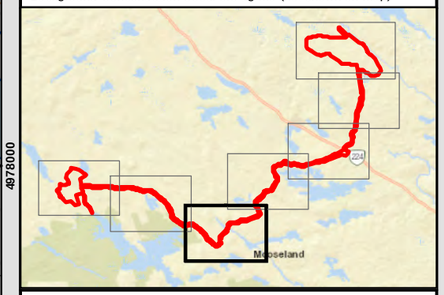
Receptor

NO2 Ranges (ug/m3)

- 0.5 - 1
- 1 - 1.5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Mooseland Rd
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-17F

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

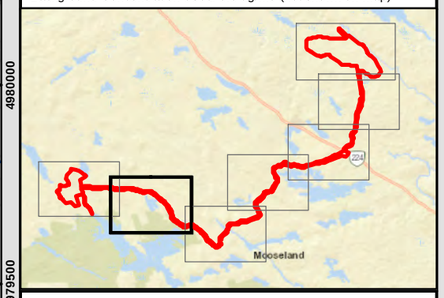
Receptor

NO2 Ranges (ug/m3)

- 0.5 - 1
- 1 - 1.5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

Cope Lake
Mooseland Rd
R9
Second Rocky Lake
Priest Lake
Camp Lake
First Rocky Lake

4982000
4981500
4981000
4980500
4980000
4979500
4979000
4978500

507500 508000 508500 509000 509500 510000 510500 511000 511500 512000

Square Lake

New Dam
Flowage

Mooseland Rd

503000 503500 504000 504500 505000 505500 506000 506500 507000 507500 508000

4983000 4982500 4982000 4981500 4981000 4980500 4980000 4979500

Prepared For:

Atlantic Gold

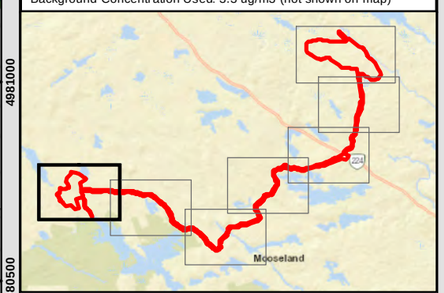
FIGURE CEAA 2-31-17G

Beaver Dam Mine Project
Air Contours
NO2 Averaged Annual Levels

NO2 Ranges (ug/m3)
- 0.5 - 1
- 1 - 1.5

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

NO2 Annual Guideline: 100 ug/m3 (not shown on map)
Background Concentration Used: 3.3 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-21
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

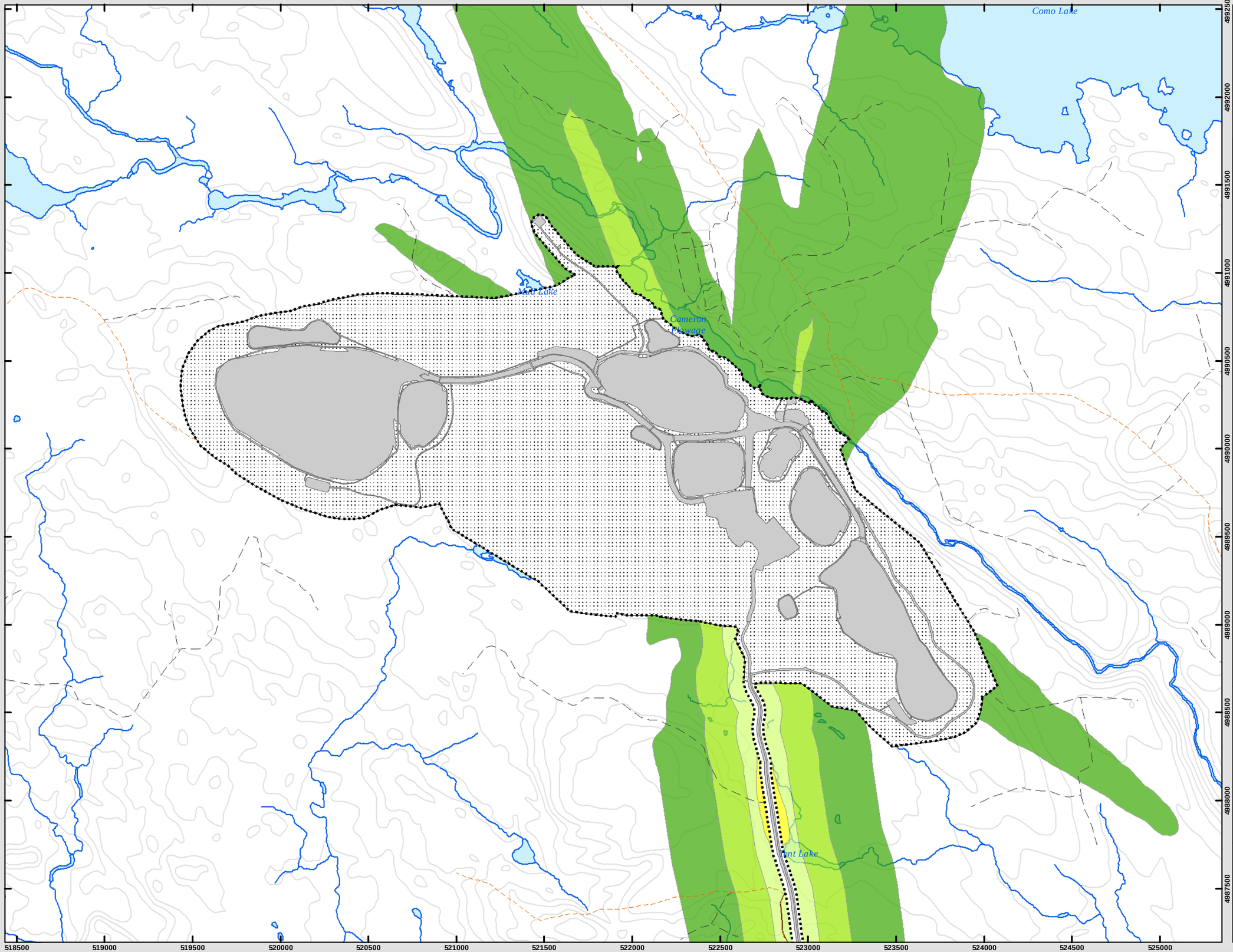
Document Name: BD_EIS_Figure6-2-X_Air_NO2_Annual

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-18A

Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels



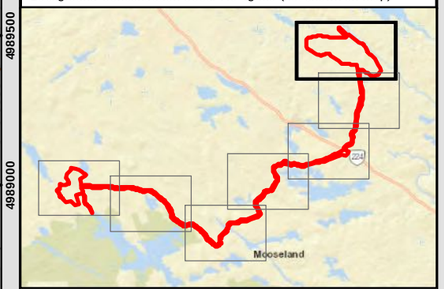
Beaver Dam Mine Site (concentrations beyond property boundary shown)

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-18B

Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels

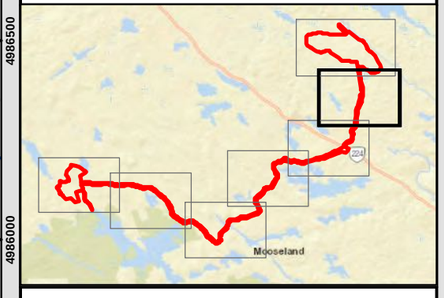
Tent Lake
McGregor Lake
Cope Pond
Kent Lake
Lawlor Lake
River Lake

Beaver Dam Mine Site (concentrations beyond property boundary shown)

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

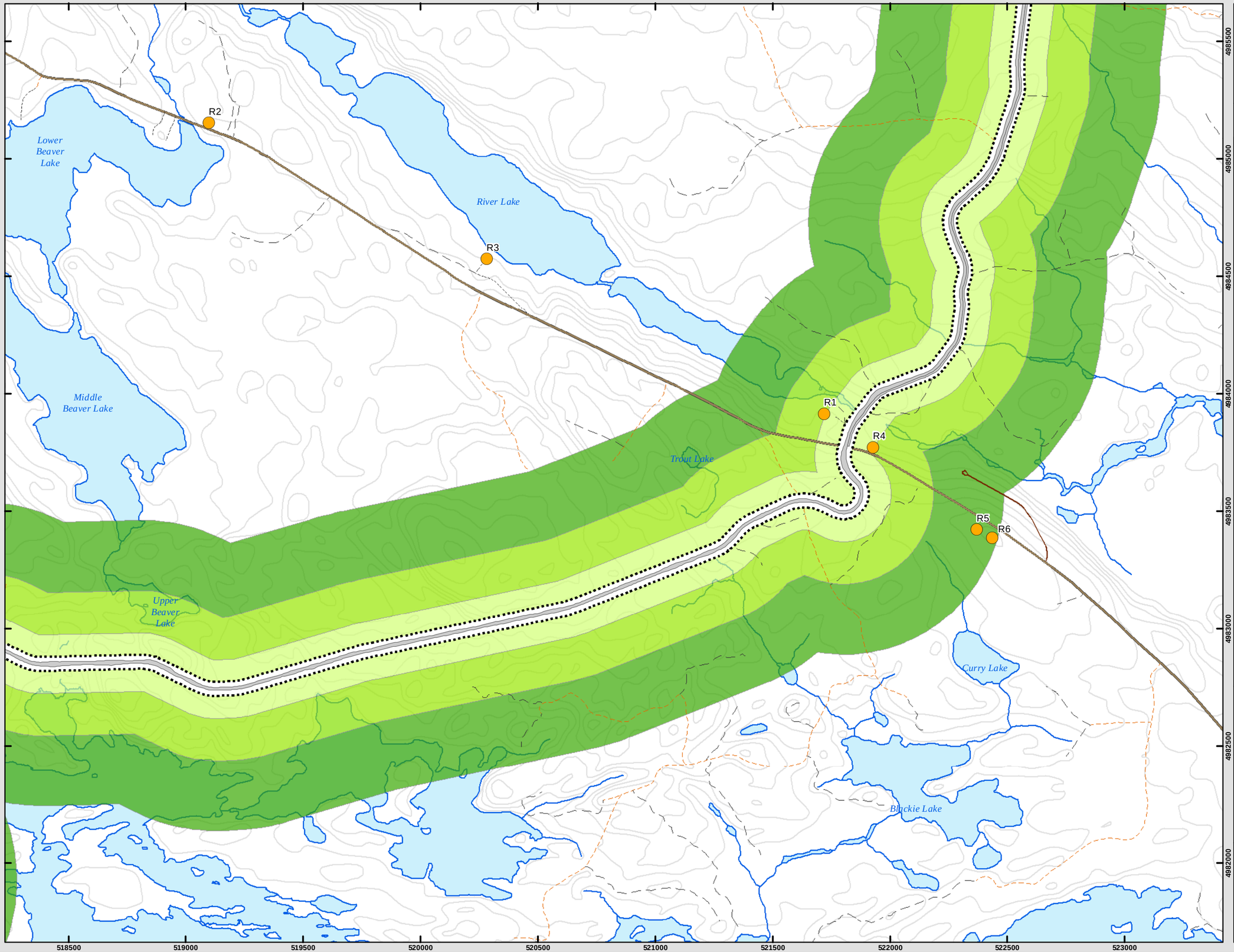
520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

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Atlantic Gold

FIGURE CEAA 2-31-18C

Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels



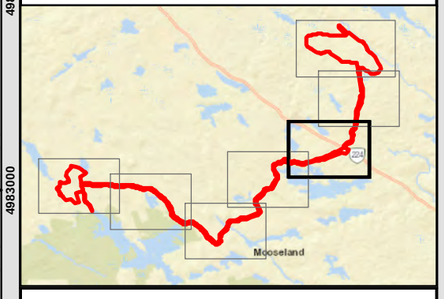
Receptor

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

Prepared For:

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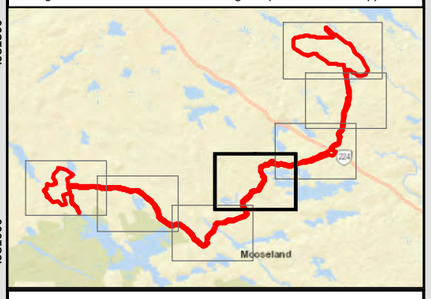
FIGURE CEAA 2-31-18D

Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-18E

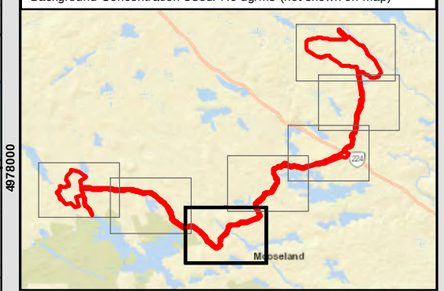
Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels

Receptor

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Mooseland Rd
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-18F

Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels

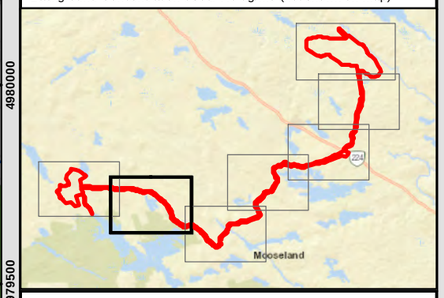
Receptor

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

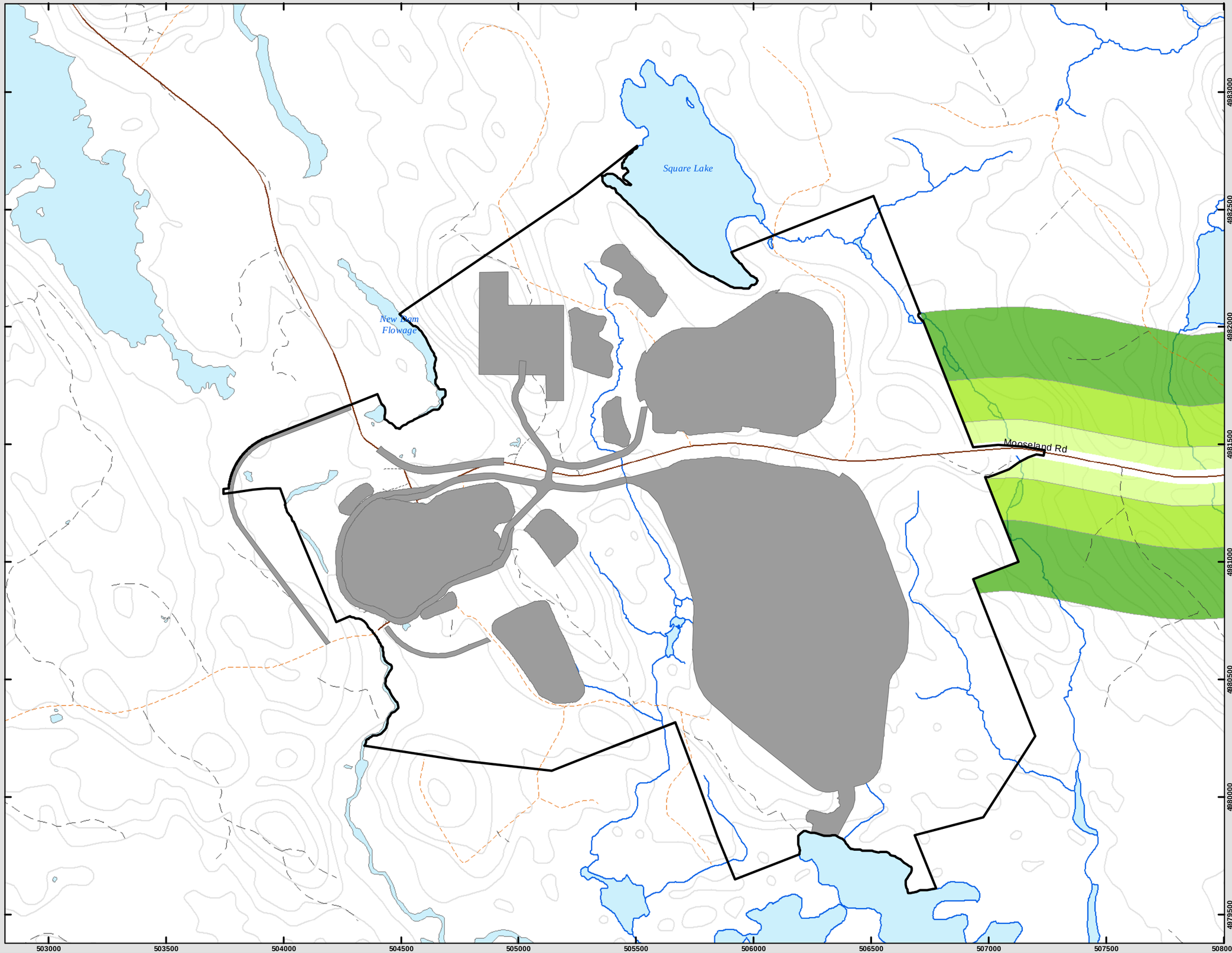
Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-18G

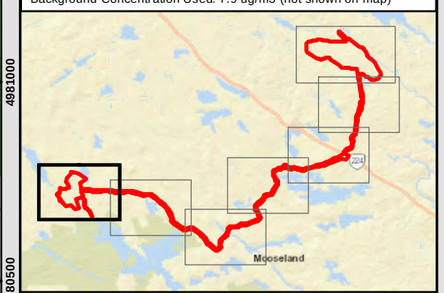
Beaver Dam Mine Project
Air Contours
SO2 1-Hour Levels



SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

SO2 1-Hour Guideline: 900 ug/m3 (not shown on map)
Background Concentration Used: 7.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_1hr

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FIGURE CEAA 2-31-19A

Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels

Como Lake

Cameron Flowage

Mud Lake

Mud Lake

Beaver Dam Mine Site (concentrations reach background within boundary)

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

Local Road

Dry Weather / Seasonal Road

Track

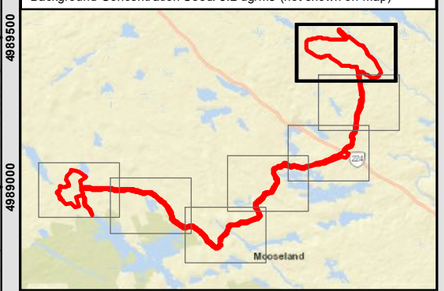
NSTDB Mapped Watercourses

Lakes

Proposed Project Infrastructure

Proposed Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS Date: 2021-09-21
Reviewed By: MM

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

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FIGURE CEAA 2-31-19B

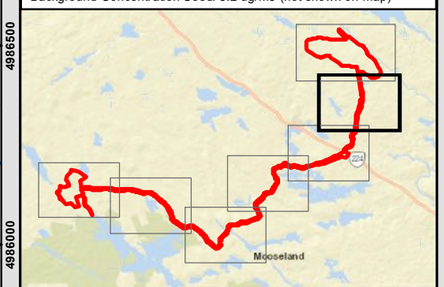
Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels

Beaver Dam Mine Site (concentrations reach background within boundary)

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

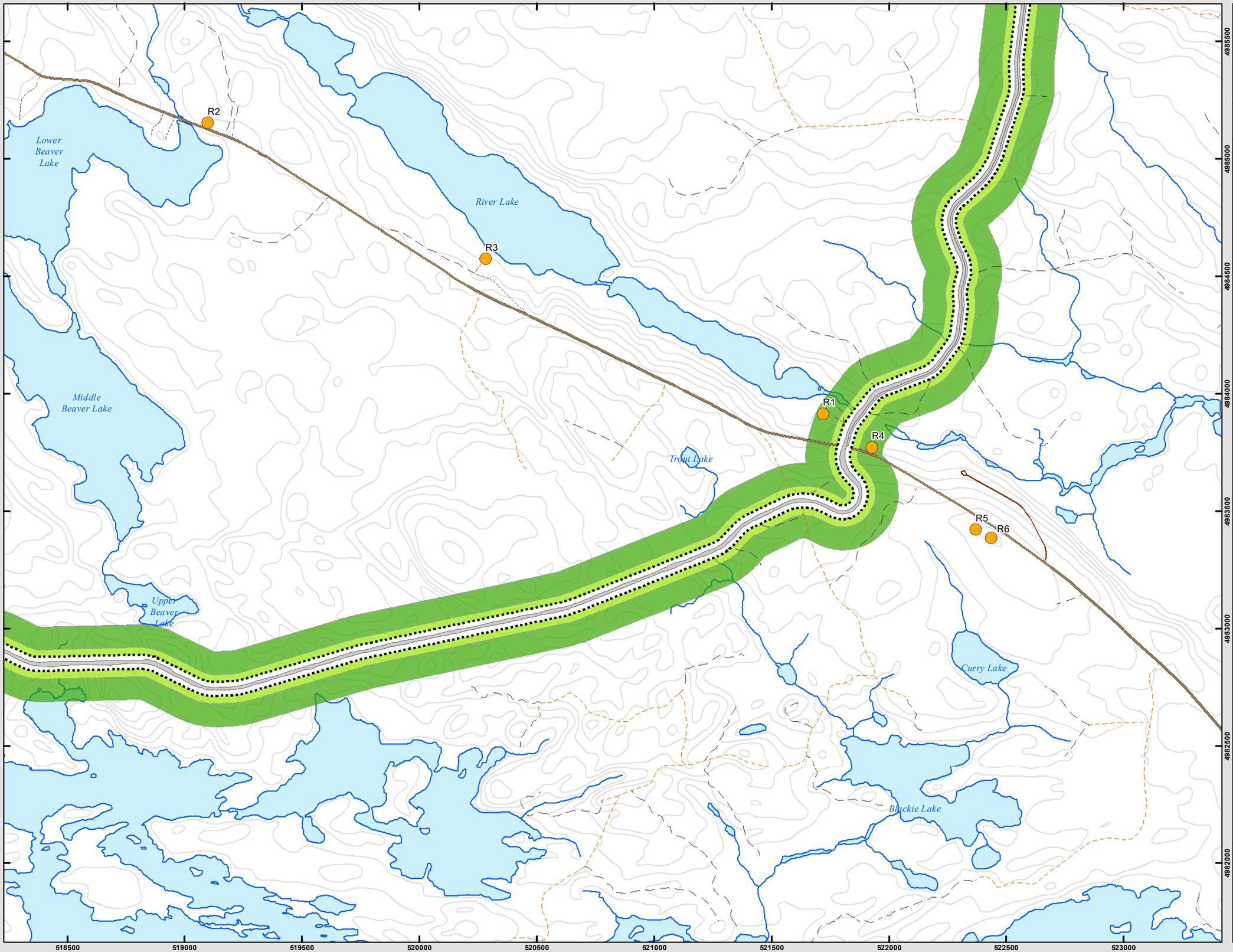
Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

Prepared For:

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FIGURE CEAA 2-31-19C

Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels



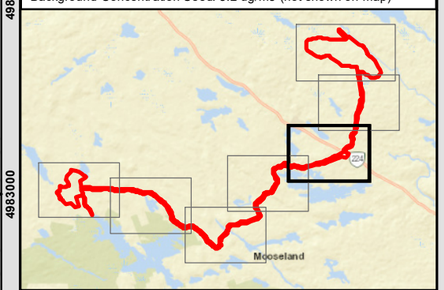
Receptor

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

Prepared For:

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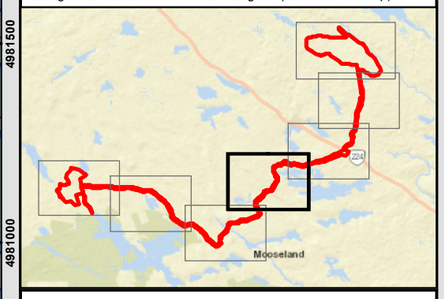
FIGURE CEAA 2-31-19D

Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-19E

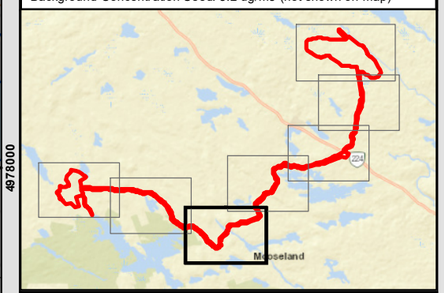
Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels

Receptor

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

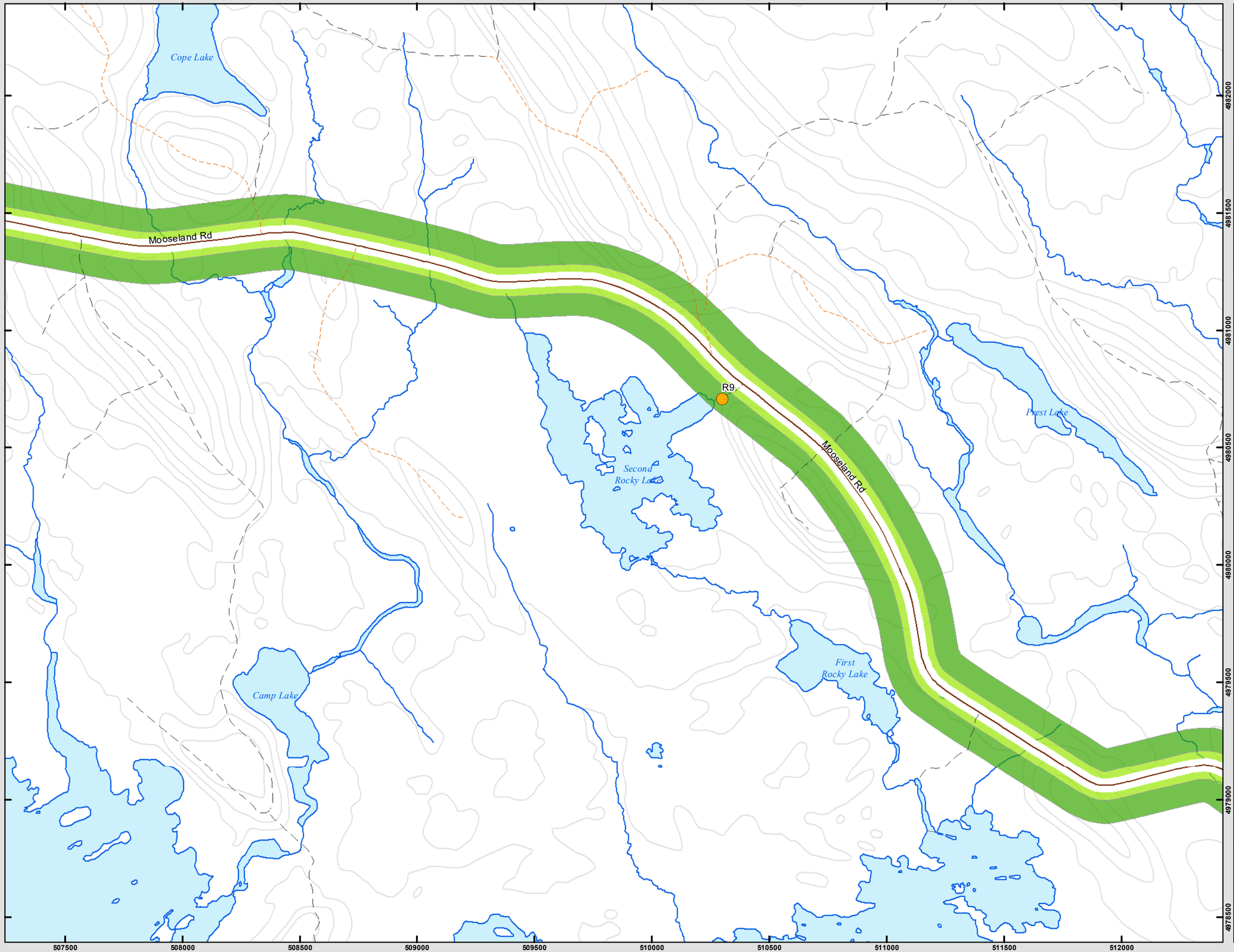
Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr



Prepared For:

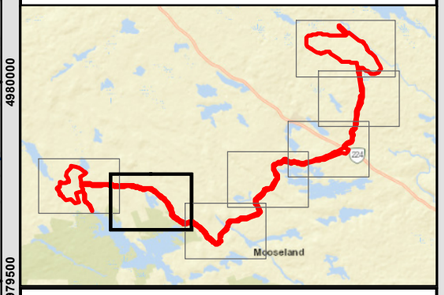
Atlantic Gold

FIGURE CEAA 2-31-19F

Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels

- Receptor
- **SO2 Ranges (ug/m3)**
  - 0.2 - 0.4
  - 0.4 - 0.6
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

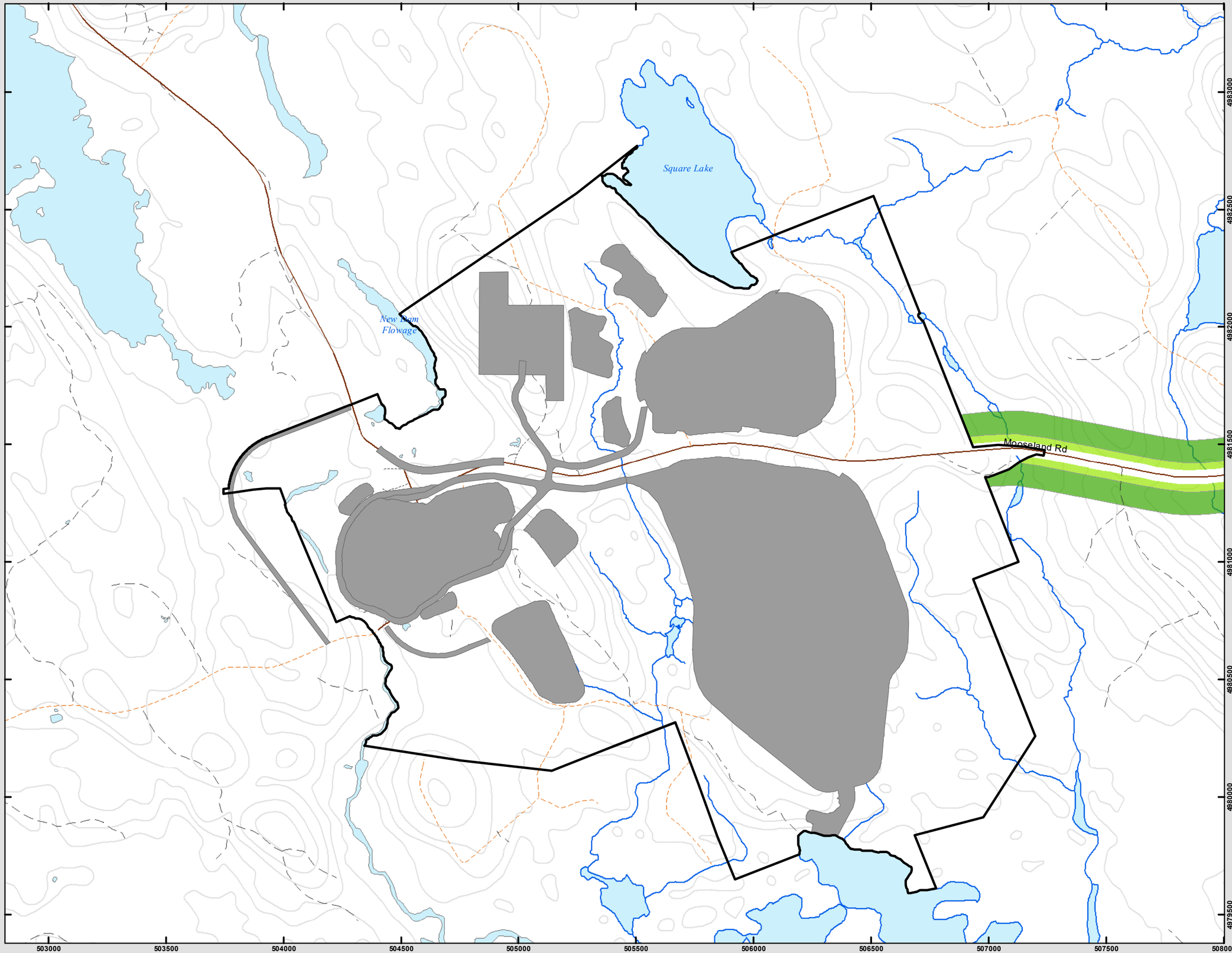
Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-19G

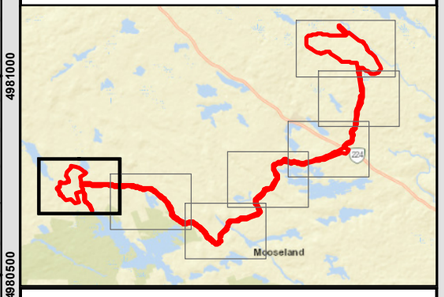
Beaver Dam Mine Project
Air Contours
SO2 24-Hour Levels



SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

SO2 24-Hour Guideline: 300 ug/m3 (not shown on map)
Background Concentration Used: 5.2 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

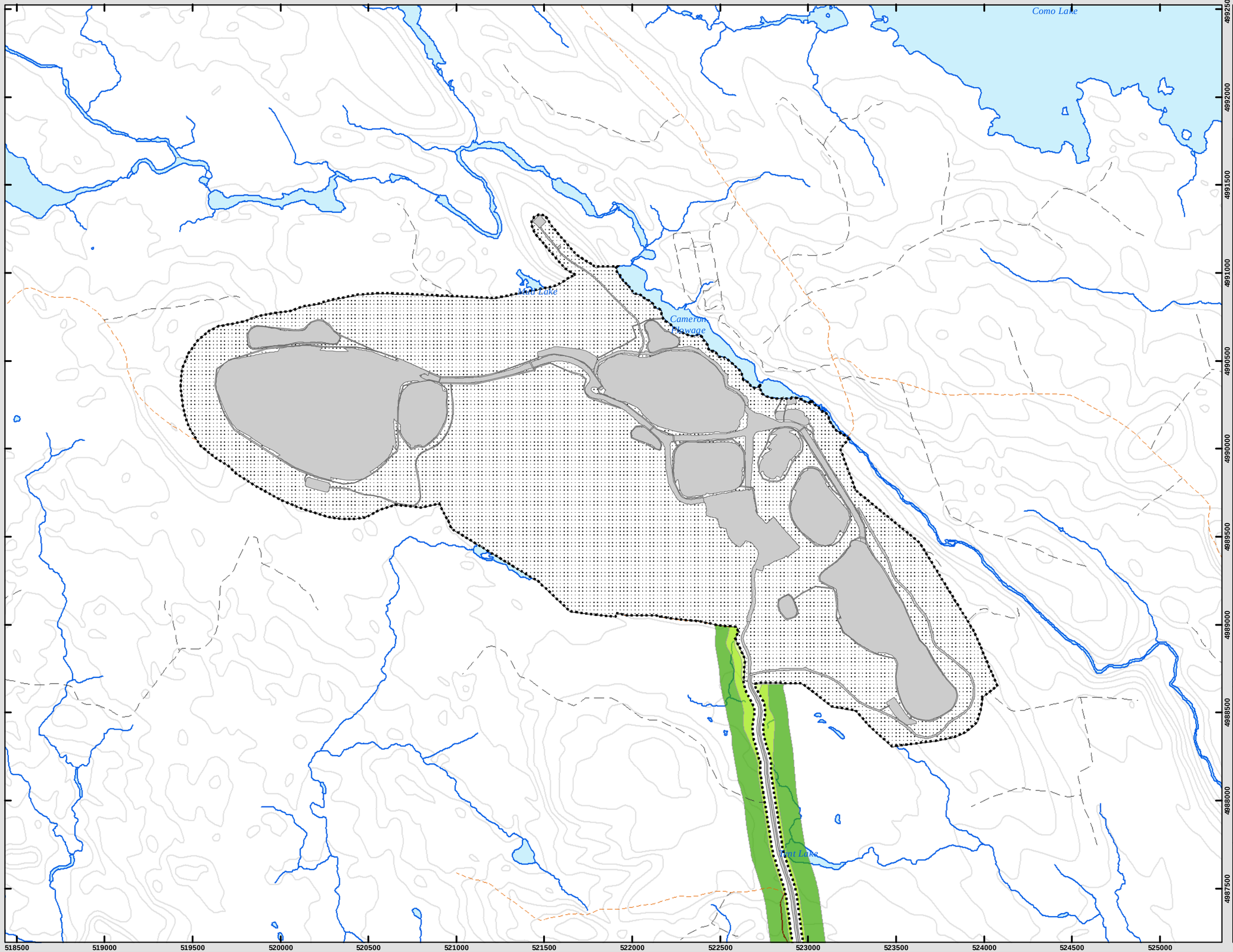
Document Name: BD_EIS_Figure6-2-X_Air_SO2_24hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-20A

Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels



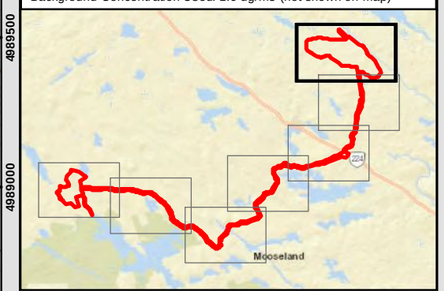
Beaver Dam Mine Site (concentrations reach background within boundary)

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-20B

Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels

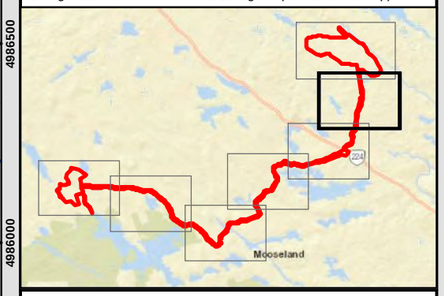
Beaver Dam Mine Site (concentrations reach background within boundary)

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Tent Lake
McGregor Lake
Cope Pond
Kent Lake
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-20C

Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels

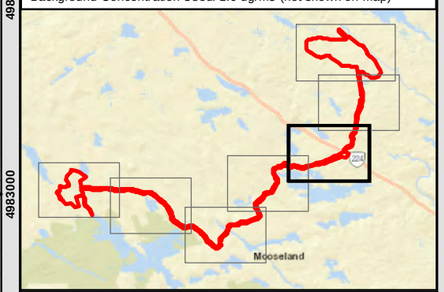
Receptor

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

Prepared For:

Atlantic Gold

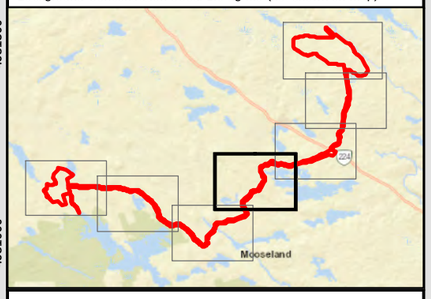
FIGURE CEAA 2-31-20D

Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

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FIGURE CEAA 2-31-20D

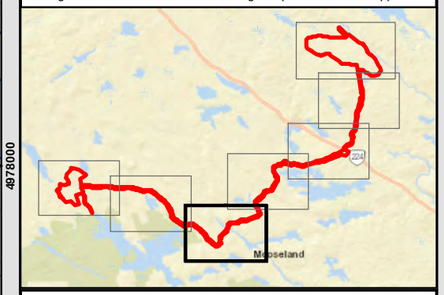
Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels

Receptor

SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

Prepared For:

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FIGURE CEAA 2-31-20F

Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels

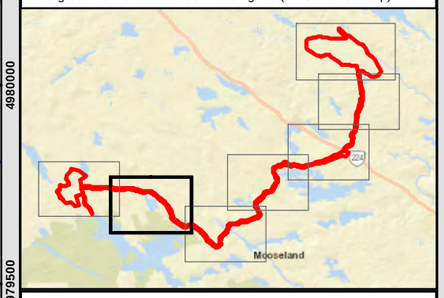
Receptor

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

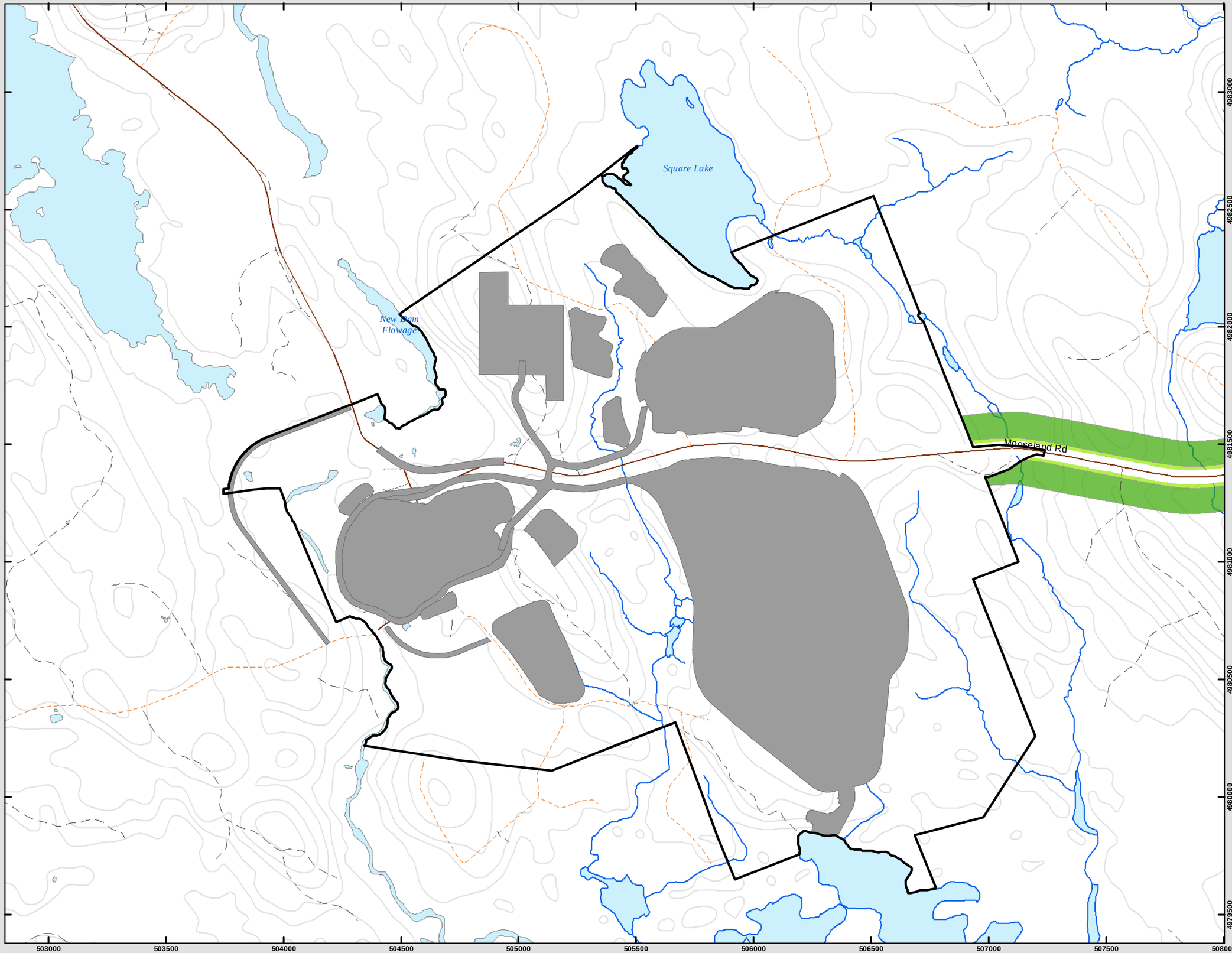
Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

Prepared For:

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FIGURE CEAA 2-31-20G

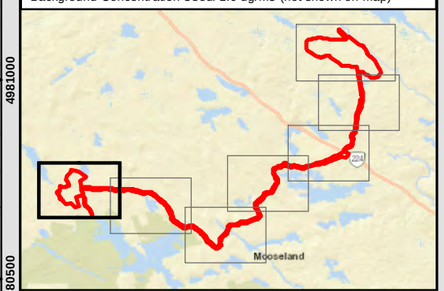
Beaver Dam Mine Project
Air Contours
SO2 Average Annual Levels



SO2 Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

SO2 Annual Guideline: 60 ug/m3 (not shown on map)
Background Concentration Used: 1.9 ug/m3 (not shown on map)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_SO2_Annual

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FIGURE CEAA 2-31-21A

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

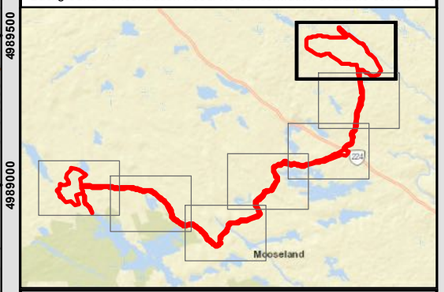
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr

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FIGURE CEAA 2-31-21B

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

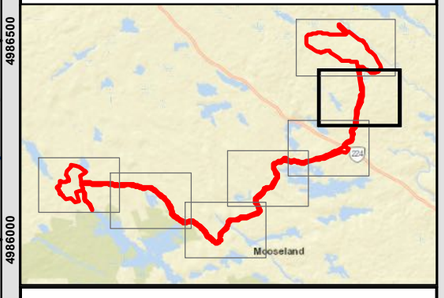
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

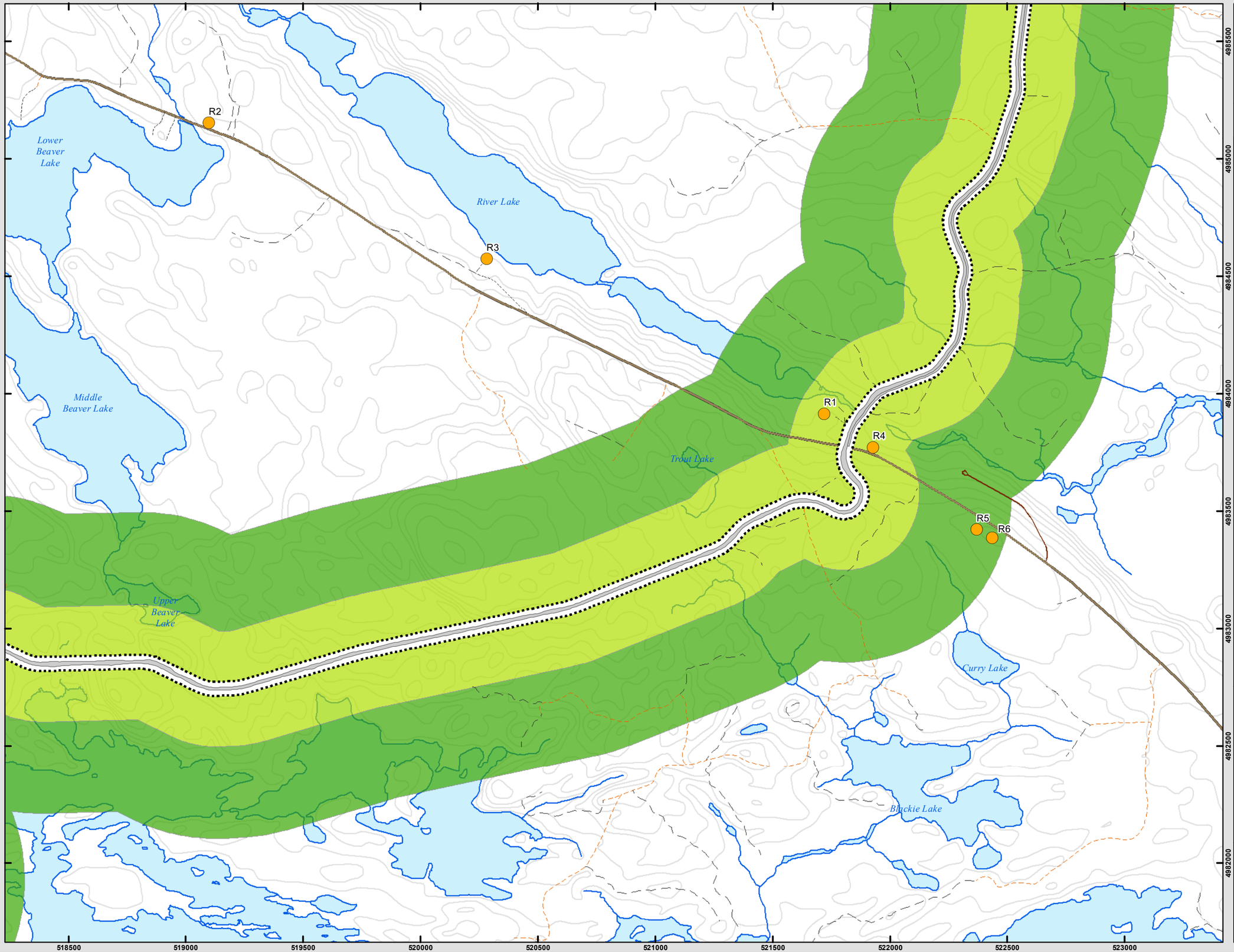
Drawn By: SS
Reviewed By: MM

Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr



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FIGURE CEAA 2-31-21C

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

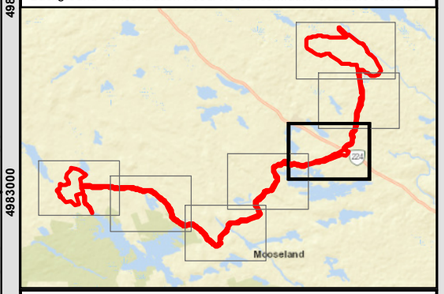
Receptor

Total VOC Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

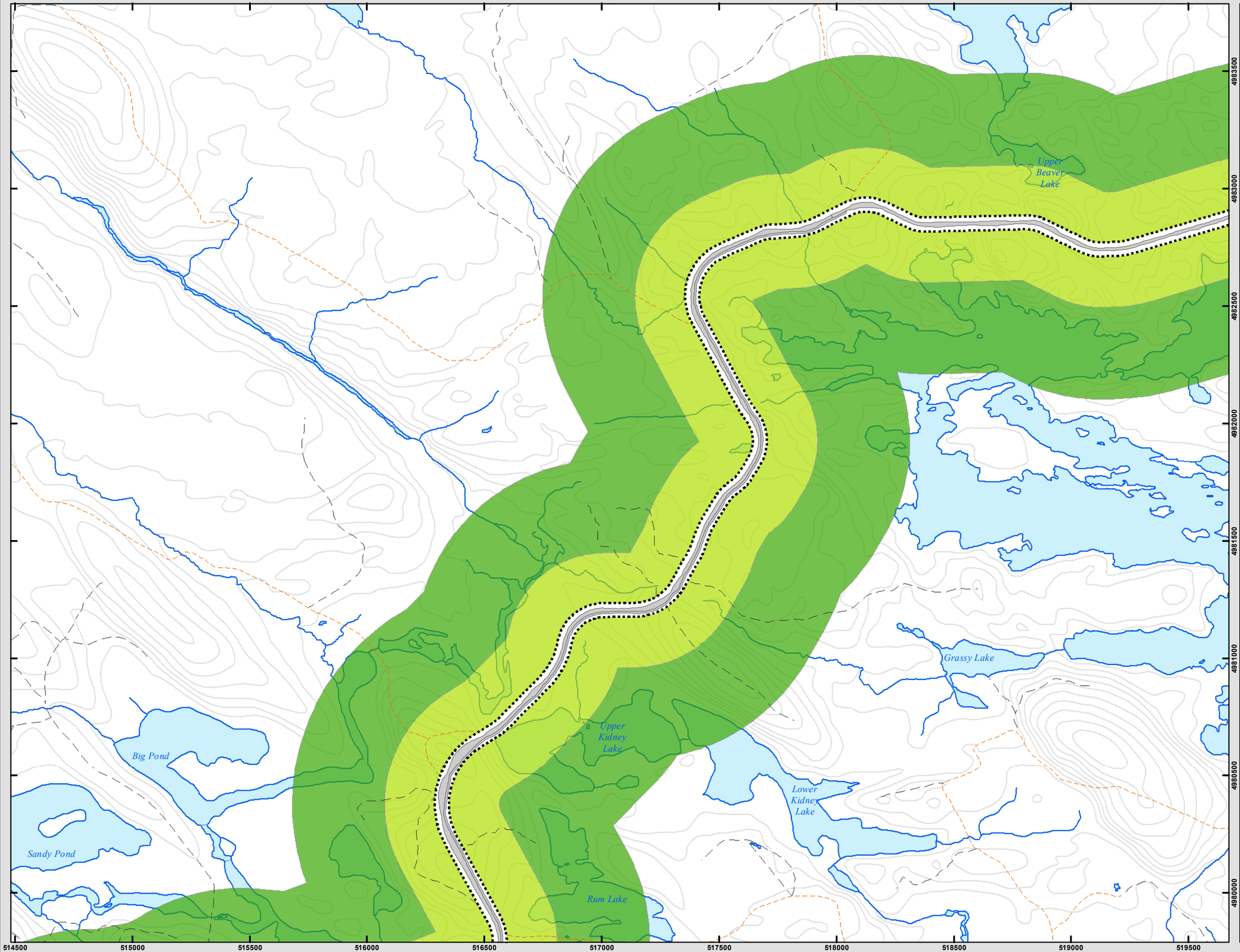
Drawn By: SS
Reviewed By: MM

Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr



Prepared For:

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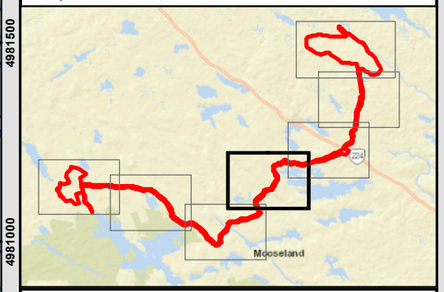
FIGURE CEAA 2-31-21D

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

Total VOC Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr

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FIGURE CEAA 2-31-21E

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

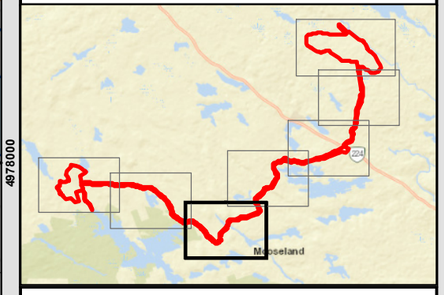
Receptor

Total VOC Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS Date: 2021-09-23
Reviewed By: MM

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-21F

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

Cope Lake
Mooseland Rd
R9
Second Rocky Lake
Priest Lake
First Rocky Lake
Camp Lake

507500 508000 508500 509000 509500 510000 510500 511000 511500 512000

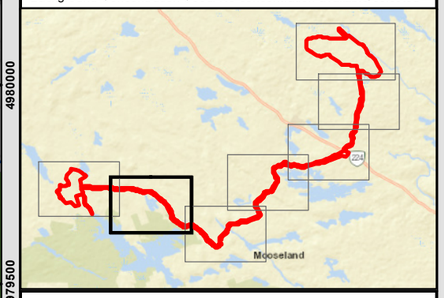
4982000 4981500 4981000 4980500 4980000 4979500 4979000 4978500

Receptor

Total VOC Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr

Prepared For:

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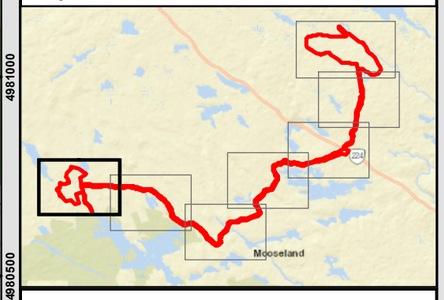
FIGURE CEAA 2-31-21G

Beaver Dam Mine Project
Air Contours
Total VOC 1-Hour Levels

Total VOC Ranges (ug/m3)
- 0.2 - 0.4
- 0.4 - 0.6

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

Total VOC 1-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-23

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

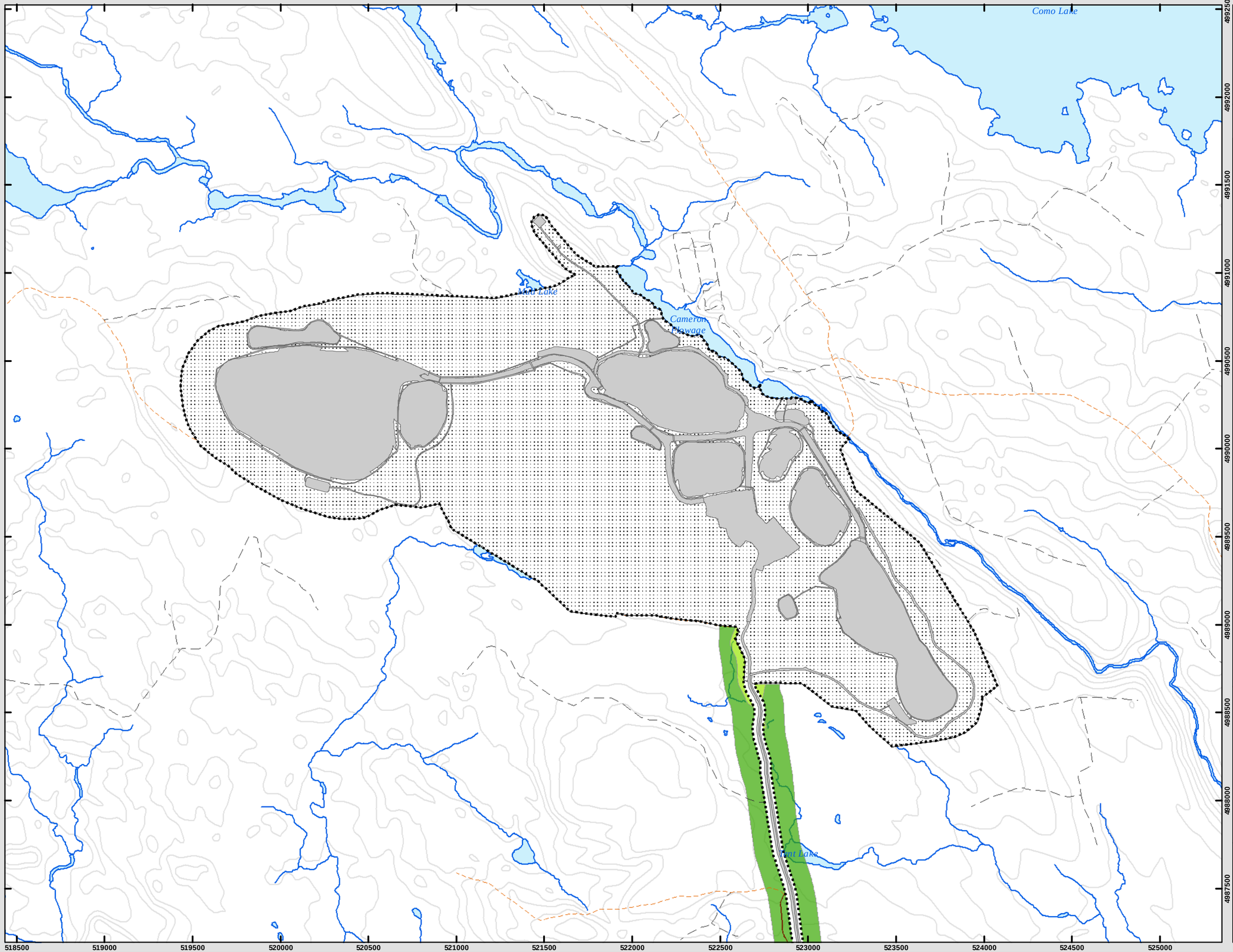
Document Name: BD_EIS_Figure6-2-X_Air_VOC_1hr

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-22A

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels



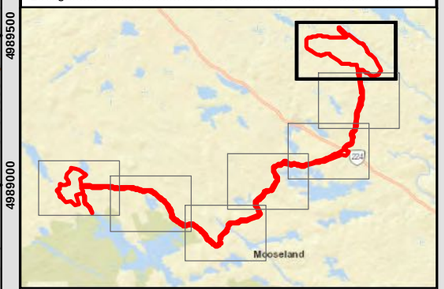
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.1-0.2
- 0.2-0.3
- 0.3

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Prepared For:

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FIGURE CEAA 2-31-22B

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels

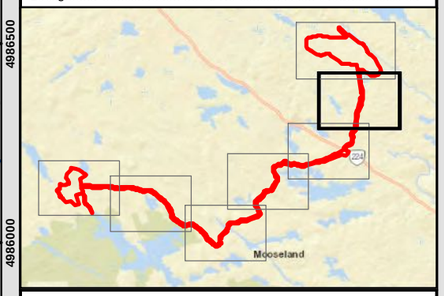
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.1-0.2
- 0.2-0.3
- 0.3

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Kent Lake
McGregor Lake
Cope Pond
Lawlor Lake
River Lake

4988500
4988000
4987500
4987000
4986500
4986000
4985500
4985000

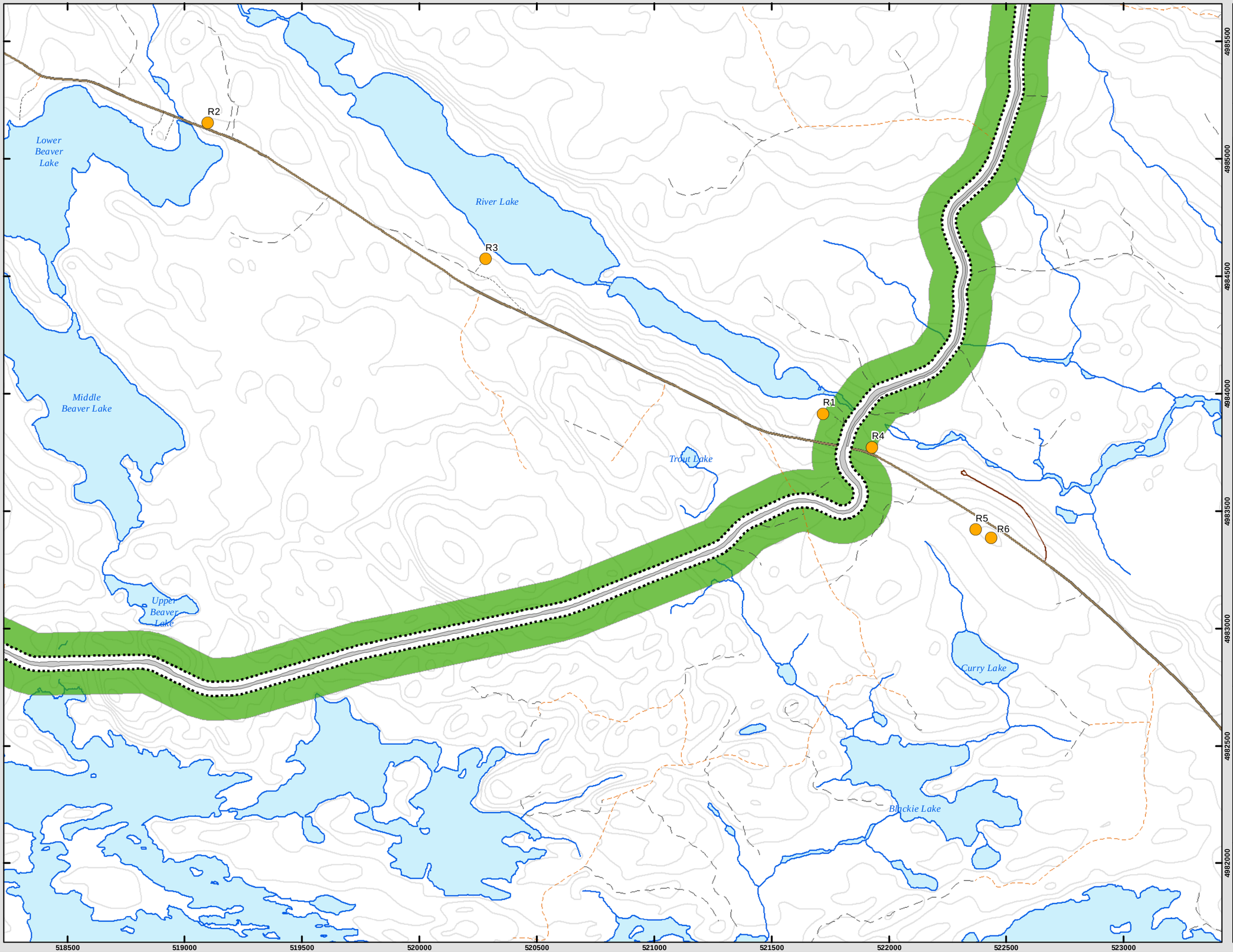
520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-22C

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels



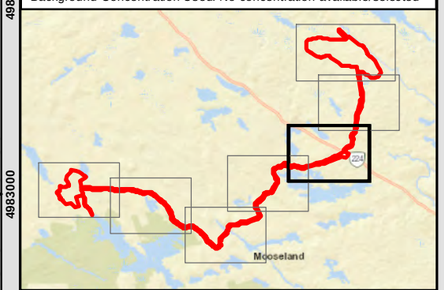
Receptor

Total VOC Ranges (ug/m3)

0.1-0.2

Collector Road
Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Proposed Project Infrastructure
Proposed Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS Date: 2021-09-21
Reviewed By: MM

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Prepared For:

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FIGURE CEAA 2-31-22D

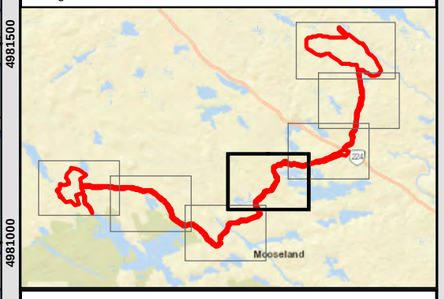
Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels

Total VOC Ranges (ug/m3)

- 0.1-0.2

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

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Atlantic Gold

FIGURE CEAA 2-31-22E

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels

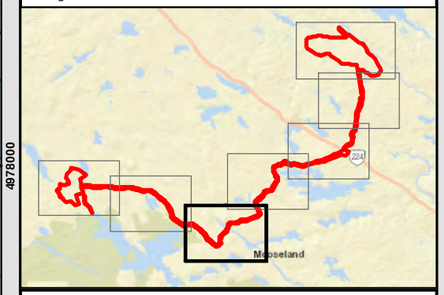
Receptor

Total VOC Ranges (ug/m3)

0.1-0.2

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Proposed Project Infrastructure
Proposed Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
R7
R8
Moosland Rd
Jackson Lake
Grassy Lake
Bear Lake

4980500
4980000
4979500
4979000
4978500
4978000
4977500
4977000

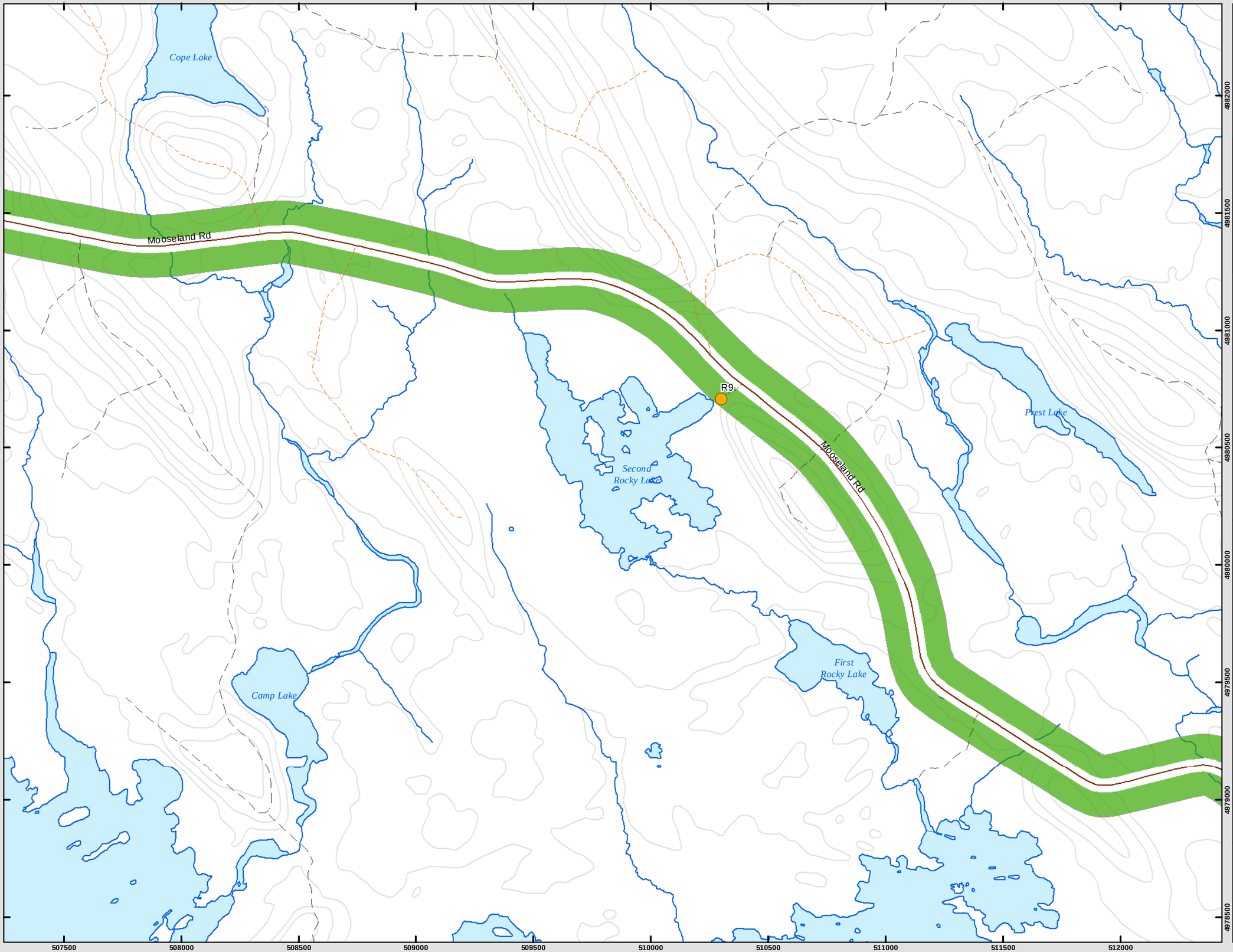
512000 512500 513000 513500 514000 514500 515000 515500 516000 516500 517000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-22F

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels



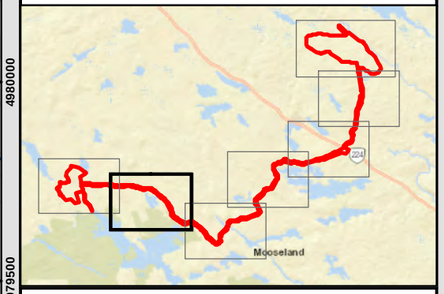
Receptor

Total VOC Ranges (ug/m3)

0.1-0.2

Local Road
Dry Weather / Seasonal Road
Diveways (>300 m)
Track
NSTDB Mapped Watercourses
Lakes
Proposed Project Infrastructure

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

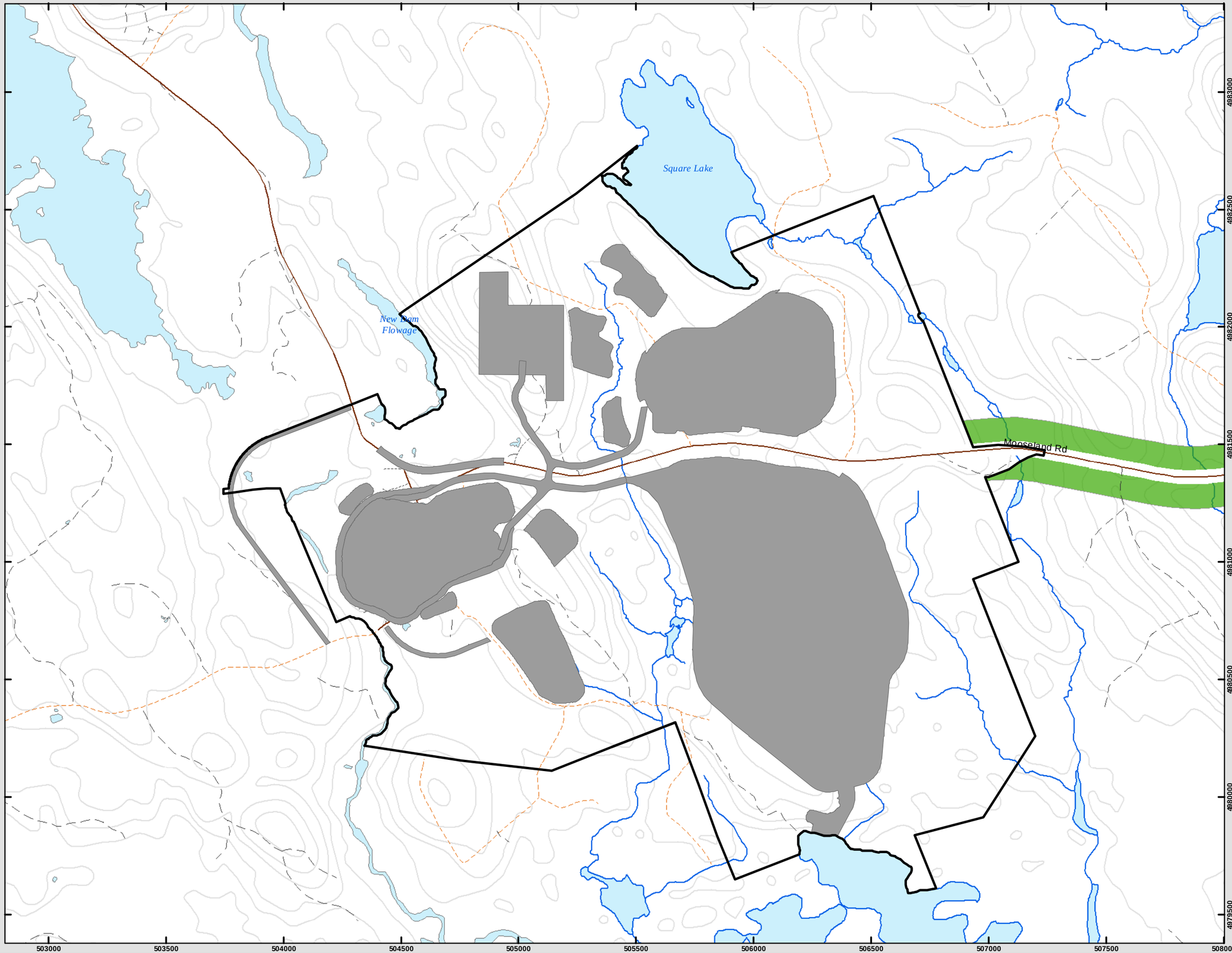
Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Prepared For:

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FIGURE CEAA 2-31-22G

Beaver Dam Mine Project
Air Contours
Total VOC 24-Hour Levels

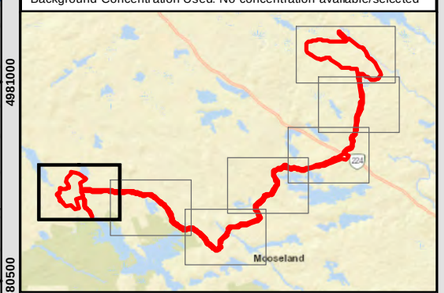


Total VOC Ranges (ug/m3)

- 0.1-0.2

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

Total VOC 24-Hour Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-2-X_Air_VOC_24hr

Prepared For:

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FIGURE CEAA 2-31-23A

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

Como Lake

Mill Lake

Cameron Flowage

Unnamed Lake

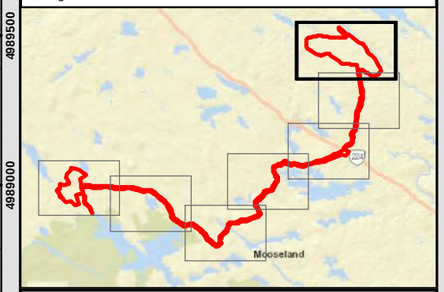
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.02-0.04
- 0.04-0.06
- 0.06-0.08
- 0.08

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 170 340 680 m

1:20,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

518500 519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000

4992500 4992000 4991500 4991000 4990500 4990000 4989500 4989000 4988500 4988000 4987500

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FIGURE CEAA 2-31-23B

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

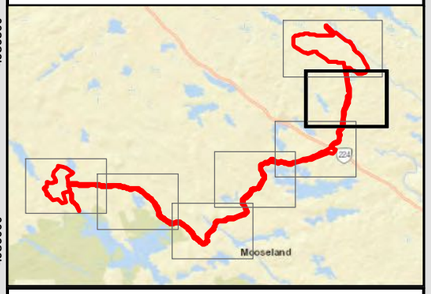
Beaver Dam Mine Site (no concentration data within boundary)

Total VOC Ranges (ug/m3)

- 0.02-0.04
- 0.04-0.06
- 0.06-0.08

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-23C

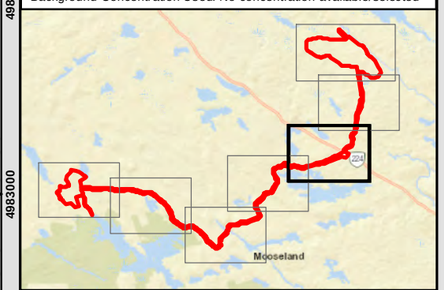
Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

Receptor

Total VOC Ranges (ug/m3)
- 0.02-0.04
- 0.04-0.06

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

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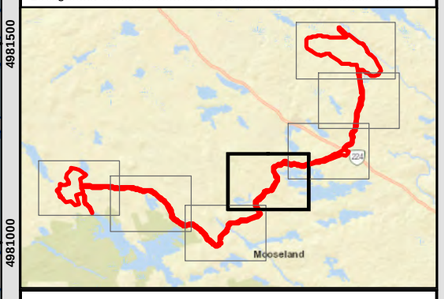
FIGURE CEAA 2-31-23D

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

Total VOC Ranges (ug/m3)
- 0.02-0.04
- 0.04-0.06

- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM
Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

Upper Beaver Lake
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Big Pond
Sandy Pond
Rum Lake

4983500
4983000
4982500
4982000
4981500
4981000
4980500
4980000

514500 515000 515500 516000 516500 517000 517500 518000 518500 519000 519500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-23E

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

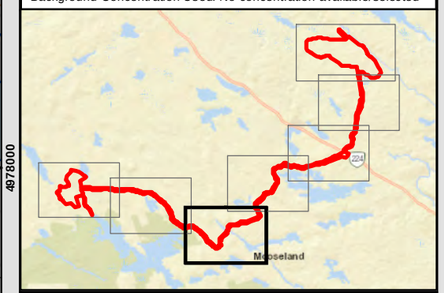
Receptor

Total VOC Ranges (ug/m3)

- 0.02-0.04
- 0.04-0.06

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Proposed Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS Date: 2021-09-21
Reviewed By: MM

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

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FIGURE CEAA 2-31-23F

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

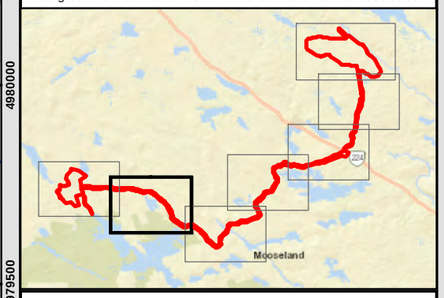
Receptor

Total VOC Ranges (ug/m3)

- 0.02-0.04
- 0.04-0.06

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

Cope Lake
Mooseland Rd
R9
Second Rocky Lake
Priest Lake
Camp Lake
First Rocky Lake

507500 508000 508500 509000 509500 510000 510500 511000 511500 512000

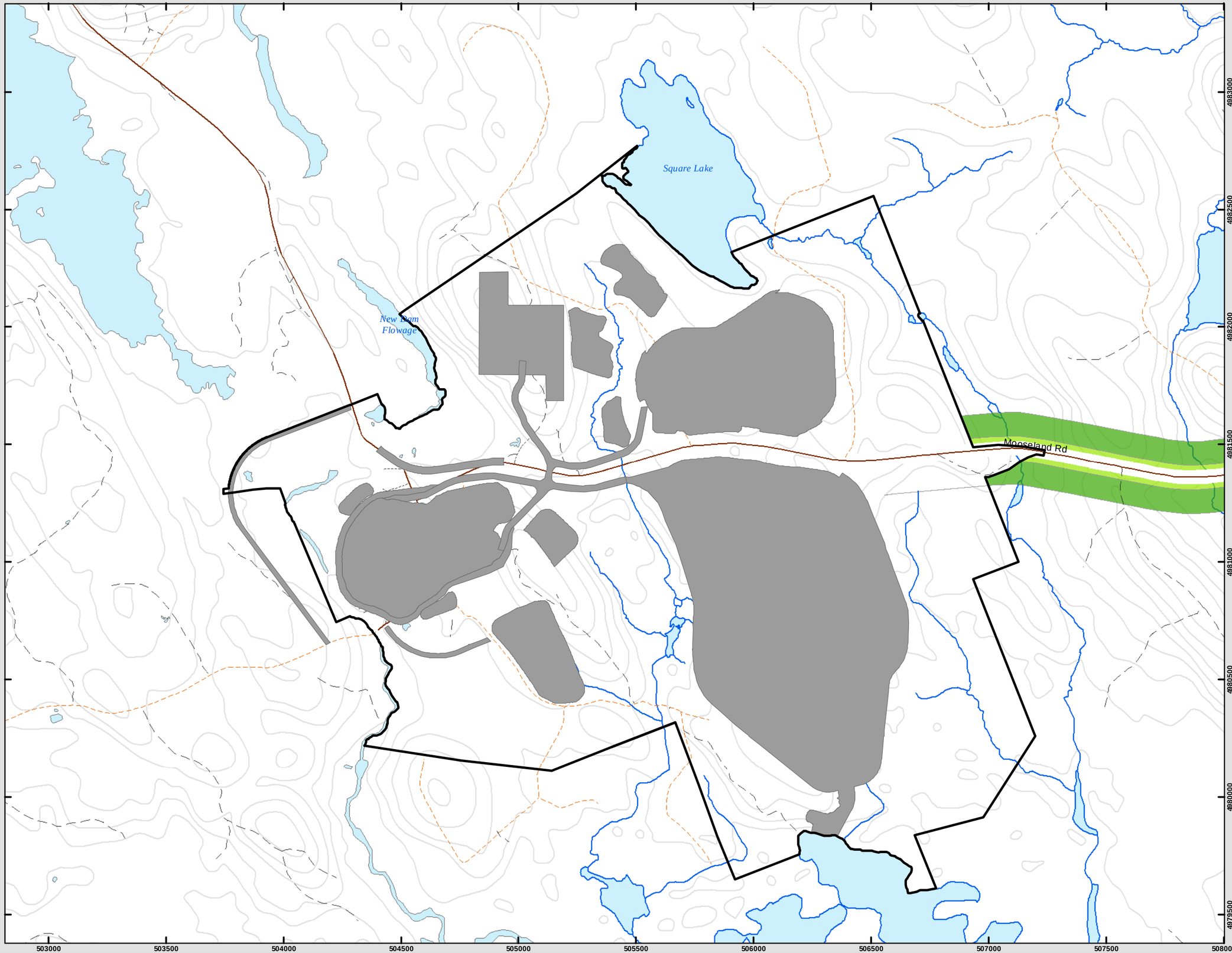
4982000 4981500 4981000 4980500 4980000 4979500 4979000 4978500

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-23G

Beaver Dam Mine Project
Air Contours
Total VOC Average Annual Levels

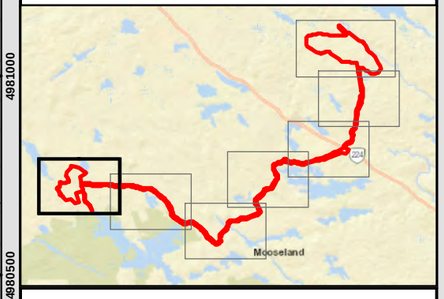


Total VOC Ranges (ug/m3)

- 0.02-0.04
- 0.04-0.06

- Local Road
- Dry Weather / Seasonal Road
- Diveways (>300 m)
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Project Infrastructure
- Existing Touquoy Infrastructure Layout
- Existing Touquoy Property Boundary

Total VOC Annual Guideline: No guideine available/selected
Background Concentration Used: No concentration available/selected



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

1:15,000 Scale when printed @ 11" x 17"

Drawn By: SS
Reviewed By: MM

Date: 2021-09-21

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-2-X_Air_VOC_Annual

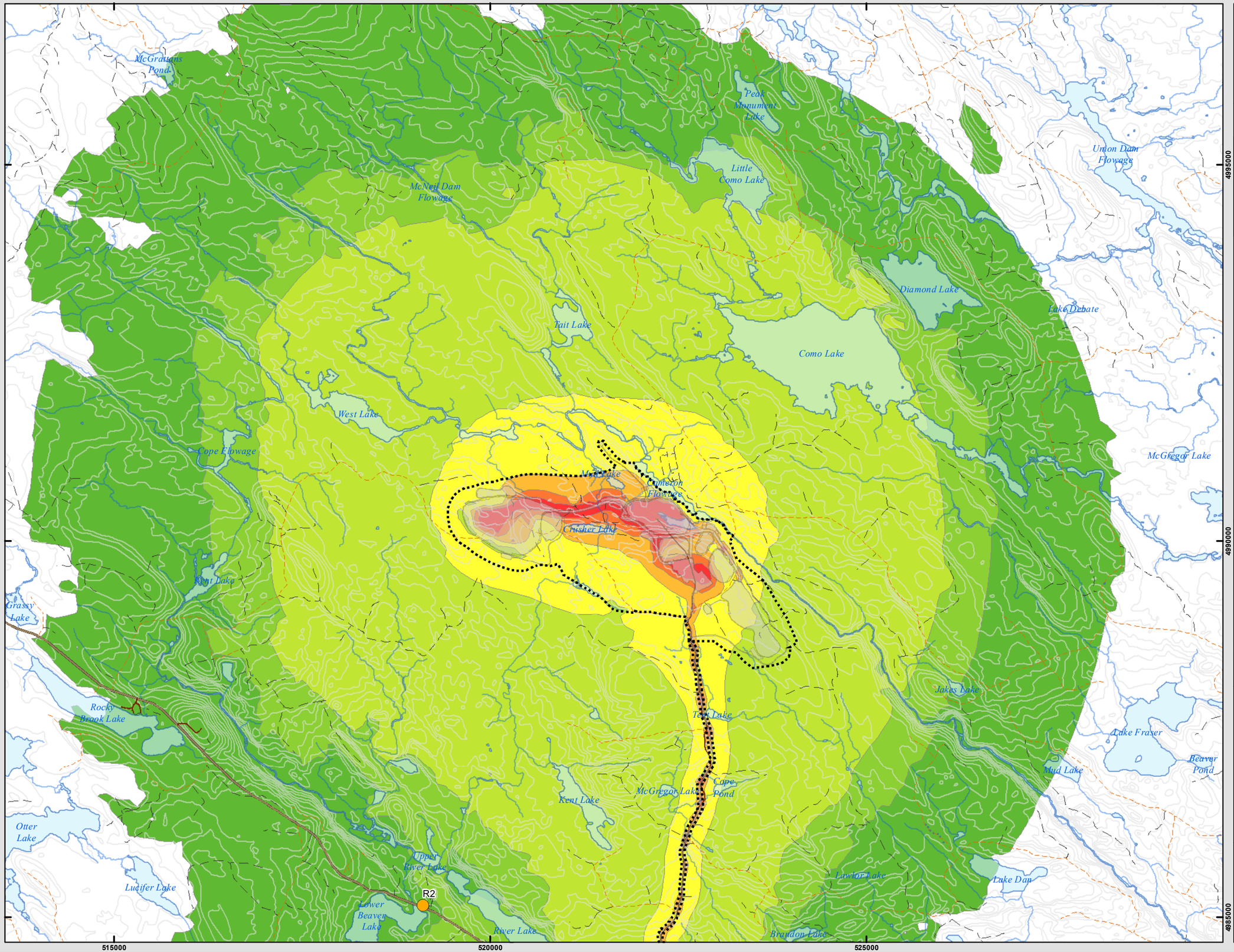
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-24A

Beaver Dam Mine Project

Noise Modelling Contours Day/Evening Operations



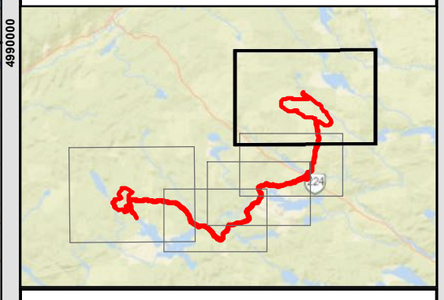
Receptor

Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Proposed Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.5 1 2 km

1:46,790 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-22
Reviewed By: GHD

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-24B

Beaver Dam Mine Project

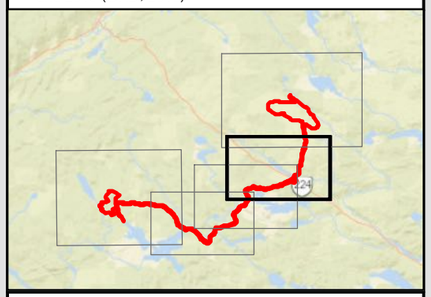
Noise Modelling Contours Day/Evening Operations

Receptor

Noise Modelling Contours (dBa)
- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Proposed Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.45 0.9 1.8 km

1:34,040 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening

Rocky Brook Lake
Lucifer Lake
Upper River Lake
Lower Beaver Lake
Middle Beaver Lake
Upper Beaver Lake
Big Pond
Upper Kidney Lake
Lower Kidney Lake
Grassy Lake
Lake Alma
Curry Lake
Buckie Lake
Trout Lake
Kent Lake
McGregor Lake
Cope Pond
Lawlor Lake
Brandon Lake
Eagle Nest Basin
Dean Basin
Jack Lowe Lake
River Lake
R1
R2
R3
R4
R5
R6

515000 520000 525000 4985000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-24C

Beaver Dam Mine Project

Noise Modelling Contours Day/Evening Operations

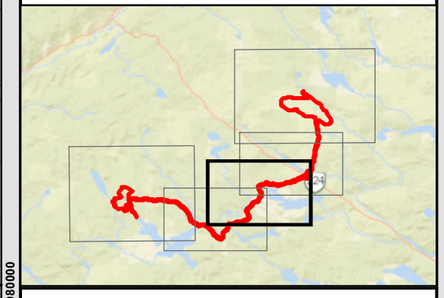
Receptor

Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.45 0.9 1.8 km

1:34,040 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening

Otter Lake
Lucifer Lake
Cranberry Lake
Shingle Lake
Upper River Lake
Lower Beaver Lake
River Lake
Middle Beaver Lake
Trout Lake
Upper Beaver Lake
Curry Lake
Blackie Lake
Lake Alma
Grassy Lake
Upper Kidney Lake
Lower Kidney Lake
Rum Lake
Brandy Lake
Southwest Lake
Lake Atlanta
Moose Lake
Sucker Ponds
Ferry Lake
Prest Lake
Big Pond
Sandy Pond
Miller Lake
Mink Lake
Johns Pond
Mooseland Rd
Jackson Lake
Grassy Lake

R1
R2
R3
R4
R5
R6
R7
R8

4985000
4980000
515000
520000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-24D

Beaver Dam Mine Project

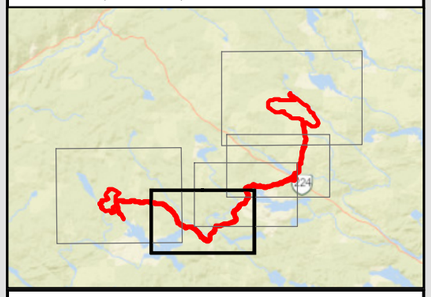
Noise Modelling Contours Day/Evening Operations

Receptor

Noise Modelling Contours (dBa)
- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.45 0.9 1.8 km

1:34,040 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening

510000

515000

4980000

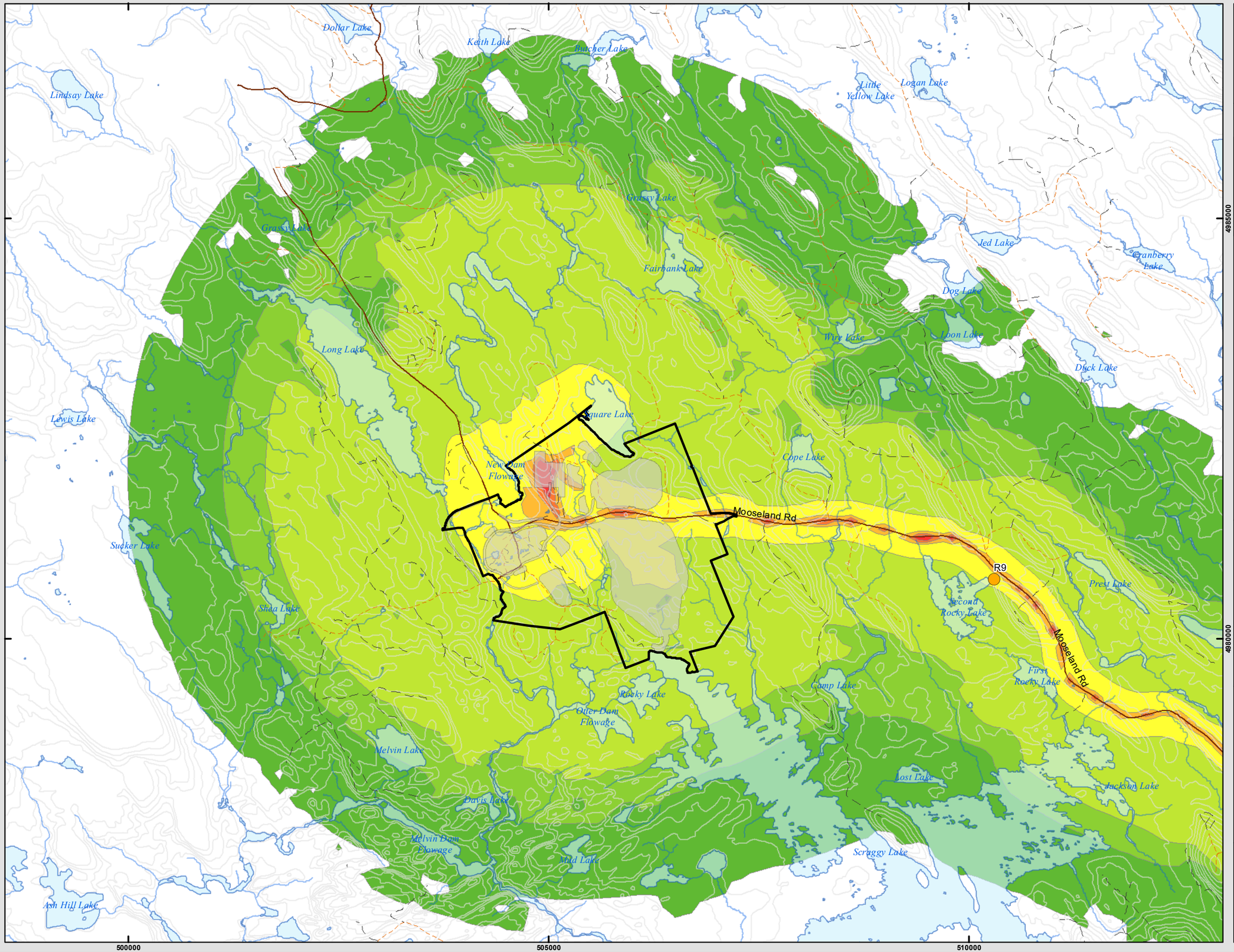
Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-24E

Beaver Dam Mine Project

Noise Modelling Contours Day/Evening Operations



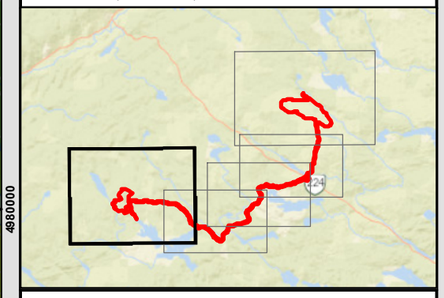
Receptor

Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Existing Touquoy Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.5 1 2 km

1:41,880 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-25

Beaver Dam Mine Project

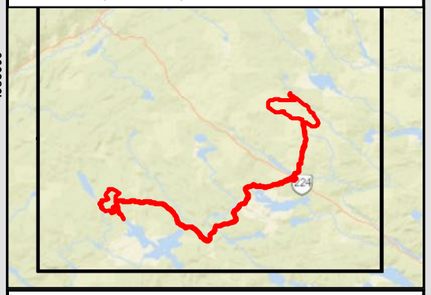
Noise Modelling Contours Nighttime Operations

Receptor

Noise Modelling Contours (dBa)
- 27
- 31
- 33
- 45
- 55
- 60
- 65

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Proposed Property Boundary
- Existing Touquoy Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.75 1.5 3 km

1:91,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_Figure6-1-3_Noise_Night

Prepared For:

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FIGURE CEAA 2-31-26

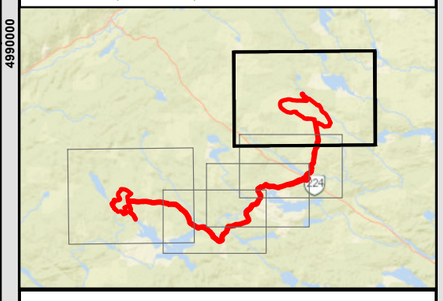
Beaver Dam Mine Project
Beaver Dam Mine Site

Noise Modelling Contours
Day/Evening Operations
UNMITIGATED

Unmitigated Noise Modelling Contours (dBa)
- 27
- 31
- 33
- 45
- 55
- 60
- 65
- Receptor

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Proposed Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.5 1 2 km

1:46,790 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-11-30

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Noise_DayEve_Unmitigated

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-27

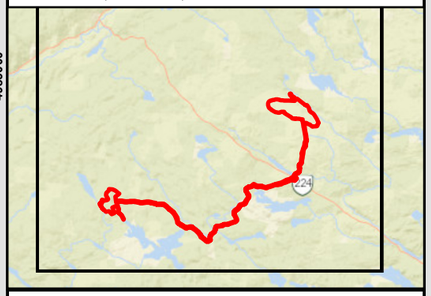
Beaver Dam Mine Project

Noise Modelling Contours Nighttime Operations UNMITIGATED

Unmitigated Noise Modelling Contours (dBa)
- 27
- 31
- 33
- 45
- 55
- 60
- 65
- Receptor

- Collector Road
- Local Road
- Dry Weather / Seasonal Road
- Track
- NSTDB Mapped Watercourses
- Lakes
- Proposed Infrastructure
- Proposed Property Boundary
- Existing Touquoy Property Boundary

Note: Background noise level at all receptors conservatively assumed to be 33 dBA during the day based on ambient sound level monitoring conducted at several locations in the Project Area between 2007 and 2016 (GHD, 2018)



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 0.75 1.5 3 km

1:91,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: GHD

Date: 2021-11-30

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX_Noise_Night_Unmitigated

Prepared For:

Atlantic Gold

FIGURE CEAA-2-31-28

Beaver Dam Mine Project

Air Contour Total Suspended Particulate Matter 24-Hour Levels Regional Scale

Receptor
Air Regional Assessment
Project Area
Air Local Assessment

TSP Ranges (ug/m3)

- 5
- 5 - 10
- 10 - 15
- 15 - 17.1
- 17.1 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65

Beaver Dam Mine Site
Touquoy Mine Site
Haul Road
R1
R2
R3
R4
R5
R6
R7
R8
R9

Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Date: 2021-09-22
Reviewed By: AMNS

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air TSP 24hr_Regional

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-29

Beaver Dam Mine Project

Air Contour PM10 24-Hour Levels Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9

- Receptor
- Air Regional Assessment
- Air Local Assessment
- Project Area

PM10 Ranges (um/m3)

- 5
- 5 - 10
- 10 - 13.5
- 13.5 - 15
- 15 - 20
- 20 - 25
- 25 - 30



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-22

Reviewed By: AMNS

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air PM10 24hr_Regional

460000 470000 480000 490000 500000 510000 520000 530000 540000 550000 560000 570000

5020000 5010000 5000000 4990000 4980000 4970000 4960000 4950000 4940000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-30

Beaver Dam Mine Project

Air Contour PM2.5 24-Hour Levels Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9

- Receptor
- Air Regional Assessment
- Project Area
- Air Local Assessment

PM 2.5 Ranges (ug/m3)

- 0.5
- 0.5 - 1
- 1- 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3

Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL Date: 2021-09-22

Reviewed By: AMNS

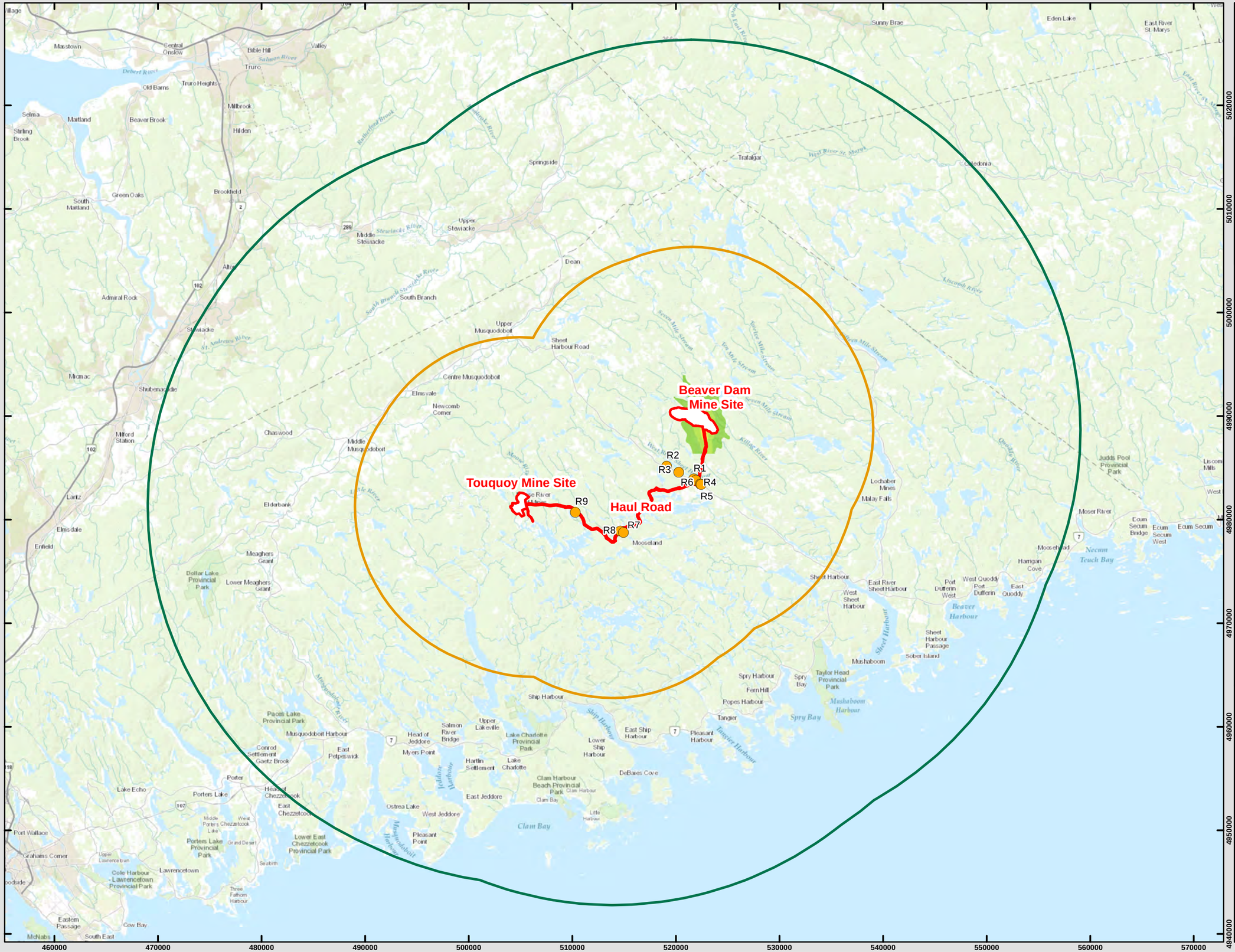
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air PM2.5 24hr_Regional

460000 470000 480000 490000 500000 510000 520000 530000 540000 550000 560000 570000

5020000 5010000 5000000 4990000 4980000 4970000 4960000 4950000 4940000



Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-31

Beaver Dam Mine Project
Beaver Dam Mine Site
Air Contour Total Suspended Particulate Matter 24-Hour Levels
Regional Scale
UNMITIGATED

- Receptor

Unmitigated TSP Ranges (ug/m3)

- 5 - 10
- 10 - 30
- 30 - 50
- 50 - 70
- 70 - 100
- 100 - 120
- 120
- Air Regional Assessment
- Project Area
- Air Local Assessment

Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Document Name: BD_EIS_FigureX Air TSP 24hr_Regional_Unmitigated

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-32

Beaver Dam Mine Project
Haul Road
Air Contour Total Suspended Particulate Matter 24-Hour Levels
Regional Scale
UNMITIGATED

Receptor

Unmitigated TSP Ranges (ug/m3)

- 5 -10
- 10 - 30
- 30 - 40
- 40 - 50
- 50 - 70
- 70 - 90
- 90 - 100
- 100 - 120
- 120

Air Regional Assessment Area

Project Area

Air Local Assessment Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX Air TSP 24hr_Regional_Unmitigated

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-33

Beaver Dam Mine Project
Beaver Dam Mine Site

Air Contour PM10 24-Hour Levels
Regional Scale
UNMITIGATED

Receptor

Unmitigated PM 10 Ranges (ug/m3)

- 5 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 50
- Air Regional Assessment
- Project Area
- Air Local Assessment



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX Air PM10 24hr_Regional_Unmitigated

Beaver Dam Mine Site
Touquoy Mine Site
Haul Road
R1
R2
R3
R4
R5
R6
R7
R8
R9

460000 470000 480000 490000 500000 510000 520000 530000 540000 550000 560000 570000

5020000 5010000 5000000 4990000 4980000 4970000 4960000 4950000 4940000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-34

Beaver Dam Mine Project
Haul Road

Air Contour PM10 24-Hour Levels
Regional Scale
UNMITIGATED

Receptor

Unmitigated PM10 Ranges (ug/m3)

- <5
- 5 -10
- 10 - 20
- 20 - 30
- 30 - 50
- 50
- Air Regional Assessment
- Air Local Assessment
- Project Area

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX Air PM10 24hr_Regional_Unmitigated

5020000 5010000 5000000 4990000 4980000 4970000 4960000 4950000 4940000

460000 470000 480000 490000 500000 510000 520000 530000 540000 550000 560000 570000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-35

Beaver Dam Mine Project
Haul Road

Air Contour PM2.5 24-Hour Levels
Regional Scale
UNMITIGATED

Receptor

Unmitigated PM2.5 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 7
- 7 - 9
- 9 - 10
- 10
- Air Regional Assessment
- Air Local Assessment
- Project Area

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-12-10

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_FigureX Air PM2.5 24hr_Regional_Unmitigated

460000 470000 480000 490000 500000 510000 520000 530000 540000 550000 560000 570000

5020000 5010000 5000000 4990000 4980000 4970000 4960000 4950000 4940000

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-36

Beaver Dam Mine Project

Air Contours NO2 24-Hour Levels
Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9

- Receptor
- Air Regional Assessment
- Project Area
- Air Local Assessment

NO2 Ranges (ug/m3)

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air NO2 24hr_Regional

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-37

Beaver Dam Mine Project

Air Contours SO2 24-Hour Levels
Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9

- Receptor
- Air Regional Assessment
- Project Area
- Air Local Assessment

SO2 Ranges (ug/m3)

- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Date: 2021-09-22
Reviewed By: AMNS

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air NO2 24hr_Regional

Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-38

Beaver Dam Mine Project

Air Contours Total VOC 24-Hour Levels
Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1
R2
R3
R4
R5
R6
R7
R8
R9

- Receptor
- Air Regional Assessment
- Project Area
- Air Local Assessment

Total VOC Ranges (ug/m3)

- 0.1-0.2
- 0.2-0.3
- 0.3



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 5 10 20 km

1:340,000 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

Date: 2021-09-22

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

McCallum Environmental Ltd.

Document Name: BD_EIS_Figure6.2-X Air VOC 24hr_Regional

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Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-39

Beaver Dam Mine Project

Noise Contours Day/Evening Operations Regional Scale

Beaver Dam Mine Site

Touquoy Mine Site

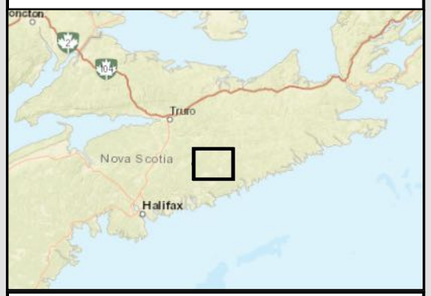
Haul Road

R1 R2 R3 R4 R5 R6 R7 R8 R9

Receptor
Noise Local Assessment
Noise Regional Assessment Area
Project Area

Noise Modelling Contours (dBa)

27
31
33
45
55
60
65



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 1.25 2.5 5 km

1:95,795 Scale when printed @ 11" x 17"

Drawn By: MEL
Reviewed By: AMNS

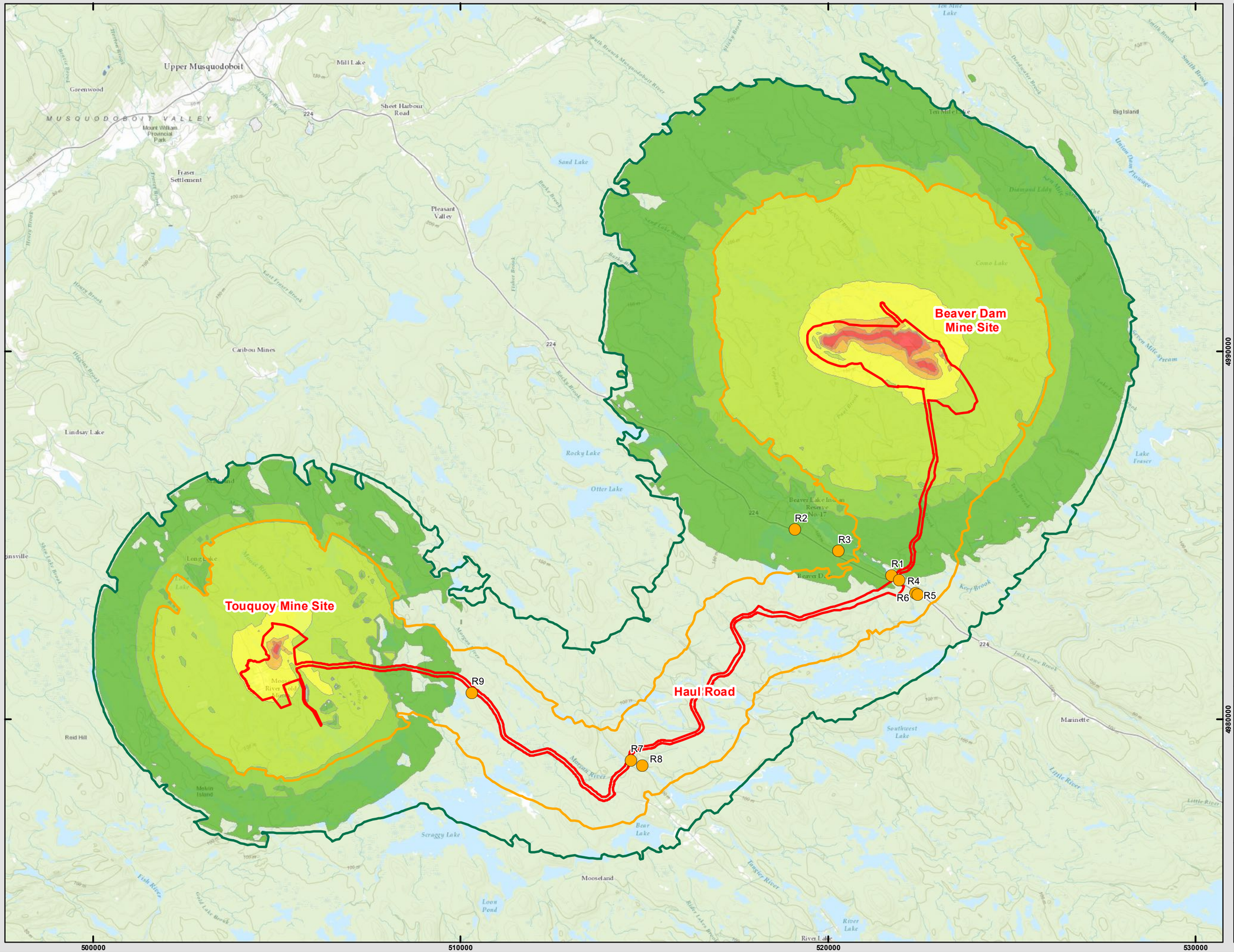
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Document Name: BD_EIS_Figure6-1-3_Noise_Day_Evening_Regional

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FIGURE CEAA 2-31-40

Beaver Dam Mine Project

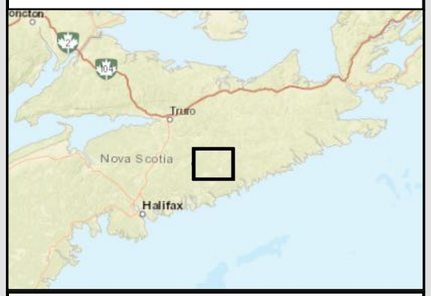
Noise Contours
Nighttime Operations
Regional Scale

- Receptor
- Noise Local Assessment
- Noise Regional Assessment Area
- Project Area

V03 Direct Lg OptionB Night

Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 1.25 2.5 5 km

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Drawn By: MEL Date: 2021-09-22
Reviewed By: AMNS

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Document Name: BD_EIS_Figure6-1-4_Noise_Night_Regional

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FIGURE CEAA 2-31-41

Beaver Dam Mine Project

Noise Contours
Day/Evening Operations
Regional Scale
UNMITIGATED

Beaver Dam Mine Site

Touquoy Mine Site

Haul Road

R1
R2
R3
R4
R5
R6
R7
R8
R9

Receptor
Noise Local Assessment Area
Noise Regional Assessment Area
Project Area

Unmitigated Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 1.25 2.5 5 km

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Prepared For:

Atlantic Gold

FIGURE CEAA 2-31-42

Beaver Dam Mine Project

Noise Contours
Nighttime Operations
Regional Scale
UNMITIGATED

Receptor
Noise Local Assessment Area
Noise Regional Assessment Area
Project Area

Unmitigated Noise Modelling Contours (dBa)

- 27
- 31
- 33
- 45
- 55
- 60
- 65

Beaver Dam Mine Site
Touquoy Mine Site
Haul Road

R1
R2
R3
R4
R5
R6
R7
R8
R9

Upper Musquodoboit
Greenwood
Mill Lake
Sheet Harbour Road
MUSQUODOBOIT VALLEY
Mount William Provincial Park
Fraser Settlement
Pleasant Valley
Caribou Mines
Lindsay Lake
Reid Hill
Melvin Island
Moosland
Sand Lake
Rocky Lake
Otter Lake
Beaver Lake Indian Reserve No. 17
Ten Mile Lake
Big Island
Diamond Lake
Coma Lake
Southwest Lake
Bear Lake
Scraggy Lake
Loon Pond
River Lake
Lake Fraser
Marinette
Little River
Moser River
Morgan River
Tangier River
Fish River
Gold Lake Brook
Jack Lowe Brook
Keef Brook
Seven Mile Stream
Ilsley Dam Pleasure
Smith Brook
Hickox Brook
Henry Brook
Lord Fraser Brook
Fraser Brook
Ingramville
Long Lake
Shaw Lake Brook
Moose River Mine
Moose River Gold Mines
Beaver Dam
Ten Mile Lake
Coma Lake

ATTACHMENT CEAA 2-31-A:

AIR EMISSIONS ASSESSMENT TECHNICAL REPORT (GHD), DECEMBER 10, 2021

Air Emissions Assessment Technical Report

Beaver Dam Mine Project
Marinette, Nova Scotia

Atlantic Mining NS Corp

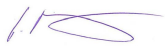
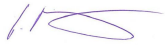
10 December 2021

→ The Power of Commitment

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Revision version	Rev [00]
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Document status

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S4	FINAL	Stephen Koo	Gord Reusing		Gord Reusing		Dec.10/21

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1. Introduction

GHD Limited (GHD) performed air emission estimates and dispersion modelling for the Atlantic Mining NS Inc. (AMNS) Beaver Dam Mine Project (Project), near Marinette, Nova Scotia. The Project is composed of the Beaver Dam Mine Site, the Touquoy Mine Site, and a connecting Haul Road. Figure 1 shows the locations of the two mine sites and the Haul Road.

This report is an update to the previous version of the Air Emissions Assessment Technical Report and provides assessment results designed to meet the Canadian Environmental Assessment Agency (CEAA) EIS Guidelines (2016). This updated report is based on the update to the Project Description (AMNS 2021a) as well as in response to Round 2, Information Requests submitted by CEAA, Nova Scotia Environment (NSE), and Eastern Shore Forest Watch Association (ESFWA), which are detailed in Table IR2. The primary updates to this report included the addition of uncontrolled emissions scenarios for the haul road and Beaver Dam Mine Site.

The methodology used to estimate the air emissions and develop the dispersion models that were used to assess the impact of air emissions from the Project is provided in Section 2.

Air emissions compounds evaluated included total suspended particulates (TSP), particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), nitrogen oxides (NOx), sulfur dioxide (SO_2), carbon monoxide (CO) and volatile organic compounds (VOC). The sources of emissions included the Beaver Dam Mine Site, Touquoy Mine Site, and the Haul Road.

Table IR2 ***Canadian Environmental Assessment Agency, Nova Scotia Environment, and Eastern Shore Forest Watch Association Round 2, Part 1 Information Requests***

Information Request Reference Number	Regulatory Agency/ Indigenous Community/ Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
CEAA-2-25	ECCC	Section 6.2.6.2; Appendix C-1, Figure 5	The revised EIS (page 165) notes the potential of PM10 criteria being exceeded up to 57% of the time. Even given the conservative estimate of a background concentration, this is still a high frequency in an area with demonstrated Indigenous land and resource issues. The scale of Figure 5 in Appendix C and the limited description of the extent of the exceedances found on page 161 of the revised EIS make it difficult to identify any interactions between the higher ambient concentrations in the vicinity of the Haul Road and the identified sensitive receptors.	Provide a more detailed description of the geographical extent of any ambient air quality exceedances and their interaction with any potential sites important for use by Indigenous people.	Section 6. Updated emissions and dispersion modelling results show there will be no exceedances of PM10 criteria.
CEAA-2-28	CEAA, KMKNO, ESFW, Save Caribou	Section 8.5 Cumulative Effects Assessment of the Valued Components	A cumulative effects assessment for air is included in section 8.5 of the revised EIS. The proponent identified projects that are certain or reasonably foreseeable that would operate concurrently with the Beaver Dam Mine Project and use the same Haul Roads.	Provide modelling to support the cumulative effects assessment for air quality, including the reasonably foreseeable projects: Fifteen Mile Stream Gold and Cochrane Hill Gold Projects.	Sections 2 and 6. Fifteen Mile Stream and Cochrane Hill projects truck traffic have been added.
CEAA-2-31	HC	Section 6.1.6, p214; 6.1.7.3, p218; Table 6.14-1, p808; Figure 2.1-2 Appendix B.1, Figures 3 and 4	The locations of the nearest human receptors that were evaluated in the air and noise assessments are not clear. Several seasonal and permanent dwelling locations appear on the maps provided; however, it is not clear if all relevant receptors were identified. For example, the locations of traditional land use were not identified. Where traditional land use is practiced closer to the project site than the permanent/seasonal dwellings, these areas should also be evaluated for potential health impacts.	Provide all human receptor locations, including locations of traditional land use and recreational use which may be closer to the project area than seasonal and/or permanent dwellings (for both air quality and noise VCs) on maps and in summary tables. - there are comments in the word document.	Figure 3 and Section 5.7. The worst-case sensitive receptors have been modeled with 80% dust mitigation and without mitigation. All lands outside the property boundaries of the two mines and haul road have been modeled.

Information Request Reference Number	Regulatory Agency/ Indigenous Community/ Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
CEAA-2-31	HC	Section 6.1.6, p214; 6.1.7.3, p218; Table 6.14-1, p808; Figure 2.1-2 Appendix B.1, Figures 3 and 4	Same Rationale as above	Update the noise and air modelling and human health assessment as required.	See updated air, noise and human health reports. All relevant receptors and lands have been assessed.
NSE-2-24	NSE	6.2.2.3	"Due to a lack of other sources of data for ambient TSP, the background concentration for TSP is based on the maximum measured 24-hour TSP concentration (there are insufficient data to provide a meaningful 90th percentile value), and the average of all the TSP measurements. There is a great deal of uncertainty in how representative."	If data is insufficient, is there a plan to sample more? Baseline TSP needs to be established as dust is going to be an issue.	Section 3.2 and Table 5. Relevant local TSP background data from 2007 to 2017 is summarized and the 90th percentile was used.
NSE-2-27	NSE	Table 6.2-7 and Section 6.2.5.3		Needs to include dust from deposition of tailings in the Touquoy Pit.	Section 5.6. Deposition of TSP was modeled and used in the Human Health Risk Assessment.
NSE-2-128	NSE	Section 6.2.10, Appendix O.1 Appendix C.1	The Proponent was requested to "provide monitoring locations identified on a map along with seasonal wind roses. The proposed baseline monitoring locations should be informed, in part, by results of air dispersion modelling". This information has not been provided. The proponent has indicated that an operational methodology and protocols will be established following granting of the IA with NSE.	The proponent should submit a detailed ambient air monitoring plan for baseline, construction, operation and reclamation phase of the project, as part of their application for an Approval to Construct and Operate. The monitoring plan should include, but not be limited to, proposed parameters to be measured, details on proposed instrumentation, monitoring schedules, proposed monitoring locations, seasonal wind roses and proposed meteorological data to be measured.	The updated air modelling and Human Health Risk Assessment (AMNS 2021a) indicates there will be no air quality impacts above applicable criteria. Therefore, an ambient air monitoring plan is not proposed. A Fugitive Dust Control Plan (AMNS 2021a) is provided to ensure emissions are controlled.

Information Request Reference Number	Regulatory Agency/ Indigenous Community/ Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
NSE-2-129	NSE	Section 6.2 Appendix C.1	The Proponent was requested to complete an inventory of expected air contaminants from this project which includes both air contaminants regulated under the NS Air Quality Regulations and any others of concern (e.g. metals, volatile organic compounds etc.). The proponent provided air dispersion modelling of TSP, PM10, PM2.5, NOx, SO2 and total VOCs. The report was silent on metals.	1) Are air emissions of metals a concern for this project? If not, the report should justify why specific metals were not included in the modelling. 2) The modelling identified predicted exceedences for TSP, PM10 and PM2.5. The submitted dust control plan requires more definitive actions and commitment to address the modelling results (see comments below regarding dust control plan). 3) The consultant has assumed that the air dispersion modelling results are conservative and that the exceedences are an overprediction. Therefore, the proposed ambient air quality monitoring plan should be designed to confirm the consultant's assumptions that the air dispersion modelling is an overprediction. The level of monitoring proposed should reflect this concern.	1. Metals were assessed in the air emissions by modelling the worst case ambient air concentration and the deposition of metals contained in the total suspended particulate. This analysis is provided in the Human Health Risk Assessment (AMNS 2021a). 2. There are no exceedances of TSP, PM10 or PM2.5 predicted to occur outside the mine sites and haul road property boundaries, with the assumed mitigation of 80% dust control on the haul road. 3. The updated emissions and dispersion modelling shows that there are no exceedances predicted, therefore ambient air monitoring is not needed.
ESFWA-2-31	ESFWA	Section 6.2, Table 6.2-19, Residual Environmental Effects for Air		Provide more information regarding the maximum wind speed to which this table applies.	Table 6.2-10 is not specific to a maximum wind speed. Wind is recognized as a potential cause of fugitive dust and mitigation measures to address fugitive emissions due to wind and other sources is provided in the Fugitive Dust Control Plan (AMNS 2021a).
ESFWA-2-33b	ESFWA		"monitoring will be carried out to confirm the assessment of	The Proponent should explain the reasoning behind allowing	A mitigation of 80% dust control on the haul road

Information Request Reference Number	Regulatory Agency/ Indigenous Community/ Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
			non-significance provided by the definition above, and to determine if the proposed mitigation will be sufficient to ensure there are no adverse air quality effects as a result of Haul road operation." (p. 172). The Precautionary Principle would require that mitigation be carried out prior to 'in vivo' monitoring, which could have deleterious effects.	predictable exposure to elevated levels of dust before mitigation is contemplated.	has been assumed. The updated emissions and dispersion modelling shows that there are no exceedances predicted,

Note:

Source: CEAA (2019), NSE (2019), ESFWA (2019), AMNS (2021b)

2. Air Emission Estimates

Emission rates from the Project-related sources were calculated using Compilation of Air Pollutant Emissions Factors USEPA AP-42, 5th Edition, (AP-42) emission factors for the Beaver Dam Mine Site and the Haul Road particulate emissions, and MOBILE6.2 (M6.2) for Haul Road vehicle tailpipe emissions. The operational phase is anticipated to be of longer duration (5 years) than the construction phase (1 year), and the number of vehicles, extraction rates, and material processing rates will be higher during operations than during construction. Operations therefore represents the worst case for air emissions, and air emission estimates were only completed for the operations phase.

2.1 Sources of Particulates

Haul Road emissions calculations assume that the roads are unpaved, and a road dust management plan will be applied (Environment Canada 2017b). AMNS aim is to achieve a minimum of 80% dust control and therefore two scenarios were evaluated as part of this air quality impact assessment. The first scenario included no mitigation. The second scenario considered 80% level of dust mitigation.

A summary of round trip truck traffic counts for the Haul Road between the Beaver Dam Mine and the Touquoy Mine are provided below:

- Beaver Dam to Touquoy Mine - 95
- Cochrane Mine vehicles - 11
- Fifteen Mile Stream vehicles - 11
- Service Trucks (3/4 tons trucks) - 20
- Forestry - 7

The total one way traffic trips are 190 for Beaver Dam Traffic and 288 for the Cumulative Traffic.

The roads are constructed using clean (non-acid generating) waste rock and therefore only road dust emissions were calculated and assessed. However, emissions of compounds contained in the rock dust, such as metals, were evaluated in the Beaver Dam Mine Project's Human Health Risk Assessment report (AMNS 2021a) using the rock chemical composition data.

Emissions calculations for Haul Road particulates are provided in Table 1A and 1B for no mitigation and 80% dust mitigation scenarios respectively, including all the assumptions, based on the AP-42 methodology.

M6.2 can estimate the particulate matter emissions from diesel highway motor vehicles (exhaust particulate, tire wear particulate, and break wear particulate), however, these represent less than 1% of the particulate emitted from the road surfaces and so were considered not significant and therefore not modelled.

Emission sources related to the Beaver Dam Mine Site consist of an onsite haul road, primary crushing of rock at the Mine Site surface processing area (Option A), blasting operations (Option B) as well as activities that occur within the mining pit such as transfer conveyors, truck loading at the working face and all other activities that occur within the mining pit.

AMNS has indicated that they are evaluating using either the crusher (Option A) or blasting to crush rock (Option B). GHD has therefore evaluated both options in this assessment. Emissions calculations for activities at the mine site processing area as well as within the mining pit (including blasting) are summarized in Tables 2A-2D for Option A and Option B for controlled and uncontrolled emissions respectively. The particulate controls considered at the mine site included particulate controls on the conveyors and crusher and haul road. AP-42 standard calculations and assumptions, including information on controls where applicable, were used to generate these emissions estimates.

Particulate-generating processes related to the Touquoy Mine Site consist of transfer conveyors, material handling, loading and unloading operations at the Raw Material Storage Pile Transfer operations (ROMTRANS), and primary,

secondary and tertiary ore crushing. These activities occur at grade. Emissions calculations for activities at the Touquoy Mine Site are summarized in Table 2E. AP-42 standard calculations and assumptions, including controls where applicable, were used to generate these values and are provided in the Table 2E.

Mine tailings are wet and are not anticipated to result in airborne emissions.

2.2 Sources of Gaseous Compounds

Tailpipe emissions from haul trucks along the Haul Road between the Beaver Dam Mine Site and the Touquoy Site include NOx, SO_2 and VOCs. The NOx emissions were modelled as nitrogen dioxide (NO_2) for comparison with the applicable air quality standards. These emissions were calculated using M6.2 which provides emission factors in a "grams-per-vehicle-mile-travelled" format. The tailpipe emissions estimates based on distance travelled are provided in Table 3.

Gaseous compound emissions also occur from blasting operations in the Mine pit. Blasting emissions from the Mine pit include NOx, SO_2 and CO. These emissions were estimated based on AP-42 Chapter 13.3 for Explosives Detonation using Ammonium Nitrate Fuel Oil (ANFO) type explosive. The Material Safety Data Sheet provided by AMNS for the explosive is provided in Appendix A. Gaseous compound emission estimates from blasting are provided in Tables 2C and 2D.

3. Background Air Quality Data

3.1 Regional Background

Appropriate background air quality data was investigated for the Project. The background air quality concentrations for the existing conditions were added to the modelled concentrations for the Project to obtain an estimate of the air quality conditions when the proposed operations commence. There are currently no permanent air monitoring stations near the Beaver Dam Mine Site.

The most recent three years (2014 to 2016) for which all ambient air quality data were available were obtained from the Government of Canada National Air Pollution Surveillance (NAPS) program. The NAPS data for 2014 to 2016 are summarized in Table 4.

The nearest representative stations which report substances of interest for this assessment are:

– Lake Major, Nova Scotia (station ID 030120) – $PM_{2.5}$, NO_2, SO_2
– Port Hawkesbury, Nova Scotia (station ID 030201) – $PM_{2.5}$, NO_2, SO_2
– Aylesford Mountain, Nova Scotia (station ID 030701) – $PM_{2.5}$, NO_2
– Pictou, Nova Scotia (station ID 030901) – $PM_{2.5}$, NO_2
– Halifax, Nova Scotia (station ID 030118) – NO_2, SO_2, CO
– Sydney, Nova Scotia (station ID 030118) – $PM_{2.5}$, NO_2, SO_2, CO

PM_{10} is not measured in many areas in Canada. Of the locations which do measure PM_{10}, most are in British Columbia urban centres, with four in Manitoba cities, one in Regina, Saskatchewan, and four in the Northwest Territories. In terms of locations that are somewhat comparable to the Project (human habitation, regional activities that may generate airborne particulate, etc.), Norman Wells NW Regional Office (Station ID 129102) is suitably rural and at a distance from significant human activities and industry and therefore appears appropriate and has recent data available. As such, this station has been included to provide context for PM_{10}, and comparison for the other species of interest ($PM_{2.5}$, NO_2, CO and SO_2) in this assessment. There is a great deal of uncertainty in how representative these values might be for background, but they represent the best available data at this time. Of particulate note is that the 75th percentile 24-hour PM_{10} value was reported at 14.0 µg/m^3, but the 90th percentile value jumped to 31.0 µg/m^3 and

the maximum value was 176.0 µg/m^3. This indicates that there are a few very high concentrations being measured which are strongly influencing the maximum and the 90th percentile. Use of the 90th percentile concentration for PM_{10} at this location as "background" for the Project is therefore likely to be very conservative, a finding supported by the limited PM_{10} monitoring completed historically in the area (Section 3.2).

Total suspended particulates (TSP) are not reported routinely anywhere in Canada, and so cannot be represented by NAPS monitoring data.

The background air concentrations provided in Table 4 shows the 25th, 50th, 75th, and 90th percentile values for ½-hour, 1-hour and 24-hour CO, 1-hour and 24-hour NO_2, 1-hour and 24-hour SO_2, and 24-hour PM_{10} and $PM_{2.5}$ for the 2014 through 2016 period.

GHD has completed the air assessment using the 90th percentile measured concentration as "background" for all compounds except $PM_{10.}$ This is a conservative approach but excludes extreme high values that are very rarely measured (the "maximum" values). Annual values for $PM_{2.5}$ are represented by the "Average" values for 24-hour. More representative background data for PM_{10} was obtained from Project monitoring data as discussed in Section 3.2.

For all species except NO_2, TSP and PM_{10}, the location with the highest 90th percentile background concentration value for each contaminant has been selected as "background". For NO_2, the highest 90th percentile background concentration value was measured at the Halifax station and equalled approximately 44 ug/m^3. It is to be noted that the NO_2 background concentrations measured at Halifax station is roughly three times higher than background NO_2 concentrations measured at any other monitoring station considered in this assessment. Furthermore, Halifax and Sydney stations are located in very urban areas and can not be considered representative for the Study Area. The Norman Well station is located in the Northwest Territories and the Aylesford station is located in a very rural farming area and therefore these two stations are also considered not representative for the Study Area. The remaining 3 stations (Pictou, Lake Major and Port Hawkesbury) are all in small town centers and can be considered representative for the Study Area. Therefore, GHD selected the highest 90th percentile concentration measured at these stations for NO_2 background concentration.

The Project plus background are the modelled concentrations from the Project activities plus the identified background air quality concentrations.

3.2 Project Monitoring

Particulate monitoring was undertaken for TSP and PM_{10} in the Project Area between 2007 and 2017. Air samples were collected at nine locations near the Beaver Dam Mine Site and along the proposed Haul Road, two locations near the Fifteen Mile Stream Site, two locations near the Cochrane Hill Site and at five additional locations on the Touquoy Site. Fifteen Mile Stream and Cochrane Hill are two additional mine projects proposed by AMNS in Nova Scotia located approximately 22 km north and 65 km northeast from the Project.

A summary of these measurements is presented in Table 5.

Total suspended particulate concentrations ranged from 1.7 to 41.7 µg/m^3, with the highest value obtained at Location #2 during monitoring in June 2008. This monitoring station was located in a recently clear-cut area, which may have contributed to higher particulate levels in comparison to the other locations. The 41.7 µg/m^3 concentration is considered to be an outlier but was kept in the data set when determining the 90th percentile. This area was resampled in 2014 (AN#2). The 2014 result for that area was 4.6 µg/m^3.

All samples collected were below the Nova Scotia *Air Quality Regulations* for TSP.

Due to a lack of other sources of data for ambient TSP, the background concentration for TSP is based on the 90th percentile of the measured 24-hour TSP concentrations (17.1 µg/m^3). Use of the 90th percentile value of the 24-hour concentrations measured is a conservative estimate.

Results for PM_{10} concentrations ranged from 7.1 to 13.1 µg/m^3, with the highest value also obtained at Location #2 during monitoring in June 2008. There is no Nova Scotia *Air Quality Regulations* for PM_{10} but the values measured were all less than 30% of the Ontario Interim guideline for PM_{10}.The maximum PM_{10} background air concentration

value at Location #2 (13.1 µg/m^3) was selected as a conservative estimate. The maximum was selected instead of the 90th percentile because of the limited number of PM_{10} samples available, and the samples did not appear to have any significant outliers.

4. Air Quality Criteria

Where Nova Scotia has air quality criteria, these have been used as the Assessment Criteria. If there were no Nova Scotia criteria for compounds of interest, then Canada-wide standards have been assumed to apply.

PM_{10} is not regulated in either Nova Scotia or federally. Ontario has an Interim Ambient Air Quality Criteria (AAQC) for PM_{10}, but this value is not used to assess compliance for single facilities or operations and is therefore generally applied at the regional level.

Volatile organic compounds are not regulated as a group in any of the jurisdictions identified and PM_{10} is not regulated at the facility level in any of the jurisdictions identified. As noted above, Ontario has an interim AAQC PM_{10} ambient guideline of 50 µg/m^3 for the 24-hour averaging period. VOC and PM_{10} concentrations are therefore provided for informational purposes only, and PM_{10} will be compared to this interim standard for context but is not considered a regulated compound in Nova Scotia.

Table 6 provides a summary of the compounds of concern for this assessment, the identified air quality criteria and averaging periods, and the data source. The assessment criteria selected for this assessment are provided in the final column of Table 6. There are no criteria applicable for total VOCs.

The deposition of particulate was assessed as part of the Human Health Risk Assessment report (AMNS 2021a).

5. Air Dispersion Modelling

Dispersion modelling was performed using the United States Environmental Protection Agency (US EPA) multi-source dispersion model AERMOD, following a modified methodology as described in the Air Dispersion Modelling Guideline for Ontario and in Ontario Regulation 419/05 (O. Reg. 419/05).

There is currently no guidance on the use of air dispersion models in Nova Scotia, therefore the Ontario O. Reg. 419/05 requirements were used as a framework for this assessment. The air dispersion model and methodology used in this project are currently accepted in Ontario, and the AERMOD model is accepted in multiple provinces and territories, as well as in the United States. AERMOD is an advanced steady-state plume model that has the ability to incorporate building cavity downwash, actual source parameters, emission rates, terrain and historical meteorological information to predict ground level concentrations (GLCs) at specified locations and has been peer reviewed and compared both to other models and monitoring data (US EPA 2003).

Dispersion modelling was performed for no mitigation as well as 80% road dust mitigation scenarios.

5.1 Dispersion Modelling Executables

The following dispersion and pre-processor models were used in this assessment:

– AERMOD digital terrain pre-processor (AERMAP), version 11103
– American Meteorological Society/Environmental Protection Agency Regulatory Improvement Committee (AERMIC) air dispersion model (AERMOD), version 19219
– Building Profile Input Program (BPIP), version 04274
– AERMET meteorological preprocess (AERMET), version 19219

5.2 Meteorological Data

Five years of unprocessed hourly meteorological data for the Facility was obtained from Environment Canada (2017a). The surface data is from the Upper Stewiacke Research Climate Station (WMO ID 71753) with missing data either interpolated for short periods (6 hours or less) or filled in using data from another nearby meteorological station (Debert Airport; WMO ID 71317). Upper air data was retrieved from the NOAA radiosonde database for Yarmouth, NS (NOAA 2018). The meteorological data covers the dates from January 1, 2012 to December 31, 2016. The data was processed using AERMET version 19219 with land use characteristics representative of the Project's surroundings. The hourly data included many factors which affect the dispersion of air compounds including wind speed, wind direction, temperature, ceiling height, and atmospheric stability.

5.3 Averaging Periods

Air compounds were modelled with appropriate averaging periods based on their respective air quality criteria. The averaging periods of interest for each compound are provided in Table 6. Maximum predicted concentrations presented are exclusive of "meteorological anomalies". Under Ontario dispersion modelling guidance, the highest 8 hours (for hourly results) or the highest 1 day (for 24-hour results) for each year modelled are considered to be attributable to meteorological anomalies, and so are not considered. Where "maximum concentrations" are reported, these are maximum concentrations after meteorological anomalies have been removed.

5.4 Digital Elevation Model Data

Digital elevation model (DEM) data was obtained from Natural Resources Canada through their geospatial data extraction tool (http://geogratis.gc.ca/site/eng/extraction). The DEM data was used to include the effects of terrain in the modelling.

DEM data was preprocessed with AERMAP version 11103 for use with AERMOD. Figure 2 shows a contour plot of the extracted terrain data for the modelling domain.

5.5 Source Input Parameters

Three sources were modelled to represent the Project: the Haul Road between the Beaver Dam Mine Site and the Touquoy Mine Site; the Beaver Dam Mine Site including the onsite haul road, and the Touquoy Mine Site.

5.5.1 Haul Road

The entire Haul Road, approximately 30 km in length between the two mine sites was modelled in AERMOD, however these AERMOD model runs require extensive computing time. GHD determined that there was no significant difference in the model results along the various sections of the Haul Road. Therefore, in order to facilitate the AERMOD model run time with the various model scenarios, GHD selected four haul road sections that have typical to worst case air impacts. The four haul road sections are located near the residential sensitive receptors that were assessed (Section 5.7). The selected four Haul Road sections that were modelled in AERMOD are presented on Figure 3.

The four Haul Road sections were modelled as line volume sources representing both road and tailpipe emissions from truck traffic. These haul road sections were assumed to have a targeted control efficiency of 80 percent of the re-suspended road dust. This control efficiency will be achieved through the implementation of a fugitive dust best management plan including dust suppressant applications on the road surface.

Project Only and Cumulative truck traffic scenarios were modelled. The Cumulative emissions scenario is the Project Only truck traffic emissions plus the Fifteen Mile Stream (FMS), Cochrane Hill (CH), and Forestry truck traffic emissions.

5.5.2 Beaver Dam Mine

Option A at the Beaver Dam Mine Site includes crushing operations that will occur at the Mine Site's surface along with the mining and transfer operations that will primarily operate from within an open pit. Option B at the Beaver Dam Mine Site includes blasting operations that will occur along with the mining and transfer operations from within an open pit. The blasting and mining and transfer operations in the pit were modelled as open pit sources. The crushing emissions were modelled as a volume source on the Mine Surface, and the emissions from the section of haul road inside the mine site was assessed.

5.5.3 Touquoy Mine Site

The Touquoy Mine Site consisted of the crushers and mining sources as volume sources. Results from this Site have been included in this report as the Beaver Dam project will use Touquoy for its refining capabilities. The sources at Touquoy were previously modelled in AERMOD for an Emissions Summary and Dispersion Modelling assessment (GHD 2007). The Touquoy Site's assessment accounted for receiving the Beaver Dam Mine’s ore bearing rock in its processing emissions.

5.6 Deposition

Deposition was modelled for TSP. For consistency, plume depletion was permitted for all three size fractions (including TSP, PM_{10} and $PM_{2.5}$), to ensure that predicted concentrations were consistent with each other. Plume depletion calculates the settling of particles from emitted plumes as a result of their mass and aerodynamic properties, and can provide the predicted deposition (in grams per square metre, g/m^2) that may be used further to estimate health risks based on biological intake (i.e., ingestion). Deposition was not modelled for the purposes of air quality assessment, but the results are included in Tables 7A, 7B, 8A, 8B and 9A1-9B2 for use in the Human Health Risk Assessment (AMNS 2021a).

5.7 Receptors

A series of discrete receptor grids and discrete receptors located at ground level were used to identify the maximum point of impingement (POI) outside the two mine sites and along the connecting Haul Road.

Around the Touquoy Mine Site, the receptor grids were set up with the following grid spacing:

– 20 m spacing within 200 m of the edge of a bounding box that encompassed all onsite facility sources
– 50 m spacing from 200 to 500 m
– 100 m spacing from 500 to 1,000 m
– 200 m spacing from 1,000 to 2,000 m
– 500 m spacing from 2,000 to 5,000 m

A property line ground level receptor grid with 10 m spacing was used to evaluate the maximum property boundary concentration. No receptors were placed inside either Mine's property line.

Around Beaver Dam Mine, the receptors were set up with the following spacing:

– 20 m spacing within 200 m of the edge of a bounding box that encompassed all onsite facility sources
– 50 m spacing from 200 to 500 m
– 100 m spacing from 500 to 1,000 m
– 200 m spacing from 1,000 to 2,000 m
– 300 m spacing from 2,000 to 3,000 m

No receptors were placed inside Beaver Dam Mine's property line.

Along the four modelled road sections, receptors were spaced at 40 m parallel to the road and at the following distances perpendicular to the road:

– 30 m from road centerline
– 45 m from road centerline
– 55 m from road centerline
– 65 m from road centerline
– 75 m from road centerline

Modelling was also completed for selected sensitive receptors that are near the Haul Road or mine sites and have the potential to be impacted by air emissions. The sensitive receptors that were considered are shown on Figure 3, as follows:

– Sensitive Receptor 1 (R1) – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)
– Sensitive Receptor 2 (R2) – 4112 Highway 224 (Beaver Lake IR 17)
– Sensitive Receptor 3 (R3) – 4115 Highway 224 (Cottage on Crown land)
– Sensitive Receptor 4 (R4) – 3492 Highway 224 (Hobbs Property)
– Sensitive Receptor 5 (R5) – 3379 Highway 224 (McLeod Property)
– Sensitive Receptor 6 (R6) – 3373 Highway 224 (Smith Property)
– Sensitive Receptor 7 (R7) – Tangier River (Deepwood Estates Property)
– Sensitive Receptor 8 (R8) – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)
– Sensitive Receptor 9 (R9) – 5579 Mooseland Road (Lloy Property)

5.8 On-Site Building Data

There are several buildings at the Touquoy Mine Site, however, point sources at this location were insignificant and not included in the dispersion modelling. There were no buildings identified for the Beaver Dam Mine Site. For these reasons, building downwash effects were not included in the modelling.

6. Results

6.1 Project Only Haul Road Truck Traffic Emissions Scenario

The modelled particulate concentration results of the Project only Haul Road emissions scenario for the four road sections modelled (Figure 3) are summarized in Table 7A and 7B for no mitigation and 80% road dust mitigation scenarios respectively. For the 80% road dust mitigation scenario, all predicted Project only maximum concentrations are well below the air quality assessment criteria with background added, as shown in Table 7B. The maximum particulate deposition along the Haul Road for the Project only truck traffic scenario ranged from 74.1 to 75.9 g/m^2/year. Table 7C summarizes the predicted maximum concentrations of the gaseous species (NO_2, SO_2 and VOCs). There are no controlled emissions scenarios considered for NO_2, SO_2 and VOCs. There are no exceedances of the air quality criteria for NO_2, and SO_2 and VOCs. There is no air quality criteria for total VOCs, and the predicted maximum concentrations of total VOCs in Table 7C are shown to be negligible.

The maximum concentrations for all contaminants occur at 30 m from the Haul Road centerline, which is the project boundary for the Haul Road.

6.2 Cumulative Haul Road Truck Traffic Emissions Scenario

The modelled particulate concentration results of the Cumulative Haul Road emissions scenario for the four road sections modelled (Figure 3) are summarized in Table 7A and 7B for no mitigation and for the 80% road dust mitigation scenario respectively. All predicted Cumulative maximum concentrations with 80% road dust mitigation are well below the air quality assessment criteria with background added, as shown in Table 7B. The maximum particulate deposition along the Haul Road for the Cumulative truck traffic scenario ranged from 78.9 to 81.6 g/m^2/year.

Table 7C summarizes the predicted maximum concentrations of the gaseous species (NO_2, SO_2 and VOCs) and Figures 6A-6I depict the resulting concentrations graphically. There are no exceedances of the air quality criteria for NO_2, and SO_2. There are no criteria applicable for total VOCs. The predicted concentrations of VOCs as presented in Table 7C show that the VOC concentrations are very low (less than 1 microgram per cubic metre) and are provided for reference only.

The maximum concentrations for all contaminants occur at 30 m from the Haul Road centerline, which is the project boundary for the Haul Road.

Figures 4A to 5E show the 30 km haul road contour plots for TSP, PM10 and PM2.5 modelled for the no mitigation and 80% road dust mitigation scenarios respectively. As shown on these figures, there are no exceedances of the applicable criteria along the haul road for 80% road dust mitigation scenario.

6.3 Concentrations at Sensitive Receptors

Tables 8A and 8B summarize the no mitigation and 80% dust mitigation particulate modelling results respectively at the sensitive (residential) receptors for the Project only and Cumulative Haul Road truck traffic scenarios. Concentrations with and without background concentrations are presented in Tables 8A and 8B. All predicted particulate concentrations are below the air quality assessment criteria with and without background air concentrations for 80% dust mitigation scenarios. There are also no exceedances of the air quality criteria for NO_2, and SO_2.

The predicted particulate deposition rates for the sensitive receptors ranged from 0.1 to 49.4 g/m^2/year for the Project only emissions scenario and from 0.2 to 74.8 g/m^2/year for the Cumulative emissions scenario for the 80% Dust mitigation scenario.

Tables 8C and 8D summarize gaseous species (NO2, SO2 and VOCs) modelling results at the sensitive (residential) receptors for the Project only and Cumulative Haul Road truck traffic scenarios respectively. All predicted gaseous species concentrations are below the identified air quality assessment criteria with and without background air concentrations. For the assessment, Canadian Ambient Air Quality Standards (CAAQS) criteria for the year 2025 for comparison for the 1-hour and annual time averaging periods were used which are more stringent than the current Nova Scotia standards. Furthermore, Nova Scotia and Ontario standards for 24-hour time averaging period for SO_2 and NO2 were used respectively. There are no applicable standards for VOCs.

6.4 Beaver Dam Mine Site Operations

Tables 9A1-9B2 summarize the estimated particulate concentrations for Option A as well as particulate and gaseous concentrations for Option B at the Beaver Dam mine site boundary from the Beaver Dam Mine Site operation sources.

Figures 7A-8D show the off-site contours at the Beaver Dam Mine Site for particulate concentrations for Option A from Beaver Dam Mine Site operations. Figures 9A-10D show the off-site contours at the Beaver Dam Mine Site for particulate and gaseous compounds concentrations for Option B.

Without mitigation and controls, TSP for 24hour and annual averaging periods, PM10 for 24hour averaging period and PM2.5 for annual averaging period exceeded the criteria for both Option A and Option B outside the Beaver Dam Mine Site property boundary. Otherwise, modelling results for all contaminants resulting from on-site operations at Beaver

Dam Mine Site were predicted to meet the identified assessment criteria for all averaging periods, from operations alone and when added to background concentrations. Furthermore, modelling results for all contaminants resulting from on-site operations at Beaver Dam Mine Site were predicted to meet the identified assessment criteria for all averaging periods, from operations alone and when added to background concentrations when road dust mitigation and source specific controls were applied.

Noise berm modelling was not considered as the existing modelling completed represents the pit emissions conservatively and assesses the emissions for worst case scenario. It is expected that the noise berms would slightly reduce offsite concentrations however to keep the number of model run scenarios to a reasonable level, GHD did not include the different berm options in the modelling. This also ensured that GHD's modelling estimated worst case offsite emissions impact.

6.5 Touquoy Mine Site Operations

Table 9C summarizes the particulate emissions modelling results at the Touquoy mine site boundary from the Touquoy Mine Site operation sources. Modelling results for all particulate size fractions resulting from on-site operations at the Touquoy Processing facility were predicted to meet the identified assessment criteria for all averaging periods, from operations alone and when added to background concentrations.

7. Conclusions

Modelling of sources at the Beaver Dam Mine Site and the Touquoy Mine Site showed maximum predicted concentrations at their respective fence lines well below applicable air quality criteria with 80% road dust mitigation.

The Haul Road between the proposed Beaver Dam and the Touquoy Mine Sites is the source primarily responsible for the maximum predicted concentrations at both the gridded receptors and the sensitive (residential) receptors identified for this assessment.

Emissions of particulate from the Haul Road, including background concentrations, do not exceed the particulate air quality criteria at 30 metres from the road centerline for both the Project only and Cumulative Haul Road truck traffic scenarios for the 80% dust mitigation scenario.

There are no exceedances of the air quality assessment criteria at any of the residential receptors for both the Project only and Cumulative Haul Road truck traffic scenarios for 80% dust mitigation scenarios.

The particulate deposition (dust fall) results have been included for use in the Human Health Risk Assessment (AMNS 2021a).

Emissions of gaseous species from the Haul Road trucks as well as blasting operations are predicted to be well below the assessment criteria.

Details on proposed dust mitigation is provided in the Fugitive Dust Control Plan (AMNS 2021a).

The proponent is proposing the use of products to address concerns related to road dust, which can achieve 80% dust mitigation on the proposed Haul Road with the projected traffic volumes. These products can be used during the times of the year when the most dust is expected to be generated.

As a conservative measure, for the purposes of this assessment it has been assumed that a minimum 80% road dust mitigation will be achieved as the worst case. With 80% dust mitigation there are no predicted exceedances of any air quality criteria at the residential receptors. At 30 m from the road centerline there are no exceedances of any of the air quality criteria with 80% dust mitigation.

In the event of dust complaints, mitigation programs and operational practices will be reviewed to determine the appropriate course of action, in order to further reduce road dust emissions and dust deposition at sensitive receptors. AMNS is also proposing to include a dust monitoring program to confirm the effectiveness of proposed dust mitigation

measures to be implemented along the roadway. This can be implemented prior to the commencement of operations to provide additional background concentrations for particulates.

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BEAVER DAM MINE

TOUQUOY MINE

Beaver Dam Mines Rd

Haul Route

Moose River Rd

Mooseland Rd

224

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LEGEND

- HAUL ROUTE
- BEAVER DAM MINE PROPERTY BOUNDARY
- TOUQUOY MINE PROPERTY BOUNDARY

0 600 1200 1800m

N

GHD

ATLANTIC MINING NS INC.
BEAVER DAM MINE PROJECT
BEAVER DAM, NOVA SCOTIA
AIR EMISSIONS ASSESSMENT TECHNICAL REPORT

SITE AND HAUL ROAD LOCATION MAP

Project No. **88664**
Date **December 2020**

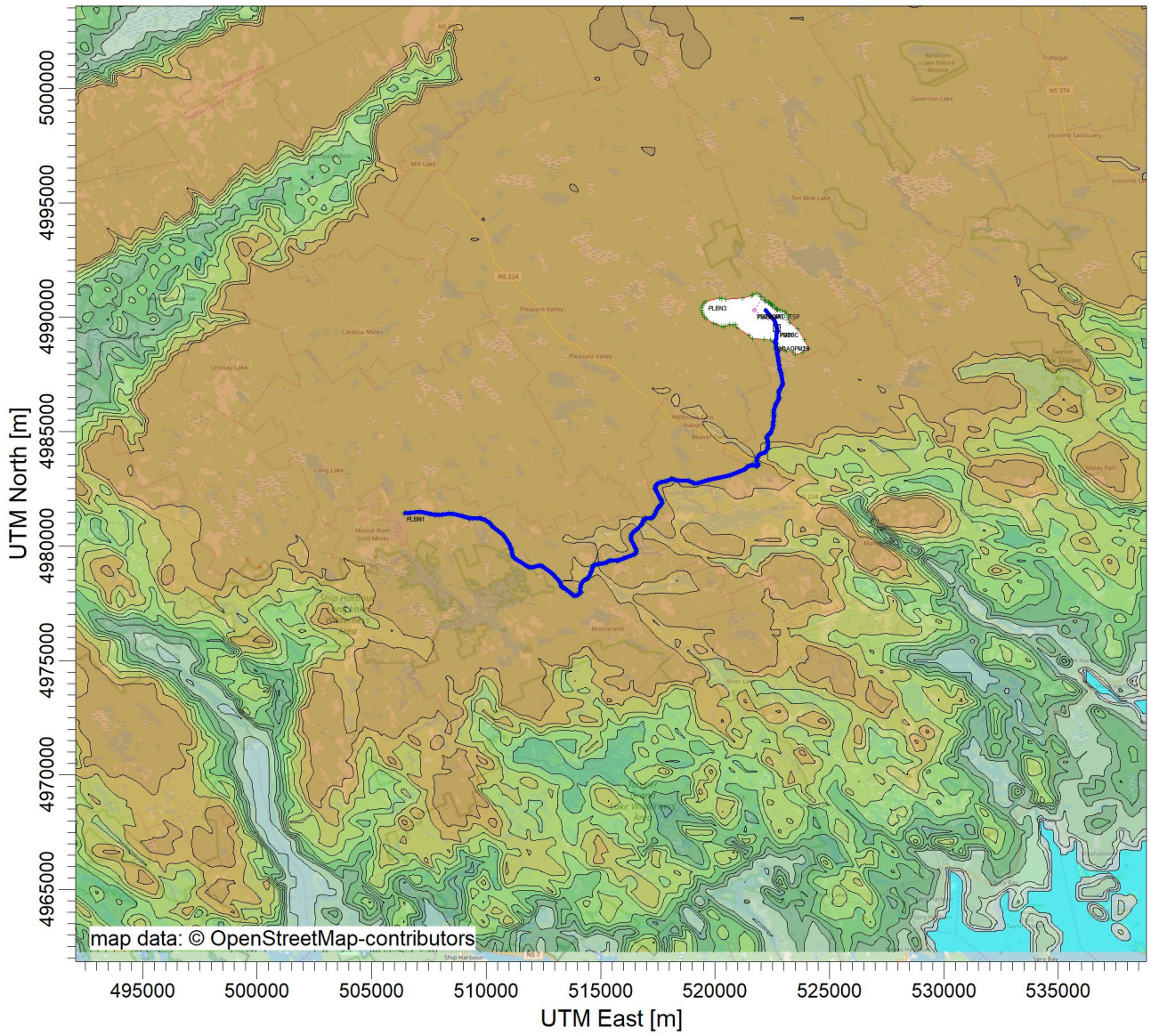
FIGURE 1

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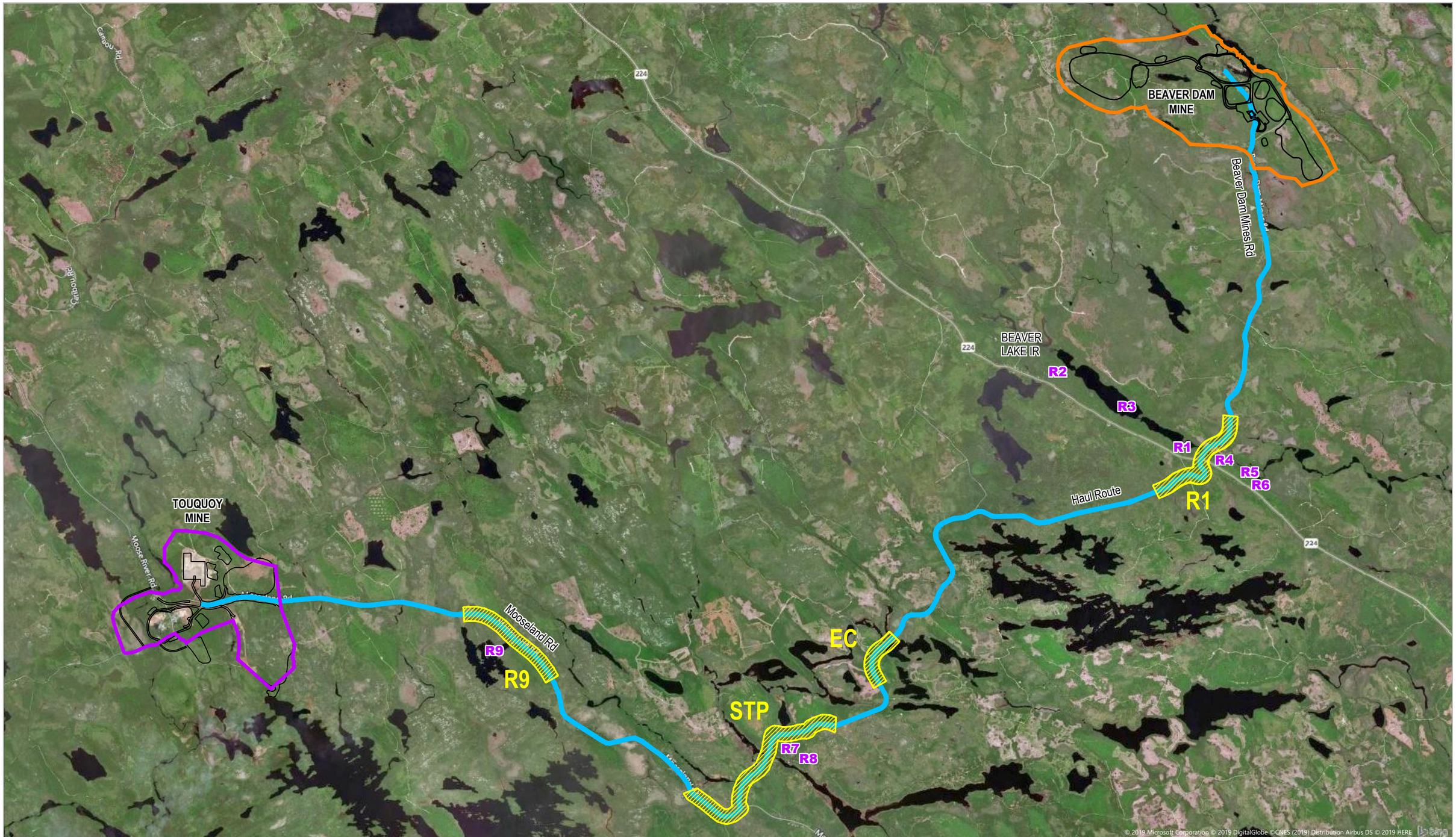
Figure 2 - Terrain Elevations



Terrain Contours — meters

0 1 5 10 30 40 50 60 70 80 90 100 200 231

COMMENTS:	SOURCES: **9**	COMPANY NAME: **Atlantic Gold**	
	RECEPTORS: **4800**	MODELER: **GHD**	
		SCALE: 1:294,220 — 0 — 10 km	
		DATE: **3/2/2020**	PROJECT NO.: **088664**



LEGEND

- HAUL ROUTE
- BEAVER DAM MINE PROPERTY BOUNDARY
- TOUQUOY MINE PROPERTY BOUNDARY

R1 POINT-OF-RECEPTION LOCATION

0 600 1200 1800m

N

GHD

ATLANTIC MINING NS INC.
BEAVER DAM MINE PROJECT
BEAVER DAM, NOVA SCOTIA
AIR EMISSIONS ASSESSMENT TECHNICAL REPORT

ROAD SECTIONS ASSESSED

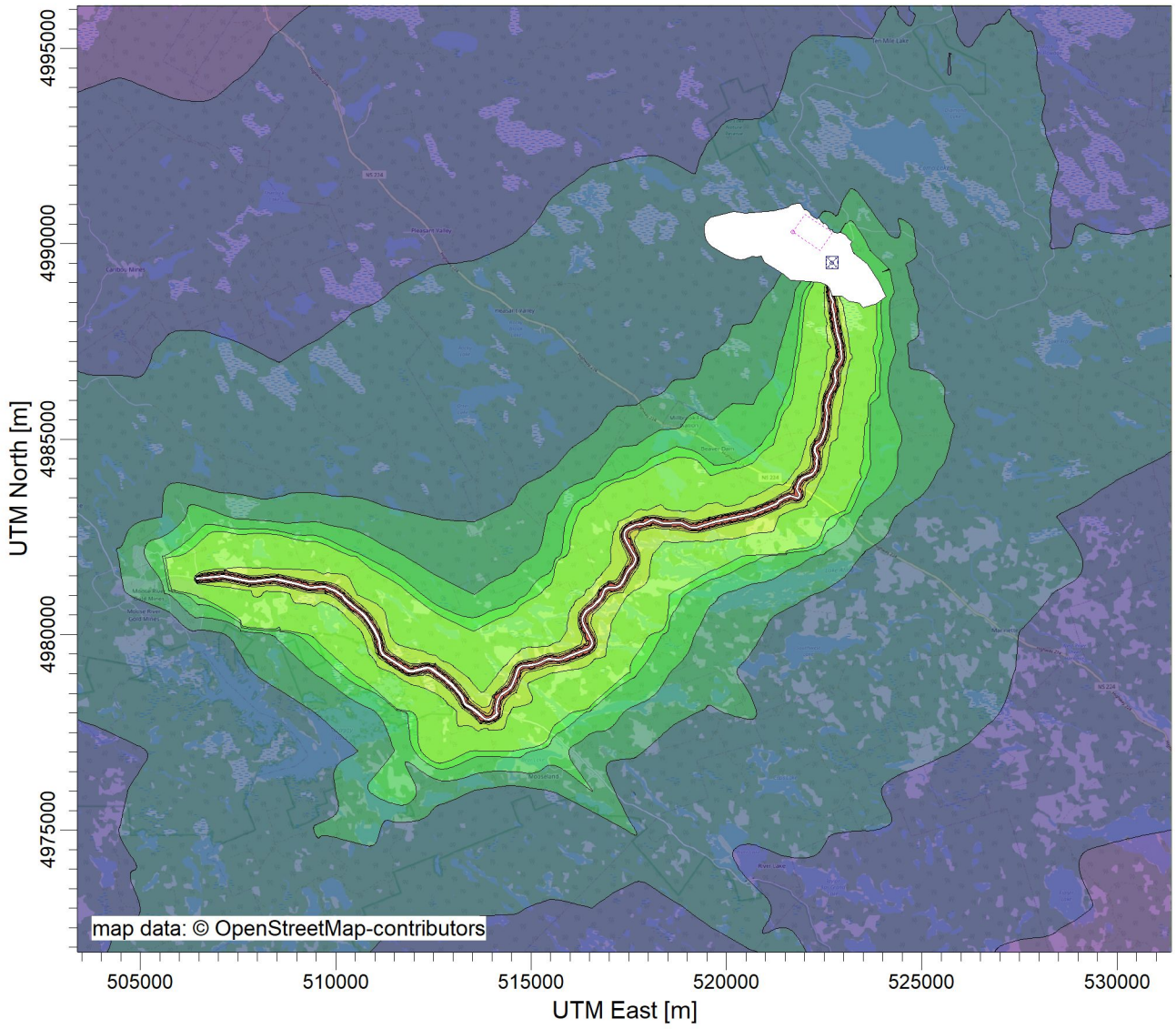
Project No. **88664**
Date **January 2021**

FIGURE 3

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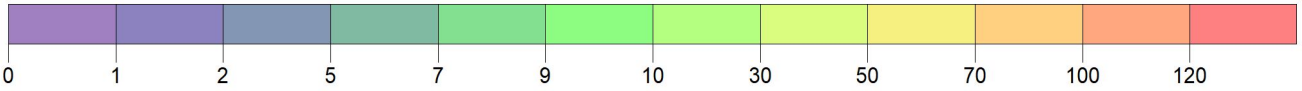
Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Accessed: 2019

Figure 4A - TSP, 24-hour
Cumulative Truck Traffic Scenario, No Mitigation



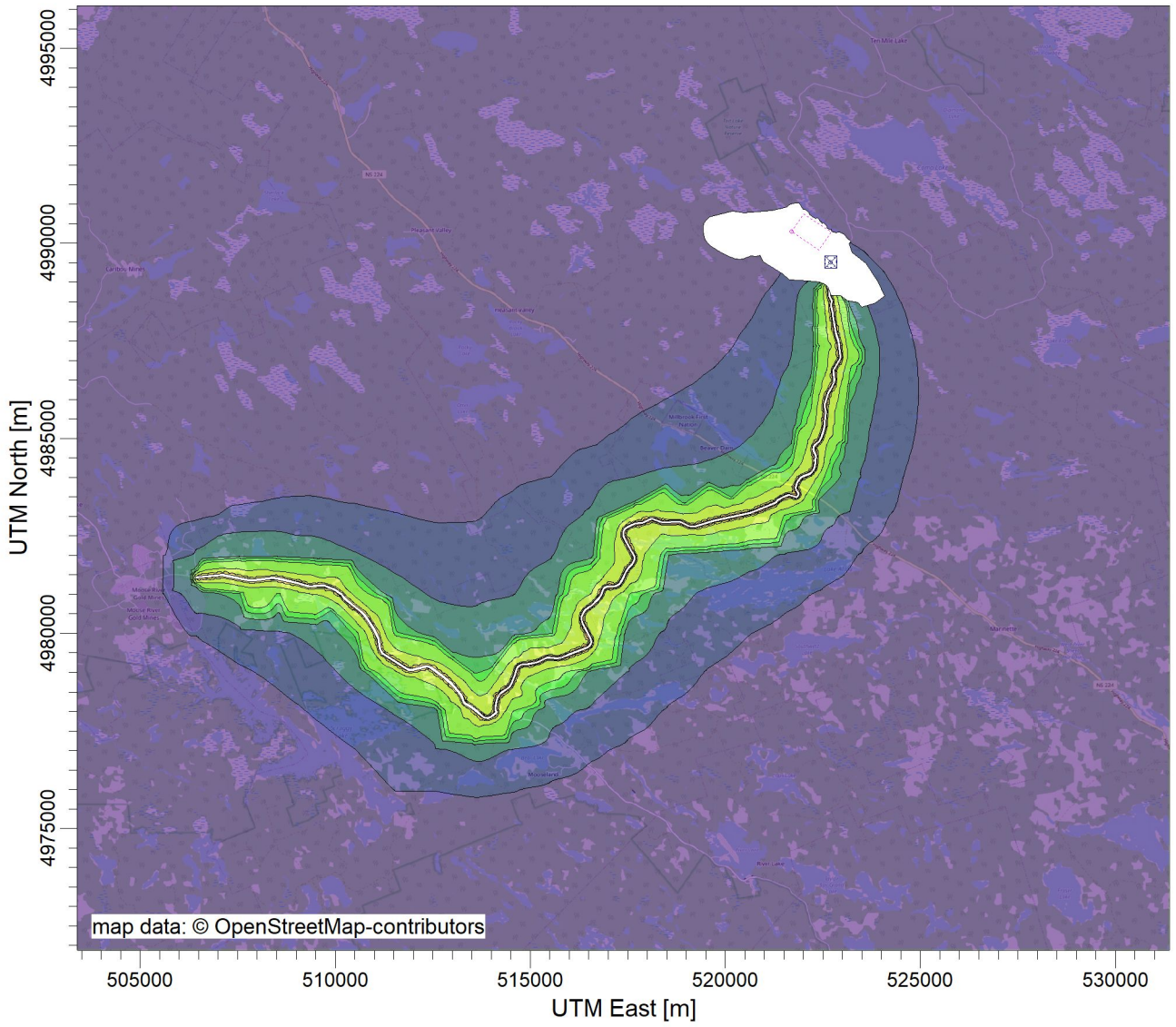
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

Max: 414 [ug/m^3] at (522682.40, 4988743.33)



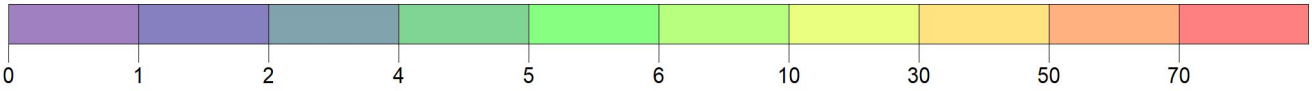
COMMENTS: 24-hour TSP Limit = 120 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,129 0 5 km	
	MAX: **414 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 4B - TSP, Annual
Cumulative Truck Traffic Scenario, No Mitigation



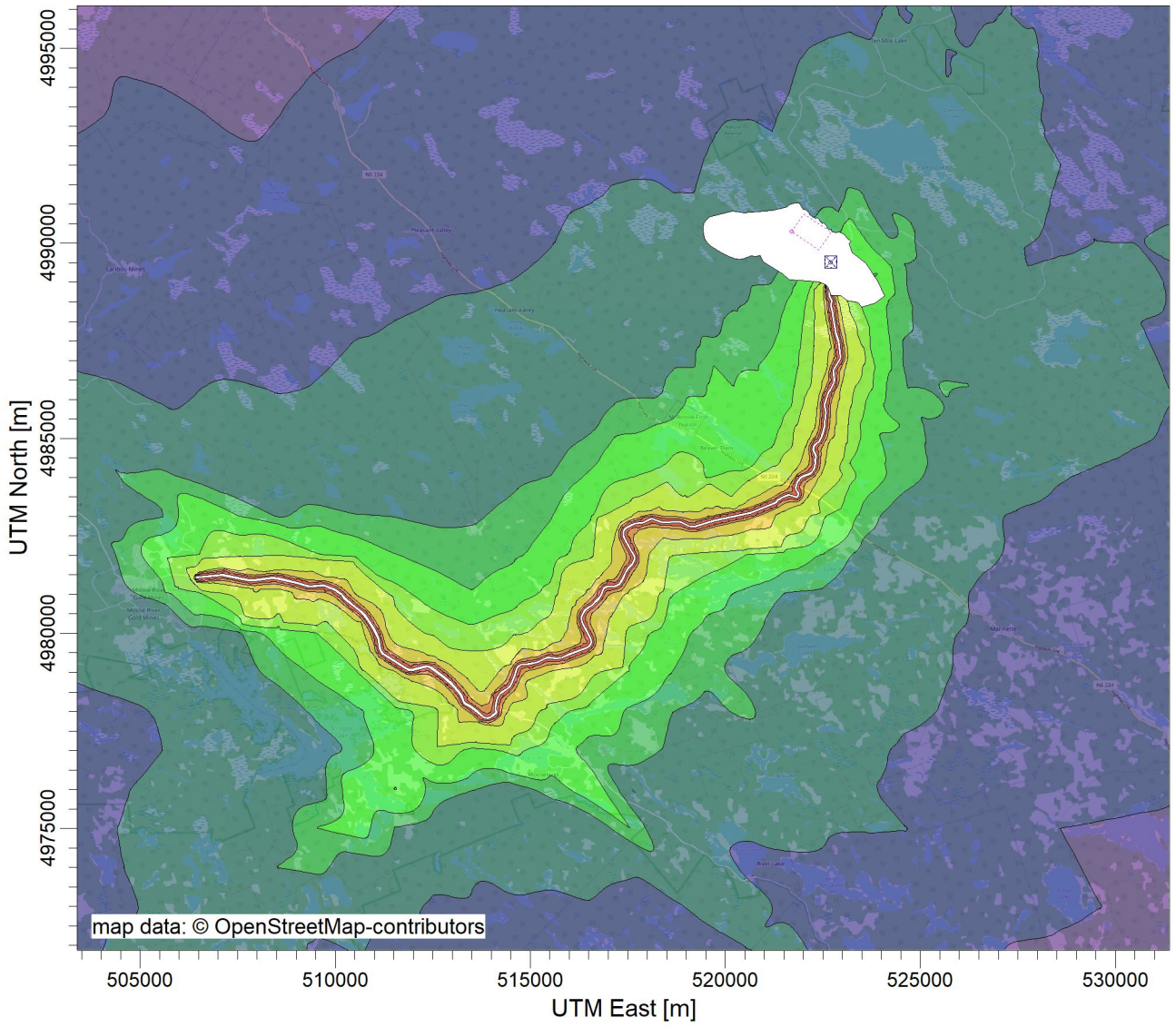
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_TSP ug/m^3

Max: 132 [ug/m^3] at (522682.40, 4988743.33)



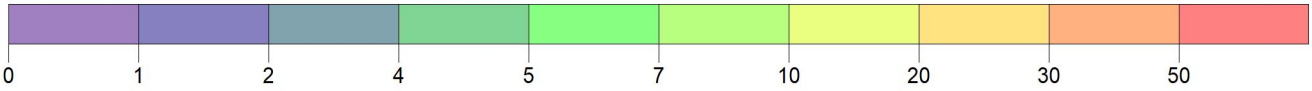
COMMENTS: Annual TSP Limit = 70 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,140 0 5 km	
	MAX: **132 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 4C - PM10, 24-hour
Cumulative Truck Traffic Scenario, No Mitigation



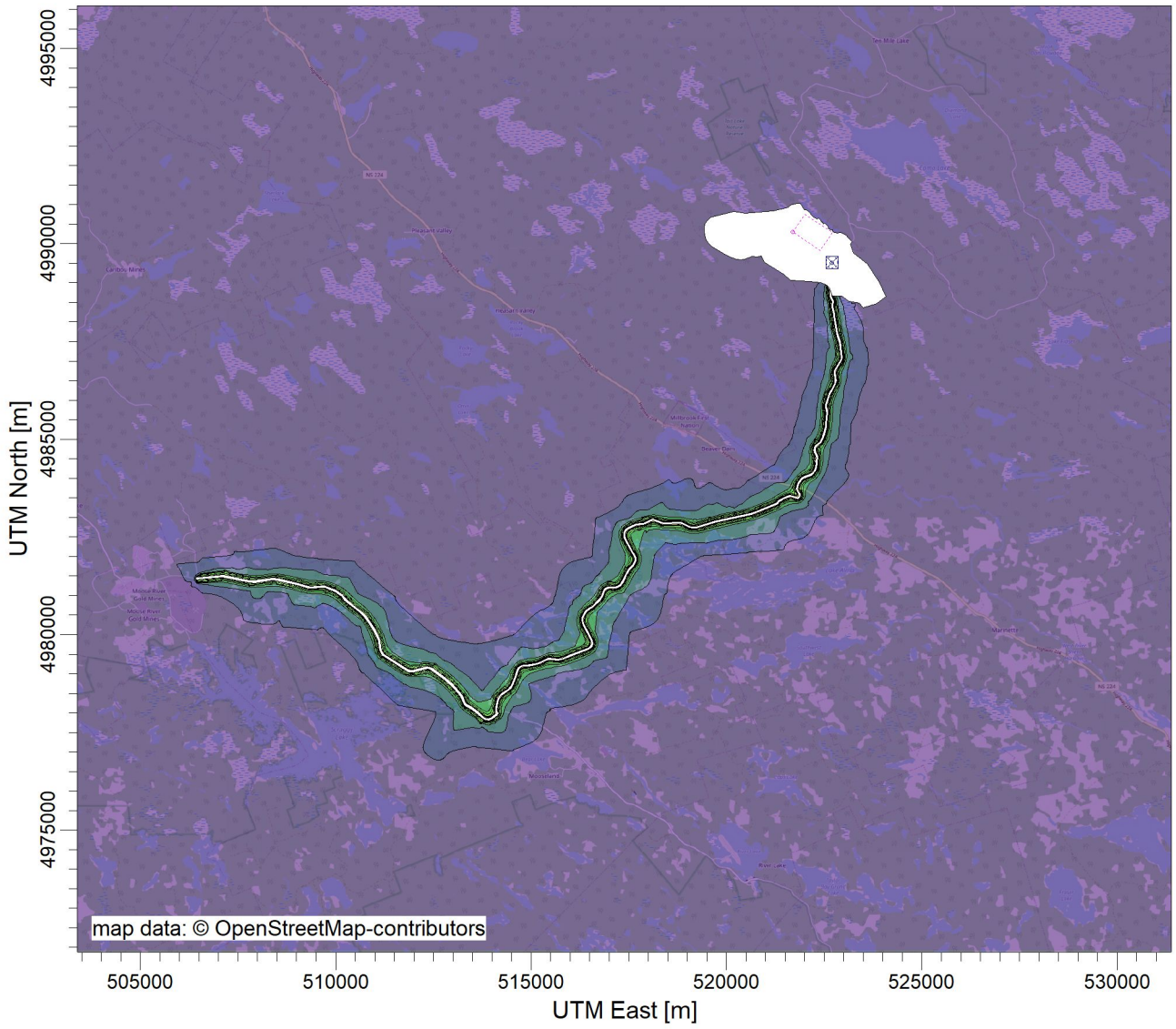
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM10 ug/m^3

Max: 179 [ug/m^3] at (522682.40, 4988743.33)



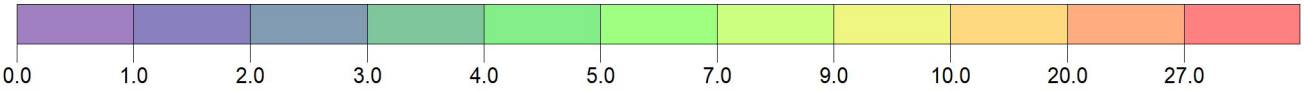
COMMENTS: 24-hour PM10 Limit = 50 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,140 0 5 km	
	MAX: **179 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 4D - PM2.5, 24-hour
Cumulative Truck Traffic Scenario, No Mitigation



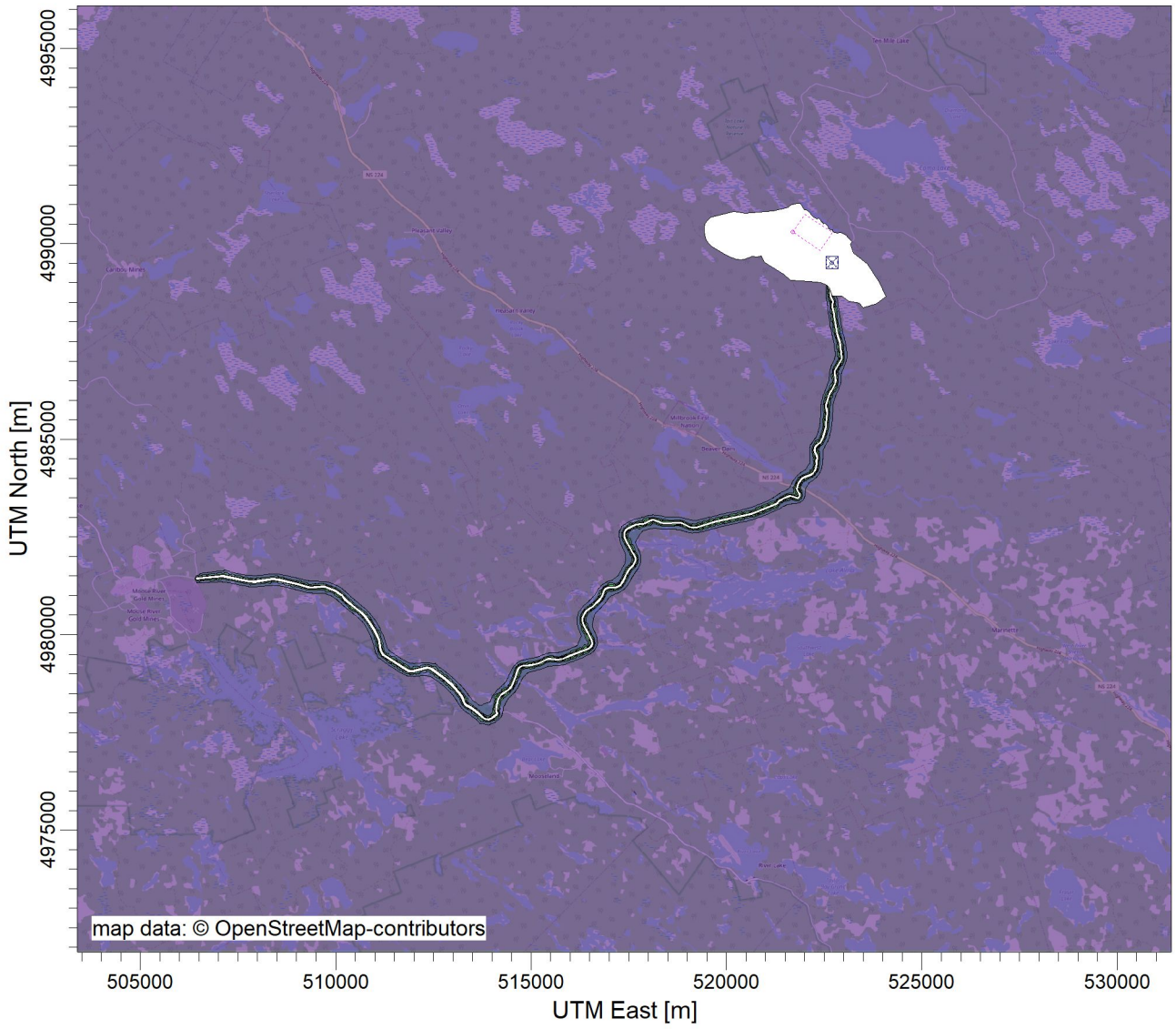
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM25 ug/m^3

Max: 19.1 [ug/m^3] at (522682.40, 4988743.33)



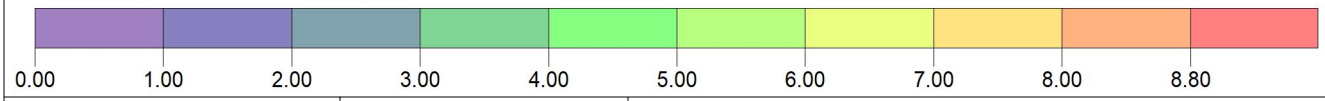
COMMENTS: 24-hour PM2.5 Limit = 27 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,124 0 5 km	
	MAX: **19.1 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 4E - PM2.5, Annual
Cumulative Truck Traffic Scenario, No Mitigation



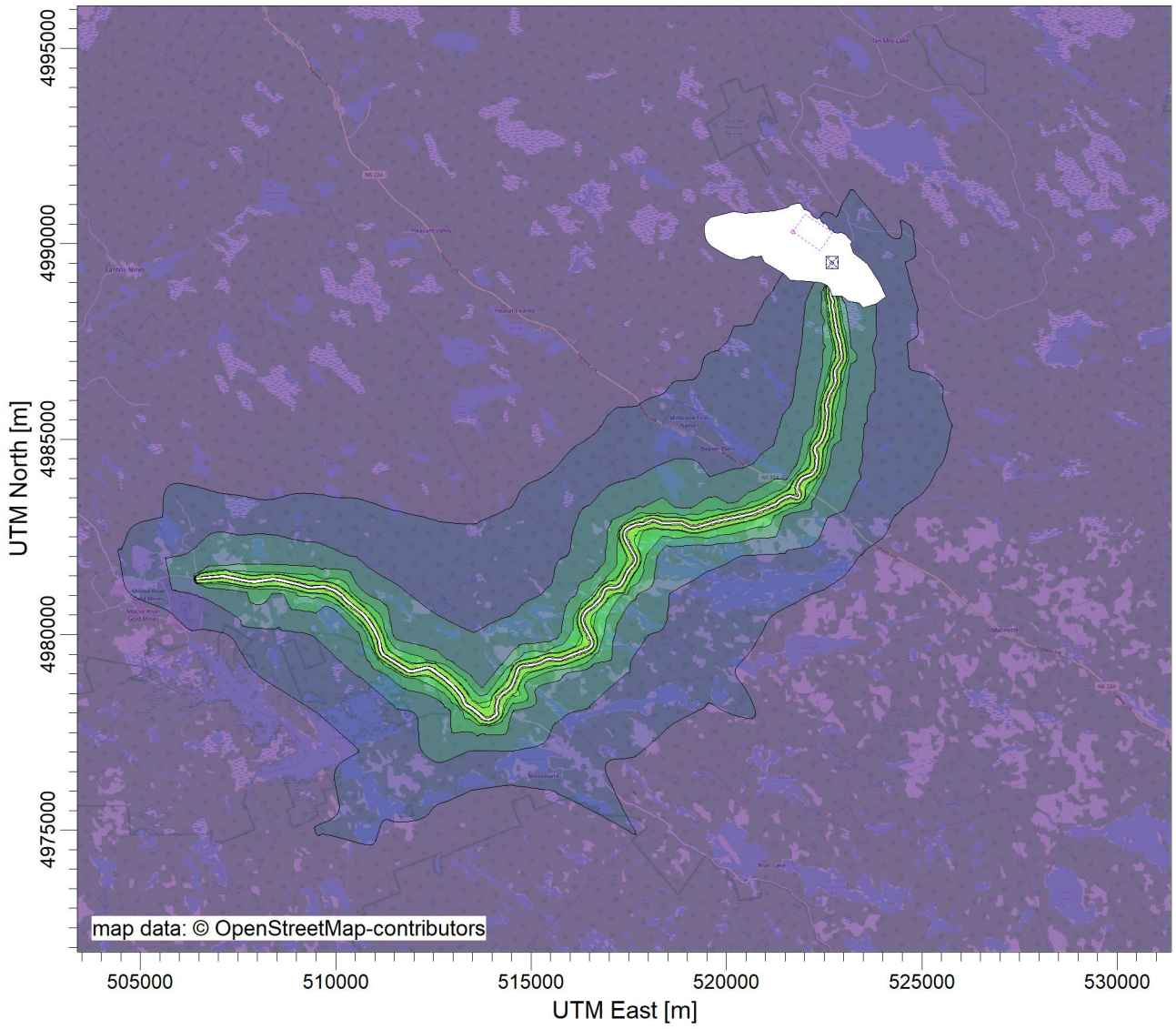
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_PM25 ug/m^3

Max: 7.40 [ug/m^3] at (522682.40, 4988743.33)



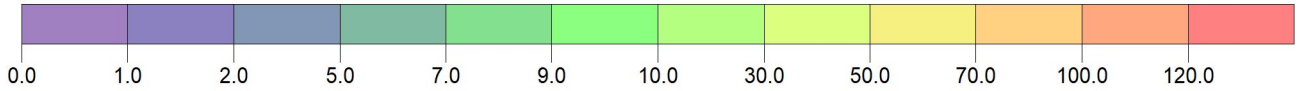
COMMENTS:	SOURCES:	COMPANY NAME:	
Annual PM2.5 Limit = 8.8 ug/m3	**9**		
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,124 0 5 km	
	MAX: **7.40 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 5A - TSP, 24-hour
Cumulative Truck Traffic Scenario, 80% Road Dust Mitigation



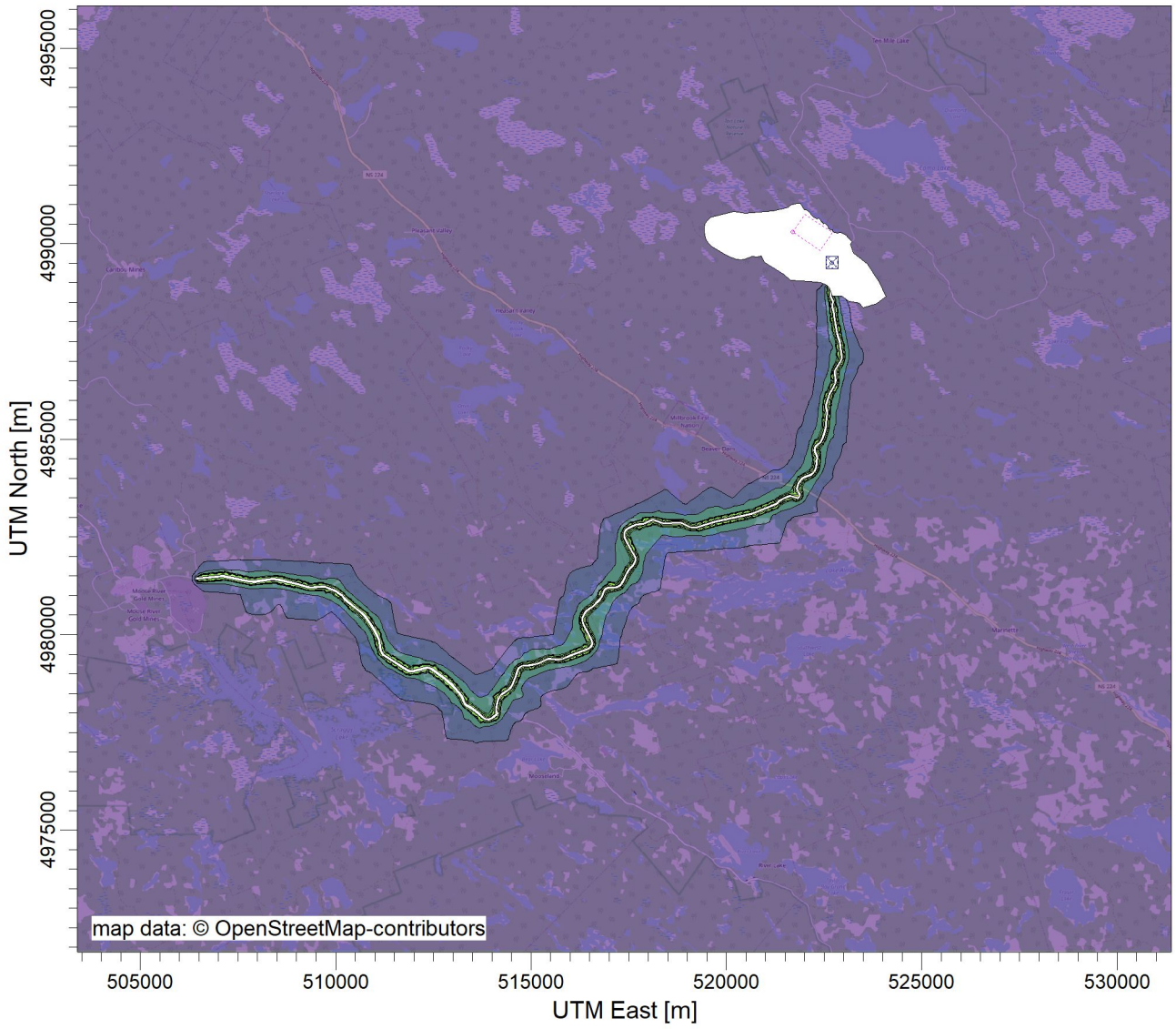
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

Max: 81.9 [ug/m^3] at (522682.40, 4988743.33)



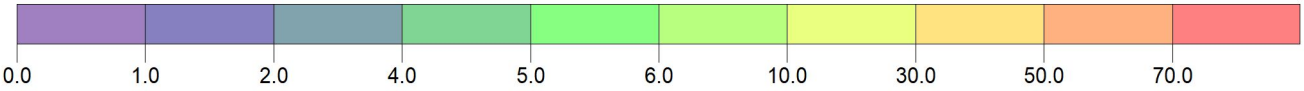
COMMENTS:	SOURCES:	COMPANY NAME:	
24-hour TSP Limit = 120 ug/m3	**9**		
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,114 (0 — 5 km)	
	MAX: **81.9 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 5B - TSP, Annual
Cumulative Truck Traffic Scenario, 80% Road Dust Mitigation



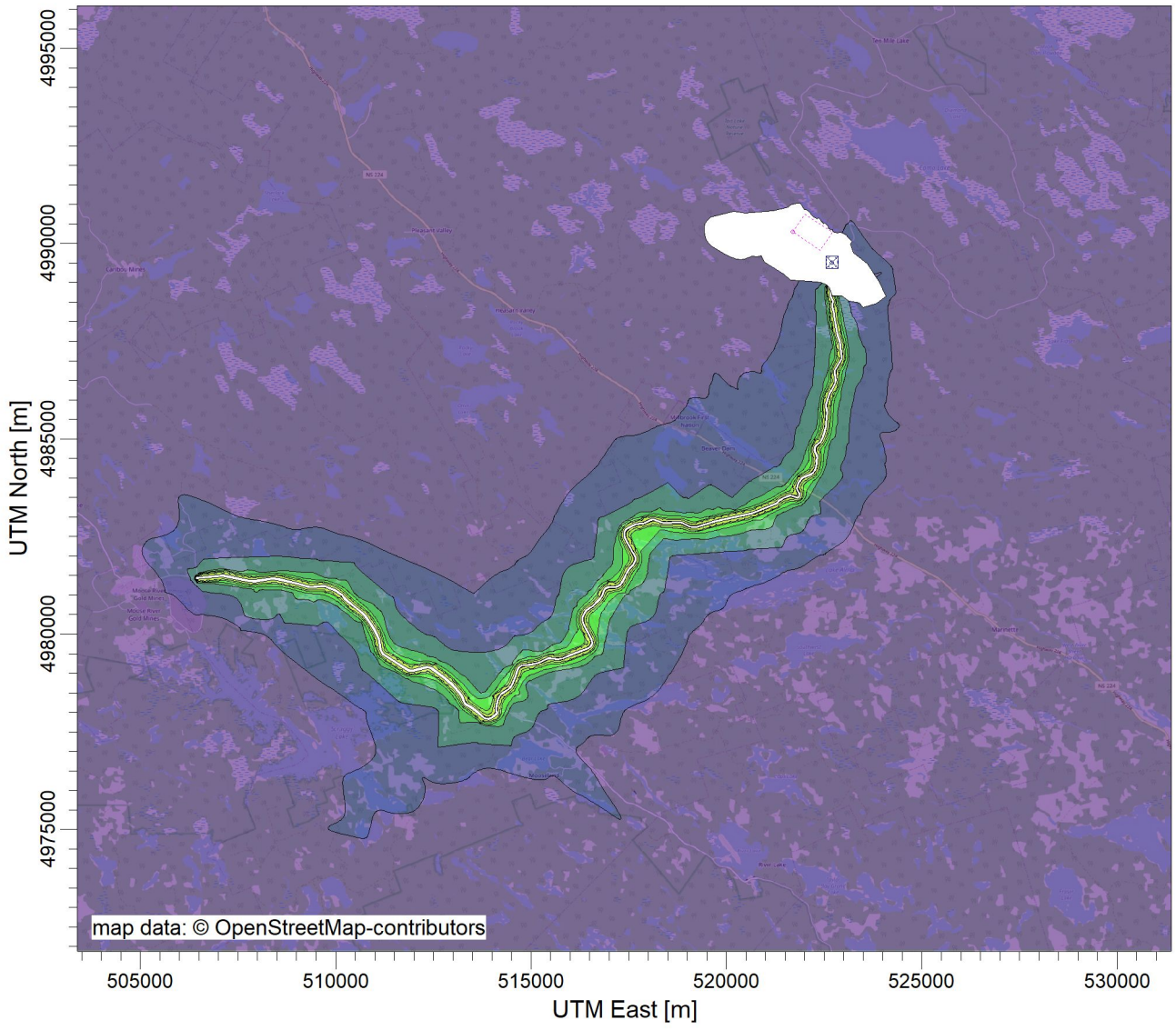
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_TSP ug/m^3

Max: 26.3 [ug/m^3] at (522682.40, 4988743.33)



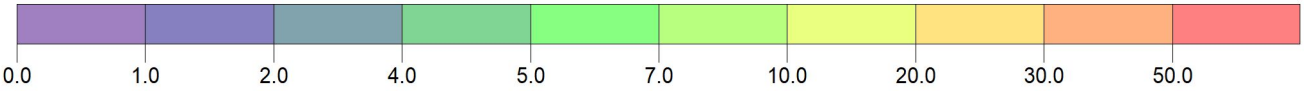
COMMENTS: Annual TSP Limit = 70 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,124 0 5 km	
	MAX: **26.3 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 5C - PM10, 24-hour
Cumulative Truck Traffic Scenario, 80% Road Dust Mitigation



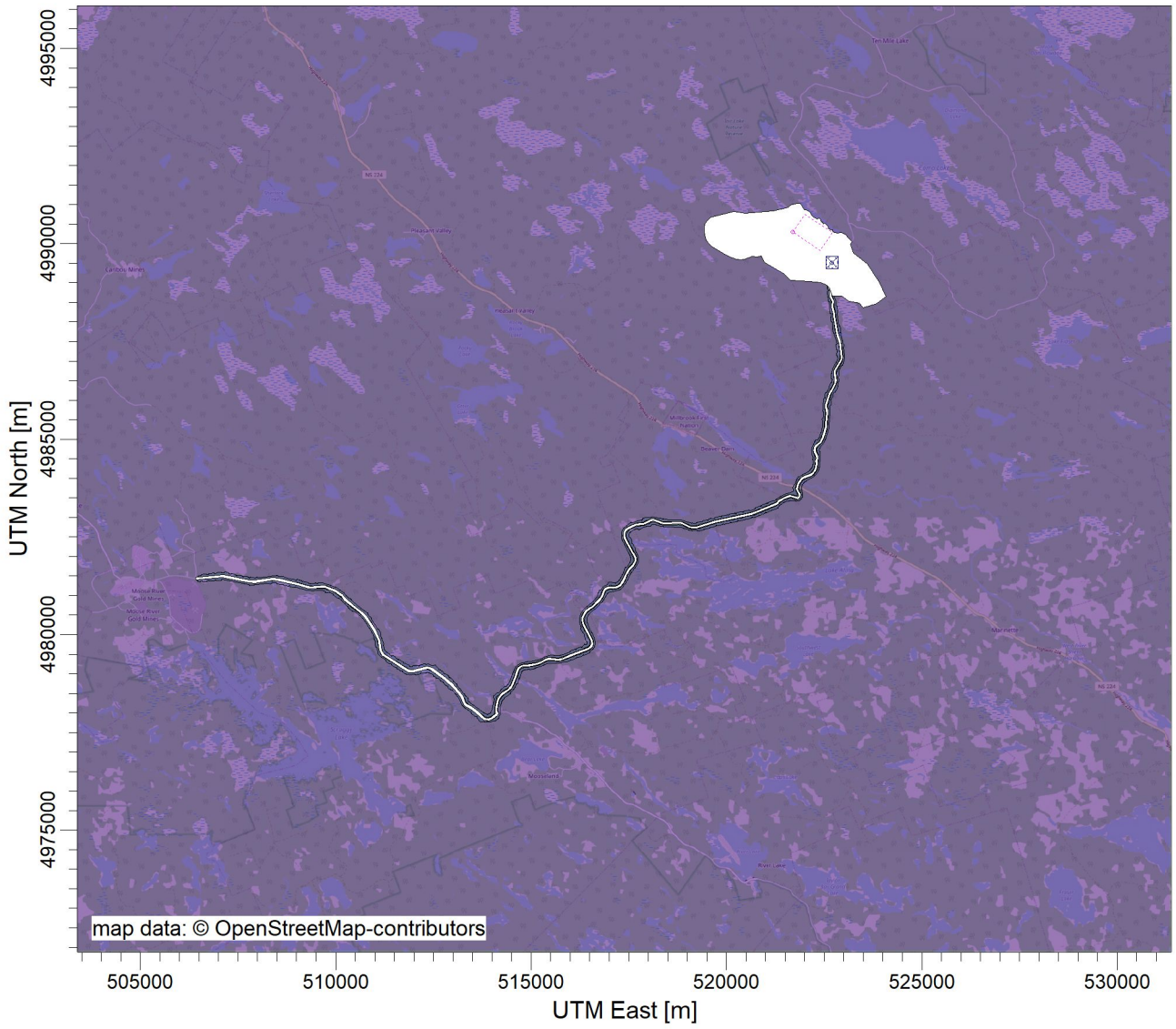
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM10 ug/m^3

Max: 35.4 [ug/m^3] at (522682.40, 4988743.33)



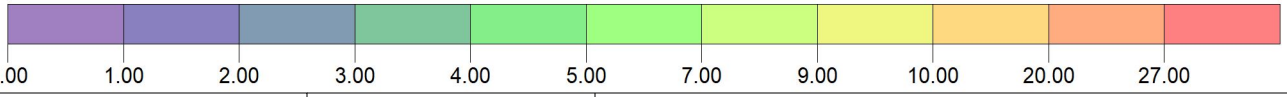
COMMENTS: 24-hour PM10 Limit = 50 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,124 0 5 km	
	MAX: **35.4 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 5D - PM2.5, 24-hour
Cumulative Truck Traffic Scenario, 80% Road Dust Mitigation



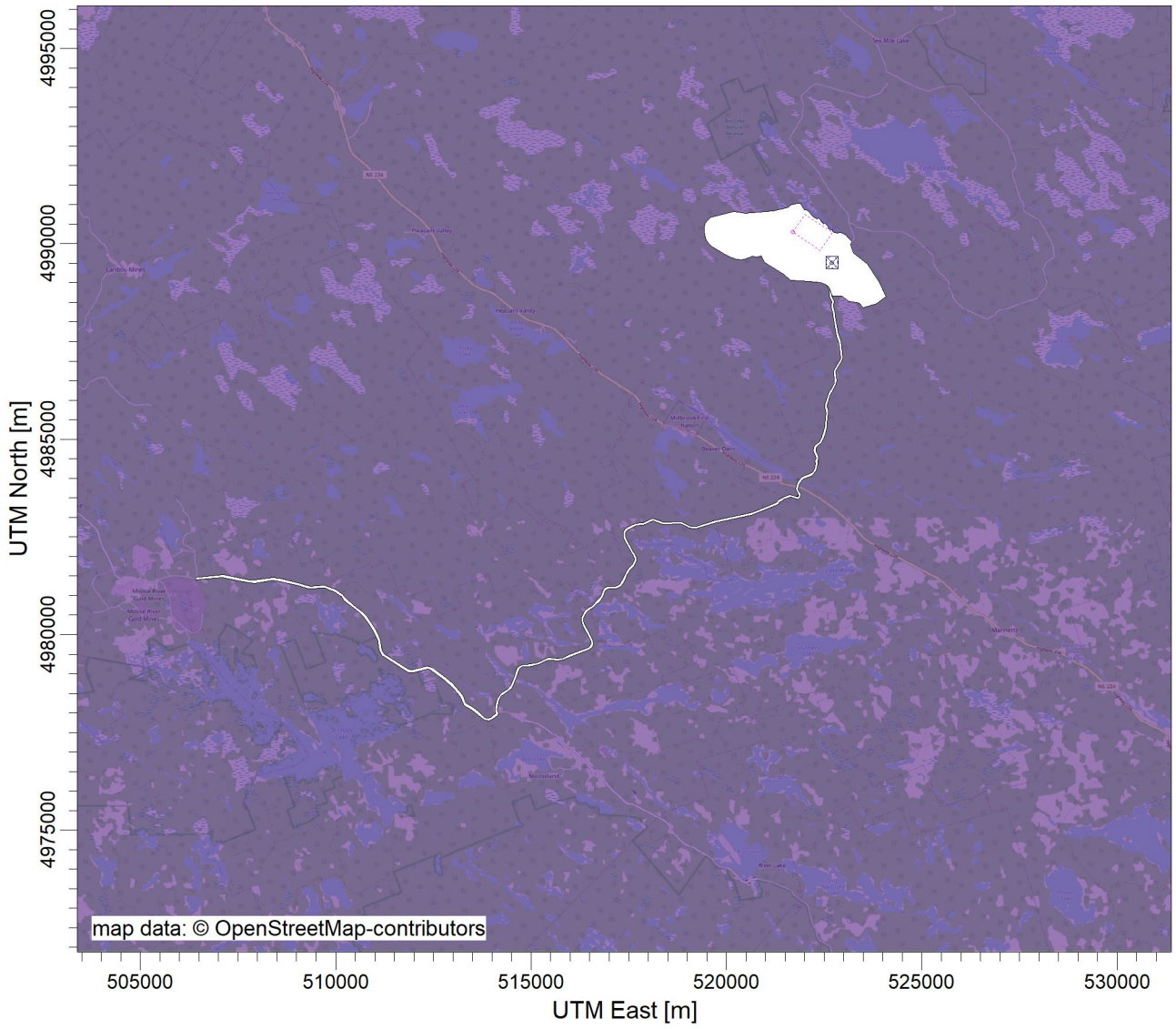
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM25 ug/m^3

Max: 3.84 [ug/m^3] at (522682.40, 4988743.33)



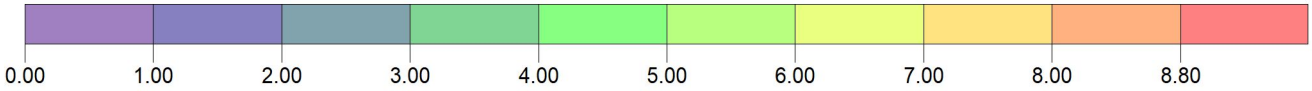
COMMENTS: 24-hour PM2.5 Limit = 27 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,114 0 5 km	
	MAX: **3.84 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

Figure 5E - PM2.5, Annual
Cumulative Truck Traffic Scenario, 80% Road Dust Mitigation



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_PM25 ug/m^3

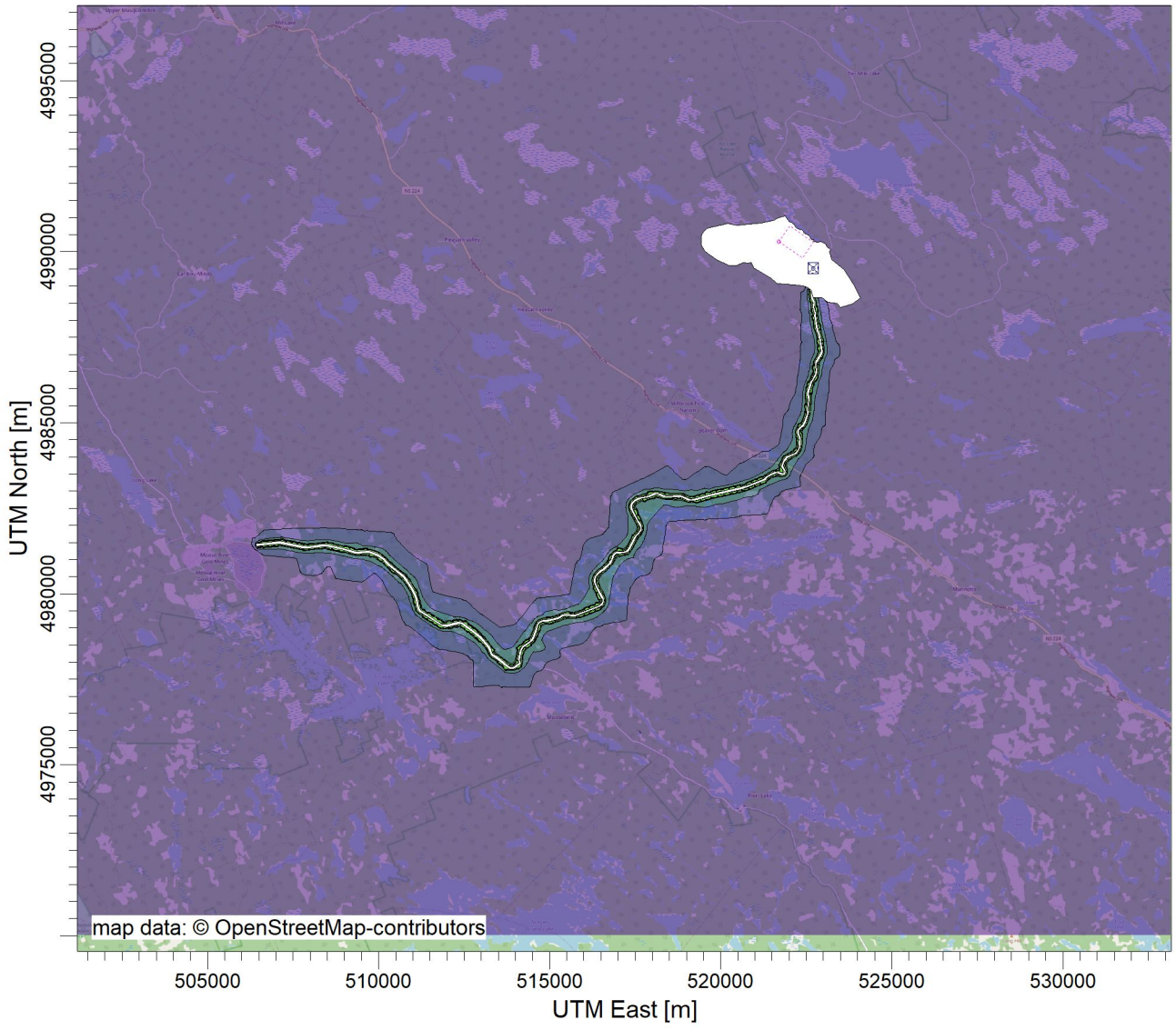
Max: 1.49 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS:	SOURCES:	COMPANY NAME:	
Annual PM2.5 Limit = 8.8 ug/m3	**9**		
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:176,124 0 5 km	
	MAX: **1.49 ug/m^3**	DATE: **11/25/2021**	PROJECT NO.: **088664**

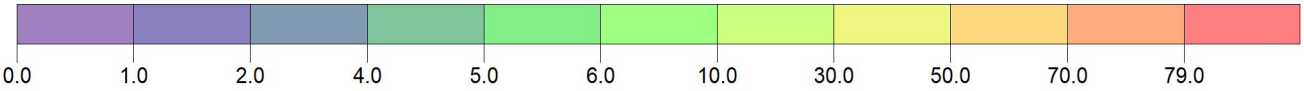
PROJECT TITLE:

Figure 6A - NO2, 1-Hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

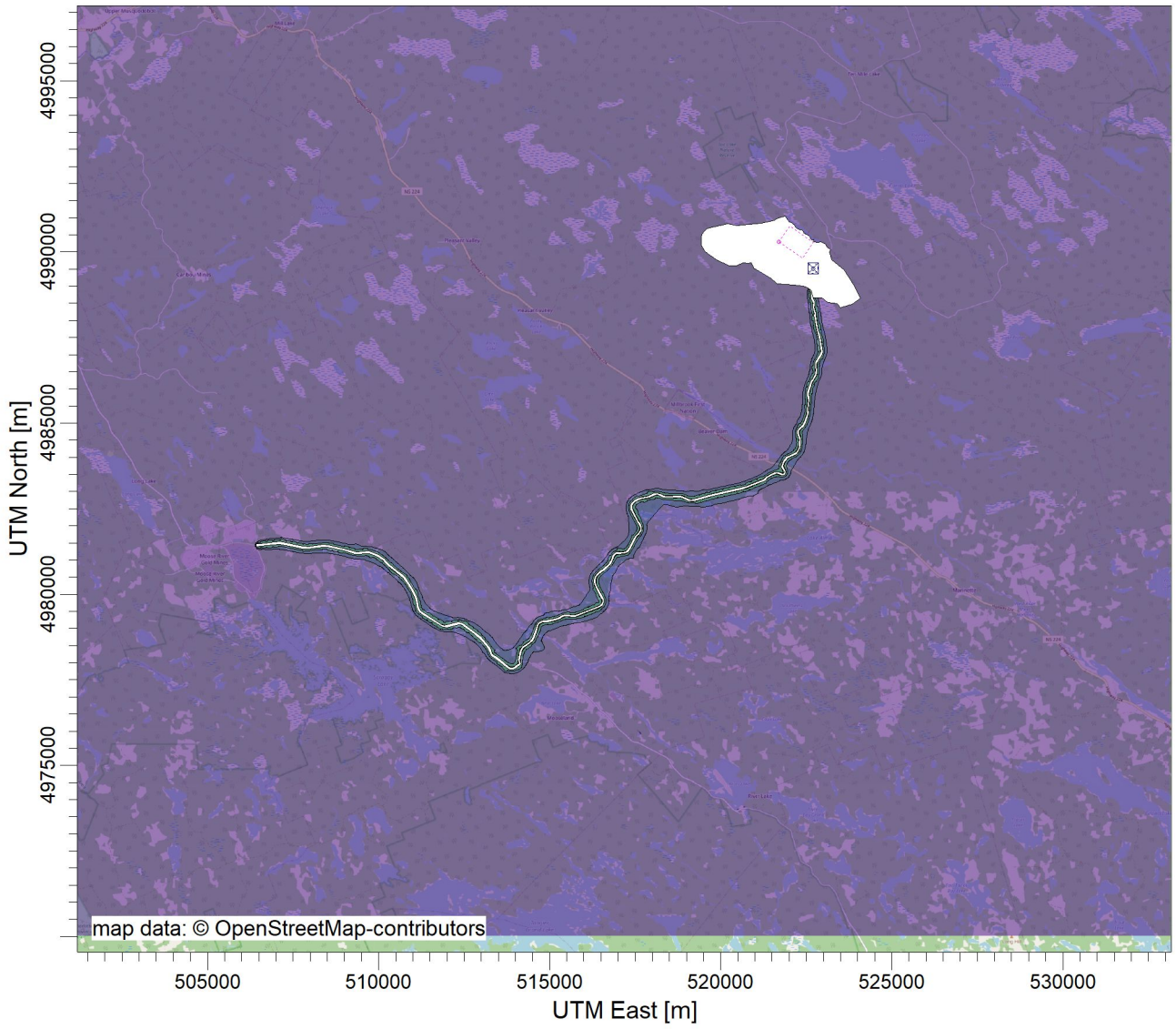
Max: 21.5 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS:	SOURCES:	COMPANY NAME:	
1hour NO2 Limit = 79 ug/m3	**9**		
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,151 0 5 km	
	MAX: **21.5 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

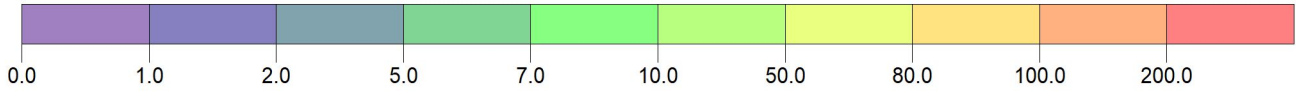
PROJECT TITLE:

Figure 6B - NO2, 24-Hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

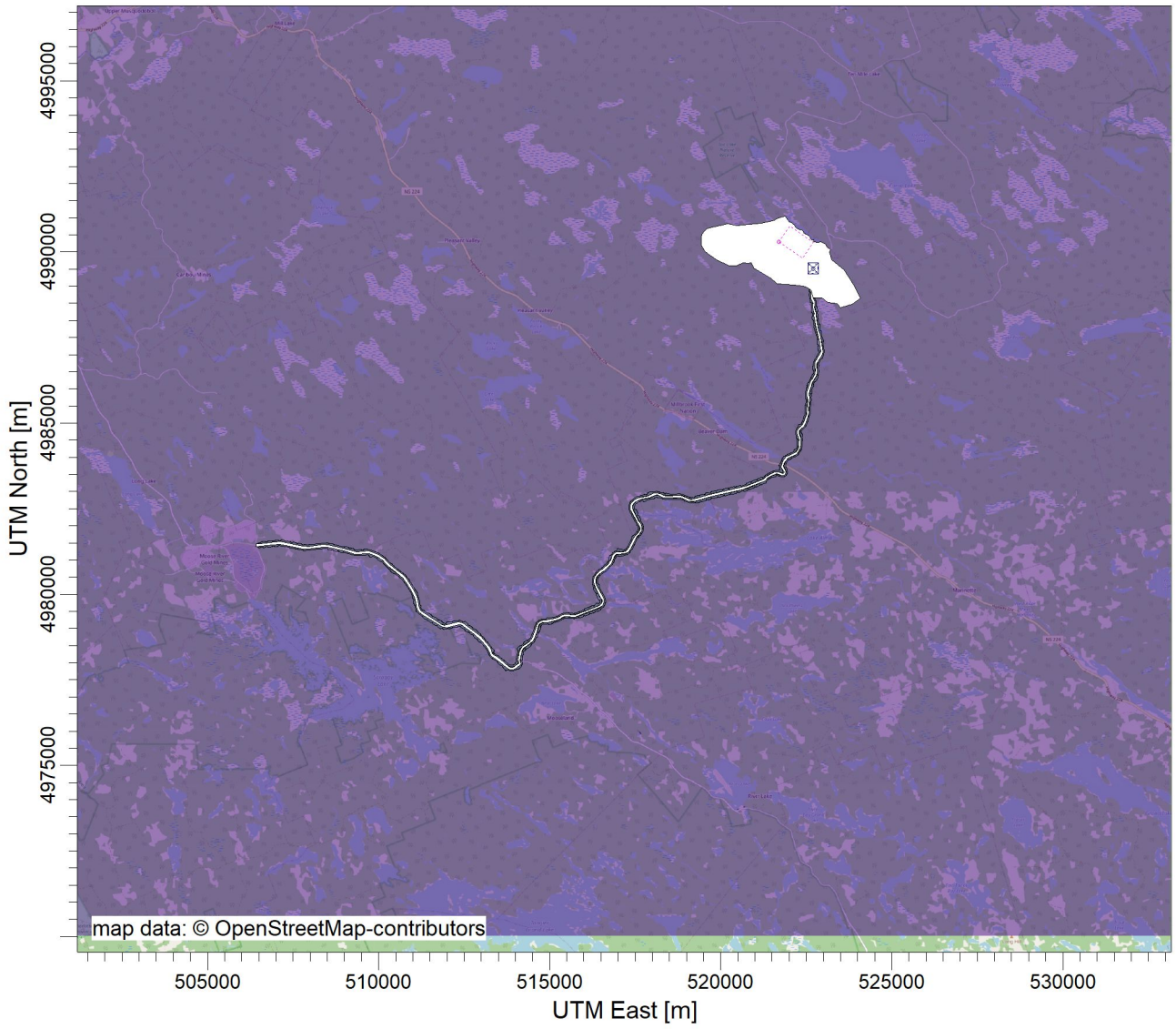
Max: 10.5 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS: 1hour NO2 Limit = 200 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,139 0 5 km	
	MAX: **10.5 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

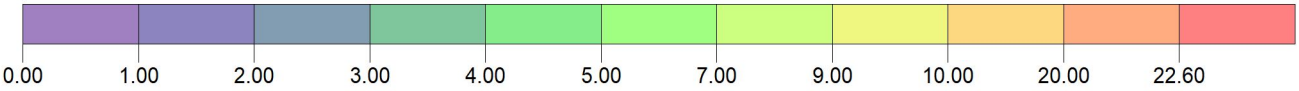
PROJECT TITLE:

Figure 6C - NO2, Annual
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

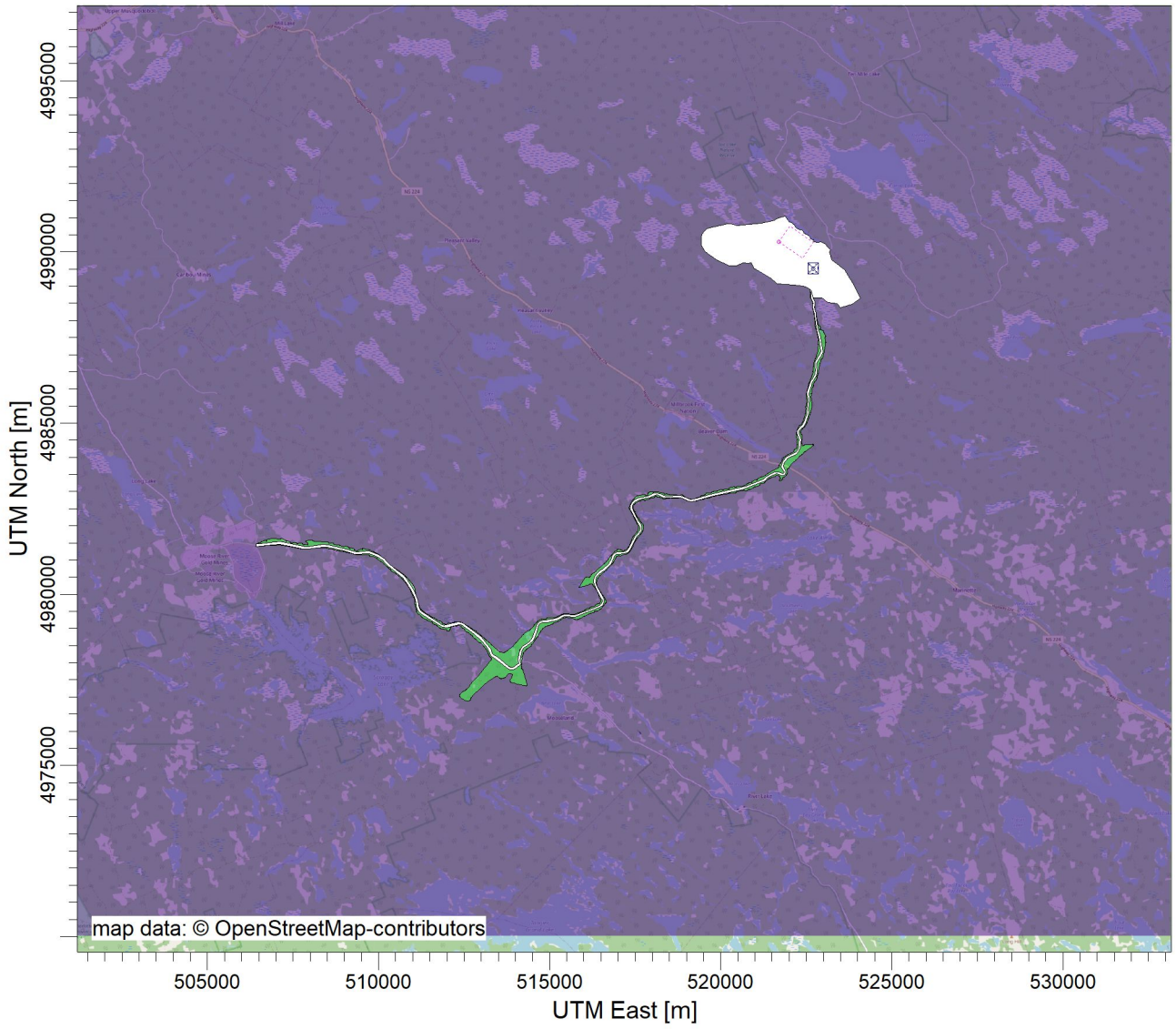
Max: 4.20 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS: 1hour NO2 Limit = 22.6 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,139 0 5 km	
	MAX: **4.20 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

PROJECT TITLE:

Figure 6D - SO2, 1hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ROADPM25 ug/m^3

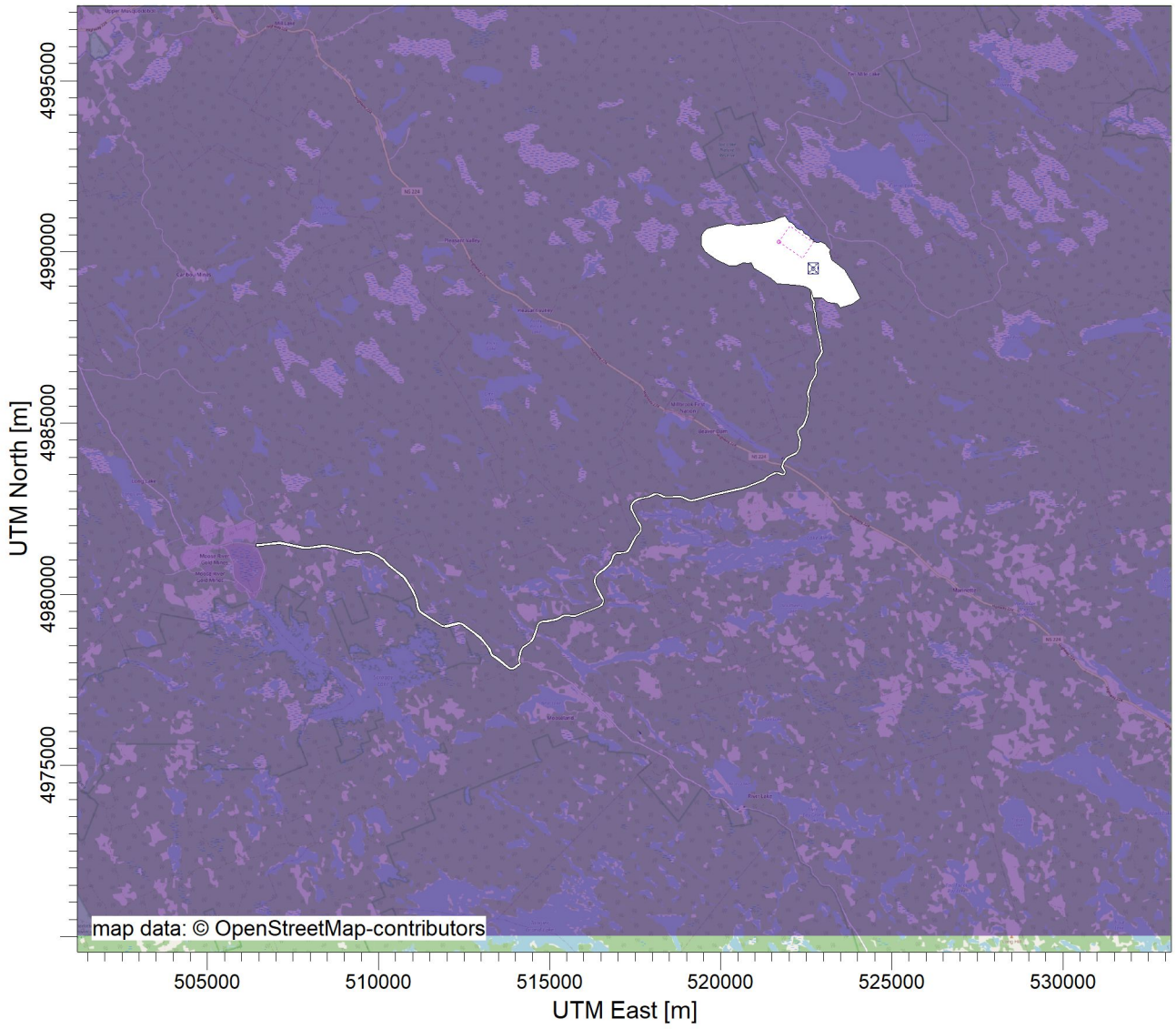
Max: 2.1E-02 [ug/m^3] at (513815.82, 4977879.43)

0.0E+00 1.0E-02 2.0E-02 2.1E-02

COMMENTS: 1hour SO2 Criteria: 900 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,115 0 5 km	
	MAX: **2.1E-02 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

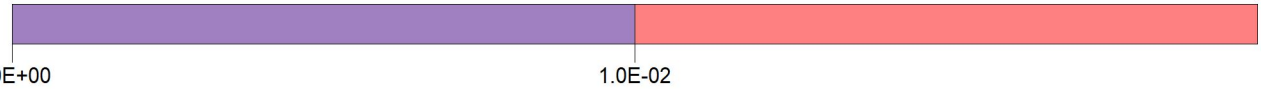
PROJECT TITLE:

Figure 6E - SO2, 24hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ROADPM25 ug/m^3

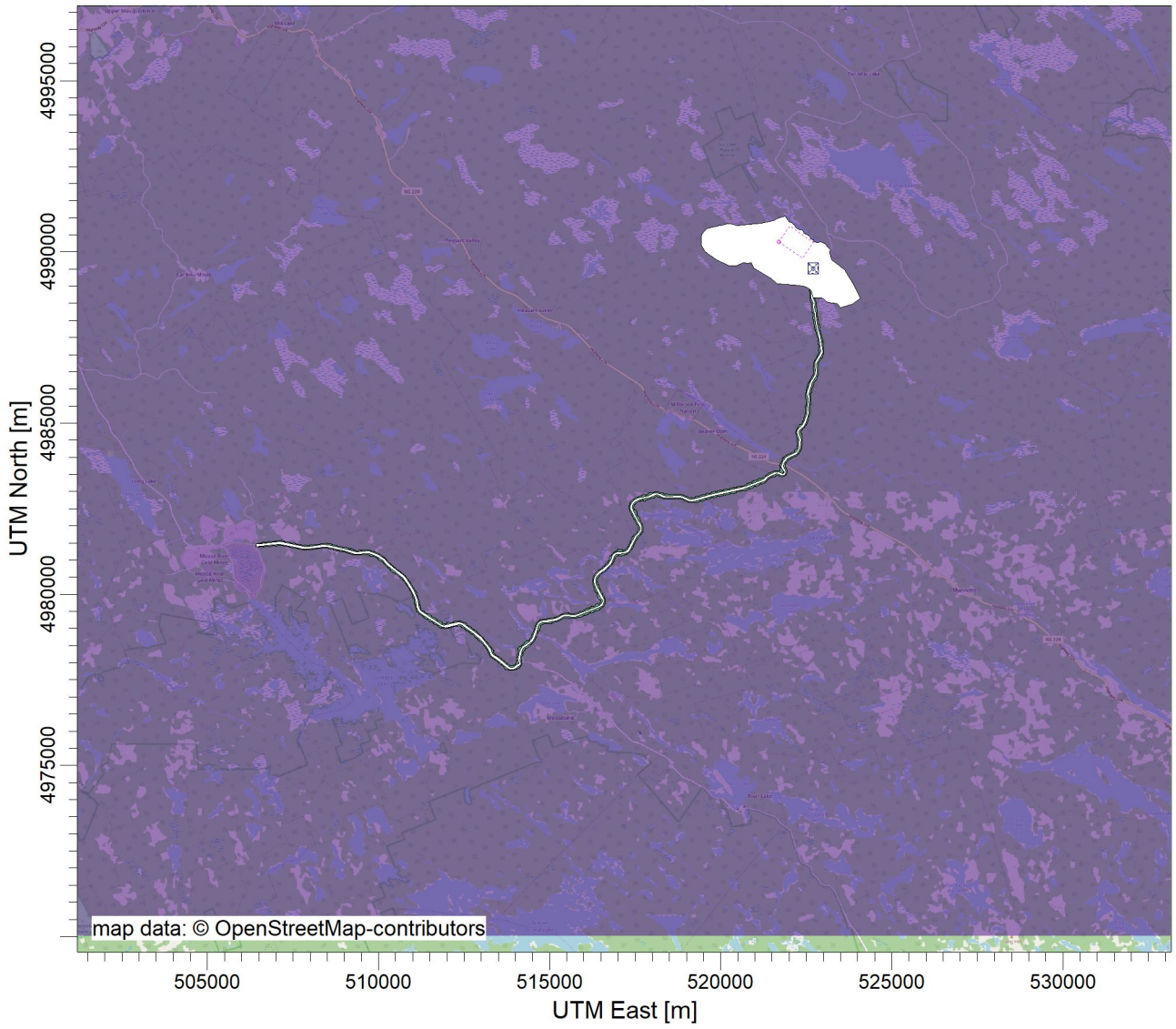
Max: 1.0E-02 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS: 24hour SO2 Criteria: 300 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,115 0 5 km	
	MAX: **1.0E-02 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

PROJECT TITLE:

Figure 6F - SO2, Annual
Cumulative Truck Traffic Scenario



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ROADPM25 ug/m^3

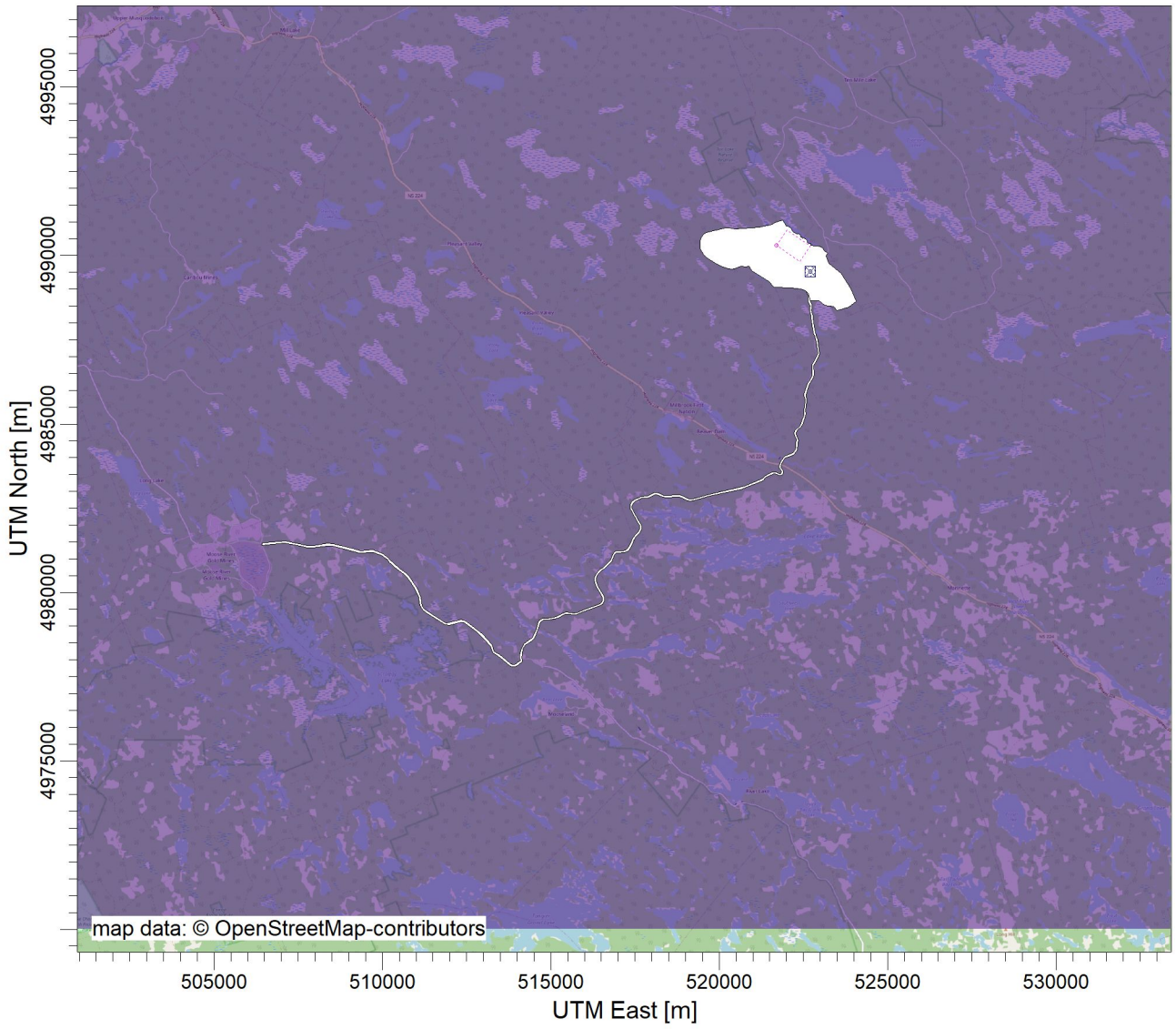
Max: 3.1E-04 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS:	SOURCES:	COMPANY NAME:	
Annual SO2 Criteria: 60 ug/m3	**9**		
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,115 (0 — 5 km)	
	MAX: **3.1E-04 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

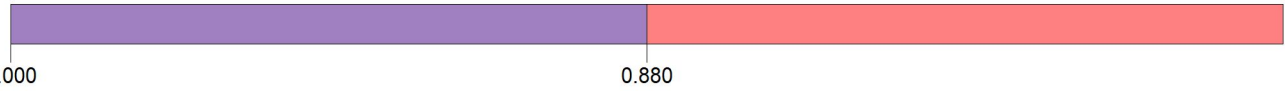
PROJECT TITLE:

Figure 6G - VOC, 1hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ROADPM25 ug/m^3

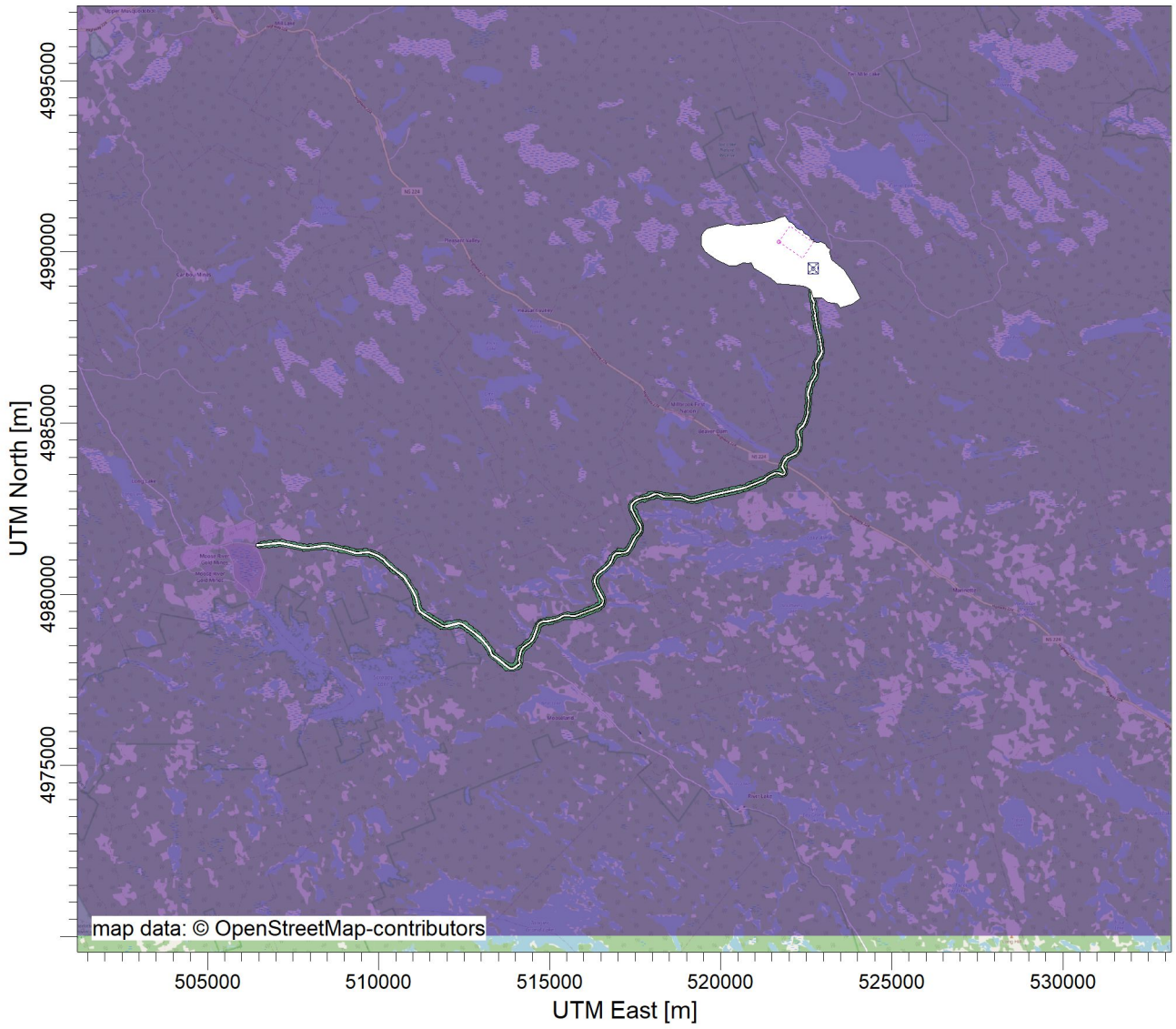
Max: 0.900 [ug/m^3] at (513815.82, 4977879.43)



COMMENTS:	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:204,336 0 5 km	
	MAX: **0.900 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

PROJECT TITLE:

Figure 6H - VOC, 24hour
Cumulative Truck Traffic Scenario



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ROADPM25 ug/m^3

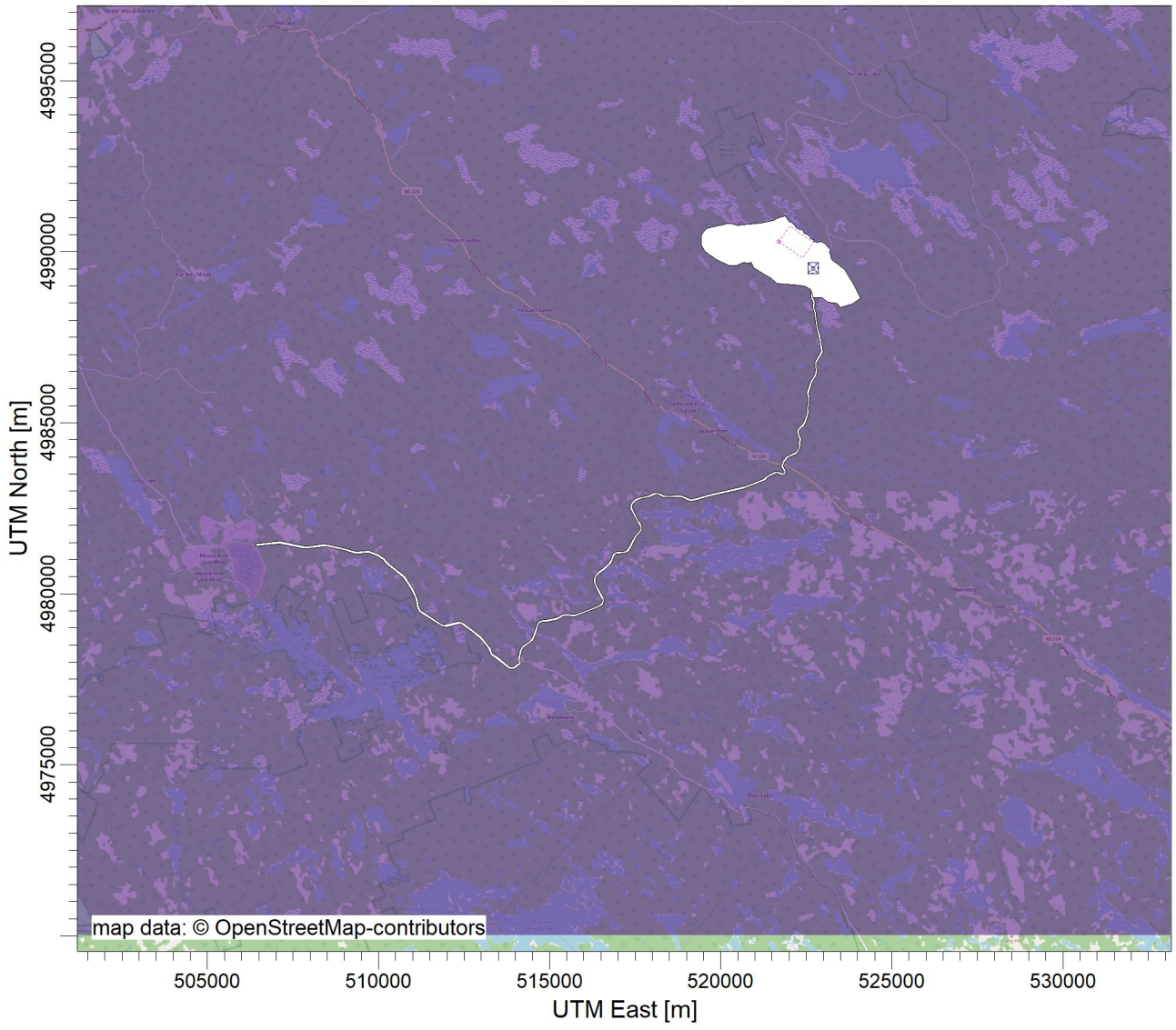
Max: 0.400 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS:	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,139 0 5 km	
	MAX: **0.400 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

PROJECT TITLE:

Figure 6I - VOC, Annual
Cumulative Truck Traffic Scenario



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ROADPM25 ug/m^3

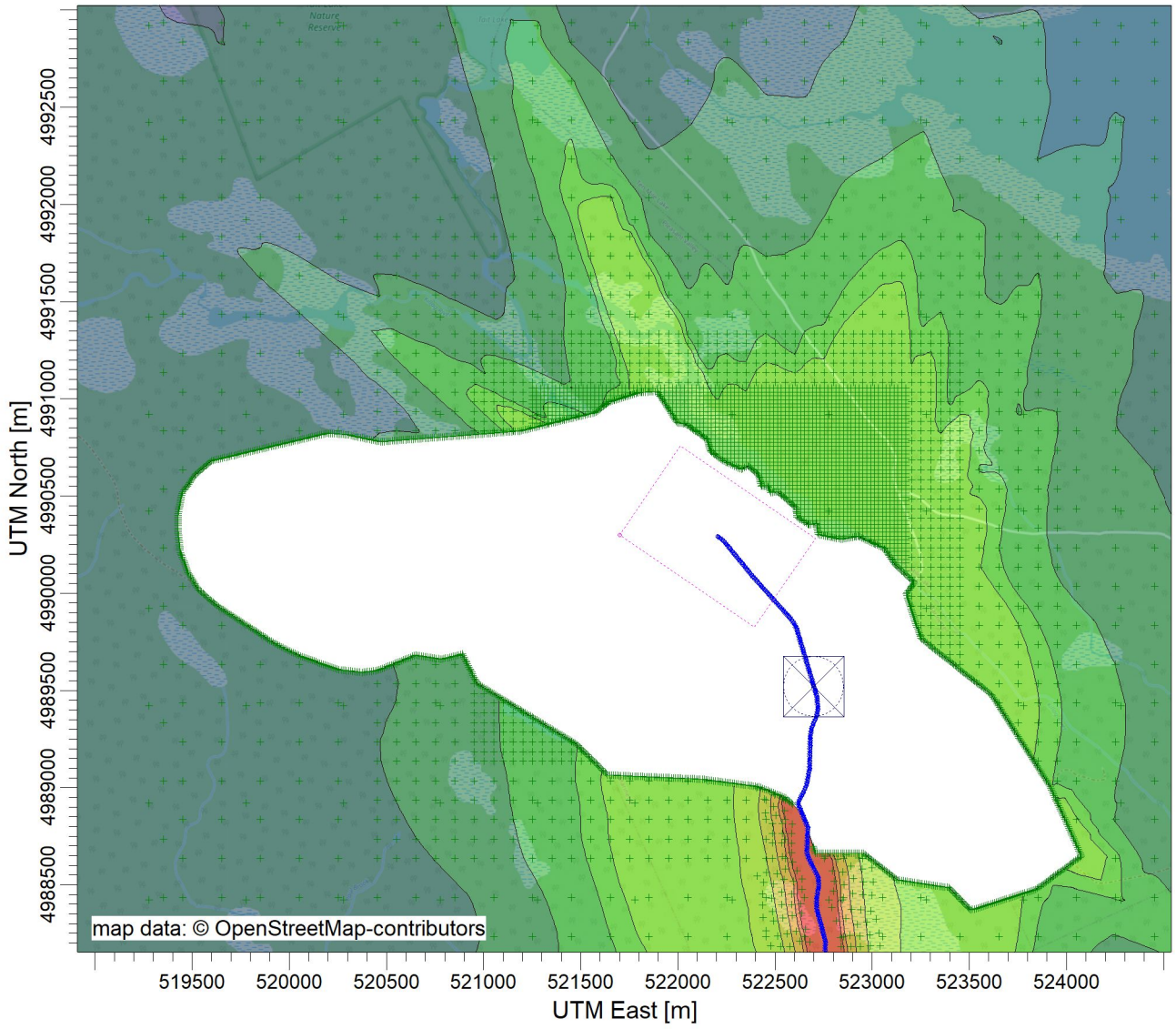
Max: 1.0E-01 [ug/m^3] at (522682.40, 4988743.33)



COMMENTS:	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **4800**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:201,115 0 5 km	
	MAX: **1.0E-01 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

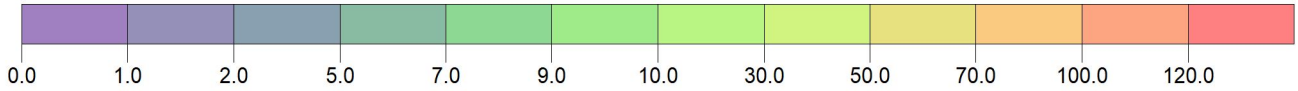
PROJECT TITLE:

Figure 7A - TSP, 24hour
Beaver Dam Mine Site - No Mitigation - Option A (Crusher)



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

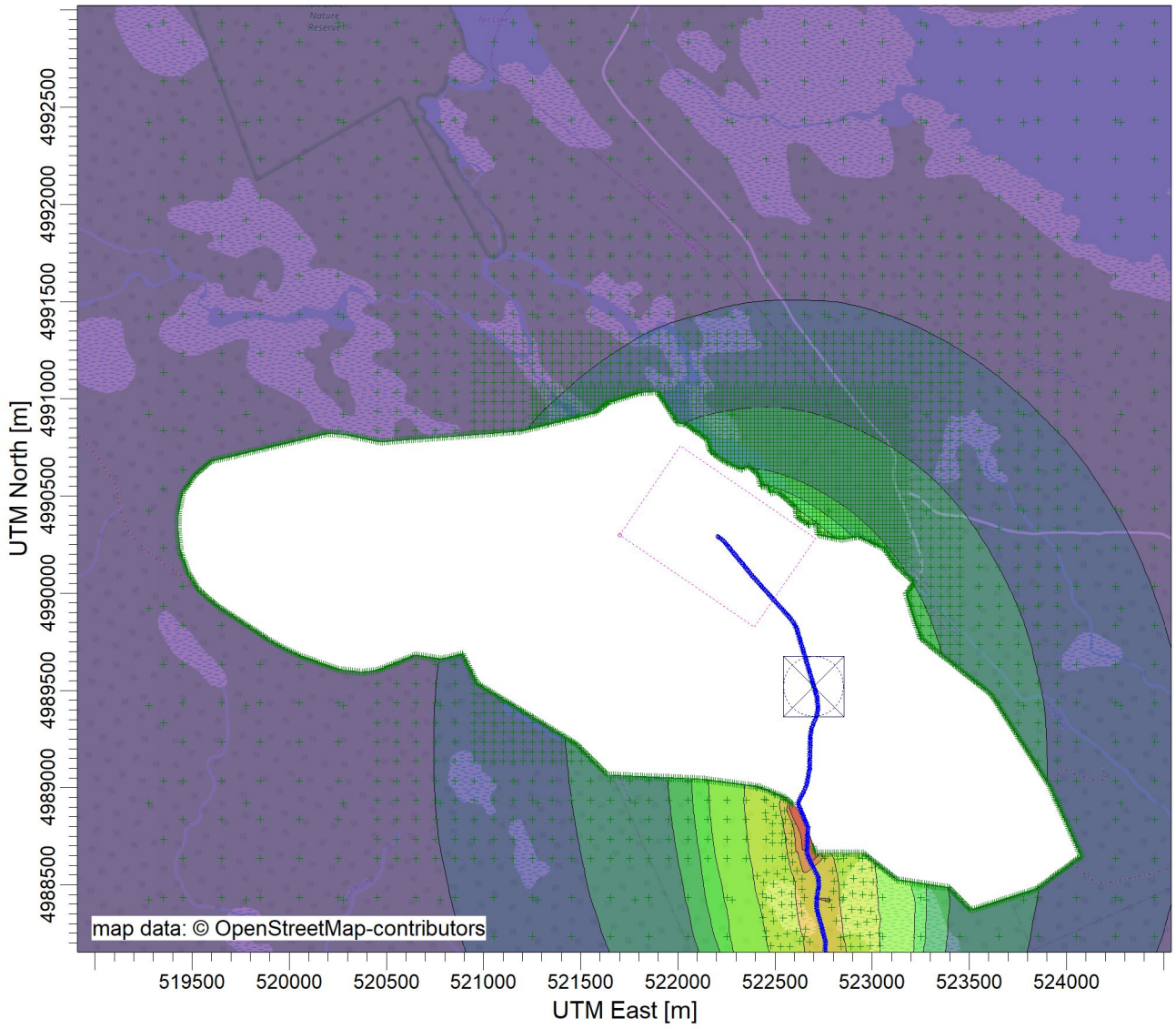
Max: 364.2 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS:	SOURCES:	COMPANY NAME:	
24hour TSP Criteria = 120 ug/m3	**9**		
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,414 (0 — 1 km)	
	MAX: **364.2 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

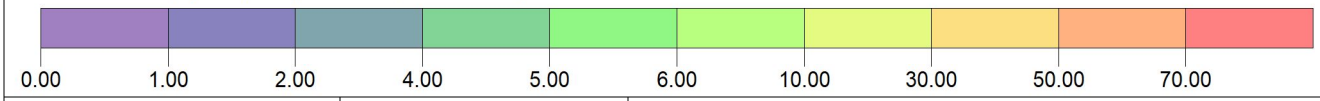
PROJECT TITLE:

Figure 7B - TSP, Annual
Beaver Dam Mine Site - No Mitigation - Option A (Crusher)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_TSP ug/m^3

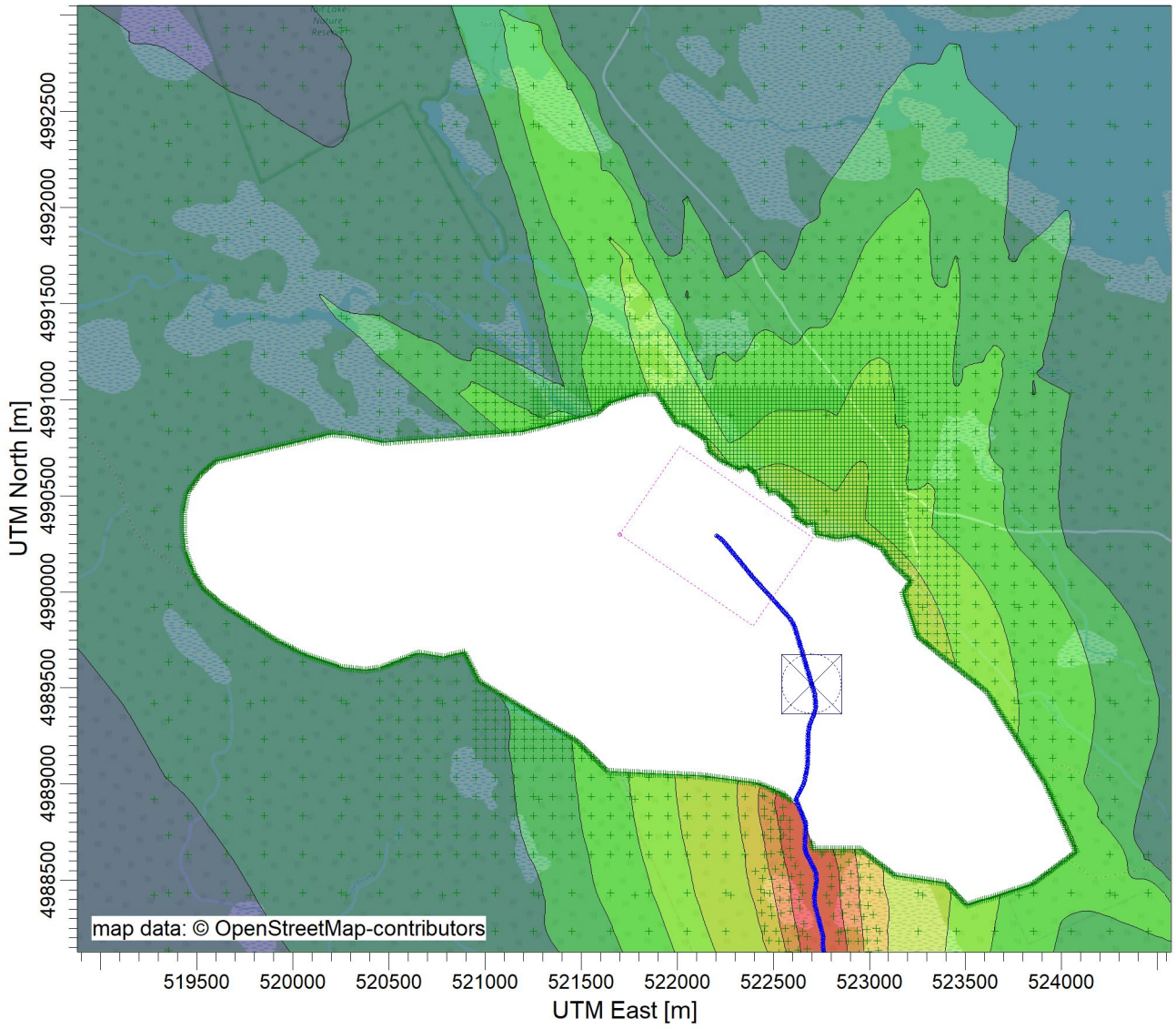
Max: 105.14 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS:	SOURCES:	COMPANY NAME:	
Annual TSP Criteria = 70 ug/m3	**9**		
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,414 (0 — 1 km)	
	MAX: **105.14 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

PROJECT TITLE:

Figure 7C - PM10, 24hour
Beaver Dam Mine Site - No Mitigation - Option A (Crusher)



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM10 ug/m^3

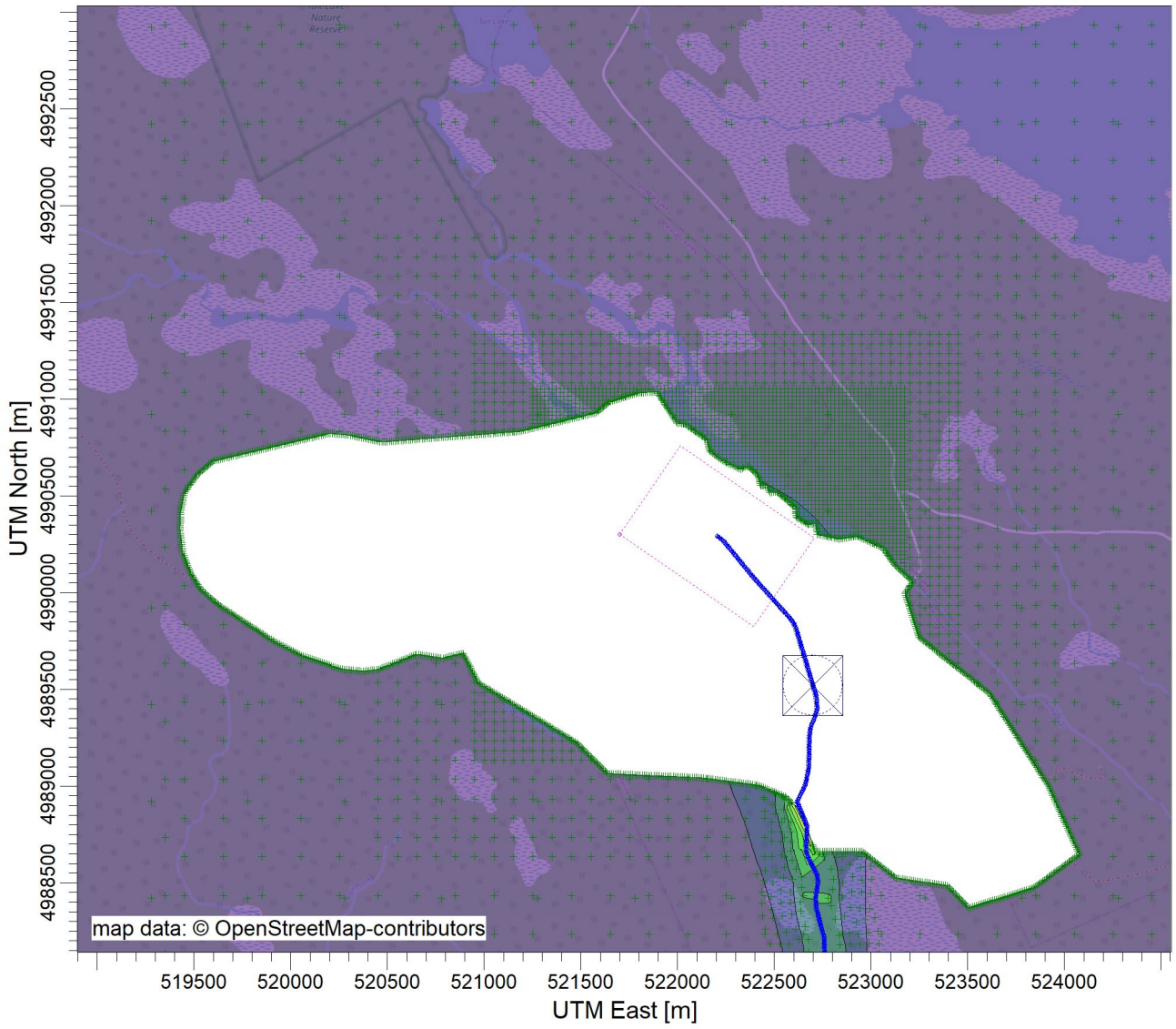
Max: 180 [ug/m^3] at (522696.80, 4988698.67)

0 1 2 4 5 7 10 20 30 50

COMMENTS: 24hour PM10 Criteria = 50 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,817 0 1 km	
	MAX: **180 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

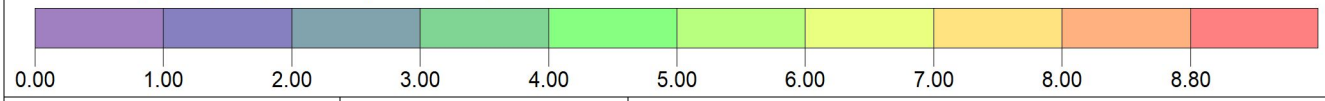
PROJECT TITLE:

Figure 7D - PM2.5, Annual
Beaver Dam Mine Site - No Mitigation - Option A (Crusher)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_PM25 ug/m^3

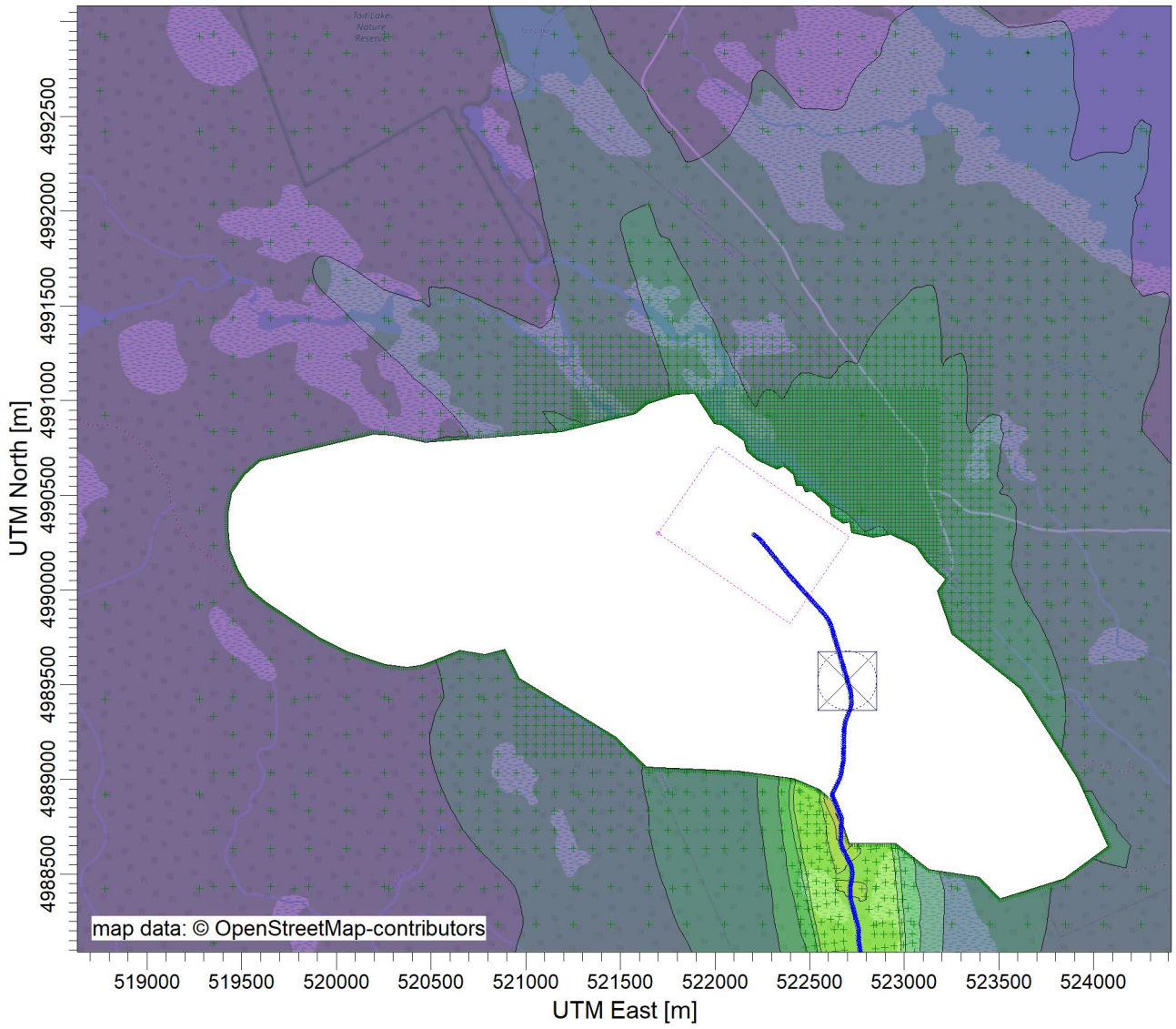
Max: 6.48 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS:	SOURCES:	COMPANY NAME:	
Annual PM2.5 Criteria = 8.8 ug/m3	**9**		
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,575 0 1 km	
	MAX: **6.48 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

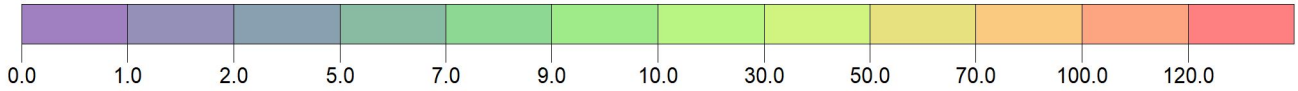
PROJECT TITLE:

Figure 8A - TSP, 24hour
Beaver Dam Mine Site - With Mitigation - Option A (Crusher)



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_TSP ug/m^3

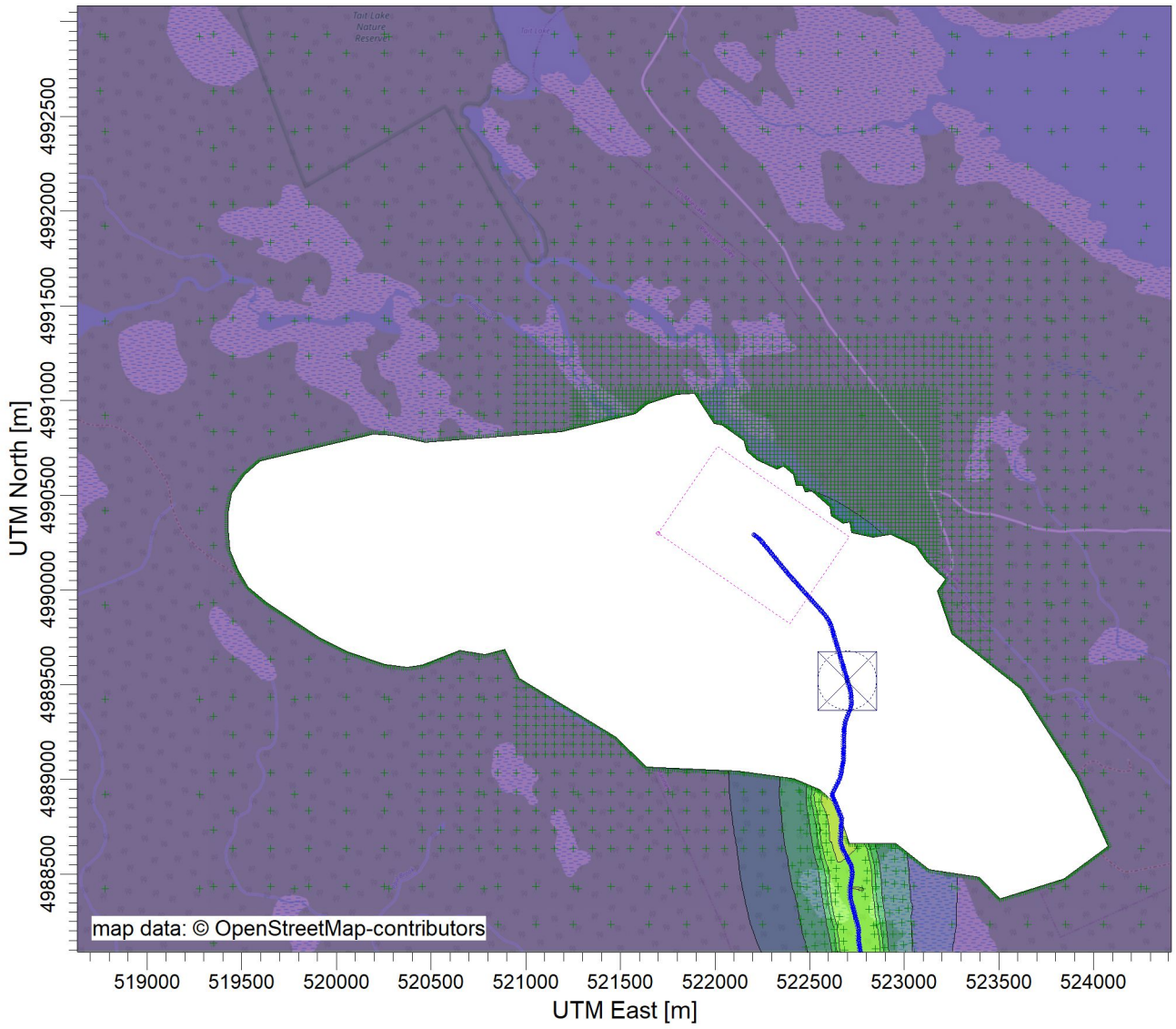
Max: 72.9 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: 24hour TSP Criteria = 120 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:36,345 0 1 km	
	MAX: **72.9 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

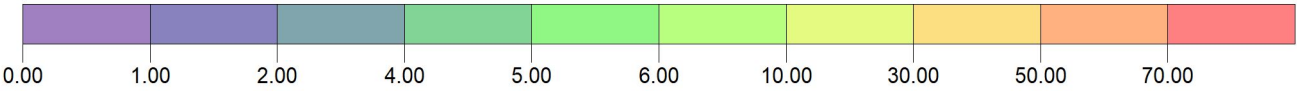
PROJECT TITLE:

Figure 8B - TSP, Annual
Beaver Dam Mine Site - With Mitigation - Option A (Crusher)



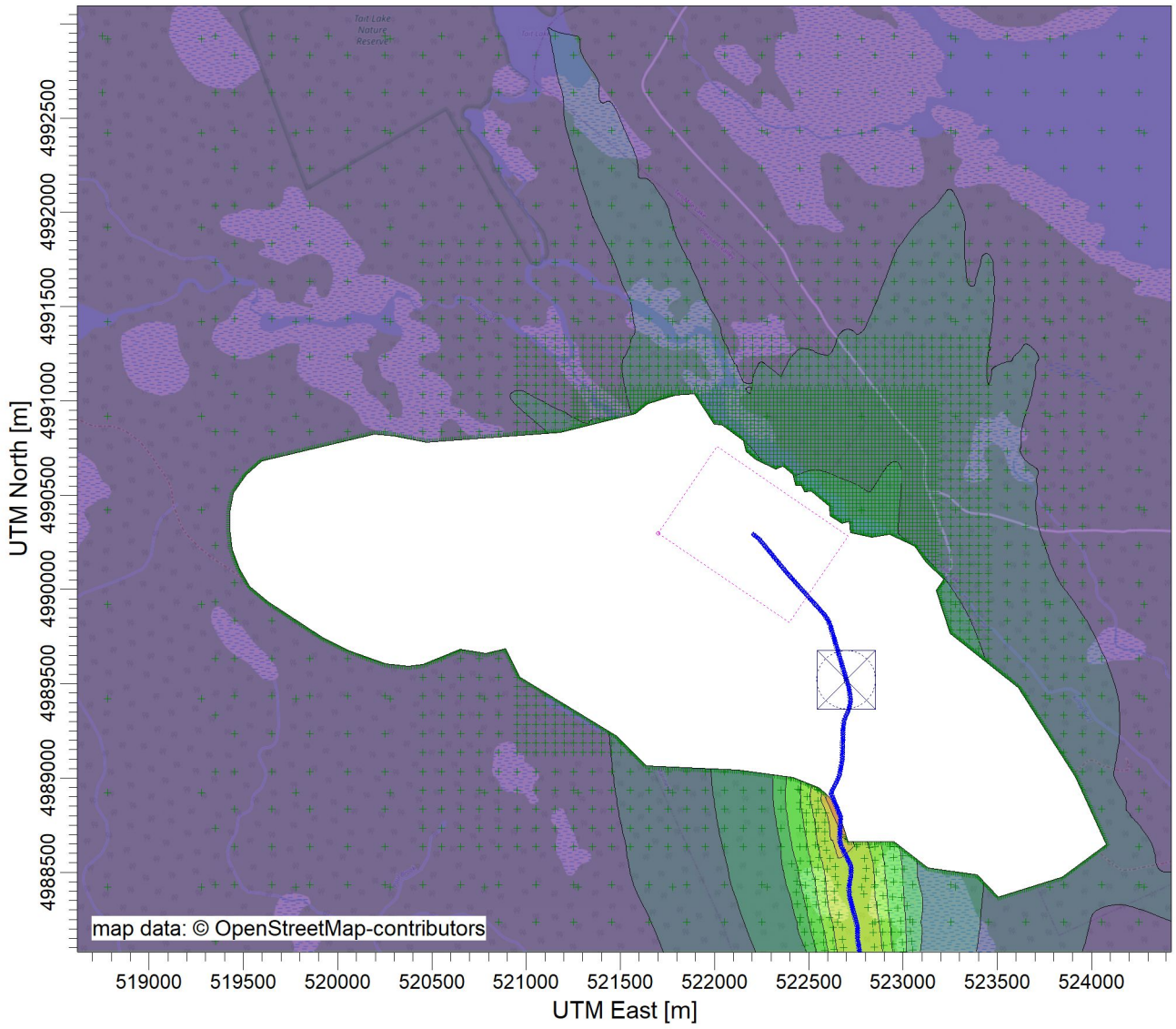
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_TSP ug/m^3

Max: 21.03 [ug/m^3] at (522696.80, 4988698.67)



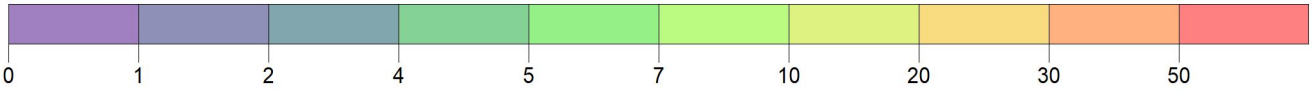
COMMENTS:	SOURCES:	COMPANY NAME:	
Annual TSP Criteria = 70 ug/m3	**9**		
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:36,345 0 1 km	
	MAX: **21.03 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

Figure 8C - PM10 - 24hour
Beaver Dam Mine Site - With Mitigation - Option A (Crusher)



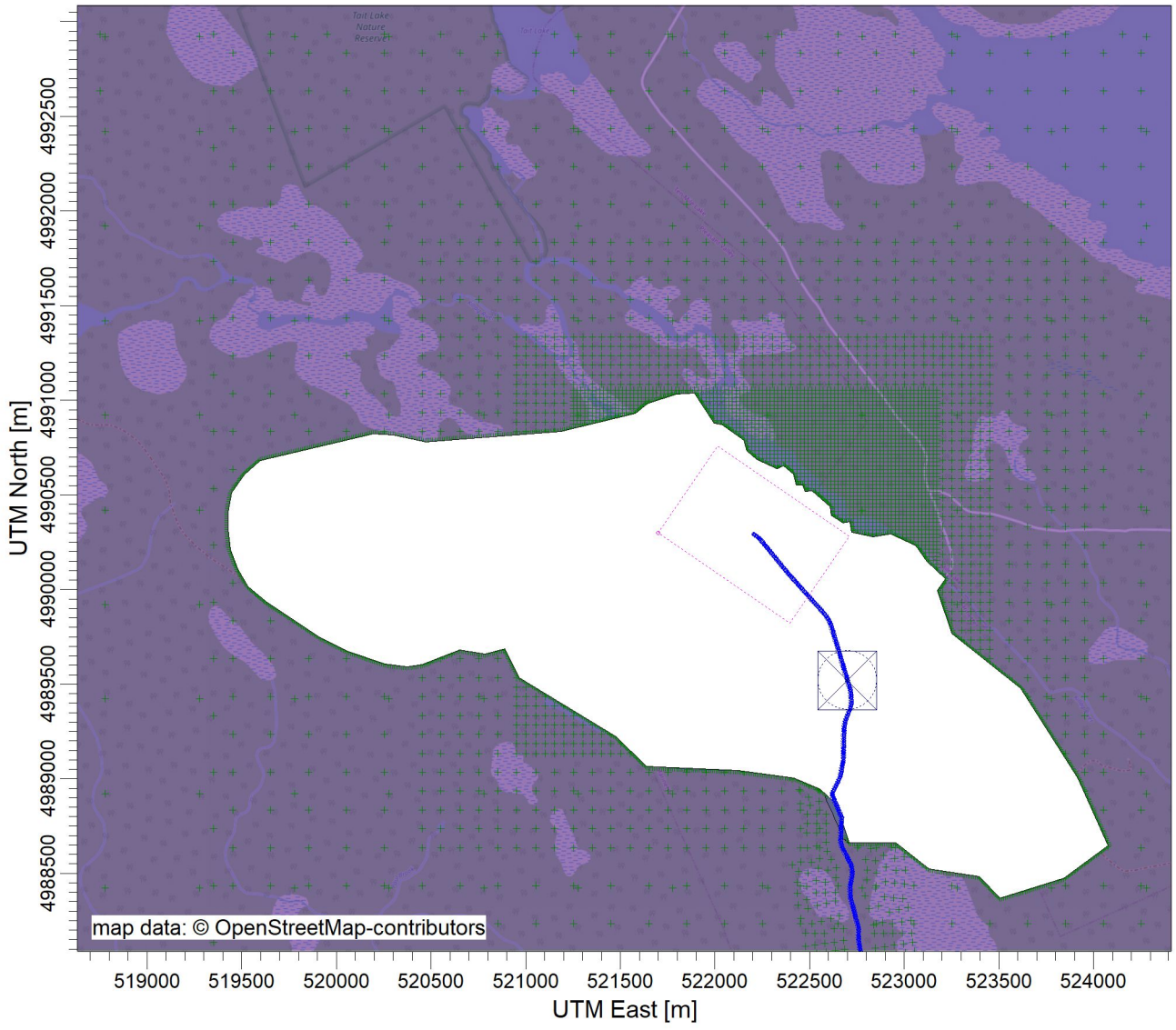
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL_PM10 ug/m^3

Max: 36 [ug/m^3] at (522696.80, 4988698.67)



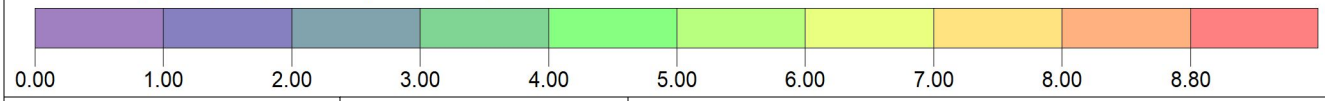
COMMENTS: 24hour PM10 Criteria = 50 ug/m3	SOURCES: **9**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:36,513 0 1 km	
	MAX: **36 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

Figure 8D - PM2.5, Annual
Beaver Dam Mine Site - With Mitigation - Option A (Crusher)



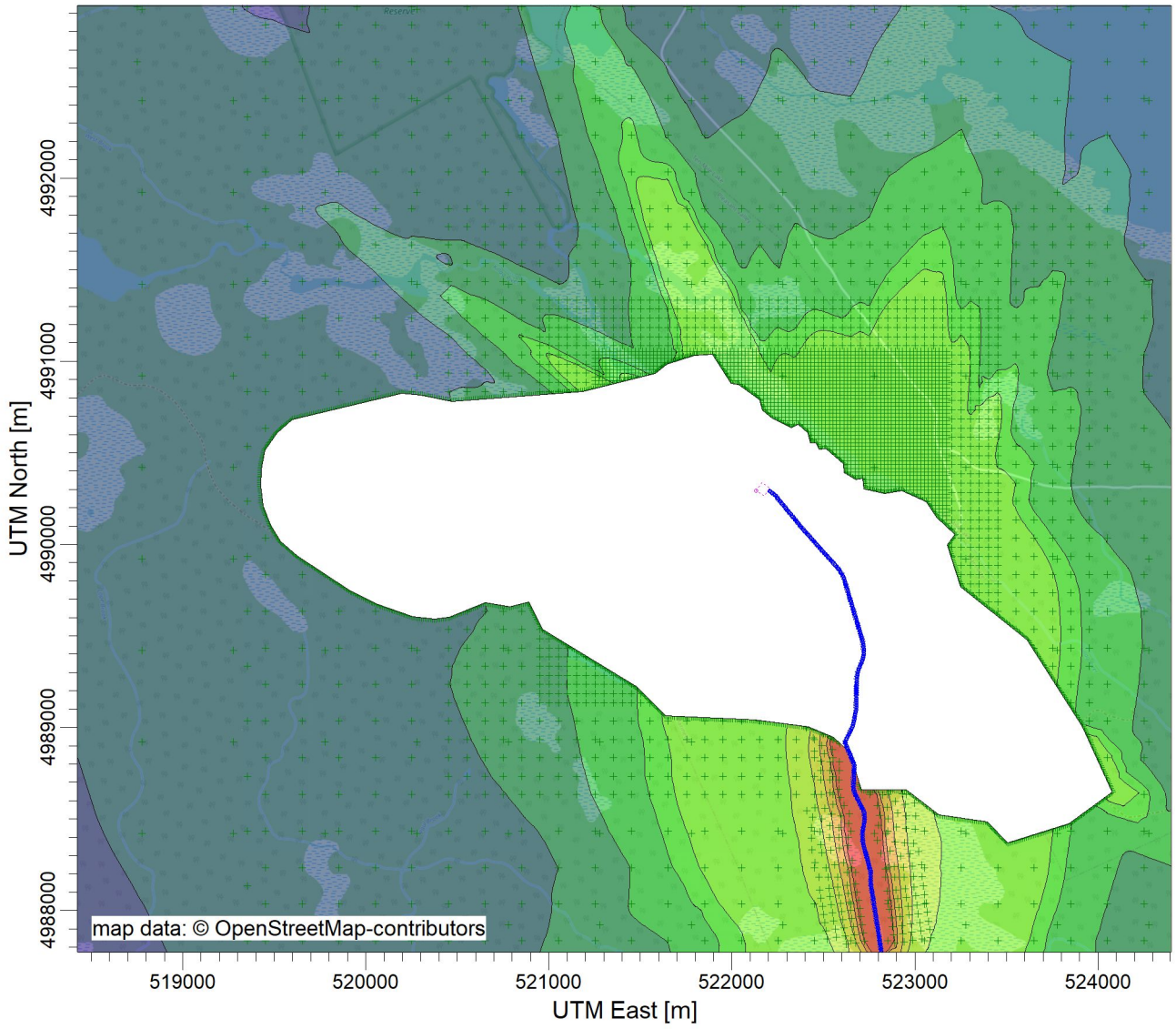
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL_PM25 ug/m^3

Max: 1.25 [ug/m^3] at (522696.80, 4988698.67)



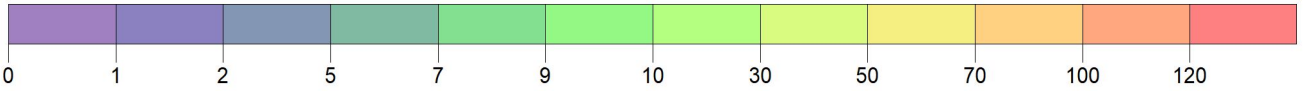
COMMENTS:	SOURCES:	COMPANY NAME:	
Annual PM2.5 Criteria = 8.8 ug/m3	**9**		
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:36,347 0 1 km	
	MAX: **1.25 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

Figure 9A - TSP, 24hour
Beaver Dam Mine Site - No Mitigation - Option B (blasting)



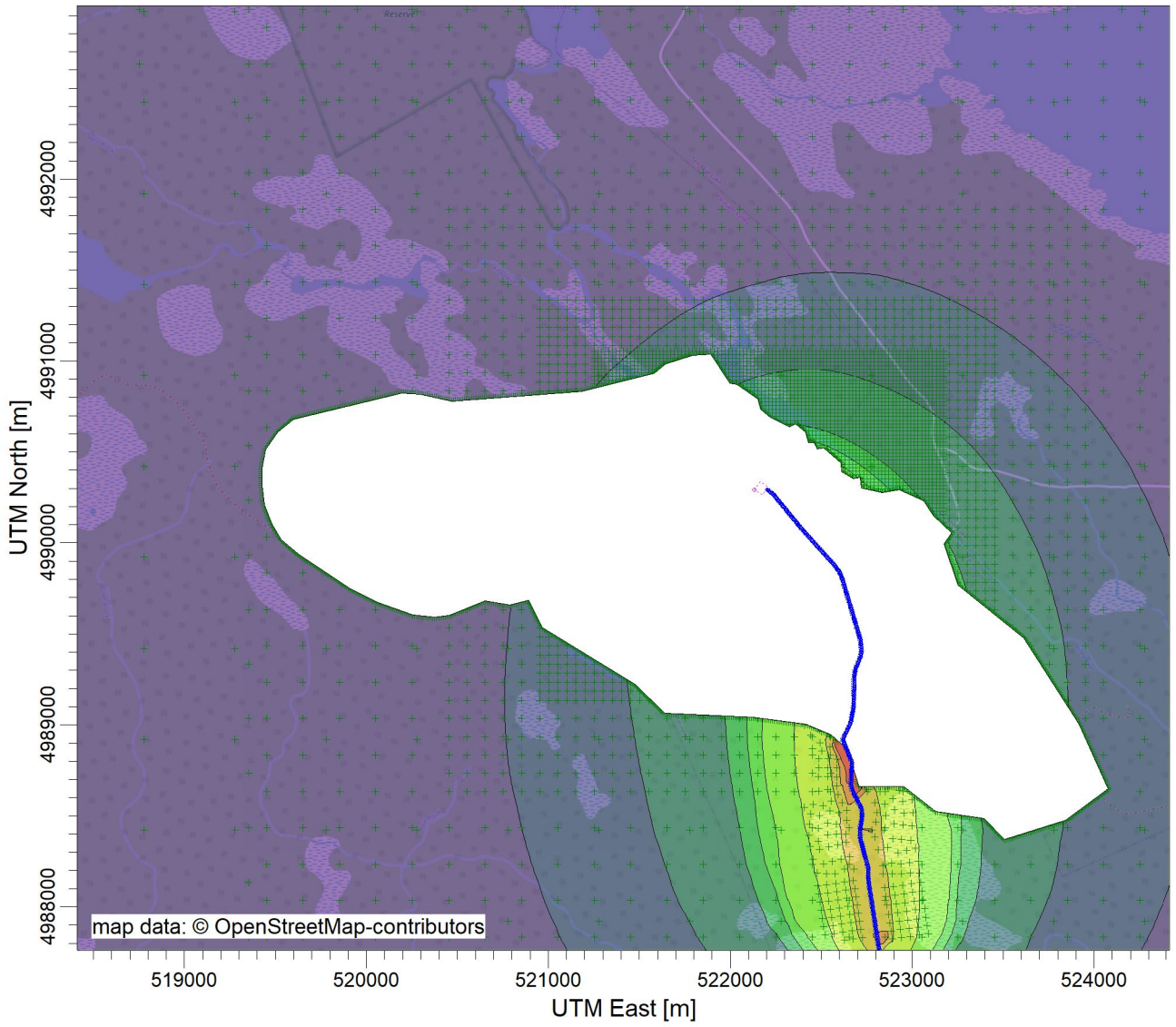
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: SALL_TSP ug/m^3

Max: 364 [ug/m^3] at (522696.80, 4988698.67)



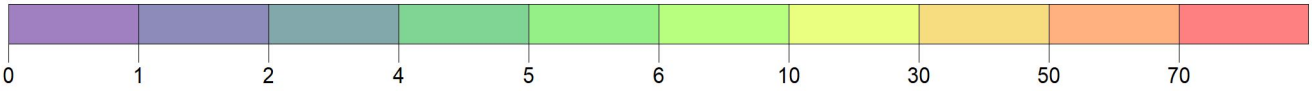
COMMENTS: 24hour TSP Criteria = 120 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:37,595 0 1 km	
	MAX: **364 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

Figure 9B - TSP, Annual
Beaver Dam Mine Site - No Mitigation - Option B (blasting)



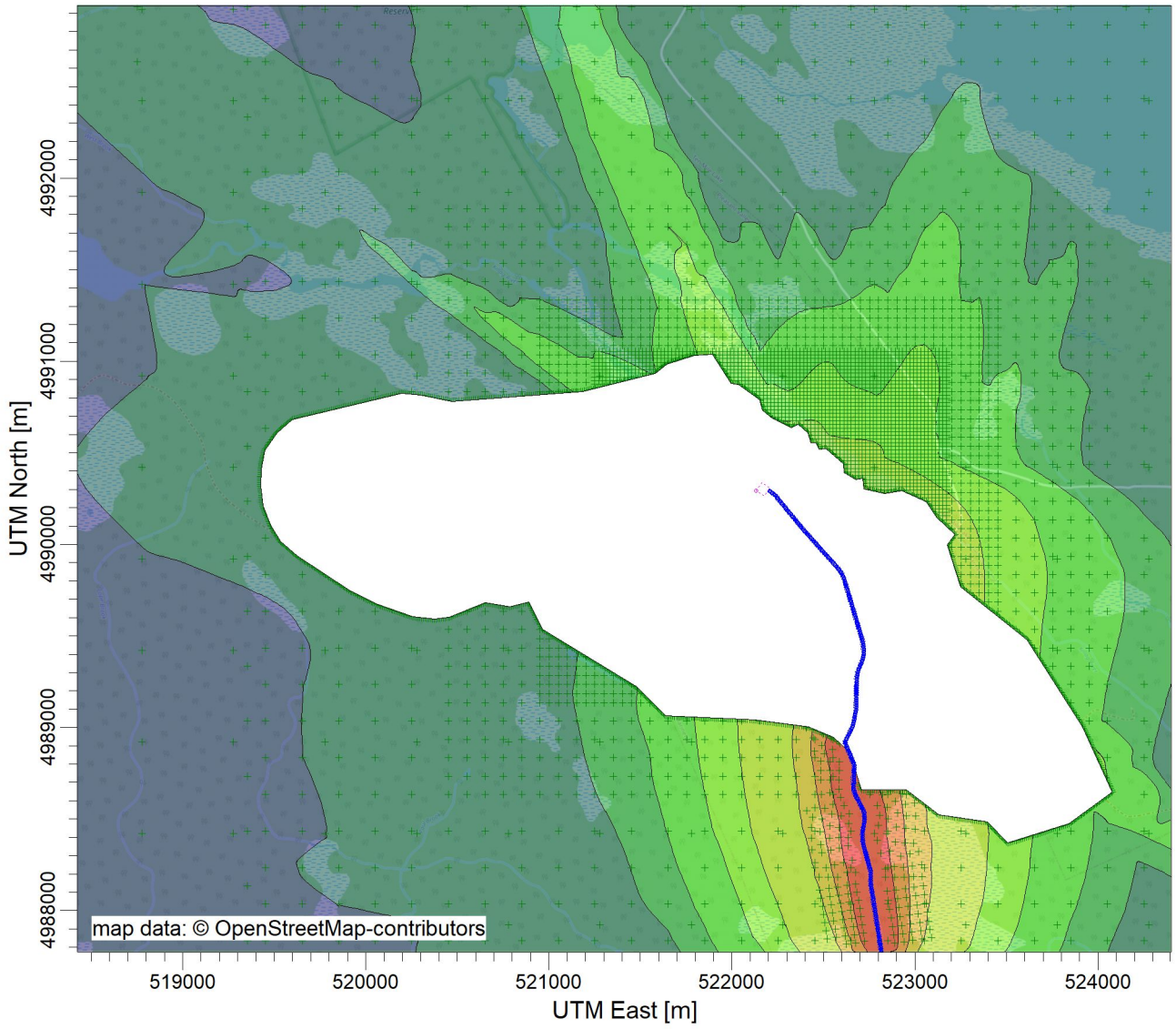
PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: SALL_TSP ug/m^3

Max: 105 [ug/m^3] at (522696.80, 4988698.67)



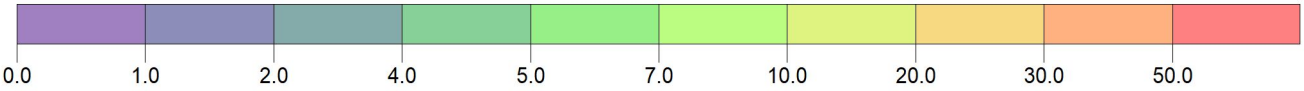
COMMENTS: Annual TSP Criteria = 120 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:37,765 0 1 km	
	MAX: **105 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

Figure 9C - PM10, 24 hour
Beaver Dam Mine Site - No Mitigation - Option B (blasting)



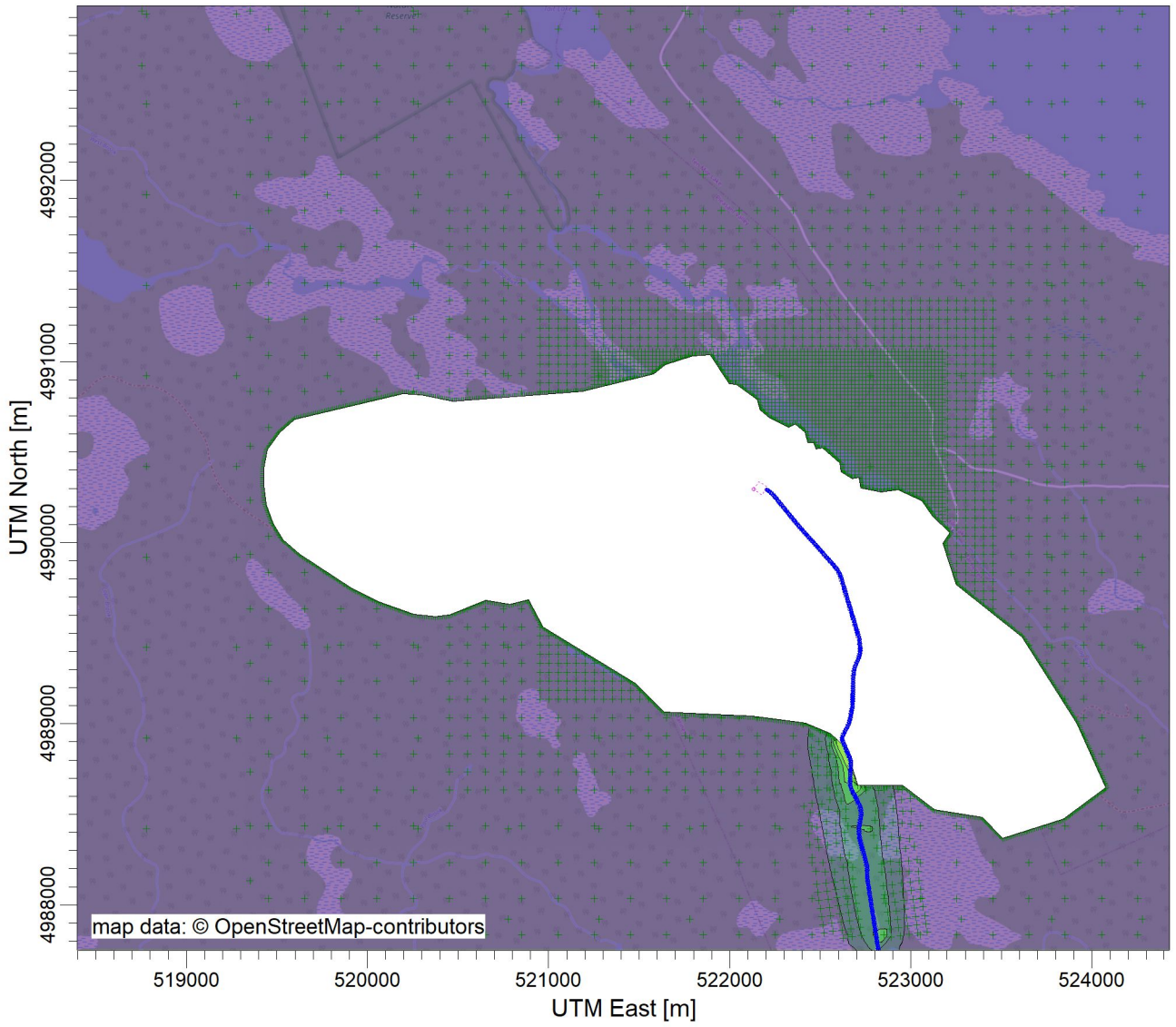
PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: SALL_PM1 ug/m^3

Max: 179.0 [ug/m^3] at (522696.80, 4988698.67)



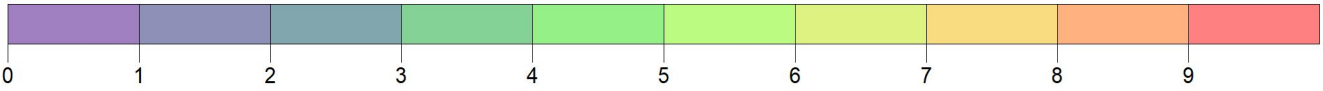
COMMENTS: 24 hour PM10 Criteria = 50 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:37,594 0 1 km	
	MAX: **179.0 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

Figure 9D - PM2.5, Annual
Beaver Dam Mine Site - No Mitigation - Option B (blasting)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: SALL_PM2 ug/m^3

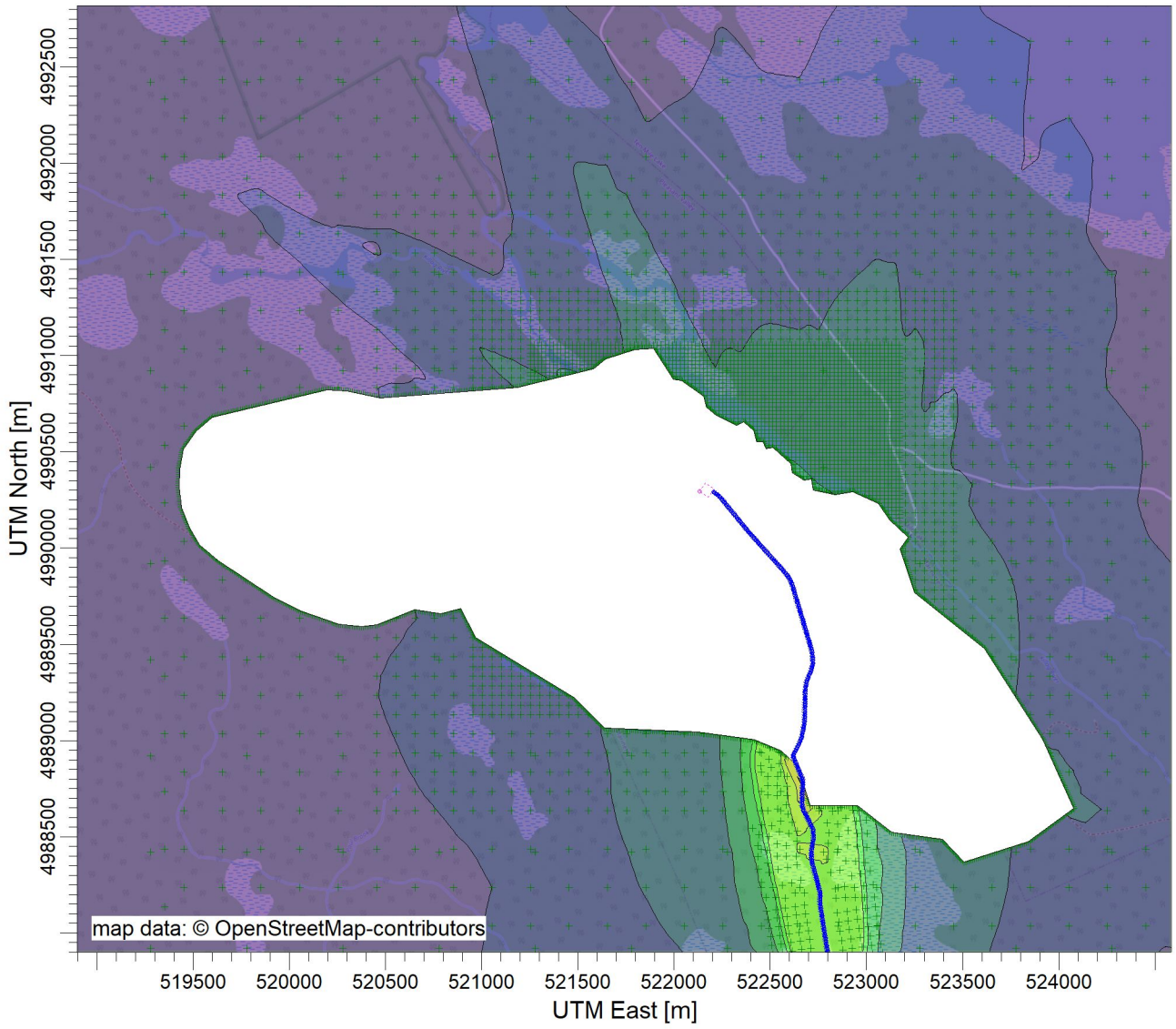
Max: 6 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: Annual PM2.5 Criteria = 8.8 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:37,936 0 1 km	
	MAX: **6 ug/m^3**	DATE: **12/1/2021**	PROJECT NO.: **088664**

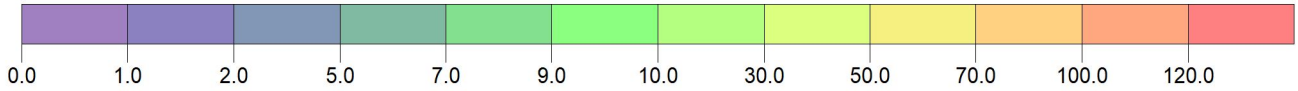
PROJECT TITLE:

Figure 10A - TSP, 24hour
Beaver Dam Mine Site - With Mitigation - Option B (blasting)



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: SALL_TSP ug/m^3

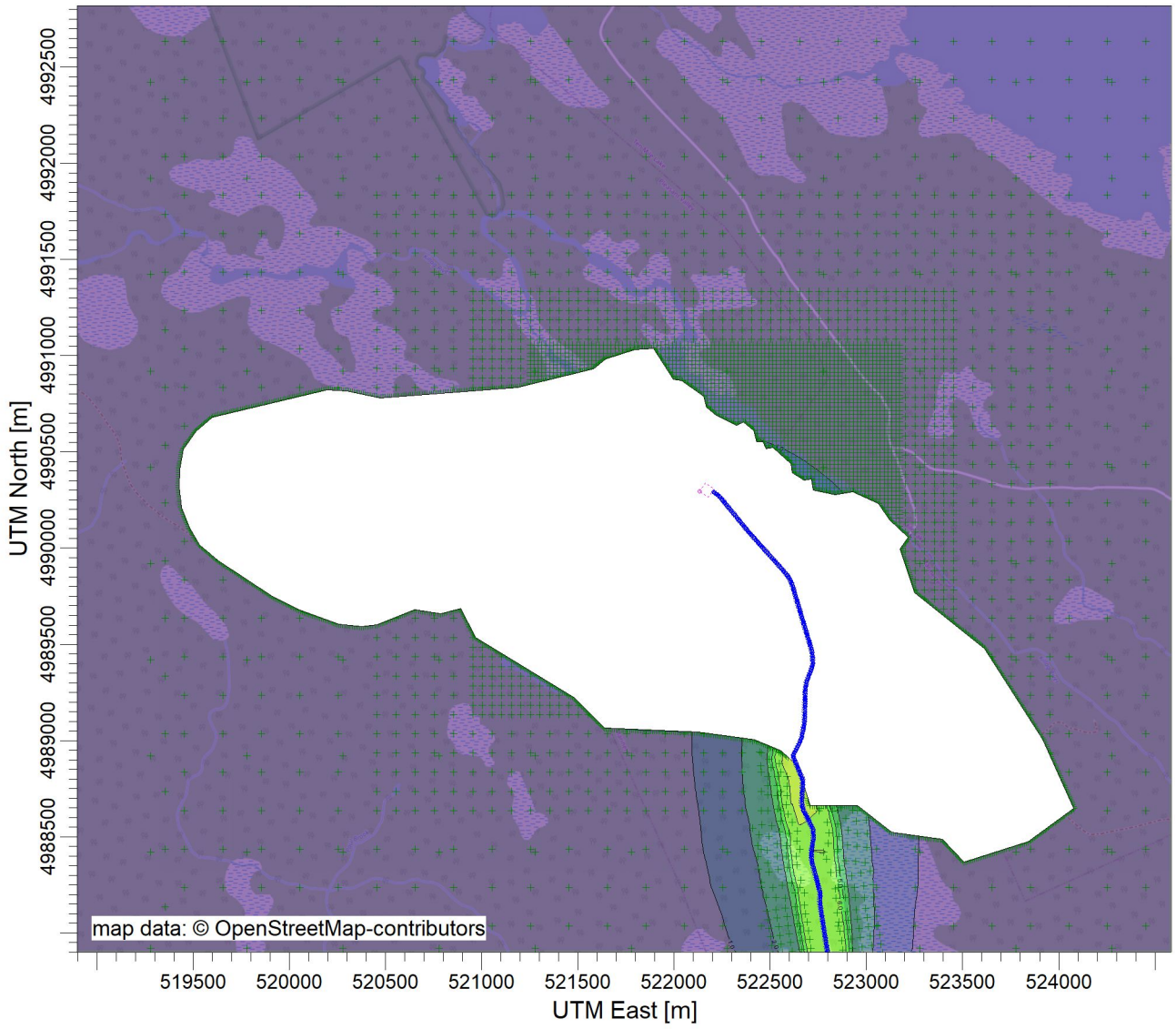
Max: 72.7 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: 24hour TSP Criteria = 120 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,783 0 1 km	
	MAX: **72.7 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

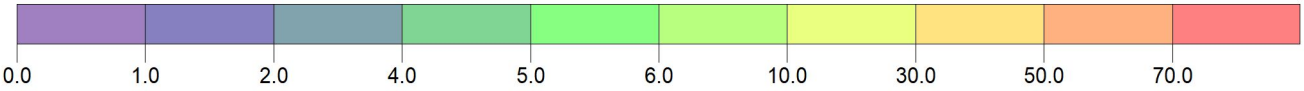
PROJECT TITLE:

Figure 10B - TSP, Annual
Beaver Dam Mine Site - With Mitigation - Option B (blasting)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: SALL_TSP ug/m^3

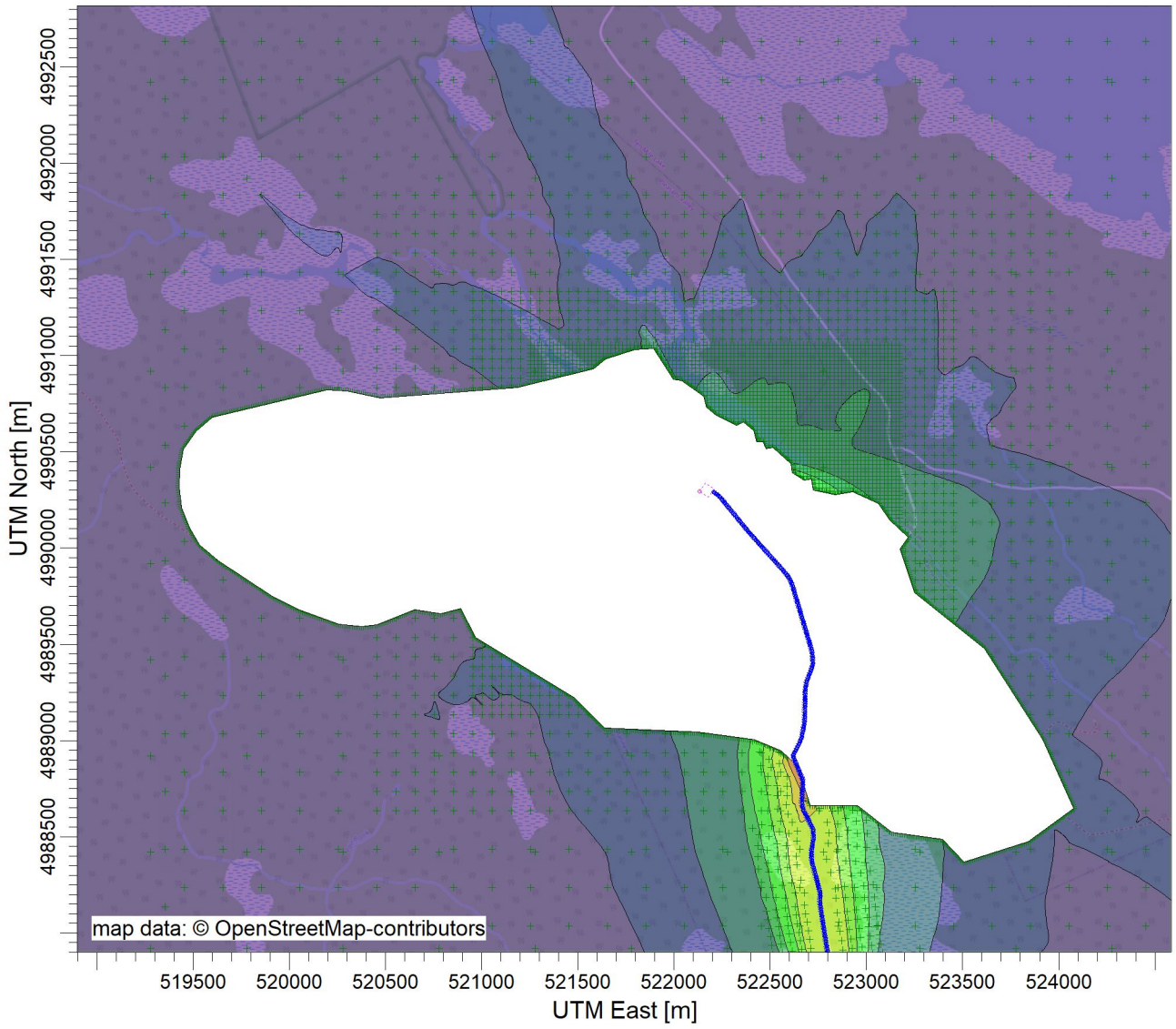
Max: 21.0 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: Annual TSP Criteria = 120 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,785 0 1 km	
	MAX: **21.0 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

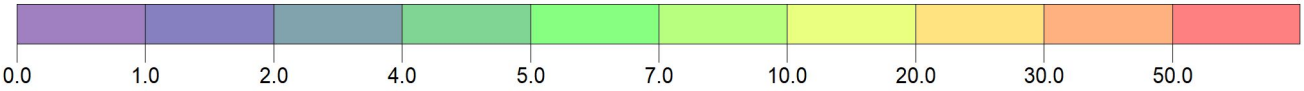
PROJECT TITLE:

Figure 10C - PM10, 24hour
Beaver Dam Mine Site - With Mitigation - Option B (blasting)



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: SALL_PM1 ug/m^3

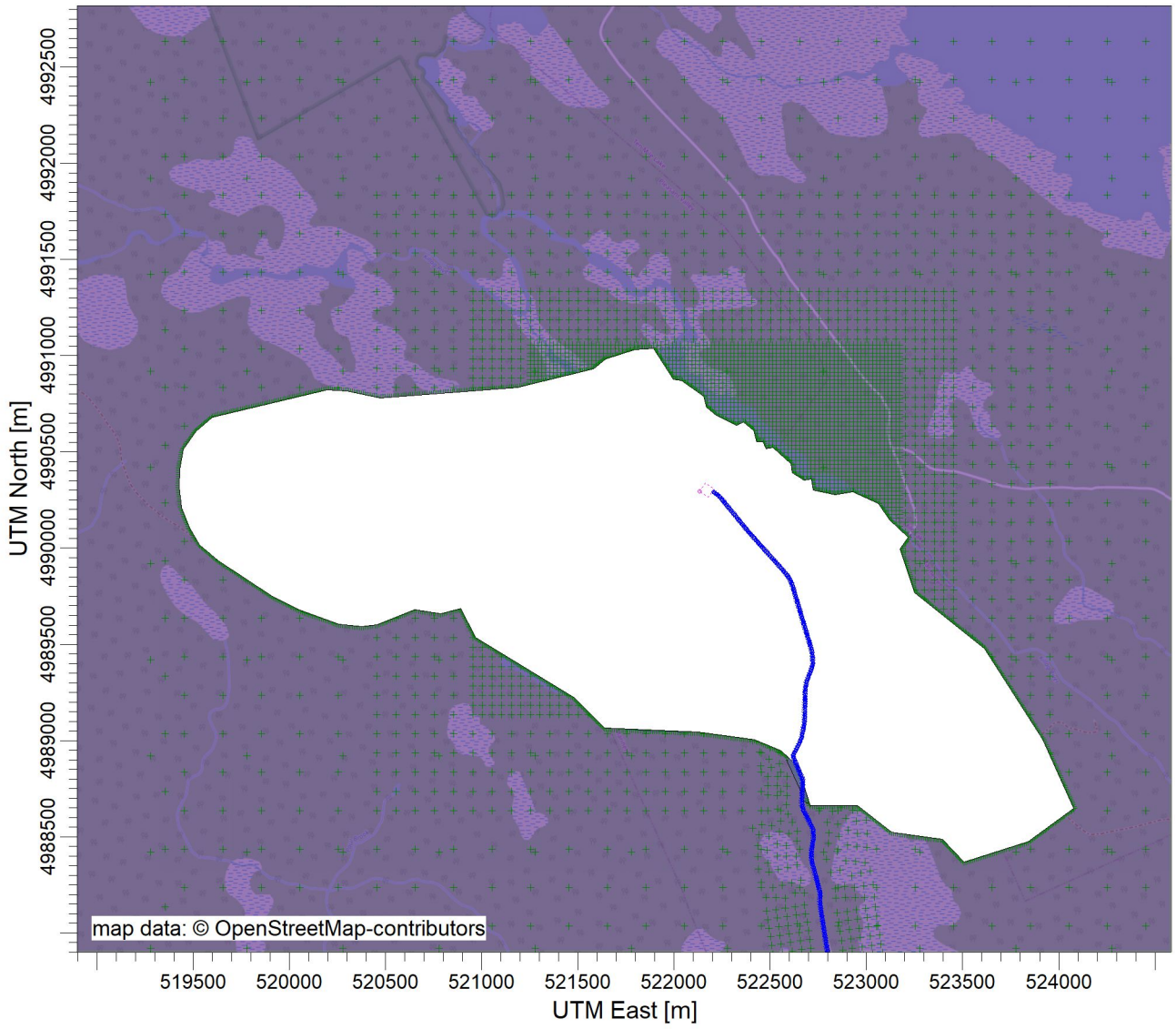
Max: 35.8 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: 24 hour PM10 Criteria = 50 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,785 0 1 km	
	MAX: **35.8 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

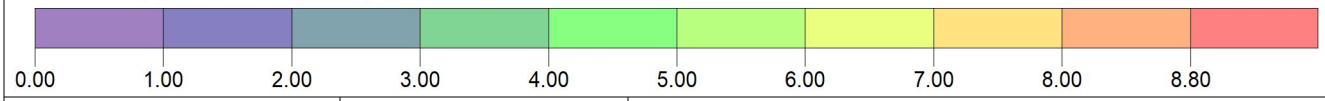
PROJECT TITLE:

Figure 10D - PM2.5, Annual
Beaver Dam Mine Site - With Mitigation - Option B (blasting)



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: SALL_PM2 ug/m^3

Max: 1.23 [ug/m^3] at (522696.80, 4988698.67)



COMMENTS: Annual PM2.5 Criteria = 8.8 ug/m3	SOURCES: **6**	COMPANY NAME:	
	RECEPTORS: **5128**	MODELER:	
	OUTPUT TYPE: **Concentration**	SCALE: 1:35,785 0 1 km	
	MAX: **1.23 ug/m^3**	DATE: **12/2/2021**	PROJECT NO.: **088664**

Table 1A

Estimated Particulate Emission Rates - Haul Route between Beaver Dam and Touquoy – No Mitigation

Variable or Constant	PM2.5	PM10	TSP
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45
Surface material silt content (3)	6.4	6.4	6.4
Conversion from lb/VMT to g/VKT	281.9	281.9	281.9

Formula:
EF(g/VKT) = 281.9 (g/VKT / lb/VMT) * k * (S/12)^a * (M/3)^b
ER(g/s) = 281.9 (g/VKT / lb/VMT) * k * (S/12)^a * (M/3)^b * # of trips * Distance (km) / (# of hours per day) / (3600 s/hr)

Truck Counts by Operation:	2-way Trips per day	% of Total Trips
Beaver Dam to Touquoy Mine	95	66.1%
Cochrane Mine vehicles	11	7.7%
Fifteen Mile Stream vehicles	11	7.7%
Service Trucks (3/4 tons truck)	20	13.9%
Forestry	7	4.6%
TOTAL Beaver Dam Traffic	**190**	Sum of 2-way trips * 2 (to generate number of 1-way vehicle trips per day)
TOTAL Cumulative Traffic	**288**	Sum of 2-way trips * 2 (to generate number of 1-way vehicle trips per day)

Variable	Value	Comments
One-Way Road Length (km)	30.7	
Hours of Operation per day	16	7 AM to 11 PM
Weighted Average Vehicle Weight (tonnes)	25.1	Fleet average, all sources, empty and full
Weighted Average Vehicle Weight (tons)	27.6	
Emission Factors (g/VKT)		
TSP	2415.7	
PM10	652.1	
PM2.5	65.2	
% Dust Control	0%	
Site-Only Emission Rates (g/s)		
TSP	244.63	
PM10	66.04	
PM2.5	6.60	
Cumulative Emission Rates (g/s)		
TSP	369.95	
PM10	99.87	
PM2.5	9.99	
Particle Density	1.00	soil or light aggregate
TSP Mass Fraction (for AERMOD)		
TSP	0.73	
PM10	0.24	
PM2.5	0.03	
PM10 Mass Fraction (for AERMOD)		
PM10	0.9	
PM2.5	0.1	

Notes:

Mean Municipal Solid Waste Landfill surface silt loading (USEPA AP-42 Paved Roads Emissions Model - Chapter 13.2.1).

An estimated reduction was applied based on expected mitigation measures.

As noted in USEPA AP-42 Chapter 13.2.1 - Paved Roads and 13.2.2 - Unpaved Roads, 'W' is the mean weight of all vehicles travelling the road. Only one emission factor (E) is to be calculated to represent the 'fleet' average of all vehicles travelling each road.

Silt content used for all material types as a conservative estimate (USEPA AP-42 Unpaved Roads - Chapter 13.2.2).
Converted to g/VKT using a conversion factor of 281.9 as specified in USEPA AP-42 Chapter 13.2.2 - Unpaved roads.
Mean landfill surface silt loading (USEPA AP-42 Paved Roads Emissions Model - Chapter 13.2.1).
Equations used to estimate dust emissions are found in USEPA AP-42 (Chapters 13.2.2 - Unpaved Road).

Tailpipe emissions have not been included as they are insignificant.

November 2020 Update: vehicle trips and payload provided by email (Veronica Chisholm, November 12, 2020): 95 daily round trips

Hours of operation for the haul road are 7 AM to 11 PM.
Forestry truck count is based on 1000 trips per year, 80% of which occur in spring and fall (1000 trips * 80% divided by 120 days for daily average trips)
Service Trucks count is based on 3000 trips per year, 80% of which occur in spring and fall (3000 trips * 80% divided by 120 days for daily average trips)

Weighted average Vehicle weight calculated per the following formula:

$$\text{Weighted Average Vehicle Weight} = (((Average\ tons\ of\ Full\ Load\ vs. Empty\ Load\ Haul\ Trucks) * Number\ of\ Haul\ Trucks) + (3/4\ ton * number\ of\ 3/4\ ton\ trucks))/(Number\ of\ Haul\ Trucks + Number\ of\ 3/4\ ton\ Trucks)$$

Table 1B

Estimated Particulate Emission Rates - Haul Route between Beaver Dam and Touquoy – 80% Road Dust Mitigation

Variable or Constant	PM2.5	PM10	TSP
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45
Surface material silt content (3)	6.4	6.4	6.4
Conversion from lb/VMT to g/VKT	281.9	281.9	281.9

Formula:
EF(g/VKT) = 281.9 (g/VKT / lb/VMT) * k * (S/12)^a * (M/3)^b
ER(g/s) = 281.9 (g/VKT / lb/VMT) * k * (S/12)^a * (M/3)^b * # of trips * Distance (km) / (# of hours per day) / (3600 s/hr)

Truck Counts by Operation:	2-way Trips per day	% of Total Trips
Beaver Dam to Touquoy Mine	95	66.1%
Cochrane Mine vehicles	11	7.7%
Fifteen Mile Stream vehicles	11	7.7%
Service Trucks (3/4 tons truck)	20	13.9%
Forestry	7	4.6%
TOTAL Beaver Dam Traffic	**190**	Sum of 2-way trips * 2 (to generate number of 1-way vehicle trips per day)
TOTAL Cumulative Traffic	**288**	Sum of 2-way trips * 2 (to generate number of 1-way vehicle trips per day)

Variable	Value	Comments
One-Way Road Length (km)	30.7	
Hours of Operation per day	16	7 AM to 11 PM
Weighted Average Vehicle Weight (tonnes)	25.1	Fleet average, all sources, empty and full
Weighted Average Vehicle Weight (tons)	27.6	
Emission Factors (g/VKT)		
TSP	2415.7	
PM10	652.1	
PM2.5	65.2	
% Dust Control	80%	
Site-Only Emission Rates (g/s)		
TSP	48.93	
PM10	13.21	
PM2.5	1.32	
Cumulative Emission Rates (g/s)		
TSP	73.99	
PM10	19.97	
PM2.5	2.00	
Particle Density	1.00	soil or light aggregate
TSP Mass Fraction (for AERMOD)		
TSP	0.73	
PM10	0.24	
PM2.5	0.03	
PM10 Mass Fraction (for AERMOD)		
PM10	0.9	
PM2.5	0.1	

Notes:

Mean Municipal Solid Waste Landfill surface silt loading (USEPA AP-42 Paved Roads Emissions Model - Chapter 13.2.1).

An estimated reduction was applied based on expected mitigation measures.

As noted in USEPA AP-42 Chapter 13.2.1 - Paved Roads and 13.2.2 - Unpaved Roads, 'W' is the mean weight of all vehicles travelling the road. Only one emission factor (E) is to be calculated to represent the 'fleet' average of all vehicles travelling each road.

Silt content used for all material types as a conservative estimate (USEPA AP-42 Unpaved Roads - Chapter 13.2.2).
Converted to g/VKT using a conversion factor of 281.9 as specified in USEPA AP-42 Chapter 13.2.2 - Unpaved roads.
Mean landfill surface silt loading (USEPA AP-42 Paved Roads Emissions Model - Chapter 13.2.1).
Equations used to estimate dust emissions are found in USEPA AP-42 (Chapters 13.2.2 - Unpaved Road).

Tailpipe emissions have not been included as they are insignificant.

November 2020 Update: vehicle trips and payload provided by email (Veronica Chisholm, November 12, 2020): 95 daily round trips

Hours of operation for the haul road are 7 AM to 11 PM.
Forestry truck count is based on 1000 trips per year, 80% of which occur in spring and fall (1000 trips * 80% divided by 120 days for daily average trips)
Service Trucks count is based on 3000 trips per year, 80% of which occur in spring and fall (3000 trips * 80% divided by 120 days for daily average trips)

Weighted average Vehicle weight calculated per the following formula:

$$\text{Weighted Average Vehicle Weight} = (((Average\ tons\ of\ Full\ Load\ vs. Empty\ Load\ Haul\ Trucks) * Number\ of\ Haul\ Trucks) + (3/4\ ton * number\ of\ 3/4\ ton\ trucks))/(Number\ of\ Haul\ Trucks + Number\ of\ 3/4\ ton\ Trucks)$$

Table 2A

Estimated Particulate Emissions from Material Handling - Beaver Dam Mine
Option A - With Crusher - Uncontrolled

Summary for Pit Emissions	**Emission Rate (g/s) Using AP-42**		
	TSP	**PM10**	**PM2.5**
Conveyors	6.16E-01	2.26E-01	2.26E-01
Truck Loading	6.57E-03	3.29E-03	1.64E-03
TOTAL	**6.23E-01**	**2.29E-01**	**2.27E-01**

Summary for Crusher Volume Source			
Crusher	1.11E+00	4.93E-01	4.93E-01

Open Pit - Conveyors

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg) (1) (2)**	**Emission Rate (g/s)**
Primary Stacker Conveyor	1,478	Uncontrolled	TSP	1.50E-03	6.16E-01
			PM10	5.50E-04	2.26E-01
			PM2.5	5.50E-04	2.26E-01

Notes
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for controlled conveyor transfer points.
(2) It has been assumed there is only one transfer point.

Open Pit - Truck Loading

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg)**	**TSP**	**Emission Rate (g/s)**
Truck Loading at Working Face	1,478		TSP	1.60E-05 (1)		6.57E-03
			PM10	8.00E-06		3.29E-03
			PM2.5	4.00E-06 (2)		1.64E-03

Notes:
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor multiplied by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor divided by 2.

Crusher

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg) (1)**	**Emission Rate (g/s)**
Crusher	1,478	Uncontrolled	TSP	2.70E-03	1.11E+00
			PM10	1.20E-03	4.93E-01
			PM2.5	1.20E-03	4.93E-01

Note:

(1) Emission factors for Tertiary Crushing have been used due to a lack of Primary Crushing emission factors. This is a conservative assumption.

Table 2B

Estimated Particulate Emissions from Material Handling - Beaver Dam Mine
Option A - With Crusher - Controlled

Summary for Pit Emissions	**Emission Rate (g/s) Using AP-42**		
	TSP	**PM10**	**PM2.5**
Conveyors	2.87E-02	9.44E-03	2.67E-03
Truck Loading	6.57E-03	3.29E-03	1.64E-03
TOTAL	**3.53E-02**	**1.27E-02**	**4.31E-03**
Summary for Crusher Volume Source			
Crusher	2.46E-01	1.11E-01	2.05E-02

Open Pit - Conveyors

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg) (1) (2)**	**Emission Rate (g/s)**
Primary Stacker Conveyor	1,478	Controlled	TSP	7.00E-05	2.87E-02
			PM10	2.30E-05	9.44E-03
			PM2.5	6.50E-06	2.67E-03

Notes
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for controlled conveyor transfer points.
(2) It has been assumed there is only one transfer point.

Open Pit - Truck Loading

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg)**	**TSP Emission Rate (g/s)**
Truck Loading at Working Face	1,478		TSP	1.60E-05 (1)	6.57E-03
			PM10	8.00E-06	3.29E-03
			PM2.5	4.00E-06 (2)	1.64E-03

Notes:
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor multiplied by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor divided by 2.

Crusher

Source ID	**Max. Production Rate (tonnes/hour)**	**Controlled or Uncontrolled?**	**Species**	**USEPA AP-42 Emission Factor (kg/Mg) (1)**	**Emission Rate (g/s)**
Crusher	1,478	Controlled	TSP	6.00E-04	2.46E-01
			PM10	2.70E-04	1.11E-01
			PM2.5	5.00E-05	2.05E-02

Note:

(1) Emission factors for Tertiary Crushing have been used due to a lack of Primary Crushing emission factors. This is a conservative assumption.

Table 2C

Estimated Particulate Emissions from Material Handling - Beaver Dam Mine
Option B - Blasting - Uncontrolled

Summary for Pit Emissions	Emission Rate (g/s) Using AP-42					
	TSP	PM10	PM2.5	NOx	CO	SO_2
Conveyors	6.16E-01	2.26E-01	2.26E-01	-	-	-
Truck Loading	6.57E-03	3.29E-03	1.64E-03	-	-	-
Blasting	3.77E-01	1.96E-01	1.13E-02	5.33E+01	2.27E+02	6.67E+00
TOTAL	**1.00E+00**	**4.25E-01**	**2.39E-01**	**5.33E+01**	**2.27E+02**	**6.67E+00**

Open Pit - Conveyors

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg) (1) (2)	Emission Rate (g/s)
Primary Stacker Conveyor	1,478	Uncontrolled	TSP	1.50E-03	6.16E-01
			PM10	5.50E-04	2.26E-01
			PM2.5	5.50E-04	2.26E-01

Note: emission factors from 11.19.2 are for PM100 (see footnotes), this has been used f
Note: Particle density is for gold o

Notes
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for controlled conveyo transfer points.
(2) It has been assumed there is only one transfer point

Open Pit - Truck Loading

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	TSP Emission Rate (g/s)
Truck Loading at Working Face	1,478		TSP	1.60E-05 (1)	6.57E-03
			PM10	8.00E-06	3.29E-03
			PM2.5	4.00E-06 (2)	1.64E-03

Notes:
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 fo truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor multiplied by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 fo truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor divided by 2.

Blasting

Source ID	Blasting Rate (Blasts/hour)	Blasting Rate (Blasts/Day)	Blasting Rate (1) (Blasts/week)	(Weeks/Year)	Emulsion 100% mixed product Titan XL 1000 (tonnes/blast)	Contaminants (1) (2)	CAS Number	US EPA AP-42 (2) Emission Factor (kg/Mg)	Maximum Hourly Emissions (g/s)	Daily Average Emission Rate (g/s)	Annual Average Emission Rate (g/s)
Blasting	1	1	3	52	2.40E+01	NOx	10102-44-0	8.00E+00	5.33E+01	2.22E+00	9.52E-01
						CO	630-08-0	3.40E+01	2.27E+02	9.44E+00	4.05E+00
						SO_2	7446--09-5	1.00E+00	6.67E+00	2.78E-01	1.19E-01
						TSP (3)	N/A	32.60 Kg/blast	9.05E+00	3.77E-01	1.62E-01
						PM10 (3)	N/A	16.95 Kg/blast	4.71E+00	1.96E-01	8.41E-02
						PM2.5 (3)	N/A	0.98 Kg/blast	2.72E-01	1.13E-02	4.85E-03

Blasting Details (1)		
Charge per hole	120	Kg/hole
Total Material Mined (Ore + Waste)	50	Mt (2022 - 2027 or 6 years)
Total Blasting amount (Ore + waste)	45	Mt
Number of Holes per Blast	200	Holes/Blast
A (Horizontal blast Area)	2,800	m^2

Sample calculations:
NOx Emission rate Calculation: Blast/hour * Emulsion (tonnes/blast) * Emission Factor (Kg/Mg) * 1000 g/Kg * 1 hr/3600s = 3.93E+01

Notes:
(1) Information including MSDS received in e-mail dated November 12, 2020 from Veronica Chisholn
(2) AP-42, CH 13.3: Explosives Detonation, Table 13.3-1, ANFO, Construction work, blasting in mines
(3) Based on AP 42 Chapter 11.9 Western Surface Coal Mining - EPA, Table 11.9-2 B, Blasting Emissions

TSP Emission Factor = 0.00022 * (A)^1.5

TSP Emission Factor = 0.00022 * (2800)^1.5	32.60	Kg/blast
PM10 Emission Factor = TSP EF * 0.52	16.95	Kg/blast
PM2.5 Emission Factor = TSP EF * 0.03	0.98	Kg/blast

Table 2D

Estimated Particulate Emissions from Material Handling - Beaver Dam Mine
Option B - Blasting - Controlled

Summary for Pit Emissions	Emission Rate (g/s) Using AP-42					
	TSP	PM10	PM2.5	NOx	CO	SO_2
Conveyors	2.87E-02	9.44E-03	2.67E-03	-	-	-
Truck Loading	6.57E-03	3.29E-03	1.64E-03	-	-	-
Blasting	3.77E-01	1.96E-01	1.13E-02	5.33E+01	2.27E+02	6.67E+00
TOTAL	**4.13E-01**	**2.09E-01**	**1.56E-02**	**5.33E+01**	**2.27E+02**	**6.67E+00**

Open Pit - Conveyors

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg) (1) (2)	Emission Rate (g/s)
Primary Stacker Conveyor	1,478	Controlled	TSP	7.00E-05	2.87E-02
			PM10	2.30E-05	9.44E-03
			PM2.5	6.50E-06	2.67E-03

Note: emission factors from 11.19.2 are for PM100 (see footnotes), this has been used f
Note: Particle density is for gold o

Notes
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for controlled conveyo transfer points.
(2) It has been assumed there is only one transfer point

Open Pit - Truck Loading

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	TSP Emission Rate (g/s)
Truck Loading at Working Face	1,478		TSP	1.60E-05 (1)	6.57E-03
			PM10	8.00E-06	3.29E-03
			PM2.5	4.00E-06 (2)	1.64E-03

Notes:
(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 fo truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor multiplied by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 fo truck unloading of fragmented stone. As the emission factors are given for PM-10 only, the total PM emission factors was assumed to be the PM-10 emission factor divided by 2.

Blasting

Source ID	Blasting Rate (Blasts/hour)	Blasting Rate (Blasts/Day)	Blasting Rate (1) (Blasts/week)	(Weeks/Year)	Emulsion 100% mixed product Titan XL 1000 (tonnes/blast)	Contaminants (1) (2)	CAS Number	US EPA AP-42 (2) Emission Factor (kg/Mg)	Maximum Hourly Emissions (g/s)	Daily Average Emission Rate (g/s)	Annual Average Emission Rate (g/s)
Blasting	1	1	3	52	2.40E+01	NOx	10102-44-0	8.00E+00	5.33E+01	2.22E+00	9.52E-01
						CO	630-08-0	3.40E+01	2.27E+02	9.44E+00	4.05E+00
						SO_2	7446--09-5	1.00E+00	6.67E+00	2.78E-01	1.19E-01
						TSP (3)	N/A	32.60 Kg/blast	9.05E+00	3.77E-01	1.62E-01
						PM10 (3)	N/A	16.95 Kg/blast	4.71E+00	1.96E-01	8.41E-02
						PM2.5 (3)	N/A	0.98 Kg/blast	2.72E-01	1.13E-02	4.85E-03

Blasting Details (1)		
Charge per hole	120	Kg/hole
Total Material Mined (Ore + Waste)	50	Mt (2022 - 2027 or 6 years)
Total Blasting amount (Ore + waste)	45	Mt
Number of Holes per Blast	200	Holes/Blast
A (Horizontal blast Area)	2,800	m^2

Sample calculations:
NOx Emission rate Calculation: Blast/hour * Emulsion (tonnes/blast) * Emission Factor (Kg/Mg) * 1000 g/Kg * 1 hr/3600s = 3.93E+01

Notes:
(1) Information including MSDS received in e-mail dated November 12, 2020 from Veronica Chisholn
(2) AP-42, CH 13.3: Explosives Detonation, Table 13.3-1, ANFO, Construction work, blasting in mines
(3) Based on AP 42 Chapter 11.9 Western Surface Coal Mining - EPA, Table 11.9-2 B, Blasting Emissions

TSP Emission Factor = 0.00022 * (A)^1.5

TSP Emission Factor = 0.00022 * (2800)^1.5	32.60	Kg/blast
PM10 Emission Factor = TSP EF * 0.52	16.95	Kg/blast
PM2.5 Emission Factor = TSP EF * 0.03	0.98	Kg/blast

Table 2E

Estimated Particulate Emissions from Material Handling - Touquoy Processing Facility

Summary

	AP-42 Emission Rate (g/s)		
	TSP	**PM10**	**PM2.5**
Crusher	9.38E-02	4.22E-02	7.81E-03
ROMTRANS	8.42E-02	3.17E-02	1.58E-02

Crushers

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg) (1)	Emission Rate (g/s)
Primary Crusher	187.5	Controlled	TSP	0.0006	3.13E-02
			PM10	0.00027	1.41E-02
			PM2.5	5.00E-05	2.60E-03
Secondary Crusher	187.5	Controlled	TSP	0.0006	3.13E-02
			PM10	0.00027	1.41E-02
			PM2.5	5.00E-05	2.60E-03
Tertiary Crusher	187.5	Controlled	TSP	0.0006	3.13E-02
			PM10	0.00027	1.41E-02
			PM2.5	5.00E-05	2.60E-03

Note:
(1) Emission factors for Tertiary Crushing have been used due to a lack of Primary Crushing and Secondary Crushing emission factors. This is a conservative assumption.

ROMTRANS (Transfer operations around Raw Material Storage Pile)

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	TSP Emission Rate (g/s)
Handling, Transfering and Conveying	187.5	Controlled	TSP	1.50E-03	7.81E-02
			PM10	5.50E-04	2.86E-02
			PM2.5	2.75E-04 (1)	1.43E-02
Loading ROM Stockpiles	187.5	Controlled	TSP	1.60E-05 (2)	8.33E-04
			PM10	8.00E-06	4.17E-04
			PM2.5	4.00E-06 (3)	2.08E-04
Unloading from ROM Stockpiles	187.5	Controlled	TSP	1.00E-04 (4)	5.21E-03
			PM10	5.00E-05	2.60E-03
			PM2.5	2.50E-05 (5)	1.30E-03

Notes:
(1) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Conveyor Transfer Point. As there is no PM-2.5 emission factor, emission factors were assumed to be the PM-10 emission factor divided by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Unloading Fragmented Stone. As the emission factors are given for PM-10 only, the total PM emission factors were assumed to be the PM-10 emission factor times 2.
(3) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Unloading Fragmented Stone. As the emission factors are given for PM-10 only, the PM2.5 emission factors were assumed to be the PM-10 emission factor divided by 2.
(4) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Loading Conveyor, crushed stone. As the emission factors are given for PM-10 only, the TSP emission factors were assumed to be the PM-10 emission factor times 2.
(5) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Loading Conveyor crushed stone. As the emission factors are given for PM-10 only, the PM2.5 emission factors were assumed to be the PM-10 emission factor divided by 2.

Table 3

Estimated NOx, SO2, and VOC Emissions from Haul Road Truck Traffic

	Trips per Day (1-way)	Road Length (mi, 1-way)	Total Distance (mi/day)	Emission Rate (g/VMT)	Emission Rate (g/s)
Project Only					
NOx	190	19.2	7291.3	15.7	1.9874
SO_2				0.0151	0.0019
VOC				0.655	0.0829
Cumulative					
NOx	287	19.2	11026.4	15.7	3.0055
SO_2				0.0151	0.0029
VOC				0.655	0.1254

Notes:

Emission Rate determined from USEPA Mobile 6.1
Beaver Dam to Touquoy is 30.7 km or approximately 19.2 mi
VMT - Vehicle Miles traveled

Table 4

Background Ambient Air Monitoring Data (NAPS) 2014 - 2016

	Concentration (µg/m^3)					
	25th %ile	**50th %ile**	**75th %ile**	**90th %ile**	**Average**	**Maximum**
24-hour PM_{10}						
Lake Major (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	3.0	6.0	14.0	31.0	14.1	176.0
Halifax (030118)	—	—	—	—	—	—
Sydney (030310)	—	—	—	—	—	—
24-hour $PM_{2.5}$						
Lake Major (030120)	3.0	5.0	6.0	8.0	5.4	24
Port Hawkesbury (030201)	4.0	5.0	7.0	**9.0**	**5.7**	31
Aylesford Mountain (030701)	4.0	5.0	7.0	8.0	5.7	23
Pictou (030901)	4.0	5.0	8.0	12.0	6.7	37
Norman Wells, NWT (129102)	1.0	2.0	3.0	5.0	3.5	85
Halifax (030118)	—	—	—	—	—	—
Sydney (030310)	1.2	2.1	3.7	5.8	2.8	358.6
1-hour NO_2						
Lake Major (030120)	0.0	1.9	3.8	5.6	2.8	47.0
Port Hawkesbury (030201)	0.0	1.9	3.8	**9.4**	3.4	79.0
Aylesford Mountain (030701)	0.0	0.0	0.0	1.9	0.6	13.2
Pictou (030901)	0.0	1.9	1.9	5.6	2.2	39.5
Norman Wells, NWT (129102)	0.0	0.0	1.9	7.5	3.6	73.4
Halifax (030118)	11.3	18.8	28.2	41.4	21.4	131.6
Sydney (030310)	1.9	3.8	7.5	13.2	6.7	69.6
24-hour NO_2						
Lake Major (030120)	1.9	1.9	3.8	5.6	2.7	11.3
Port Hawkesbury (030201)	0.0	1.9	5.6	7.5	3.3	28.2
Aylesford Mountain (030701)	0.0	0.0	0.0	1.9	0.5	5.6
Pictou (030901)	0.0	1.9	3.8	3.8	2.2	13.2
Norman Wells, NWT (129102)	0.0	1.9	3.8	9.4	3.5	30.1
Halifax (030118)	4.6	7.7	11.6	**17.0**	8.8	54.1
Sydney (030310)	0.8	1.5	3.1	5.4	2.7	28.6
1-hour SO_2						
Lake Major (030120)	0.0	0.0	0.0	2.6	0.4	62.8
Port Hawkesbury (030201)	0.0	0.0	2.6	2.6	1.9	222.5
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	0.0	0.0	2.6	2.6	0.7	5.2
Halifax (030118)	2.6	5.2	5.2	**7.9**	4.8	70.7
Sydney (030310)	0.0	2.6	2.6	5.2	2.3	172.9
24-hour SO_2						
Lake Major (030120)	0.0	0.0	0.0	2.6	0.3	7.9
Port Hawkesbury (030201)	0.0	0.0	2.6	**5.2**	1.9	31.4
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	0.0	0.0	0.0	2.6	0.5	2.6
Halifax (030118)	1.1	2.2	2.2	3.2	2.0	29.1
Sydney (030310)	0.0	1.1	1.1	2.2	0.9	71.0
1/2-hour CO						
Lake Major (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	—	—	—	—	—	—
Halifax (030118)	306	389	487	**834**	420	6687
Sydney (030310)	264	334	417	695	397	2099
1-hour CO						
Lake Major (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	—	—	—	—	—	—
Halifax (030118)	252	321	401	**687**	346	5507
Sydney (030310)	218	275	344	573	327	1729
8-hour CO						
Lake Major (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
Norman Wells, NWT (129102)	—	—	—	—	—	—
Halifax (030118)	141	179	224	**384**	193	3077
Sydney (030310)	122	154	192	320	183	966

Note:

Values in **BOLD** are the identified concentrations used to define "background" for this assessment.

Table 5

Beaver Dam Area Background Air Quality Sampling Data

Location	Program Date	24-hour TSP (µg/m^3)	24-hour PM_{10} (µg/m^3)
Location #1	June 5-6, 2008	19.4	9.1
Location #2	June 5-6, 2008	41.7	**13.1**
Location #3	June 5-6, 2008	12.9	7.1
AN#1	October 20-21, 2014	6.9	—
AN#2	October 20-21, 2014	4.6	—
AN#3	October 20-21, 2014	1.7	—
AN#4	October 20-21, 2014	3.9	—
Beaver Dam Road	September 7-8, 2016	9.7	—
Mooseland Road	September 7-8, 2016	5.8	—
Location # 1 (Touquoy)	3-Jan-07	11.6	—
Location # 2 (Touquoy)	3-Jan-07	10.5	—
Location # 3 (Touquoy)	4-Jan-07	14	—
Location # 4 (Touquoy)	4-Jan-07	16.1	—
Location # 5 (Touquoy)	4-Jan-07	14.4	—
Fifteen Mile Stream	November 2017	9.6	9.2
Fifteen Mile Stream	November 2017	14	9.5
Cochrane Hill	November 2017	10.7	9.7
Cochrane Hill	1-Nov-17	10.7	10.5
Average		**12.1**	9.7
90th percentile		**17.1**	—

Notes:

Additional measurements of TSP and PM_{10} from similar sites Fifteen Mile Stream and Cochrane Hill in Nova Scotia have been obtained for this assessment

Values in **BOLD** are the identified concentrations used to define "background" for this assessment.

Table 6

Ambient Air Quality Criteria

Substance	Averaging Period	Nova Scotia (A) ($\mu g/m^3$)	Ontario (B) ($\mu g/m^3$)	CAAQS (C) ($\mu g/m^3$)	Selected for this Assessment ($\mu g/m^3$)
TSP	24-hour	120	120	—	120
	Annual (1)	70	—	—	70
PM_{10}	24-hour (2)	—	50	—	50
$PM_{2.5}$	24-hour (3)	—	—	28	27
	24-hour (2020) (3)	—	—	27	
	Annual (4)	—	—	10	8.8
	Annual (2020) (4)	—	—	8.8	
NO_2	1-hour	400	400	—	400
	1-hour (2020) (5)	—	—	112.9	112.9
	1-hour (2025) (5)	—	—	79.0	79.0
	24-hour	—	200	—	200
	Annual	100	—	—	100
	Annual (2020)	—	—	32.0	32.0
	Annual (2025)	—	—	22.6	22.6
SO_2	1-hour	900	690	—	
	1-hour (2020) (6)	—	—	183.2	900
	1-hour (2023)	—	100	—	
	1-hour (2025) (6)	—	—	170.1	
	24-hour	300	275	—	300
	24-hour (2023)	—	—	—	
	Annual	60	—	—	
	Annual (2020)	—	—	13.1	60
	Annual (2023)	—	10	—	
	Annual (2025)	—	—	10.5	
VOC	—	—	—	—	—
Deposition	Annual (7)	—	84	—	-
CO	1/2 hour	—	6000	—	6000
CO	1-hour	34600	—	22900	34600
CO	8-hour	12700	—	10305	12700

Notes:

(A) https://novascotia.ca/just/regulations/regs/envairqt.htm Accessed February, 2019.
(B) MECP (Ontario), 2018
(C) https://www.ccme.ca/en/resources/air Accessed February, 2019.
(1) Geometric mean.
(2) Interim standard, never implemented.
(3) The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
(4) The 3-year average of the annual average concentrations.
(5) Three-year average of the annual 98th percentile of the NO2 daily-maximum 1-hour average concentrations
(6) The 3-year average of the annual 99th percentile of the SO2 daily-maximum 1-hour average concentrations.
(7) Ontario's 2018 ACB List Dustfall monthly Criteria of 7 ug/m3 annualized by multiplying by 12 months

Table 7A

Particulate Modelling Results for Project Only and Cumulative Truck Traffic Scenarios – No Mitigation

Project Only Truck Traffic - Summary of Results from Road Sections Model Runs						
Road Section:		R1	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	273.21	17.10	290.31	120	**241.92%**
TSP	annual	87.30	12.10	99.40	70	**142.01%**
PM10	24 hour	117.07	13.10	130.17	50	**260.33%**
PM2.5	24 hour	12.53	9.00	21.53	27	79.74%
PM2.5	annual	4.82	5.70	10.52	8.8	**119.58%**
Deposition (g/m2/year)	annual	681.43	-	-	-	**-**
Road Section:		STP	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	269.63	17.10	286.73	120	**238.94%**
TSP	annual	86.77	12.10	98.87	70	**141.25%**
PM10	24 hour	117.96	13.10	131.06	50	**262.12%**
PM2.5	24 hour	12.62	9.00	21.62	27	80.06%
PM2.5	annual	4.90	5.70	10.60	8.8	**120.46%**
Deposition (g/m2/year)	annual	669.03	-	-	-	**-**
Road Section:		East Corner (EC)	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	234.65	17.10	251.75	120	**209.79%**
TSP	annual	76.26	12.10	88.36	70	**126.23%**
PM10	24 hour	101.73	13.10	114.83	50	**229.66%**
PM2.5	24 hour	10.82	9.00	19.82	27	73.41%
PM2.5	annual	4.12	5.70	9.82	8.8	**111.56%**
Deposition (g/m2/year)	annual	609.53	-	-	-	**-**
Road Section:		R9	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	221.26	17.10	238.36	120	**198.63%**
TSP	annual	74.46	12.10	86.56	70	**123.66%**
PM10	24 hour	99.31	13.10	112.41	50	**224.81%**
PM2.5	24 hour	10.59	9.00	19.59	27	72.57%
PM2.5	annual	4.14	5.70	9.84	8.8	**111.82%**
Deposition (g/m2/year)	annual	582.22	-	-	-	**-**
Cumulative Truck Traffic - Summary of Results from Road Sections Model Runs						
Road Section		R1	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	413.17	17.10	430.27	120	**358.56%**
TSP	annual	132.03	12.10	144.13	70	**205.90%**
PM10	24 hour	177.04	13.10	190.14	50	**380.28%**
PM2.5	24 hour	18.95	9.00	27.95	27	**103.51%**
PM2.5	annual	7.29	5.70	12.99	8.8	**147.66%**
Deposition (g/m2/year)	annual	1030.51	**-**	-	-	**-**
Road Section		STP	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	407.75	17.10	424.85	120	**354.04%**
TSP	annual	131.23	12.10	143.33	70	**204.75%**
PM10	24 hour	178.39	13.10	191.49	50	**382.97%**
PM2.5	24 hour	19.08	9.00	28.08	27	**103.99%**
PM2.5	annual	7.41	5.70	13.11	8.8	**148.98%**
Deposition (g/m2/year)	annual	1011.76	**-**	-	-	**-**
Road Section		East Corner (EC)	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	354.86	17.10	371.96	120	**309.97%**
TSP	annual	115.33	12.10	127.43	70	**182.04%**
PM10	24 hour	153.84	13.10	166.94	50	**333.89%**
PM2.5	24 hour	16.37	9.00	25.37	27	93.95%
PM2.5	annual	6.23	5.70	11.93	8.8	**135.53%**
Deposition (g/m2/year)	annual	921.78	**-**	-	-	**-**
Road Section		R9	Background	Maximum + Background	Assessment Criteria	**% of criteria**
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	**%**
TSP	24 hour	334.61	17.10	351.71	120	**293.09%**
TSP	annual	112.61	12.10	124.71	70	**178.15%**
PM10	24 hour	150.18	13.10	163.28	50	**326.56%**
PM2.5	24 hour	16.02	9.00	25.02	27	92.67%
PM2.5	annual	6.26	5.70	11.96	8.8	**135.92%**
Deposition (g/m2/year)	annual	880.48	**-**	-	-	**-**

Max POI after Meteorological Anomalies removed.

Table 7B

Particulate Modelling Results for Project Only and Cumulative Truck Traffic Scenarios – 80% Road Dust Mitigation

Project Only Truck Traffic - Summary of Results from Road Sections Model Runs						
Road Section:		R1	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	54.64	17.10	71.74	120	59.78%
TSP	annual	17.46	12.10	29.56	70	42.23%
PM10	24 hour	23.41	13.10	36.51	50	73.03%
PM2.5	24 hour	2.51	9.00	11.51	27	42.61%
PM2.5	annual	0.96	5.70	6.66	8.8	75.73%
Deposition (g/m2/year)	annual	136.29	-	-	-	-
Road Section:		STP	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	53.93	17.10	71.03	120	59.19%
TSP	annual	17.35	12.10	29.45	70	42.08%
PM10	24 hour	23.59	13.10	36.69	50	73.38%
PM2.5	24 hour	2.52	9.00	11.52	27	42.68%
PM2.5	annual	0.98	5.70	6.68	8.8	75.90%
Deposition (g/m2/year)	annual	133.81	-	-	-	-
Road Section:		East Corner (EC)	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	46.93	17.10	64.03	120	53.36%
TSP	annual	15.25	12.10	27.35	70	39.07%
PM10	24 hour	20.35	13.10	33.45	50	66.89%
PM2.5	24 hour	2.16	9.00	11.16	27	41.35%
PM2.5	annual	0.82	5.70	6.52	8.8	74.12%
Deposition (g/m2/year)	annual	121.91	-	-	-	-
Road Section:		R9	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	44.25	17.10	61.35	120	51.13%
TSP	annual	14.89	12.10	26.99	70	38.56%
PM10	24 hour	19.86	13.10	32.96	50	65.92%
PM2.5	24 hour	2.12	9.00	11.12	27	41.18%
PM2.5	annual	0.83	5.70	6.53	8.8	74.18%
Deposition (g/m2/year)	annual	116.44	-	-	-	-
Cumulative Truck Traffic - Summary of Results from Road Sections Model Runs						
Road Section		R1	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	82.63	17.10	99.73	120	83.11%
TSP	annual	26.41	12.10	38.51	70	55.01%
PM10	24 hour	35.41	13.10	48.51	50	97.02%
PM2.5	24 hour	3.79	9.00	12.79	27	47.37%
PM2.5	annual	1.46	5.70	7.16	8.8	81.34%
Deposition (g/m2/year)	annual	206.10	-	-	-	-
Road Section		STP	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	81.55	17.10	98.65	120	82.21%
TSP	annual	26.25	12.10	38.35	70	54.78%
PM10	24 hour	35.68	13.10	48.78	50	97.55%
PM2.5	24 hour	3.82	9.00	12.82	27	47.46%
PM2.5	annual	1.48	5.70	7.18	8.8	81.61%
Deposition (g/m2/year)	annual	202.35	-	-	-	-
Road Section		East Corner (EC)	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	70.97	17.10	88.07	120	73.39%
TSP	annual	23.07	12.10	35.17	70	50.24%
PM10	24 hour	30.77	13.10	43.87	50	87.74%
PM2.5	24 hour	3.27	9.00	12.27	27	45.46%
PM2.5	annual	1.25	5.70	6.94	8.8	78.92%
Deposition (g/m2/year)	annual	184.36	-	-	-	-
Road Section		R9	Background	Maximum + Background	Assessment Criteria	% of criteria
		Max POI Concentration (ug/m3)	ug/m3	ug/m3	ug/m3	%
TSP	24 hour	66.92	17.10	84.02	120	70.02%
TSP	annual	22.52	12.10	34.62	70	49.46%
PM10	24 hour	30.04	13.10	43.14	50	86.27%
PM2.5	24 hour	3.20	9.00	12.20	27	45.20%
PM2.5	annual	1.25	5.70	6.95	8.8	79.00%
Deposition (g/m2/year)	annual	176.10	-	-	-	-

Max POI after Meteorological Anomalies removed.

Table 7C

NO2, SO2 and VOC Modelling Results for Project Only and Cumulative Truck Traffic Scenarios

Road Section - R1							
Project Only							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	10.6	1-hour	400	3%	9.4	20.0	5%
	10.6	1-hour (CAAQS 2020)	112.9	9%	9.4	20.0	18%
	10.6	1-hour (CAAQS 2025)	79	13%	9.4	20.0	25%
	5.9	24-hour	200	3%	17.0	22.9	11%
	2.6	Annual	100	3%	3.3	5.9	6%
	2.6	Annual (CAAQS 2020)	32	8%	3.3	5.9	18%
	2.6	Annual (CAAQS 2025)	22.6	12%	3.3	5.9	26%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.4	1-hour	—	—	—	—	—
	0.2	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—

Cumulative							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	16.1	1-hour	400	4%	9.4	25.5	6%
	16.1	1-hour (CAAQS 2020)	112.9	14%	9.4	25.5	23%
	16.1	1-hour (CAAQS 2025)	79	20%	9.4	25.5	32%
	9.0	24-hour	200	4%	17.0	26.0	13%
	4.0	Annual	100	4%	3.3	7.3	7%
	4.0	Annual (CAAQS 2020)	32	12%	3.3	7.3	23%
	4.0	Annual (CAAQS 2025)	22.6	18%	3.3	7.3	32%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.7	1-hour	—	—	—	—	—
	0.4	24-hour	—	—	—	—	—
	0.2	Annual	—	—	—	—	—

Road Section - R9							
Project Only							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	14.2	1-hour	400	4%	9.4	23.6	6%
	14.2	1-hour (CAAQS 2020)	112.9	13%	9.4	23.6	21%
	14.2	1-hour (CAAQS 2025)	79	18%	9.4	23.6	30%
	6.7	24-hour	200	3%	17.0	23.7	12%
	2.2	Annual	100	2%	3.3	5.5	6%
	2.2	Annual (CAAQS 2020)	32	7%	3.3	5.5	17%
	2.2	Annual (CAAQS 2025)	22.6	10%	3.3	5.5	24%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.6	1-hour	—	—	—	—	—
	0.3	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—

Cumulative							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	21.5	1-hour	400	5%	9.4	30.9	8%
	21.5	1-hour (CAAQS 2020)	112.9	19%	9.4	30.9	27%
	21.5	1-hour (CAAQS 2025)	79	27%	9.4	30.9	39%
	10.2	24-hour	200	5%	17.0	27.2	14%
	3.4	Annual	100	3%	3.3	6.7	7%
	3.4	Annual (CAAQS 2020)	32	11%	3.3	6.7	21%
	3.4	Annual (CAAQS 2025)	22.6	15%	3.3	6.7	30%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.9	1-hour	—	—	—	—	—
	0.4	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—

Table 7C

NO2, SO2 and VOC Modelling Results for Project Only and Cumulative Truck Traffic Scenarios

Road Section - STP							
Project Only							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	10.2	1-hour	400	3%	9.4	19.6	5%
	10.2	1-hour (CAAQS 2020)	112.9	9%	9.4	19.6	17%
	10.2	1-hour (CAAQS 2025)	79	13%	9.4	19.6	25%
	6.0	24-hour	200	3%	17.0	23.0	12%
	2.7	Annual	100	3%	3.3	5.9	6%
	2.7	Annual (CAAQS 2020)	32	8%	3.3	5.9	19%
	2.7	Annual (CAAQS 2025)	22.6	12%	3.3	5.9	26%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.4	1-hour	—	—	—	—	—
	0.3	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	15.4	1-hour	400	4%	9.4	24.8	6%
	15.4	1-hour (CAAQS 2020)	112.9	14%	9.4	24.8	22%
	15.4	1-hour (CAAQS 2025)	79	20%	9.4	24.8	31%
	9.1	24-hour	200	5%	17.0	26.1	13%
	4.0	Annual	100	4%	3.3	7.3	7%
	4.0	Annual (CAAQS 2020)	32	13%	3.3	7.3	23%
	4.0	Annual (CAAQS 2025)	22.6	18%	3.3	7.3	32%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.6	1-hour	—	—	—	—	—
	0.4	24-hour	—	—	—	—	—
	0.2	Annual	—	—	—	—	—

Road Section - East Corner							
Project Only							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	9.8	1-hour	400	2%	9.4	19.2	5%
	9.8	1-hour (CAAQS 2020)	112.9	9%	9.4	19.2	17%
	9.8	1-hour (CAAQS 2025)	79	12%	9.4	19.2	24%
	5.0	24-hour	200	3%	17.0	22.0	11%
	2.2	Annual	100	2%	3.3	5.5	6%
	2.2	Annual (CAAQS 2020)	32	7%	3.3	5.5	17%
	2.2	Annual (CAAQS 2025)	22.6	10%	3.3	5.5	24%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.4	1-hour	—	—	—	—	—
	0.2	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration ($\mu g/m^3$)**	**Averaging Period**	**Assessment Criteria ($\mu g/m^3$)**	**Percentage of Assessment Criteria (%)**	**Background Concentration ($\mu g/m^3$)**	**Modelled Concentration and Background Concentration ($\mu g/m^3$)**	**Percentage of Limit (%)**
NO_2	14.9	1-hour	400	4%	9.4	24.3	6%
	14.9	1-hour (CAAQS 2020)	112.9	13%	9.4	24.3	21%
	14.9	1-hour (CAAQS 2025)	79	19%	9.4	24.3	31%
	7.7	24-hour	200	4%	17.0	24.7	12%
	3.4	Annual	100	3%	3.3	6.7	7%
	3.4	Annual (CAAQS 2020)	32	11%	3.3	6.7	21%
	3.4	Annual (CAAQS 2025)	22.6	15%	3.3	6.7	29%
SO_2	0.0	1-hour	900	<1%	7.9	7.9	<1%
	0.0	24-hour	300	<1%	5.2	5.2	2%
	0.0	Annual	60	<1%	1.9	1.9	3%
VOC	0.6	1-hour	—	—	—	—	—
	0.3	24-hour	—	—	—	—	—
	0.1	Annual	—	—	—	—	—

Max POI after Meteorological Anomalies removed.

Table 8a

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – No Road Dust Mitigation

No Mitigation							
R1 - 9 Beaver Dam Mines Road							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	45.6 65.1	24 hour Annual	120 70	38% 93%	17.1 12.1	62.7 77.2	52% **110%**
PM_{10}	23.1	24 hour	50	46%	13.1	36.2	72%
$PM_{2.5}$	2.5 0.8	24 hour Annual	27 8.8	9% 9%	9.0 5.7	11.5 6.5	43% 73%
Deposition ($g/m^2/yr$)	84.4	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	69.0 98.5	24 hour Annual	120 70	57% 141%	17.1 12.1	86.1 110.6	72% **158%**
PM_{10}	35.0	24 hour	50	70%	13.1	48.1	96%
$PM_{2.5}$	3.8 1.1	24 hour Annual	27 8.8	14% 13%	9.0 5.7	12.8 6.8	47% 78%
Deposition ($g/m^2/yr$)	127.7	Annual	—	—	—	—	—
R2 - 4112 Highway 224 (Beaver Lake IR)							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	3.1 0.6	24 hour Annual	120 70	3% <1%	17.1 12.1	20.2 12.7	17% 18%
PM_{10}	2.0	24 hour	50	4%	13.1	15.1	30%
$PM_{2.5}$	0.2 0.0	24 hour Annual	27 8.8	<1% <1%	9.0 5.7	9.2 5.7	34% 65%
Deposition ($g/m^2/yr$)	0.7	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	4.7 0.8	24 hour Annual	120 70	4% 1%	17.1 12.1	21.8 12.9	18% 18%
PM_{10}	3.0	24 hour	50	6%	13.1	16.1	32%
$PM_{2.5}$	0.3 0.0	24 hour Annual	27 8.8	1% <1%	9.0 5.7	9.3 5.7	35% 65%
Deposition ($g/m^2/yr$)	1.1	Annual	—	—	—	—	—
R3 – 4115 Highway 224 (Cottage on Crown land)							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	5.3 1.8	24 hour Annual	120 70	4% 3%	17.1 12.1	22.4 13.9	19% 20%
PM_{10}	3.0	24 hour	50	6%	13.1	16.1	32%
$PM_{2.5}$	0.3 0.0	24 hour Annual	27 8.8	1% <1%	9.0 5.7	9.3 5.7	35% 65%
Deposition ($g/m^2/yr$)	2.4	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	8.1 2.8	24 hour Annual	120 70	7% 4%	17.1 12.1	25.2 14.9	21% 21%
PM_{10}	4.5	24 hour	50	9%	13.1	17.6	35%
$PM_{2.5}$	0.5 0.1	24 hour Annual	27 8.8	2% <1%	9.0 5.7	9.5 5.8	35% 65%
Deposition ($g/m^2/yr$)	3.6	Annual	—	—	—	—	—

Table 8a

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – No Road Dust Mitigation

No Mitigation

R4 – 3492 Highway 224 (Hobbs Property)

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	67.9	24 hour	120	57%	17.1	85.0	71%
	104.3	Annual	70	149%	12.1	116.4	**166%**
PM_{10}	35.3	24 hour	50	71%	13.1	48.4	97%
$PM_{2.5}$	3.8	24 hour	27	14%	9.0	12.8	47%
	1.2	Annual	8.8	13%	5.7	6.9	78%
Deposition (g/m^2/yr)	135.2	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	102.6	24 hour	120	86%	17.1	119.7	100%
	157.7	Annual	70	225%	12.1	169.8	**243%**
PM_{10}	53.4	24 hour	50	107%	13.1	66.5	**133%**
$PM_{2.5}$	5.7	24 hour	27	21%	9.0	14.7	54%
	1.7	Annual	8.8	20%	5.7	7.4	85%
Deposition (g/m^2/yr)	204.5	Annual	—	—	—	—	—

R5 – 3379 Highway 224 (McLeod Property)

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	13.4	24 hour	120	11%	17.1	30.5	25%
	13.6	Annual	70	19%	12.1	25.7	37%
PM_{10}	7.1	24 hour	50	14%	13.1	20.2	40%
$PM_{2.5}$	0.8	24 hour	27	3%	9.0	9.8	36%
	0.2	Annual	8.8	2%	5.7	5.9	67%
Deposition (g/m^2/yr)	17.7	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	20.3	24 hour	120	17%	17.1	37.4	31%
	20.6	Annual	70	29%	12.1	32.7	47%
PM_{10}	10.8	24 hour	50	22%	13.1	23.9	48%
$PM_{2.5}$	1.2	24 hour	27	4%	9.0	10.2	38%
	0.2	Annual	8.8	3%	5.7	5.9	68%
Deposition (g/m^2/yr)	26.7	Annual	—	—	—	—	—

R6 - 3373 Highway 224

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	11.6	24 hour	120	10%	17.1	28.7	24%
	11.4	Annual	70	16%	12.1	23.5	34%
PM_{10}	6.2	24 hour	50	12%	13.1	19.3	39%
$PM_{2.5}$	0.7	24 hour	27	2%	9.0	9.7	36%
	0.1	Annual	8.8	2%	5.7	5.8	66%
Deposition (g/m^2/yr)	14.8	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	17.5	24 hour	120	15%	17.1	34.6	29%
	17.2	Annual	70	25%	12.1	29.3	42%
PM_{10}	9.3	24 hour	50	19%	13.1	22.4	45%
$PM_{2.5}$	1.0	24 hour	27	4%	9.0	10.0	37%
	0.2	Annual	8.8	2%	5.7	5.9	67%
Deposition (g/m^2/yr)	22.4	Annual	—	—	—	—	—

Table 8a

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – No Road Dust Mitigation

No Mitigation

R7 - Deepwood Estates Property

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	121.7	24 hour	120	101%	17.1	138.8	**116%**
	33.4	Annual	70	48%	12.1	45.5	65%
PM_{10}	61.8	24 hour	50	124%	13.1	74.9	**150%**
$PM_{2.5}$	6.6	24 hour	27	24%	9.0	15.6	58%
	2.1	Annual	8.8	23%	5.7	7.8	88%
Deposition (g/m^2/yr)	247.2	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	184.0	24 hour	120	153%	17.1	201.1	**168%**
	50.4	Annual	70	72%	12.1	62.5	89%
PM_{10}	93.4	24 hour	50	187%	13.1	106.5	**213%**
$PM_{2.5}$	9.9	24 hour	27	37%	9.0	18.9	70%
	3.1	Annual	8.8	35%	5.7	8.8	**100%**
Deposition (g/m^2/yr)	373.8	Annual	—	—	—	—	—

R8 - Musqudoboit Lumber Co Ltd. Property

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	21.0	24 hour	120	18%	17.1	38.1	32%
	4.9	Annual	70	7%	12.1	17.0	24%
PM_{10}	12.0	24 hour	50	24%	13.1	25.1	50%
$PM_{2.5}$	1.3	24 hour	27	5%	9.0	10.3	38%
	0.3	Annual	8.8	4%	5.7	6.0	69%
Deposition (g/m^2/yr)	34.9	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	31.8	24 hour	120	26%	17.1	48.9	41%
	7.5	Annual	70	11%	12.1	19.6	28%
PM_{10}	18.2	24 hour	50	36%	13.1	31.3	63%
$PM_{2.5}$	2.0	24 hour	27	7%	9.0	11.0	41%
	0.5	Annual	8.8	6%	5.7	6.2	70%
Deposition (g/m^2/yr)	52.7	Annual	—	—	—	—	—

R9 - 5579 Mooseland Road

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	56.8	24 hour	120	47%	17.1	73.9	62%
	15.2	Annual	70	22%	12.1	27.3	39%
PM_{10}	30.3	24 hour	50	61%	13.1	43.4	87%
$PM_{2.5}$	3.3	24 hour	27	12%	9.0	12.3	45%
	1.0	Annual	8.8	11%	5.7	6.7	76%
Deposition (g/m^2/yr)	109.3	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	85.9	24 hour	120	72%	17.1	103.0	86%
	23.1	Annual	70	33%	12.1	35.2	50%
PM_{10}	45.9	24 hour	50	92%	13.1	59.0	**118%**
$PM_{2.5}$	4.9	24 hour	27	18%	9.0	13.9	52%
	1.5	Annual	8.8	17%	5.7	7.2	82%
Deposition (g/m^2/yr)	165.3	Annual	—	—	—	—	—

Table 8b

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – 80% Road Dust Mitigation

80% Dust Mitigation							
R1 - 9 Beaver Dam Mines Road							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	9.1 13.0	24 hour Annual	120 70	8% 19%	17.1 12.1	26.2 25.1	22% 36%
PM_{10}	4.6	24 hour	50	9%	13.1	17.7	35%
$PM_{2.5}$	0.5 0.2	24 hour Annual	27 8.8	2% 2%	9.0 5.7	9.5 5.9	35% 66%
Deposition (g/m²/yr)	16.9	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	13.8 19.7	24 hour Annual	120 70	11% 28%	17.1 12.1	30.9 31.8	26% 45%
PM_{10}	7.0	24 hour	50	14%	13.1	20.1	40%
$PM_{2.5}$	0.8 0.2	24 hour Annual	27 8.8	3% 3%	9.0 5.7	9.8 5.9	36% 67%
Deposition (g/m²/yr)	25.5	Annual	—	—	—	—	—
R2 - 4112 Highway 224 (Beaver Lake IR)							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	0.6 0.1	24 hour Annual	120 70	<1% <1%	17.1 12.1	17.7 12.2	15% 17%
PM_{10}	0.4	24 hour	50	<1%	13.1	13.5	27%
$PM_{2.5}$	0.0 0.0	24 hour Annual	27 8.8	<1% <1%	9.0 5.7	9.0 5.7	33% 65%
Deposition (g/m²/yr)	0.1	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	0.9 0.2	24 hour Annual	120 70	<1% <1%	17.1 12.1	18.0 12.3	15% 18%
PM_{10}	0.6	24 hour	50	1%	13.1	13.7	27%
$PM_{2.5}$	0.1 0.0	24 hour Annual	27 8.8	<1% <1%	9.0 5.7	9.1 5.7	34% 65%
Deposition (g/m²/yr)	0.2	Annual	—	—	—	—	—
R3 – 4115 Highway 224 (Cottage on Crown land)							
Project Only							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	1.1 0.4	24 hour Annual	120 70	<1% <1%	17.1 12.1	18.2 12.5	15% 18%
PM_{10}	0.6	24 hour	50	1%	13.1	13.7	27%
$PM_{2.5}$	0.1 0.0	24 hour Annual	27 8.8	<1% <1%	9.0 5.7	9.1 5.7	34% 65%
Deposition (g/m²/yr)	0.5	Annual	—	—	—	—	—
Cumulative							
Contaminant	**Maximum Predicted Concentration (µg/m³)**	**Averaging Period**	**Assessment Criteria (µg/m³)**	**Percentage of Assessment Criteria (%)**	**Background Concentration (µg/m³)**	**Modelled Concentration and Background Concentration (µg/m³)**	**Percentage of Limit (%)**
Total Suspended Particulate	1.6 0.6	24 hour Annual	120 70	1% <1%	17.1 12.1	18.7 12.7	16% 18%
PM_{10}	0.9	24 hour	50	2%	13.1	14.0	28%
$PM_{2.5}$	0.1 0.0	24 hour Annual	27 8.8	<1% <1%	9.0 5.7	9.1 5.7	34% 65%
Deposition (g/m²/yr)	0.7	Annual	—	—	—	—	—

Table 8b

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – 80% Road Dust Mitigation

80% Dust Mitigation

R4 – 3492 Highway 224 (Hobbs Property)

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	13.6	24 hour	120	11%	17.1	30.7	26%
	20.9	Annual	70	30%	12.1	33.0	47%
PM_{10}	7.1	24 hour	50	14%	13.1	20.2	40%
$PM_{2.5}$	0.8	24 hour	27	3%	9.0	9.8	36%
	0.2	Annual	8.8	3%	5.7	5.9	67%
Deposition (g/m^2/yr)	27.0	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	20.5	24 hour	120	17%	17.1	37.6	31%
	31.5	Annual	70	45%	12.1	43.6	62%
PM_{10}	10.7	24 hour	50	21%	13.1	23.8	48%
$PM_{2.5}$	1.1	24 hour	27	4%	9.0	10.1	38%
	0.3	Annual	8.8	4%	5.7	6.0	69%
Deposition (g/m^2/yr)	40.9	Annual	—	—	—	—	—

R5 – 3379 Highway 224 (McLeod Property)

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	2.7	24 hour	120	2%	17.1	19.8	16%
	2.7	Annual	70	4%	12.1	14.8	21%
PM_{10}	1.4	24 hour	50	3%	13.1	14.5	29%
$PM_{2.5}$	0.2	24 hour	27	<1%	9.0	9.2	34%
	0.0	Annual	8.8	<1%	5.7	5.7	65%
Deposition (g/m^2/yr)	3.5	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	4.1	24 hour	120	3%	17.1	21.2	18%
	4.1	Annual	70	6%	12.1	16.2	23%
PM_{10}	2.2	24 hour	50	4%	13.1	15.3	31%
$PM_{2.5}$	0.2	24 hour	27	<1%	9.0	9.2	34%
	0.0	Annual	8.8	<1%	5.7	5.7	65%
Deposition (g/m^2/yr)	5.3	Annual	—	—	—	—	—

R6 - 3373 Highway 224

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	2.3	24 hour	120	2%	17.1	19.4	16%
	2.3	Annual	70	3%	12.1	14.4	21%
PM_{10}	1.2	24 hour	50	2%	13.1	14.3	29%
$PM_{2.5}$	0.1	24 hour	27	<1%	9.0	9.1	34%
	0.0	Annual	8.8	<1%	5.7	5.7	65%
Deposition (g/m^2/yr)	3.0	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	3.5	24 hour	120	3%	17.1	20.6	17%
	3.4	Annual	70	5%	12.1	15.5	22%
PM_{10}	1.9	24 hour	50	4%	13.1	15.0	30%
$PM_{2.5}$	0.2	24 hour	27	<1%	9.0	9.2	34%
	0.0	Annual	8.8	<1%	5.7	5.7	65%
Deposition (g/m^2/yr)	4.5	Annual	—	—	—	—	—

Table 8b

Particulate Modelling Results at Sensitive Receptors for Project Only and Cummulative Truck Traffic Scenarios – 80% Road Dust Mitigation

80% Dust Mitigation

R7 - Deepwood Estates Property

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	24.3	24 hour	120	20%	17.1	41.4	35%
	6.7	Annual	70	10%	12.1	18.8	27%
PM_{10}	12.4	24 hour	50	25%	13.1	25.5	51%
$PM_{2.5}$	1.3	24 hour	27	5%	9.0	10.3	38%
	0.4	Annual	8.8	5%	5.7	6.1	69%
Deposition (g/m^2/yr)	49.4	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	36.8	24 hour	120	31%	17.1	53.9	45%
	10.1	Annual	70	14%	12.1	22.2	32%
PM_{10}	18.7	24 hour	50	37%	13.1	31.8	64%
$PM_{2.5}$	2.0	24 hour	27	7%	9.0	11.0	41%
	0.6	Annual	8.8	7%	5.7	6.3	72%
Deposition (g/m^2/yr)	74.8	Annual	—	—	—	—	—

R8 - Musqudoboit Lumber Co Ltd. Property

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	4.2	24 hour	120	4%	17.1	21.3	18%
	1.0	Annual	70	1%	12.1	13.1	19%
PM_{10}	2.4	24 hour	50	5%	13.1	15.5	31%
$PM_{2.5}$	0.3	24 hour	27	<1%	9.0	9.3	34%
	0.1	Annual	8.8	<1%	5.7	5.8	66%
Deposition (g/m^2/yr)	7.0	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	6.4	24 hour	120	5%	17.1	23.5	20%
	1.5	Annual	70	2%	12.1	13.6	19%
PM_{10}	3.6	24 hour	50	7%	13.1	16.7	33%
$PM_{2.5}$	0.4	24 hour	27	1%	9.0	9.4	35%
	0.1	Annual	8.8	1%	5.7	5.8	66%
Deposition (g/m^2/yr)	10.5	Annual	—	—	—	—	—

R9 - 5579 Mooseland Road

Project Only

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	11.4	24 hour	120	9%	17.1	28.5	24%
	3.0	Annual	70	4%	12.1	15.1	22%
PM_{10}	6.1	24 hour	50	12%	13.1	19.2	38%
$PM_{2.5}$	0.7	24 hour	27	2%	9.0	9.7	36%
	0.2	Annual	8.8	2%	5.7	5.9	67%
Deposition (g/m^2/yr)	21.9	Annual	—	—	—	—	—

Cumulative

Contaminant	Maximum Predicted Concentration (µg/m^3)	Averaging Period	Assessment Criteria (µg/m^3)	Percentage of Assessment Criteria (%)	Background Concentration (µg/m^3)	Modelled Concentration and Background Concentration (µg/m^3)	Percentage of Limit (%)
Total Suspended Particulate	17.2	24 hour	120	14%	17.1	34.3	29%
	4.6	Annual	70	7%	12.1	16.7	24%
PM_{10}	9.2	24 hour	50	18%	13.1	22.3	45%
$PM_{2.5}$	1.0	24 hour	27	4%	9.0	10.0	37%
	0.3	Annual	8.8	3%	5.7	6.0	68%
Deposition (g/m^2/yr)	33.1	Annual	—	—	—	—	—

Table 8C

Gaseous Compounds Modelling Results at Residential Receptors
Project Only Truck Traffic
Beaver Dam, Nova Scotia

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Combined Effect[(a)] ($\mu g/m^3$)	Percentage of Assessment Criteria for Combined Effect (%)
			Project Only				
R1 – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)							
NO_2	1-hour	78.96	6.37	8%	9.40	15.77	20%
	24-hour	200	1.03	1%	17.00	18.03	9%
	Annual	22.56	0.30	1%	3.30	3.60	16%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.27	-	-	-	-
	24-hour	-	0.04	-	-	-	-
	Annual	-	0.01	-	-	-	-
R2 – 4112 Highway 224 (Beaver Lake IR 17)							
NO_2	1-hour	78.96	6.17	8%	9.40	15.57	20%
	24-hour	200	0.46	0%	17.00	17.46	9%
	Annual	22.56	0.07	0%	3.30	3.37	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.02	-	-	-	-
	Annual	-	0.00	-	-	-	-
R3 – 4115 Highway 224 (Cottage on Crown Land)							
NO_2	1-hour	78.96	3.99	5%	9.40	13.39	17%
	24-hour	200	0.41	0%	17.00	17.41	9%
	Annual	22.56	0.10	0%	3.30	3.40	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.17	-	-	-	-
	24-hour	-	0.02	-	-	-	-
	Annual	-	0.00	-	-	-	-
R4 – 3492 Highway 224 (Hobbs Property)							
NO_2	1-hour	78.96	11.93	15%	9.40	21.33	27%
	24-hour	200	2.74	1%	17.00	19.74	10%
	Annual	22.56	0.84	4%	3.30	4.14	18%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.50	-	-	-	-
	24-hour	-	0.11	-	-	-	-
	Annual	-	0.03	-	-	-	-
R5 – 3379 Highway 224 (McLeod Property)							
NO_2	1-hour	78.96	6.31	8%	9.40	15.71	20%
	24-hour	200	0.69	0%	17.00	17.69	9%
	Annual	22.56	0.18	1%	3.30	3.48	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.01	-	-	-	-
R6 – 3373 Highway 224 (Smith Property)							
NO_2	1-hour	78.96	6.27	8%	9.40	15.67	20%
	24-hour	200	0.63	0%	17.00	17.63	9%
	Annual	22.56	0.16	1%	3.30	3.46	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.01	-	-	-	-

Table 8C

Gaseous Compounds Modelling Results at Residential Receptors
Project Only Truck Traffic
Beaver Dam, Nova Scotia

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Combined Effect[a] ($\mu g/m^3$)	Percentage of Assessment Criteria for Combined Effect (%)
			Project Only				
R7 – Tangier River (Deepwood Estates Property)[b]							
NO_2	1-hour	78.96	13.29	17%	9.40	22.69	29%
	24-hour	200	4.43	2%	17.00	21.43	11%
	Annual	22.56	1.37	6%	3.30	4.67	21%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.55	-	-	-	-
	24-hour	-	0.18	-	-	-	-
	Annual	-	0.06	-	-	-	-
R8 – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)							
NO_2	1-hour	78.96	8.00	10%	9.40	17.40	22%
	24-hour	200	1.17	1%	17.00	18.17	9%
	Annual	22.56	0.30	1%	3.30	3.60	16%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.33	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.01	-	-	-	-
R9 – 5579 Mooseland Road (Lloy Property)							
NO_2	1-hour	78.96	9.16	12%	9.40	18.56	24%
	24-hour	200	2.93	1%	17.00	19.93	10%
	Annual	22.56	0.87	4%	3.30	4.17	18%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.38	-	-	-	-
	24-hour	-	0.12	-	-	-	-
	Annual	-	0.03	-	-	-	-

Table 8D

Gaseous Compounds Modelling Results at Residential Receptors
Cumulative Truck Traffic
Beaver Dam, Nova Scotia

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Cumulative Combined Effect[(a)] ($\mu g/m^3$)	Cumulative Percentage of Assessment Criteria for Combined Effect (%)
R1 – 9 Beaver Dam Mines Road (Marlborough/Goodland Property)							
NO_2	1-hour	78.96	9.65	12%	9.40	19.05	24%
	24-hour	200	1.56	1%	17.00	18.56	9%
	Annual	22.56	0.45	2%	3.30	3.75	17%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.41	-	-	-	-
	24-hour	-	0.06	-	-	-	-
	Annual	-	0.02	-	-	-	-
R2 – 4112 Highway 224 (Beaver Lake IR 17)							
NO_2	1-hour	78.96	9.35	12%	9.40	18.75	24%
	24-hour	200	0.70	0%	17.00	17.70	9%
	Annual	22.56	0.11	0%	3.30	3.41	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.00	-	-	-	-
R3 – 4115 Highway 224 (Cottage on Crown Land)							
NO_2	1-hour	78.96	6.05	8%	9.40	15.45	20%
	24-hour	200	0.62	0%	17.00	17.62	9%
	Annual	22.56	0.15	1%	3.30	3.45	15%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.26	-	-	-	-
	24-hour	-	0.03	-	-	-	-
	Annual	-	0.00	-	-	-	-
R4 – 3492 Highway 224 (Hobbs Property)							
NO_2	1-hour	78.96	18.08	23%	9.40	27.48	35%
	24-hour	200	4.15	2%	17.00	21.15	11%
	Annual	22.56	1.27	6%	3.30	4.57	20%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.76	-	-	-	-
	24-hour	-	0.17	-	-	-	-
	Annual	-	0.05	-	-	-	-
R5 – 3379 Highway 224 (McLeod Property)							
NO_2	1-hour	78.96	9.56	12%	9.40	18.96	24%
	24-hour	200	1.05	1%	17.00	18.05	9%
	Annual	22.56	0.27	1%	3.30	3.57	16%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.02	-	-	-	-
R6 – 3373 Highway 224 (Smith Property)							
NO_2	1-hour	78.96	9.50	12%	9.40	18.90	24%
	24-hour	200	0.95	0%	17.00	17.95	9%
	Annual	22.56	0.24	1%	3.30	3.54	16%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.39	-	-	-	-
	24-hour	-	0.05	-	-	-	-
	Annual	-	0.02	-	-	-	-

Table 8D

Gaseous Compounds Modelling Results at Residential Receptors
Cumulative Truck Traffic
Beaver Dam, Nova Scotia

Parameter	Averaging Period	Assessment Criteria (Air Quality Standard) ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Combined Effect[a] ($\mu g/m^3$)	Percentage of Assessment Criteria for Combined Effect (%)
			Cumulative				
R7 – Tangier River (Deepwood Estates Property)[b]							
NO_2	1-hour	78.96	20.14	26%	9.40	29.54	37%
	24-hour	200	6.71	3%	17.00	23.71	12%
	Annual	22.56	2.08	9%	3.30	5.38	24%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.83	-	-	-	-
	24-hour	-	0.27	-	-	-	-
	Annual	-	0.09	-	-	-	-
R8 – Tangier River (Musquodoboit Lumber Co Ltd. Property/John Dickson Lease)							
NO_2	1-hour	78.96	12.12	15%	9.40	21.52	27%
	24-hour	200	1.77	1%	17.00	18.77	9%
	Annual	22.56	0.45	2%	3.30	3.75	17%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.50	-	-	-	-
	24-hour	-	0.08	-	-	-	-
	Annual	-	0.02	-	-	-	-
R9 – 5579 Mooseland Road (Lloy Property)							
NO_2	1-hour	78.96	13.88	18%	9.40	23.28	29%
	24-hour	200	4.44	2%	17.00	21.44	11%
	Annual	22.56	1.32	6%	3.30	4.62	20%
SO_2	1-hour	170.3	0.00	<1%	7.90	7.90	5%
	24-hour	300	0.00	<1%	5.20	5.20	2%
	Annual	10.48	0.00	<1%	1.90	1.90	18%
VOCs	1-hour	-	0.58	-	-	-	-
	24-hour	-	0.18	-	-	-	-
	Annual	-	0.05	-	-	-	-

Table 9A1

Estimated Maximum Particulate Concentrations at the Beaver Dam Mine Site
Option A - Crusher with no Mitigation

Beaver Dam Mine Site

Contaminant	Maximum Predicted Concentration ($\mu g/m^3$)	Averaging Period	Assessment Criteria ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Modelled Concentration and Background Concentration ($\mu g/m^3$)	Percentage of Limit (%)
Total Suspended Particulate	276.8	24 hour	120	231%	17.1	293.9	**245%**
	105.1	Annual	70	150%	12.1	117.2	**167%**
PM_{10}	129.2	24 hour	50	258%	13.1	142.3	**285%**
$PM_{2.5}$	15.3	24 hour	27	56%	9.0	24.3	90%
	6.5	Annual	8.8	74%	5.7	12.2	**138%**
Deposition (g/m2/year)	483.2	Annual	-	-	-	-	-

Table 9A2

Estimated Maximum Particulate Concentrations at the Beaver Dam Mine Site
Option A - Crusher with Mitigation for Crusher, Conveyors and Roads

Beaver Dam Mine Site

Contaminant	Maximum Predicted Concentration ($\mu g/m^3$)	Averaging Period	Assessment Criteria ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Modelled Concentration and Background Concentration ($\mu g/m^3$)	Percentage of Limit (%)
Total Suspended Particulate	55.4	24 hour	120	46%	17.1	72.5	60%
	21.0	Annual	70	30%	12.1	33.1	47%
PM_{10}	25.9	24 hour	50	52%	13.1	39.0	78%
$PM_{2.5}$	2.9	24 hour	27	11%	9.0	11.9	44%
	1.2	Annual	8.8	14%	5.7	6.9	79%
Deposition (g/m2/year)	96.7	Annual	-	-	-	-	-

Table 9B1

Estimated Maximum Particulate Concentrations at the Beaver Dam Mine Site
Option B - Blasting - No Mitigation

Beaver Dam Mine Site

Contaminant	Maximum Predicted Concentration ($\mu g/m^3$)	Averaging Period	Assessment Criteria ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Modelled Concentration and Background Concentration ($\mu g/m^3$)	Percentage of Limit (%)
Total Suspended Particulate	276.9	24 hour	120	231%	17.1	294.0	**245%**
	105.1	Annual	70	150%	12.1	117.2	**167%**
PM_{10}	128.8	24 hour	50	258%	13.1	141.9	**284%**
$PM_{2.5}$	14.5	24 hour	27	54%	9.0	23.5	87%
	6.2	Annual	8.8	70%	5.7	11.9	**135%**
Deposition (g/m2/year)	4832.2	Annual	-	-	-	-	**-**
NO2	65.3	1-hour	400	16%	9.4	74.7	19%
NO2	65.3	1-hour (CAAQS 2020)	112.9	58%	9.4	74.7	66%
NO2	65.3	1-hour (CAAQS 2025)	79	83%	9.4	74.7	95%
NO2	0.4	24 hour	200	<1%	17.0	17.4	9%
NO2	0.0	Annual	100	<1%	3.3	3.3	3%
NO2	0.0	Annual (CAAQS 2020)	32	<1%	3.3	3.3	10%
NO2	0.0	Annual (CAAQS 2025)	22.6	<1%	3.3	3.3	15%
CO	386.6	1/2 hour	6000	6%	834	1220.8	20%
CO	318.4	1-hour	34600	<1%	687	1005.4	3%
CO	177.9	8-hour	12700	1%	384	561.7	4%
SO_2	9.4	1-hour	900	1%	7.9	17.3	2%
SO_2	0.1	24-hour	300	<1%	5.2	5.3	2%
SO_2	0.0	Annual	60	<1%	1.9	1.9	3%

Table 9B2

Estimated Maximum Particulate Concentrations at the Beaver Dam Mine Site
Option B - Blasting with Mitigation for Conveyors and Roads

Beaver Dam Mine Site

Contaminant	Maximum Predicted Concentration [(1)] ($\mu g/m^3$)	Averaging Period	Assessment Criteria ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Modelled Concentration and Background Concentration ($\mu g/m^3$)	Percentage of Limit (%)
Total Suspended Particulate	55.3	24 hour	120	46%	17.1	72.4	60%
	21.0	Annual	70	30%	12.1	33.1	47%
PM_{10}	25.9	24 hour	50	52%	13.1	39.0	78%
$PM_{2.5}$	2.9	24 hour	27	11%	9.0	11.9	44%
	1.2	Annual	8.8	14%	5.7	6.9	79%
Deposition (g/m2/year)	96.5	Annual	-	-	-	-	-
NO2	65.3	1-hour	400	16%	9.4	74.7	19%
NO2	65.3	1-hour (CAAQS 2020)	112.9	58%	9.4	74.7	66%
NO2	65.3	1-hour (CAAQS 2025)	79	83%	9.4	74.7	95%
NO2	0.4	24 hour	200	<1%	17.0	17.4	9%
NO2	0.014	Annual	100	<1%	3.3	3.3	3%
NO2	0.014	Annual (CAAQS 2020)	32	<1%	3.3	3.3	10%
NO2	0.014	Annual (CAAQS 2025)	22.6	<1%	3.3	3.3	15%
CO	386.6	1/2 hour	6000	6%	834	1220.8	20%
CO	318.4	1-hour	34600	<1%	687	1005.4	3%
CO	177.9	8-hour	12700	1%	384	561.7	4%
SO_2	9.4	1-hour	900	1%	7.9	17.3	2%
SO_2	0.1	24-hour	300	<1%	5.2	5.3	2%
SO_2	0.0019	Annual	60	<1%	1.9	1.9	3%

[(1)] Meteorological anomalies have been removed.

Table 9C

Estimated Maximum Particulate Concentrations at the Touquoy Mine Site

Touquoy Mine Site

Contaminant	Maximum Predicted Concentration ($\mu g/m^3$)	Averaging Period	Assessment Criteria ($\mu g/m^3$)	Percentage of Assessment Criteria (%)	Background Concentration ($\mu g/m^3$)	Modelled Concentration and Background Concentration ($\mu g/m^3$)	Percentage of Limit (%)
Total Suspended Particulate	3.1	24 hour	120	3%	17.1	20.2	17%
	1.1	Annual	70	2%	12.1	13.2	19%
PM_{10}	3.1	24 hour	50	6%	13.1	16.2	32%
$PM_{2.5}$	1.3	24 hour	27	5%	9.0	10.3	38%
	0.4	Annual	8.8	5%	5.7	6.1	70%

Appendix A

Material Safety Data Sheet

DYNO
Dyno Nobel

MATERIAL SAFETY DATA SHEET
DYNO NOBEL INC.
11TH FLOOR CROSSROADS TOWER
SALT LAKE CITY, UTAH 84144
PHONE: 801-364-4800 FAX: 801-328-6452
E-MAIL: DNNA.HSE@AM.DYNONOBEL.COM
FOR 24 HOUR EMERGENCY CALL 800-424-9300

MSDS# 1052

DATE: 11/11/03

Supersedes MSDS
1052 05/09/03

SECTION I - PRODUCT IDENTIFICATION

Trade Name(s): DYNO GOLD® C, DYNOGOLD® C EXTRA
DYNO GOLD® C LITE, DYNO GOLD® C LITE SUPER
DYNO GOLD® CS LITE
DYNO GOLD®, DYNO GOLD® LITE
DYNO GOLD® B, DYNO GOLD® B LITE
HD
1116, 1126P, 1136P, 1146P
IREMEX 362, IREMEX 562, IREMEX 762, IREMEX 764
RJ5
RG1-A
RUG-1 (Canada Only)
DX 5007; DX 5010
TITAN® XL 1000
TITAN® 1000, TITAN® 1000 G

Product Class: Bulk Emulsion
Product Appearance & Odor: Translucent to opaque, viscous liquid. May be silvery in color. May have fuel odor.
DOT Hazard Shipping Description: As Transported:
Oxidizing Liquid, n.o.s. (Ammonium Nitrate) 5.1 UN3139 II
After Blending with Density Control Agent On-site:
Explosive, Blasting, Type E 1.5D UN0332 II

NFPA Hazard Classification: Not Applicable (See Section IV - Special Fire Fighting Procedures)

SECTION II - HAZARDOUS INGREDIENTS

Ingredients:	CAS#	% (Range)	TLV-ACGIH
Ammonium Nitrate	6484-52-2	30-80	No Value Established
Sodium Nitrate	7631-99-4	0-15	No Value Established
Calcium Nitrate	10124-37-5	0-35	No Value Established
Fuel Oil	68476-34-6	0-10	No Value Established
Mineral Oil	64742-35-4	0-7	5 mg/m^3
Aluminum *	7429-90-5	0-5	10 mg/m^3

* The hazardous ingredients marked with an asterisk are not found in the majority of listed products.

Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations.

SECTION III - PHYSICAL DATA

Boiling Point: Not Applicable

Vapor Pressure: Not Applicable

Vapor Density: (Air = 1) Not Applicable

Density: 0.8 - 1.5 g/cc

Percent Volatile by Volume: <30

Solubility in Water: Nitrate salts are completely soluble, but emulsion dissolution is very slow.

Evaporation Rate (Butyl Acetate = 1): <1

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable **Flammable Limits:** Not Applicable

Extinguishing Media: (See Special Fire Fighting Procedures Section)

Special Fire Fighting Procedures: Do not attempt to fight fires involving explosive materials or emulsion explosive precursors. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.

Unusual Fire and Explosion Hazards: May explode or detonate under fire conditions. Burning material may produce toxic vapors.

SECTION V - HEALTH HAZARD DATA

Effects of Overexposure

Eyes: Can cause irritation, redness and tearing.

Skin: Prolonged contact may cause irritation.

Ingestion: Large amounts may be harmful if swallowed.

Inhalation: May cause dizziness, nausea or intestinal upset.

Systemic or Other Effects: None known.

Emergency and First Aid Procedures

Eyes: Irrigate with running water for at least fifteen minutes. If irritation persists, seek medical attention.

Skin: Remove contaminated clothing. Wash with soap and water.

Ingestion: Seek medical attention.

Inhalation: Remove to fresh air. If irritation persists, seek medical attention.

Special Considerations: None.

SECTION VI - REACTIVITY DATA

Stability: Stable under normal conditions. May explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Conditions to Avoid: Keep away from heat, flame, ignition sources and strong shock.

Materials to Avoid (Incompatibility): Corrosives (strong acids and strong bases or alkalis).

Hazardous Decomposition Products: Nitrogen Oxides (NO_X), Carbon Monoxide (CO)

Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in Case Material is Released or Spilled: Protect from all ignition sources. In case of fire evacuate area not less than 2,500 feet in all directions. Notify authorities in accordance with emergency response procedures. Only personnel trained in emergency response should respond. If no fire danger is present, and product is undamaged and/or uncontaminated, repackage product in original packaging or other clean DOT approved container. Ensure that a complete account of product has been made and is verified. Follow applicable Federal, State and local spill reporting requirements.

Waste Disposal Method: Disposal must comply with Federal, State and local regulations. If product becomes a waste, it is potentially regulated as a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR, part 261. Review disposal requirements with a person knowledgeable with applicable environmental law (RCRA) before disposing of any explosive material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: Not required for normal handling.

Respiratory Protection: None normally required.

Protective Clothing: Gloves and work clothing that reduce skin contact are suggested.

Eye Protection: Safety glasses are recommended.

Other Precautions Required: None.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storage: Store in cool, dry, well-ventilated location. Store in compliance with Federal, State and local regulations. Keep away from heat, flame, ignition sources and strong shock.

Precautions to be taken during use: Avoid breathing the fumes or gases from detonation of explosives. Use accepted safe industry practices when using explosive materials. Unintended detonation of explosives or explosive devices can cause serious injury or death.

Other Precautions: It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications.

SECTION X - SPECIAL INFORMATION

The reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 may become applicable if the physical state of this product is changed to an aqueous solution. If an aqueous solution of this product is manufactured, processed, or otherwise used, the nitrate compounds category and ammonia listings of the previously referenced regulation should be reviewed.

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GHD

ATTACHMENT CEAA 2-31-B:

UPDATED NOISE ASSESSMENT TECHNICAL REPORT (GHD), NOVEMBER 19, 2021

Updated Noise Impact Assessment Technical Report

Atlantic Mining NS Inc.
Beaver Dam Mine Project
Nova Scotia

Atlantic Mining NS Inc.

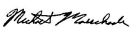
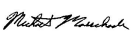
November 19, 2021

→ The Power of Commitment

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1. Introduction

GHD Limited (GHD) updated the Noise Impact Study (GHD 2018) for the Beaver Dam Mine Project (Project), based on updates to the project description (AMNS 2021a) and in responses to information requests (IRs) (CEAA 2019). This Updated Noise Impact Assessment Technical Report summarizes updated noise modelling results, assessments, and mitigation measures, based on the current infrastructure design, planned operations, and schedule for the Project. The effects of the following key project changes are summarized in this report:

– Duration of Construction Phase reduced to <1 year (previously 1 to 2 years)
– Duration of Operation Phase extended to 5 years (previously 3 to 4 years)
– Maximum daily volume of truck traffic on the haul road updated
– Updated minor alignments of the haul road to avoid environmentally sensitive areas
– Updated Touquoy Mine Site Property line
– Two options for raw material processing considered at the Beaver Dam Mine Site (Option A: jaw crusher at crusher pad; and Option B: secondary blasting and rock breaking in the pit)
– Addition of unmitigated and mitigated noise impacts for Options A and B at the Beaver Dam Mine Site

The specific noise related IRs from the Canadian Environmental Effects Assessment Agency (CEAA) 2019 review (CEAA 2019) are included in Table 1.1.

Table 1.1 Canadian Environmental Assessment Agency Round 2, Part 1 Information Requests

Information Request Reference Number	Regulatory Agency/Indigenous Community/Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
CEAA-2-27	CEAA, KMKNO, ESFW, Save Caribou	Section 8.5 Cumulative Effects Assessment of the Valued Components	Section 8 of the revised EIS does not contain a cumulative effects assessment for noise.	Provide a cumulative effects assessment for noise, including the reasonably foreseeable projects: Fifteen Mile Stream Gold and Cochrane Hill Gold Projects.	Section 3.3
CEAA-2-27	CEAA, KMKNO, ESFW, Save Caribou	Section 8.5 Cumulative Effects Assessment of the Valued Components	The proponent states that residual adverse effects from noise will remain after the application of mitigations. Residual effects of other past, present and reasonably foreseeable projects noted in the revised EIS have the potential to interact with the residual effects of the Beaver Dam Mine Project, both spatially and temporally (Table 8.4-4). Specifically, the proposed Beaver Dam Mine, Fifteen Mile	Provide a worst-case scenario for noise along the Haul Road in consideration of Beaver Dam, Fifteen Mile Stream Gold, and Cochrane Hill Gold Projects and forestry operations.	Section 3.3

Information Request Reference Number	Regulatory Agency/Indigenous Community/Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
			Stream Gold and Cochrane Hill Gold Projects will be operating concurrently and using the same Haul Roads to transport ore to the existing Touquoy Mine and Facility for final processing.		
CEAA-2-27	CEAA, KMKNO, ESFW, Save Caribou	Section 8.5 Cumulative Effects Assessment of the Valued Components	The proponent's rationale for not carrying noise into the cumulative effects assessment is that the residual effects from noise are anticipated to revert back to baseline conditions upon completion of the Project. The Agency notes that noise levels were close to or exceeded thresholds during the assessment of direct Project effects. As such, the Agency requires that noise be carried forward into the cumulative effects assessment. In addition to Fifteen Mile Stream Gold and Cochrane Hill Gold Projects, the proponent has identified forestry operations as an ongoing project in the area. Although sporadic, the proponent indicated that there is a potential for cumulative effects between forestry and the other mining projects, and stated that an overlap of these projects will likely occur.	Update the direct and cumulative effects assessment of related valued components as appropriate and include additional mitigation to reflect this scenario.	Section 3.3
CEAA-2-30	HC	Section 6.1.9, p223; Appendix B.1 - Section 2.0 Methodology	The EIS states that during construction "noise will be elevated above baseline for limited periods but for a short duration (12-24 months)". According to Section 6.3.1 of Health Canada (2016),	Provide a quantitative evaluation of construction noise as operational noise using the approach described in Health Canada (2016) given the expected duration of the	GHD 2021 (Technical Memorandum - Beaver Dam Mine Construction Noise Assessment)

Information Request Reference Number	Regulatory Agency/Indigenous Community/Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
			construction noise lasting longer than one year should be assessed as operational noise. The methods to evaluate operational noise are also presented in Health Canada (2016). Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.	construction phase (up to 2 years).	
CEAA-2-31	HC	Appendix B.1 Section 6.1; Section 6.1.3.2, p211	Noise Given that the Nova Scotia (NSE) Noise Guidelines are intended not only for dwellings but also for recreational areas, any area used for recreational or traditional purposes by Indigenous peoples located closer to the project site should be included in the noise assessment. This is particularly relevant because of the predicted exceedances of the provincial noise guidelines at the Beaver Dam Mine site property boundary.	Provide further justification for the conclusion that the noise limits in the NSE Pit and Quarry Guidelines (1999) are not valid at the property boundary of the Beaver Dam Mine Site.	Section 3.2
CEAA-2-31	HC	Appendix B.1 - Section 6.2	In terms of noise, section 6.1 of Appendix B.1 states that "the Nova Scotia Guidelines for Environmental Noise Measurement and Assessment state that their guideline limit values are intended to be applied where people normally live, work, or take part in recreation". According to section 6.1.7.3 of the EIS, "activities in the project site area include recreational use (hunting, ATVs, etc.)". According to	Provide additional mitigation measures that reduce noise at the property boundary given the predicted exceedances.	Section 3.2, Section 4

Information Request Reference Number	Regulatory Agency/Indigenous Community/Public Community	Revised EIS Reference	Context and Rationale	The Proponent is Required to …	Information Request Response Location
			Table 6.14-1, "Mi'kmaq families also enjoy camps in the area for recreational purposes."		
CEAA-2-31	HC	Section 6.2.6.4, p235	Additionally, the EIS states that "the highest predicted noise levels at the property boundaries of the Beaver Dam Mine Site exceed the criteria NSE Pit and Quarry Guidelines (1999) for all time periods…. While the limits stated in these guidelines are clear and specific, they are not considered practical to meet for open pit mines with operations located close to property lines."	Update any monitoring or follow up programs at the property boundary to verify predicted noise levels and evaluate the level of conservatism used in the modelling.	Section 3.2
CEAA-2-32	HC	Section 2.3.2.2, p127	Section 6.1.8 states that "traffic on the Haul Road will generally be restricted to 16 hours per day during the operational phase. This will minimize noise along the Haul Road during evening hours."	Confirm that the truck traffic for the noise assessment has been adjusted to reflect 16 hours rather than 12 hours. If noise levels are likely to be elevated during the evening/overnight period, provide a discussion of any additional mitigation measures that may be employed to reduce noise levels at the nearest receptor locations.	Section 3.2

Source: CEAA (2019), AMNS (2021b).

2. Noise Assessment Methodology Update

The acoustic modelling has been updated to reflect the current infrastructure for the Project and current estimates of truck traffic on the Haul Road, which are provided in Appendix B. The updated noise analysis results presented herein include all sensitive receptors (i.e., human receptors – seasonal and permanent dwellings) locations (R1 to R9). Specific non-residential locations of traditional land use and recreation have not been identified for inclusion in the analysis; however, it is understood that traditional and recreational uses such as hunting may occur in areas close to the Project Area. The noise isopleths provided in Figures 3A to 3Q indicate the predicted noise levels produced by the Project.

Figures 3A and 3B are used to assess the effects on traditional uses and wildlife (AMNS 2021a, Sections 6.12 to 6.17).

The updated analysis also includes the effects of haul truck traffic from the Project only (Direct Effects), and haul truck traffic on the Haul Road from other projects as well as forestry operations (Cumulative Effects).

2.1 Construction Phase

This Technical Report does not contain a detailed assessment of noise impacts resulting from the Construction Phase of the Project, which now has a planned duration of less than one year (i.e., short duration). A separate Technical Memorandum has been prepared to summarize the noise assessment of the Construction Phase (GHD 2021).

2.2 Operation Phase

The equipment and activities planned for the Operation Phase have been assessed with respect to the applicable Nova Scotia Environment and Labour (NSEL) noise guidelines (NSEL 1990, NSEL 1999). The NSEL (1990) guidelines apply to sensitive receptors, and at property lines of mine sites and the Haul Road.

2.2.1 Sensitive Receptors

Predicted noise impacts during the Operation Phase were assessed at all of the sensitive receptors (i.e., human receptors – seasonal and permanent dwellings) using the NSEL "Guidelines for Environmental Noise Measurement and Assessment" (NSEL 1990). This guideline includes the following criteria:

– $L_{eq} \leq 65$ dBA between 7:00 AM and 7:00 PM
– $L_{eq} \leq 60$ dBA between 7:00 PM and 11:00 PM
– $L_{eq} \leq 55$ dBA between 11:00 PM and 7:00 AM

Nine worst-case sensitive receptors (i.e., human receptors – seasonal and permanent dwellings) receptor locations have been identified for assessment (R1 to R9). These receptor locations are listed below and shown in Figures 1A to 1D:

– R1 – 9 Beaver Dam Mine Road (Marlborough Property)
– R2 – 4112 Highway 224 (Beaver Lake IR 17)
– R3 – 4115 Highway 224 (Cottage on Crown Land)
– R4 – 3492 Highway 224 (Hobbs Property)
– R5 – 3379 Highway 224 (McLeod Property)
– R6 – 3373 Highway 224 (Smith Property)
– R7 – Tangier River (Deepwood Estates Property)
– R8 – Tanger River (Musqudoboit Lumber Co. Ltd. Property/John Dickson Lease)
– R9 – 5579 Mooseland Road (Lloy Property)

2.2.2 Property Lines

Predicted noise levels were also evaluated at the property lines for the Operation Phase. The NSEL regulates noise levels at the property lines of mines using noise level limits contained in the "Pit and Quarry Guidelines" (NSEL 1999). The noise level criteria contained in this guideline are as follows:

– $L_{eq} \leq 65$ dBA between 7:00 AM and 7:00 PM
– $L_{eq} \leq 60$ dBA between 7:00 PM and 11:00 PM
– $L_{eq} \leq 55$ dBA between 11:00 PM and 7:00 AM

2.2.3 Haul Roads – Direct and Cumulative Effects

Direct impacts from the Project and Cumulative Effects have been analysed to evaluate the total cumulative noise levels from Project truck traffic on the Haul Road, as well as truck traffic associated with other projects and industries.

Trucks transporting gold concentrate from the Cochrane Hill and Fifteen Mile Stream mine sites (both more than 15 km from the Project) to the Touquoy Mine Site will pass through the Project Area, and have the potential to increase the cumulative noise levels at the receptors along the Haul Road. Truck traffic from forestry industry operations in the area is also expected to operate on the Haul Road.

Direct impacts from the Project and cumulative truck traffic was evaluated to determine potential noise impacts on receptors, using the criteria for sensitive receptors presented in Section 2.2.1.

3. Project Activities and Noise Assessment Update

The Project will operate as a satellite open pit mine. Crushed ore from the Project will be transported by truck via the Haul Road to the existing and fully permitted Touquoy Mine. Processing of ore from the Beaver Dam gold deposit at the existing the Beaver Dam Mine Site is anticipated to begin construction in 2022, come into production in 2023, cease operations in 2027 and then be reclaimed.

The Touquoy Mine is currently in operation and has been assessed as such. The primary effect of the continued use of the Touquoy Mine Site is the continued generation of noise due to haul truck traffic on the site, and processing of ore from the proposed Beaver Dam Mine. There are no new or additional effects from noise anticipated to be caused by the processing of ore and the management of tailings (exhausted pit) from the Project, as no new construction or disturbance, aside from upgrades to the process plant, is required at the Touquoy Mine related to the processing of ore from the Beaver Dam Mine Site.

Relevant Project activities during the Operation Phase is summarized in Table 3.1.

Table 3.1 Potential Noise Interactions with Project Activities During the Operation Phase

Location	Duration	Relevant Project Activity
Beaver Dam Mine Site	5 years	• Rock blasting to access and extract ore • Management of waste rock produced from crushing and/or blasting and preparing ore for transport • Petroleum products management • Site maintenance and repairs • Equipment to power lighting at Mine and along roads • General management of wastes derived from operation activities
Along Haul Road	5 years	• Ore transport • Road lighting • Equipment to power lighting at Mine Sites and along road • Haul road maintenance and repairs
Touquoy Mine Site	5 years	• Ore management and processing • Lighting equipment for on-site facilities and Mine roads

There are two alternatives currently under consideration by Atlantic Mining NS Inc. (AMNS) for the processing of raw materials at the Beaver Dam Mine Site during the Operation Phase. These alternatives are summarized as follows:

– **Option A:** A jaw crusher (noise model source ID: S120) will be used at the crusher pad of the Beaver Dam Mine. This is consistent with the project activities summarized in this Technical Report.
– **Option B:** Mined material from the pit will be further processed with additional blasting and rock breaking using an excavator-mounted rock breaker, without the need for a crusher at the Beaver Dam Mine. As per the NSEL Pit and Quarry Guidelines (1999), noise due to blasting activities is subject to separate noise level requirements, which are outside of the scope of this Technical Report. However, an explosive management plan is being developed and will be submitted as part of the permitting process to assess and mitigate impacts from the use of explosives. An excavator-mounted rock breaker (noise model source ID: S131) will also be used within the pit, which is a source of noise and has been included in this assessment.

These alternatives have been evaluated separately as part of this Technical Report.

3.1 Operation Phase Noise Impacts at the Sensitive Receptors

During the Operation Phase, predicted noise levels at each of the sensitive receptors are summarized in Table 3.2. The predicted noise levels include equipment and activities at the Beaver Dam Mine Site, the Haul Road, and the Touquoy Mine Site.

Table 3.2 Predicted Noise Effects at the Sensitive Receptors

Receptor ID	Receptor Description	Noise Level (dBA) (Day / Evening / Night)	Sound Level Limit [(a)] (dBA) (Day / Evening / Night)	Compliance
R1	9 Beaver Dam Mine Road (Marlborough Property)	48 / 48 / 27	65 / 60 / 55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	30 / 30 / 28	65 / 60 / 55	Yes
R3	4115 Highway 224 (Cottage on Crown land)	32 / 32 / 28	65 / 60 / 55	Yes
R4	3492 Highway 224 (Hobbs Property)	50 / 50 / 27	65 / 60 / 55	Yes
R5	3379 Highway 224 (McLeod Property)	39 / 39 / 27	65 / 60 / 55	Yes
R6	3373 Highway 224 (Smith Property)	37 / 37 / 27	65 / 60 / 55	Yes
R7	Tangier River (Deepwood Estates Property)	53 / 53 / 20	65 / 60 / 55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson Lease)	42 / 42 / 20	65 / 60 / 55	Yes
R9	5579 Mooseland Road (Lloy Property)	50 / 50 / 27	65 / 60 / 55	Yes

(a) NSEL 1990

Predicted noise effects during the Operation Phase of the Project are within the applicable sound level limits at all the sensitive receptors (Table 3.2). Most notably, predicted noise levels during the nighttime period are at least 27 dBA below the applicable nighttime sound level limit at all sensitive receptors.

The results presented in Table 3.2 are identical for both Option A and Option B for raw material processing at the Beaver Dam Mine Site and includes the effects of required noise mitigation measures. Note that the noise mitigation

measures associated with the property line evaluation have no impact on the predicted noise levels at the sensitive receptors as the noise sources affected by the mitigation measures are an insignificant contributor to the overall sound level at these receptors due to line of sight and separation distance.

3.2 Property Line Noise Assessment

Noise levels were evaluated at the property boundaries of the Beaver Dam Mine, Haul Road, and Touquoy Mine Site. All of the noise sources from the Operations at both mine sites and on the Haul Road were used in the property line noise level predictions.

3.2.1 Unmitigated Noise Impacts

Operations, infrastructure, and property boundaries for the Beaver Dam Mine have been updated to predict noise levels at the property line. The current proposed property lines and noise source locations are identified in Figures 2A to 2D, with source sound levels and operating conditions summarized in Appendices A and D. Table 3.3 summarizes the predicted noise levels without mitigation.

Table 3.3 Unmitigated Noise Levels at Property Lines

Property Line Description	Maximum Noise Level (dBA) (Day / Evening / Night)	Sound Level Limit (dBA) [(a)] (Day / Evening / Night)	Compliance Achieved?
Beaver Dam Mine Site Property, Option A	60 / 60 / **60**	65 / 60 / 55	**No**
Beaver Dam Mine Site Property, Option B	62 / **62** / **62**	65 / 60 / 55	**No**
Haul Road (30 m from centerline of road)	58 / 58 / --	65 / 60 / 55	Yes
Touquoy Mine Site Property	61 / **61** / **61**	65 / 60 / 55	**No**

[(a)] NSEL 1990

Noise contour plots showing unmitigated noise levels at the Beaver Dam and Touquoy Mine Sites are included in Figures 3F, 3G, 3J, 3K, 3N, and 3O.

3.2.2 Mitigated Noise Impacts

The following noise mitigation measures are incorporated into the current design of the Beaver Dam Mine and Touquoy Mine:

– No more than **four drills** will operate concurrently at the Beaver Dam Site during any day, evening, or nighttime hour.

– Increase the height of the safety berm along the north boundary of the pit at the Beaver Dam Site:

  - For **Option A**, the safety berm should be considered. It is recommended that the berm be at least 138.3 metres above sea level (approximately 7.3 metres above existing grade) along the northeast boundary of the pit, and at least 139 metres above sea level (approximately 4.0 metres above existing grade) along the northwest boundary of the pit (see Figures 3H and 3I).
  - For **Option B**, the safety berm should be considered. It is recommended that the berm be at least 143 metres above sea level (i.e., approximately 13.0 metres above existing grade) along the entire north boundary of the pit (see Figures 3L and 3M).

– Construct a berm at least 148 metres above sea level (i.e., 9.0 metres above existing grade) along the north and west sides of the crusher circuit at the Touquoy Mine Site (see Figures 3P and 3Q).

The maximum predicted noise levels at the property lines during Operations with the mitigations are presented in Table 3.4.

Table 3.4 Mitigated Noise Levels at Property Lines

Property Line Description	Maximum Noise Level (dBA) (Day / Evening / Night)	Sound Level Limit (dBA) [(a)] (Day / Evening / Night)	Compliance Achieved?
Beaver Dam Mine Site Property, Option A	55 / 55 / 55	65 / 60 / 55	Yes
Beaver Dam Mine Site Property, Option B	55 / 55 / 55	65 / 60 / 55	Yes
Haul Road (30 m from centerline of road)	58 / 58 / --	65 / 60 / 55	Yes
Touquoy Mine Site Property	55 / 55 / 54	65 / 60 / 55	Yes

[(a)] NSEL 1990

With the proposed mitigation measures, predicted noise levels at the property line of the Beaver Dam Mine, along the length of the Haul Road, and the Touquoy Mine Site are within the sound level limits specified in the NSEL Pit and Quarry Guidelines (NSEL 1999) provided that the recommended mitigation measures for Option A or Option B are applied at Beaver Dam Mine Site (Table 3.3). Figures 3A to 3E, 3H, 3I, 3L, 3M, 3P, and 3Q show the applicable noise level isopleths in areas of sensitive receptors, and at the Beaver Dam Mine Site, Touquoy Mine Site, and Haul Road with noise mitigation.

3.3 Haul Road Direct and Cumulative Effects

Truck traffic from other projects operating on the Haul Road, in addition to truck traffic from the Project, have the potential to produce increased cumulative effects noise levels at the identified receptors. As such, a Cumulative Effects analysis has been conducted to determine the potential Cumulative Effects of truck traffic from the proposed Fifteen Mile Stream Gold Project, Cochrane Hill Gold Project and Forestry operations that may use the Haul Road concurrently with trucks from the Beaver Dam Mine Site.

Truck traffic volumes used in the Direct (i.e., Project only) and Cumulative Effects analysis are summarized in Table 3.5 below.

Table 3.5 Summary of Estimated Truck Traffic on Haul Road

Originating Facility / Industry	Truck Traffic Volume (round trips per day, 7:00 AM to 11:00 PM)	
	Direct Effects	Cumulative Effects
Project (Beaver Dam Mine Site)	95	95
Cochrane Hill Mine	-	11
Fifteen Mine Stream Mine	-	11
Forestry	-	7
Total	**95**	**124**

Truck traffic from the Project will operate on the Haul Road 16 hours per day, during day and evening time periods only (7:00 AM to 11:00 PM). It is assumed that trucks originating from the other projects and industries will operate during the same hours for the purposes of the Cumulative Effects analysis.

In addition to the heavy truck traffic summarized above, it is estimated 3/4-ton service trucks would make up to approximately 20 round trips per day on the haul roads. Noise emissions from these service trucks have also been included in the cumulative effects noise model.

Table 3.6 shows the predicted cumulative effects of truck traffic for noise during the Operation Phase of the Project are within the applicable sound level limits at all of the identified sensitive receptors, including noise emissions from equipment and activities at the Beaver Dam Mine Site, Touquoy Mine Site, and Haul Road (Figures 4A to 4F).

Table 3.6 Operation Phase Predicted Cumulative Noise Effects

Receptor ID	Receptor Description	Noise Level (dBA) (Day / Evening / Night)	Sound Level Limit [(a)] (dBA) (Day / Evening / Night)	Compliance?
R1	9 Beaver Dam Mine Road (Marlborough Property)	50 / 50 / 27	65 / 60 / 55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	31 / 31 / 28	65 / 60 / 55	Yes
R3	4115 Highway 224 (Cottage on Crown land)	33 / 33 / 28	65 / 60 / 55	Yes
R4	3492 Highway 224 (Hobbs Property)	56 / 56 / 27	65 / 60 / 55	Yes
R5	3379 Highway 224 (McLeod Property)	51 / 51 / 27	65 / 60 / 55	Yes
R6	3373 Highway 224 (Smith Property)	51 / 51 / 27	65 / 60 / 55	Yes
R7	Tangier River (Deepwood Estates Property)	55 / 55 / 20	65 / 60 / 55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson)	44 / 44 / 20	65 / 60 / 55	Yes
R9	5579 Mooseland Road (Lloy Property)	51 / 51 / 26	65 / 60 / 55	Yes

[(a)] NSEL 1990

The tables in Appendix B indicate noise levels from each noise source for each of the sensitive receptors for the Direct Effects and Cumulative Effects scenarios, with Option A and Option B. Table 3 in Appendix C documents compliance with the applicable sound level limits for each scenario.

4. Mitigation Measures Update

Equipment that lack effective mufflers are significant sources of noise. Procurement of equipment that meets best practices in terms of noise emissions, and regular maintenance of the equipment will reduce noise levels. Site workers will be trained to ensure equipment is used in ways that minimize noise and are maintained regularly. As part of the workplace health and safety program, noise monitors may be attached to workers from time to time to measure and monitor noise exposure over a shift.

The majority of mining operations will occur in the pit well below ground surface thereby providing noise shielding and blasting will be restricted to daytime hours, per the NSEL Pit and Quarry Guidelines (NSEL 1999). Additionally, traffic on the Haul Road will generally be restricted to 12 to 16 hours per day during the Operation phase, which will minimize noise along the Haul Road during nighttime hours. The dense forest surrounding the Beaver Dam Mine Site and the Haul Road will also provide noise attenuation, which is not accounted for in the noise model to be conservative. Topography and distance from receptors also contribute to a reduction of Project-generated sound at greater distances, and topographical elevation data has been included in the model to account for this effect.

This combination of measures will adequately mitigate potential noise impacts. The mitigation procedures may vary as long as noise levels are in accordance with the regulatory approval.

Additionally, noise and vibration monitoring must be completed during each blasting event, as required by the NSEL Pit and Quarry Guidelines (NSEL 1999). Monitoring and mitigations explicit to blasting will be described in the Explosive Management Plan that will be submitted as part of the permitting process. Elements of this plan will include site specific monitoring triggers and mitigations. An Engagement Plan (AMNS 2021a) will be implemented and based on feedback additional mitigations will be considered. Table 4.1 provides a summary mitigations measures being considered in the Explosive Management Plan to reduce noise.

Table 4.1 Mitigation for Noise

VC	Project Phase	Mitigation Measure
Noise	OP	Blasting will not be undertaken on Sundays, statutory holidays, or any day between the hours of 1800 hours and 0800 hours (NSEL 1999)
	OP	Construct a large safety berm along the entire north boundary of the pit, dependent on how raw materials are processed at the Beaver Dam Mine Site: • Option A: It is recommended that the berm be at least 138.3 metres above sea level (approximately 7.3 metres above existing grade) at the northeast boundary of the pit, and at least 139 metres above sea level (approximately 4.0 metres above existing grade) along the northwest boundary of the pit. • Option B: It is recommended that the berm be at least 143 metres above sea level (i.e., approximately 13.0 metres above existing grade) along the entire north boundary of the pit. Construct a large berm at the Touquoy Mine Site at least 148 metres above sea level (approximately 9.0 metres above grade) on the north and west sides of the crushing circuit.
	OP	Operating hours for trucking on the Haul Road will be restricted to the day and evening periods only
	OP	Maximum 4 drills will operate at the Beaver Dam Mine Site pit at any time during the Operation Phase of the Project
	OP	Regular check by site manager for excessive noise on site and in relation to sensitive receptors so that resolution can be timely
	OP, DEC	Implement preventative maintenance plans for all mobile and stationary equipment
	PC	Noise-reduction as criteria in equipment selection
	OP	Speed reduction
	OP	Use equipment that meets appropriate noise emission standards for off-road diesel equipment
	OP	Subcontractor agreements will include an obligation to comply with environmental protection including noise reduction
	OP	Site design to reduce need for reversing and vehicle reversing alarms
	OP	A procedure, including a response plan, will be available for public to be able to register complaints regarding noise concerns

5. Proposed Compliance and Effects Monitoring Program Update

Noise monitoring will be completed as directed by regulators or feedback received from engagement.

6. Conclusions

In general, mining operations often produce elevated noise levels that have the potential to impact the surrounding environment. Thus, noise levels produced by equipment at the proposed Beaver Dam Mine Project have been assessed at the identified worst-case receptors to determine the future impact on residents of the nearest communities. This is not intended to preclude residents at farther distances but rather is presented to document those sensitive receptors (i.e., human receptors – seasonal and permanent dwellings) that are closest and represent a worst-case scenario.

Noise Compliance at Receptors

The predicted noise levels produced by worst-case activities during the Operation of the Project, including noise emissions from the Beaver Dam Mine Site, the Haul Road, and the Touquoy Mine Site, are within the applicable guideline limits for all identified receptors. Based on these predictions, noise levels at nearby sensitive receptors are expected to be within the NSEL noise level limits, provided the mitigation measures identified in this report are followed.

Noise Compliance at Receptors Along Haul Route

Trucks from other projects and forestry operations on the Haul Road have the potential to increase the Cumulative Effect of noise at the receptors. However, noise levels due to Cumulative Effects of trucks on the Haul Road were assessed, and the predicted noise levels remain within the applicable NSEL sound level limits at all identified sensitive receptors.

Noise Compliance at Property Boundaries

The NSEL Pit and Quarry Guidelines also include noise level criteria for assessment at the property boundaries (NSEL 1999). The predicted noise levels from the Project meet the NSEL limits at all locations on the property boundaries of the Beaver Dam Mine Site, the Haul Road, and the Touquoy Mine Site, provided the mitigation measures identified in this report are followed.

Baseline ambient sound level monitoring was conducted at several locations in the Project Area between January 2007 and September 2016 (GHD 2018). Based on the data obtained from these sound level monitors, ambient sound levels in some parts of the Study Area are low, as expected for a characteristically rural environment. Specific non-residential locations of traditional land use and recreation have not been identified for inclusion in the analysis; however, it is understood that traditional uses such as hunting may occur in areas close to the Project Area. The noise isopleths provided in Figures 3A and 3B attached indicate the expected noise levels produced by the Project and may be used to determine where Project noise levels may impact traditional uses and wildlife.

7. References

AMNS (Atlantic Mining NS Inc.). 2019. *Revised Environmental Impact Statement – February 28, 2019.* Submitted to the Canadian Environmental Assessment Agency and Nova Scotia Environment. February 2019. NS.

AMNS. 2021a. *Updated Environmental Impact Statement – 2021*. Submitted to the Canadian Environmental Assessment Agency and Nova Scotia Environment. 2021. NS.

AMNS. 2021b. *Canadian Environmental Assessment Agency, Nova Scotia Environment and Eastern Shore Forest Watch Association Round 2, Information Request Responses*. Submitted to the Canadian Environmental Assessment Agency and Nova Scotia Environment. 2021. NS.

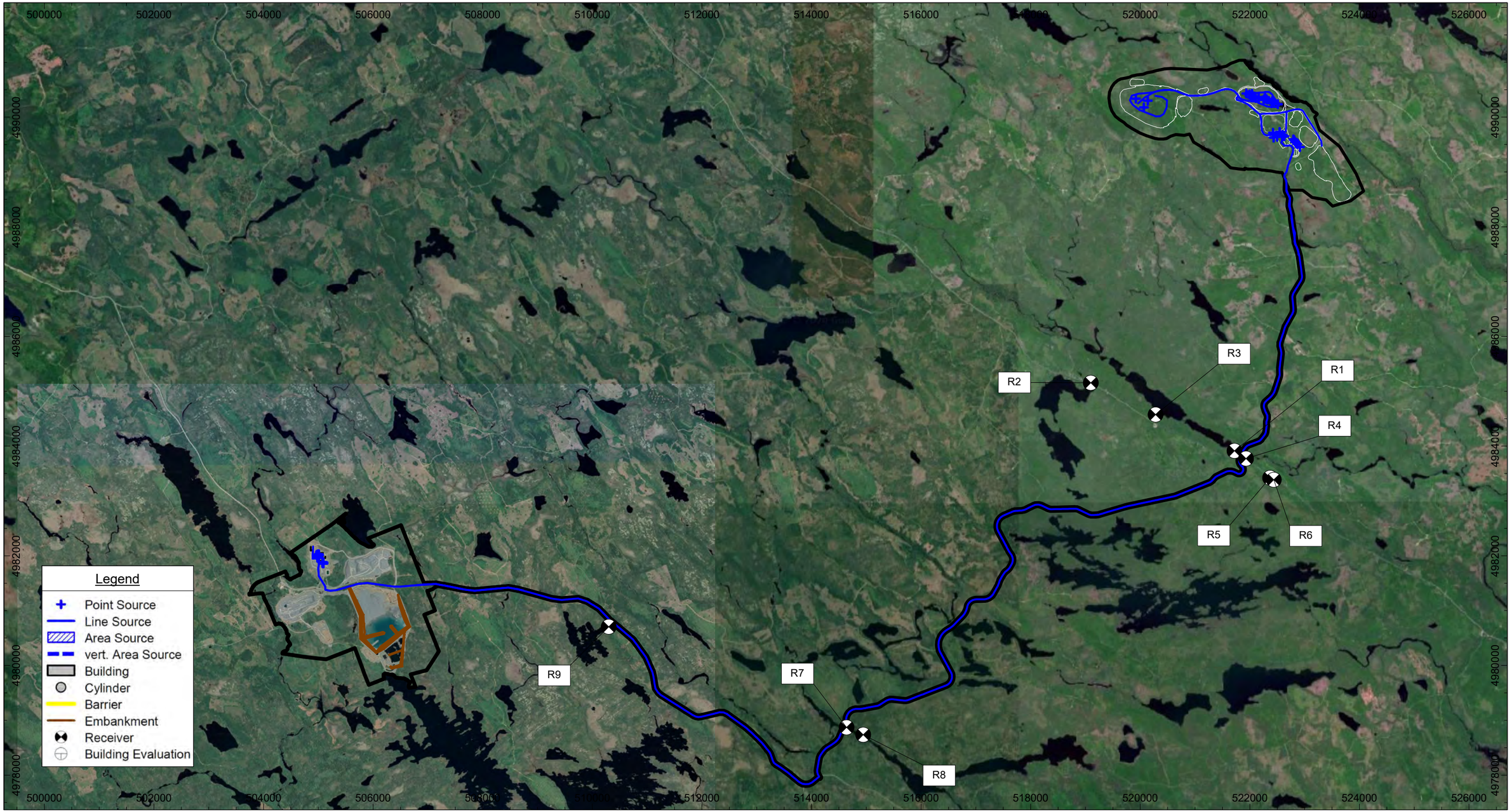
CEAA (Canadian Environmental Assessment Agency). 2019. *Beaver Dam Mine Project – Round 2, Part 1 Information Requirements*. May 8, 2019. Halifax, NS.

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GHD. 2021. *Technical Memorandum - Beaver Dam Mine Construction Noise Assessment*. Prepared by GHD. 2021. Waterloo, ON.

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Source: Google Satellite

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GHD

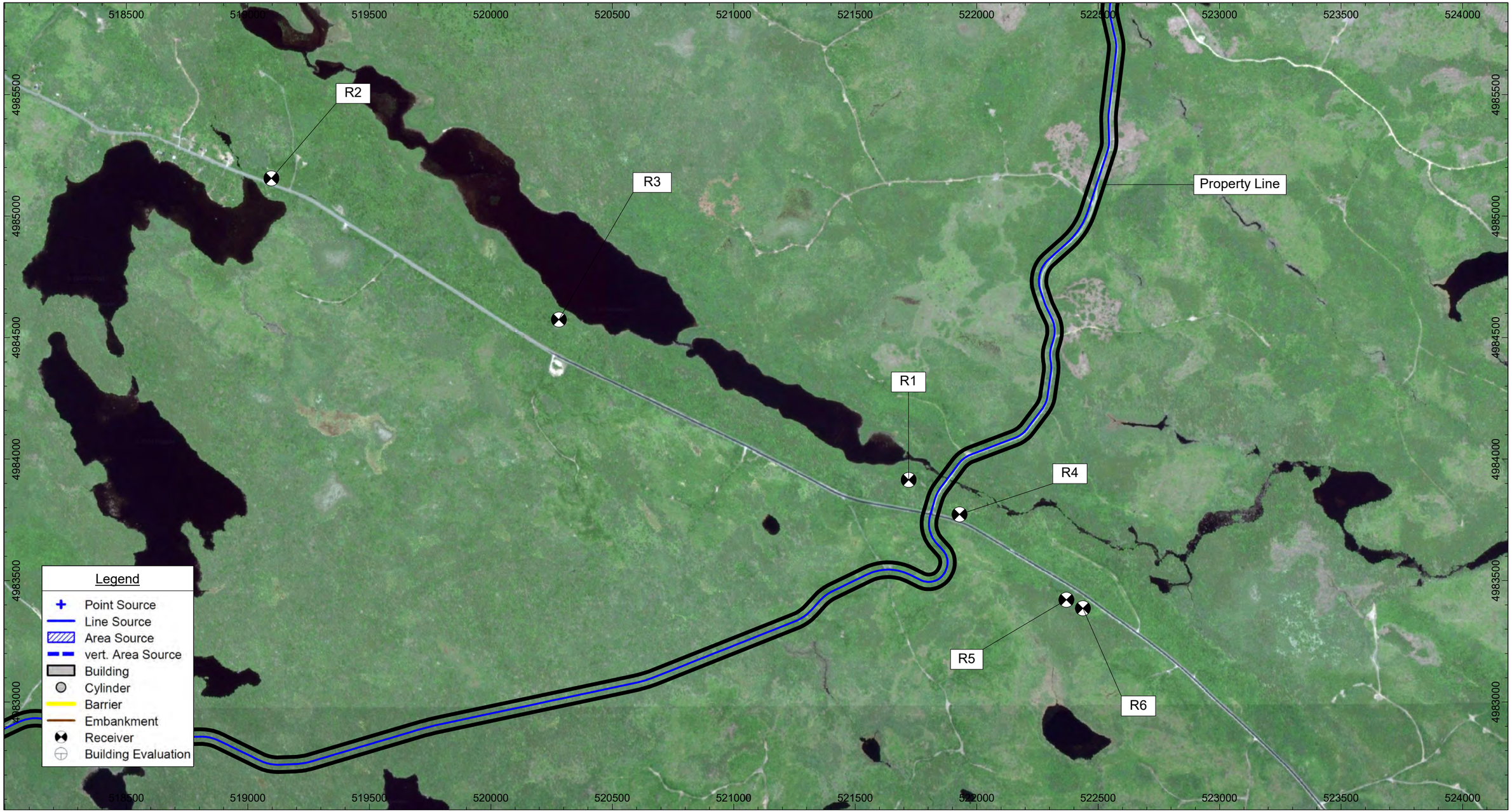
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

RECEPTOR LOCATIONS

FIGURE 1A

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

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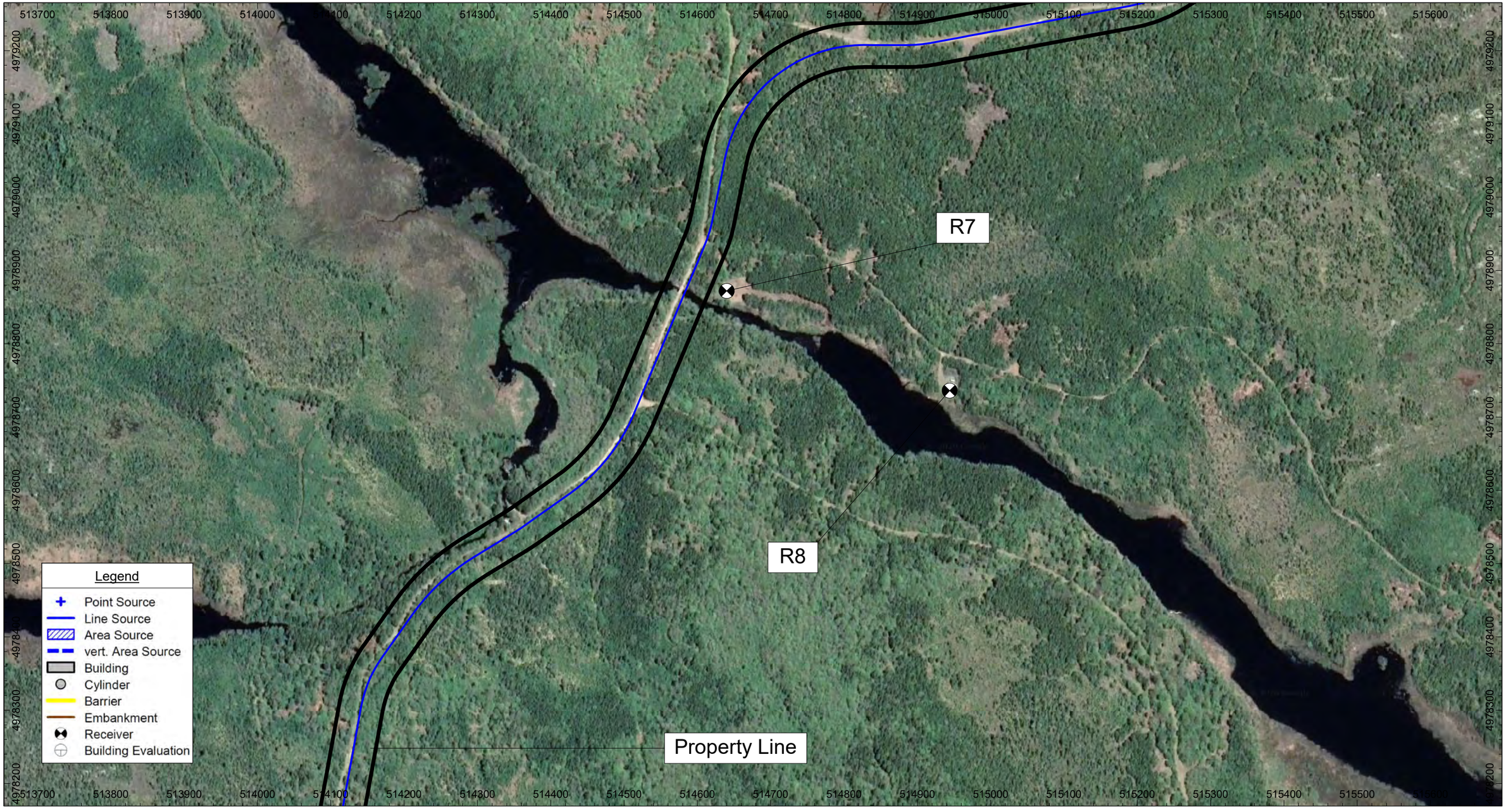
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

RECEPTOR LOCATIONS - R1 to R6 ENLARGED

FIGURE 1B

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Source: Google Satellite

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ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

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RECEPTOR LOCATIONS - R7 & R8 ENLARGED

FIGURE 1C

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Source: Google Satellite

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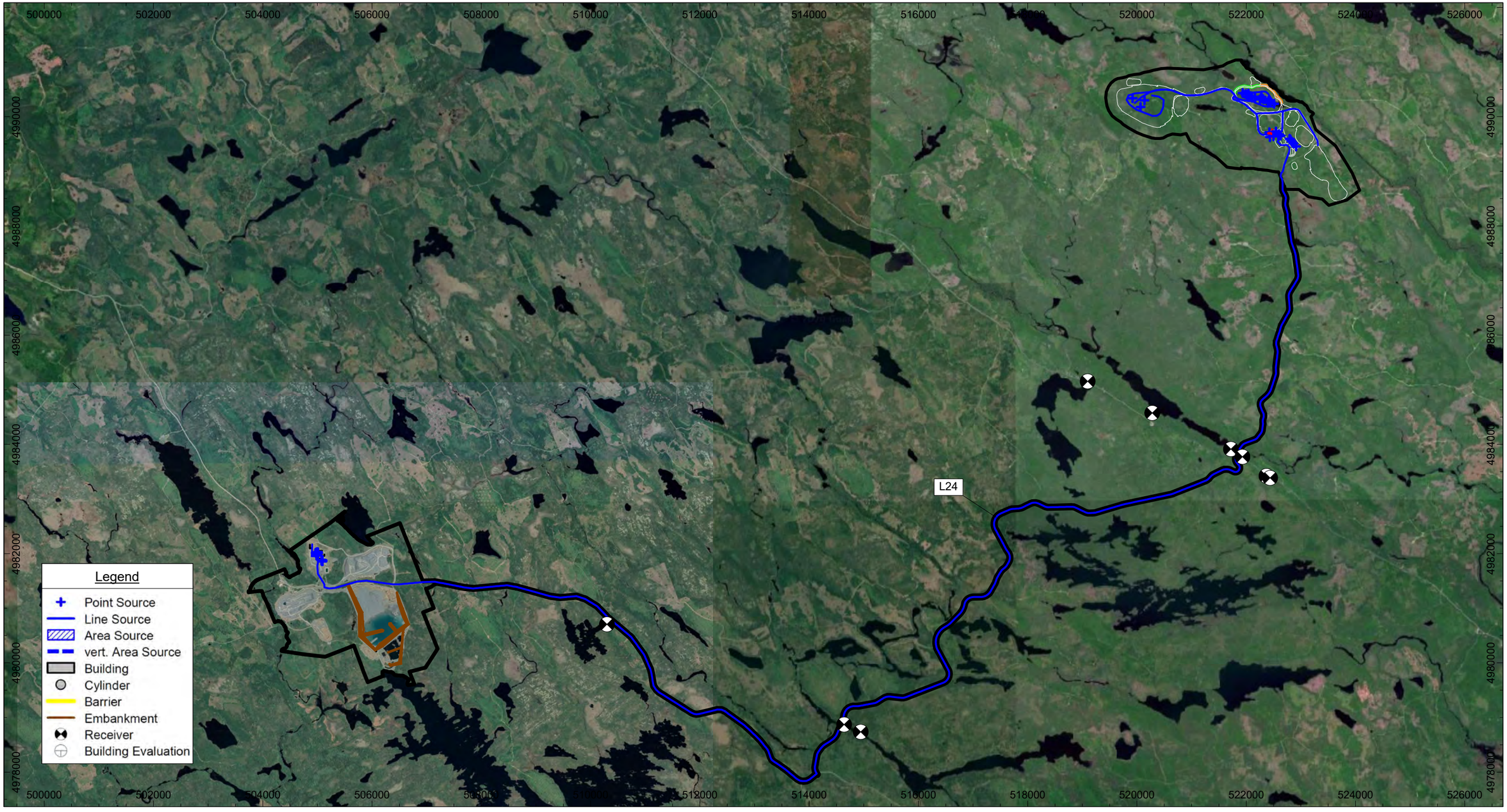
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BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

RECEPTOR LOCATIONS - R9 ENLARGED

FIGURE 1D

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Source: Google Satellite

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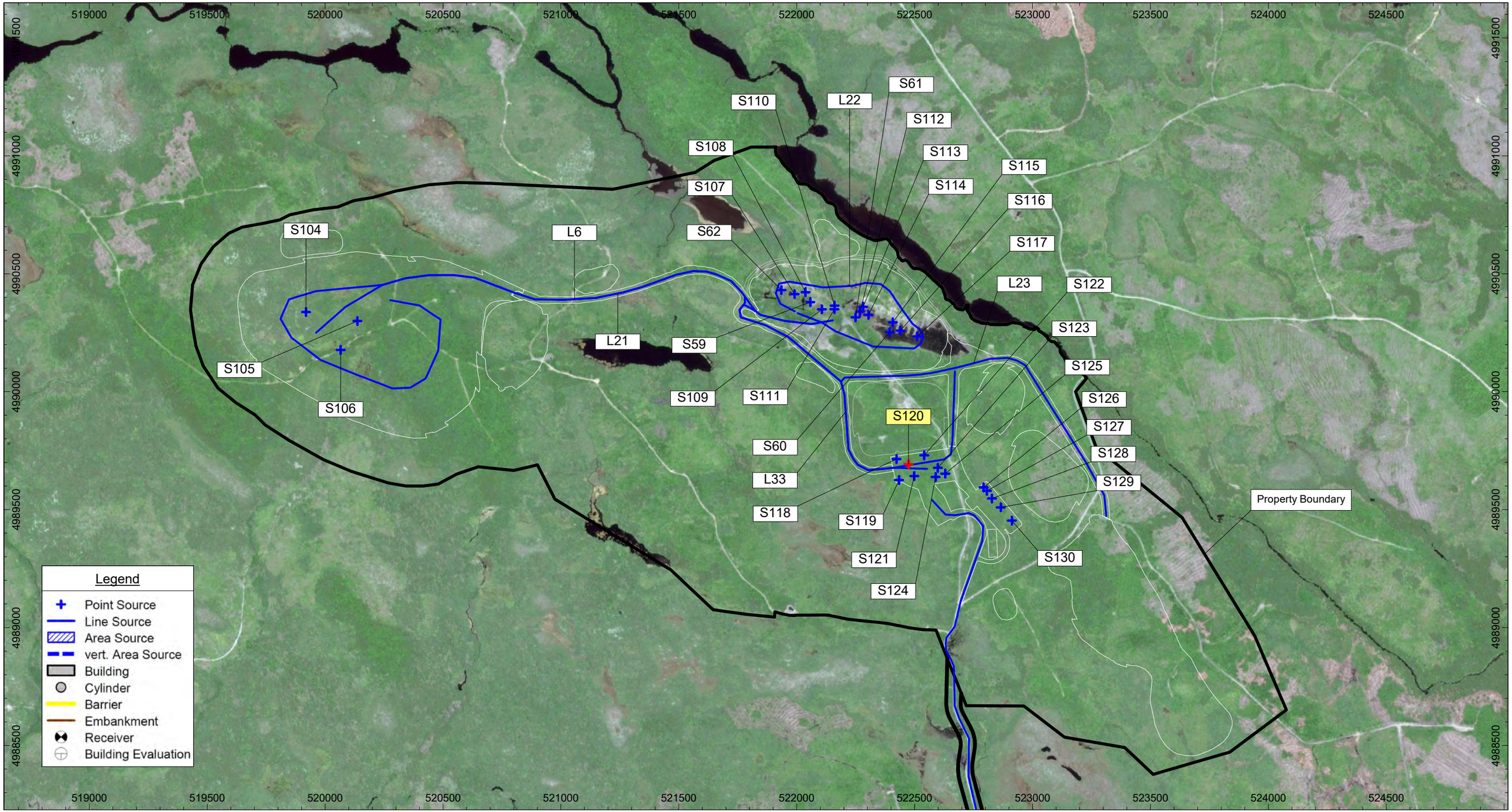
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

SOURCE LOCATIONS

FIGURE 2A

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Source: Google Satellite

N

GHD

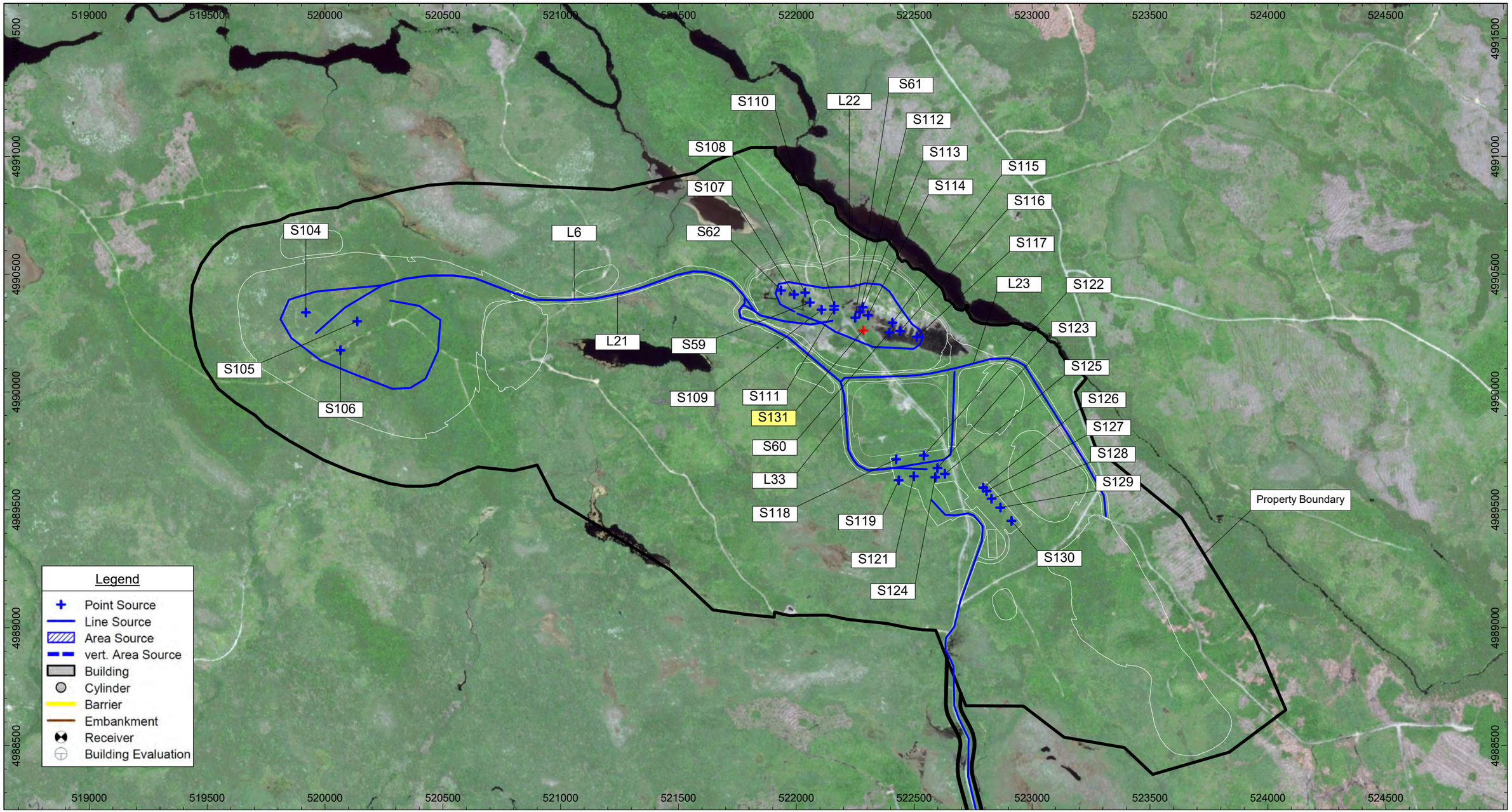
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

SOURCE LOCATIONS - BEAVER DAM MINE SITE ENLARGED, OPTION A

FIGURE 2B

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

GHD

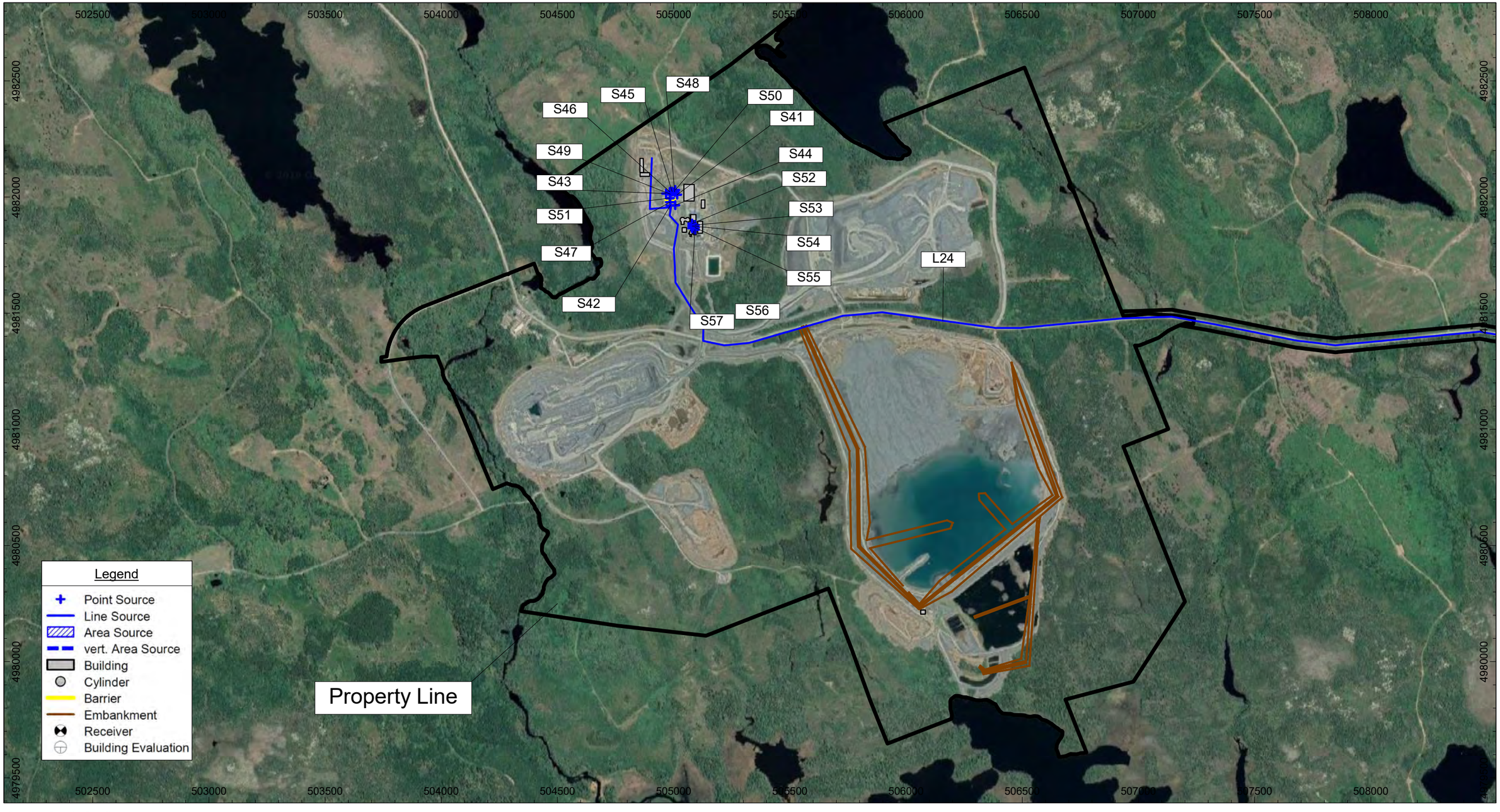
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

SOURCE LOCATIONS - BEAVER DAM MINE SITE ENLARGED, OPTION B

FIGURE 2C

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

GHD

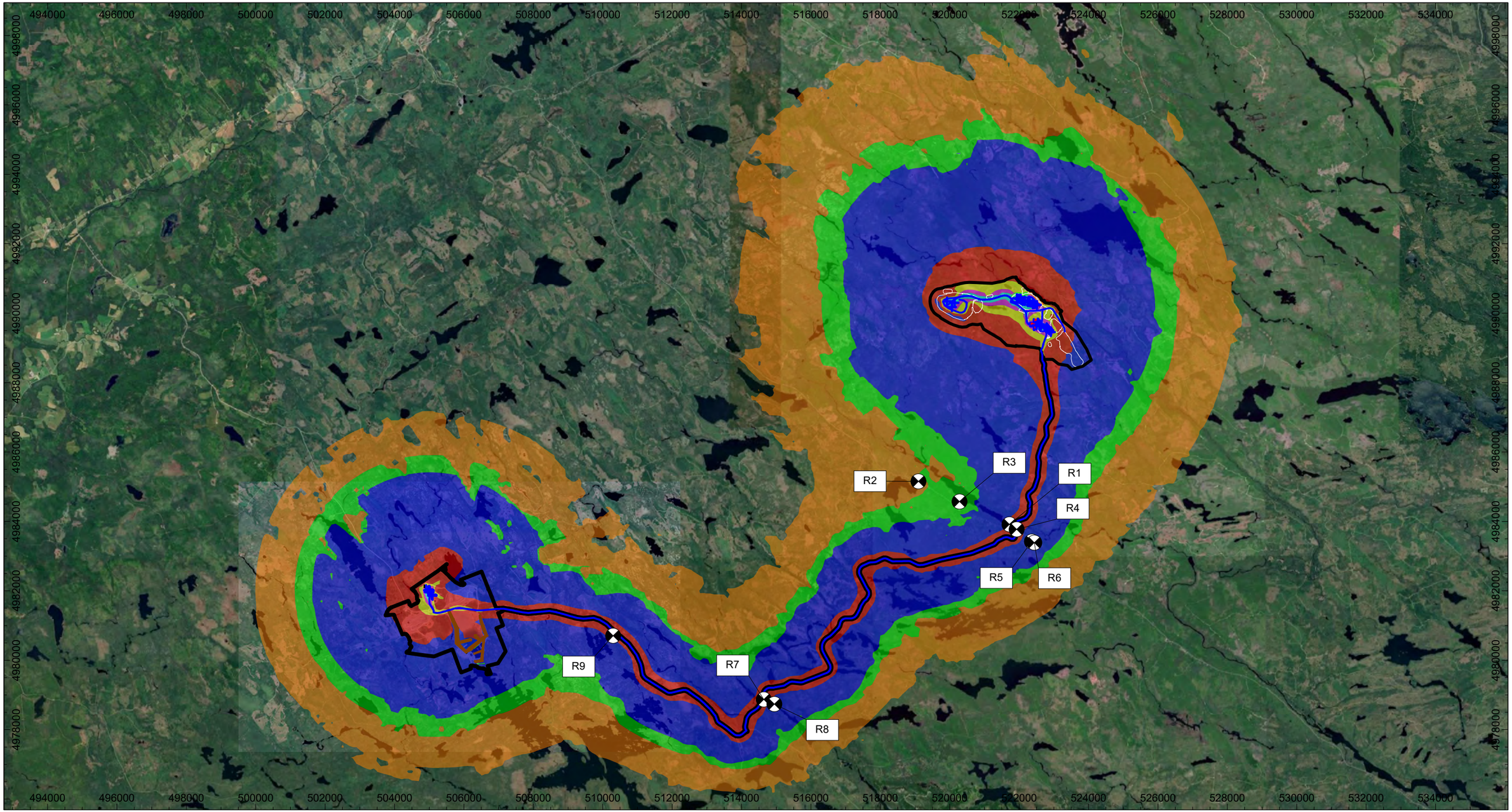
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

SOURCE LOCATIONS - TOUQUOY MINE SITE ENLARGED

FIGURE 2D

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

- > 27 dBA
- > 31 dBA
- > 33 dBA
- > 45 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA

GHD

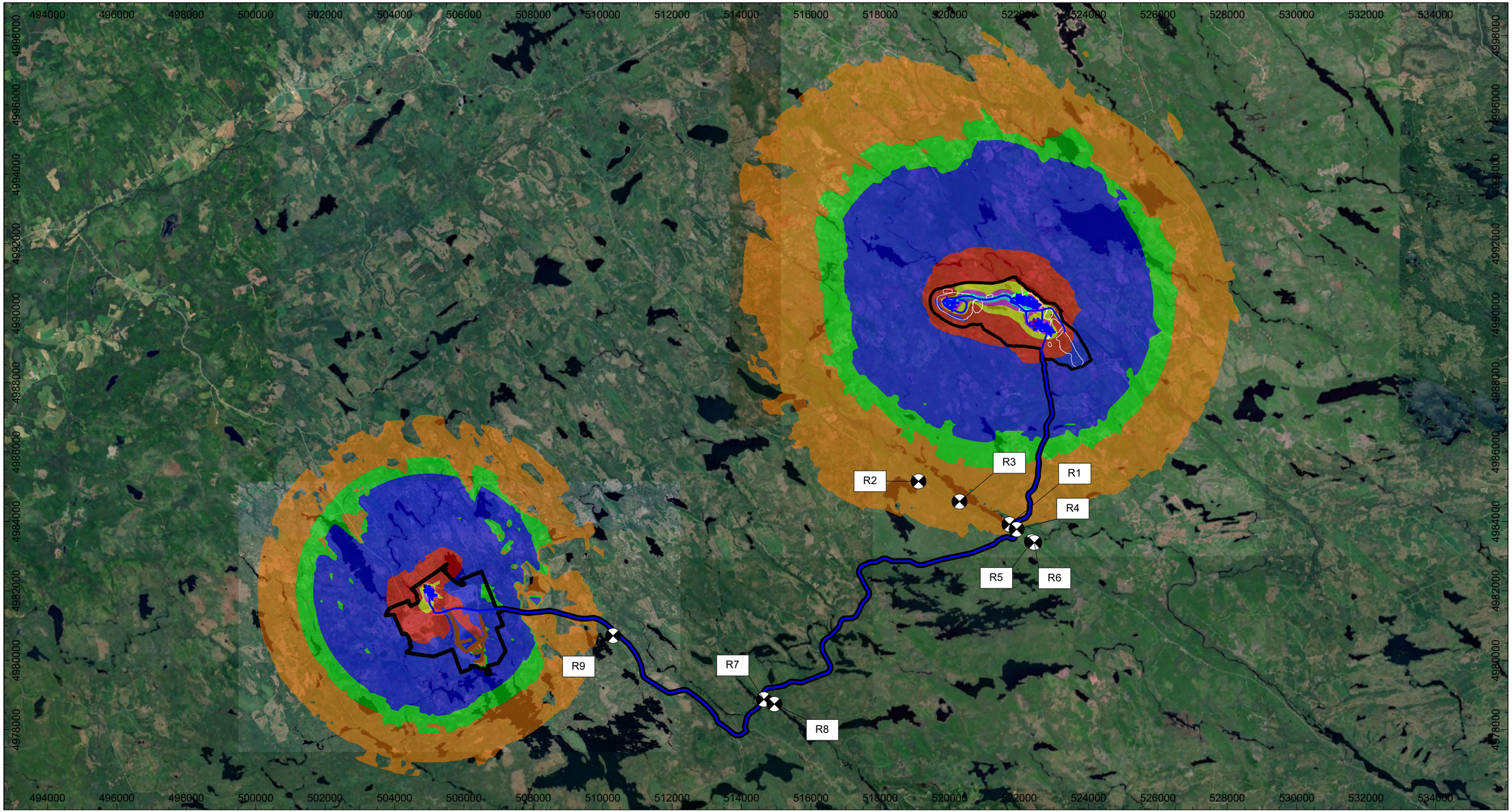
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

088664
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NOISE CONTOUR PLOT - OVERALL STUDY AREA (DAY/EVENING 1.5 m A.G.)

FIGURE 3A

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

- > 27 dBA
- > 31 dBA
- > 33 dBA
- > 45 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA

GHD

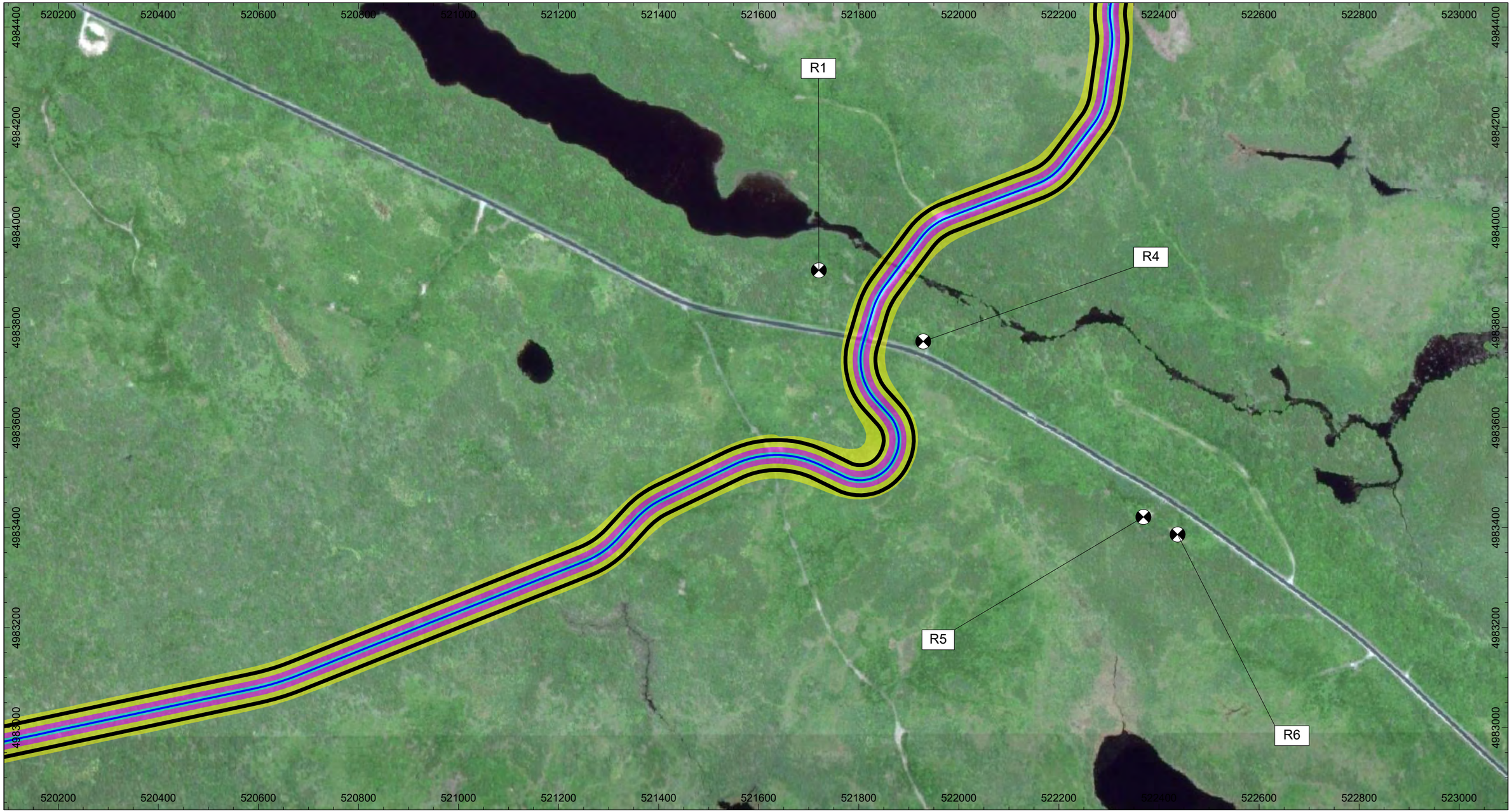
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

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NOISE CONTOUR PLOT - OVERALL STUDY AREA (NIGHT 1.5 m A.G.)

FIGURE 3B

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

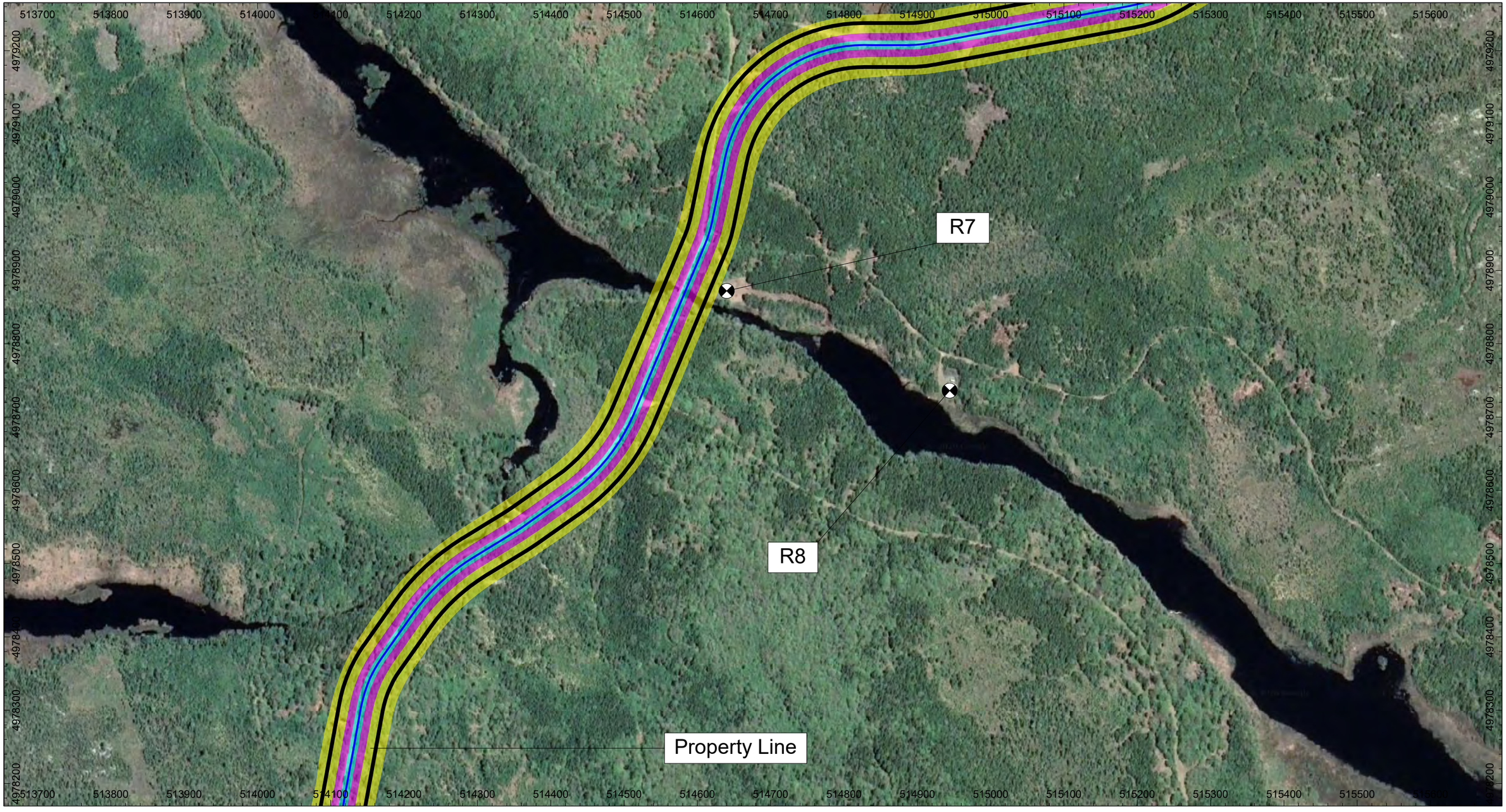
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NOISE CONTOUR PLOT - R1, R4, R5, AND R6 ENLARGED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3C

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

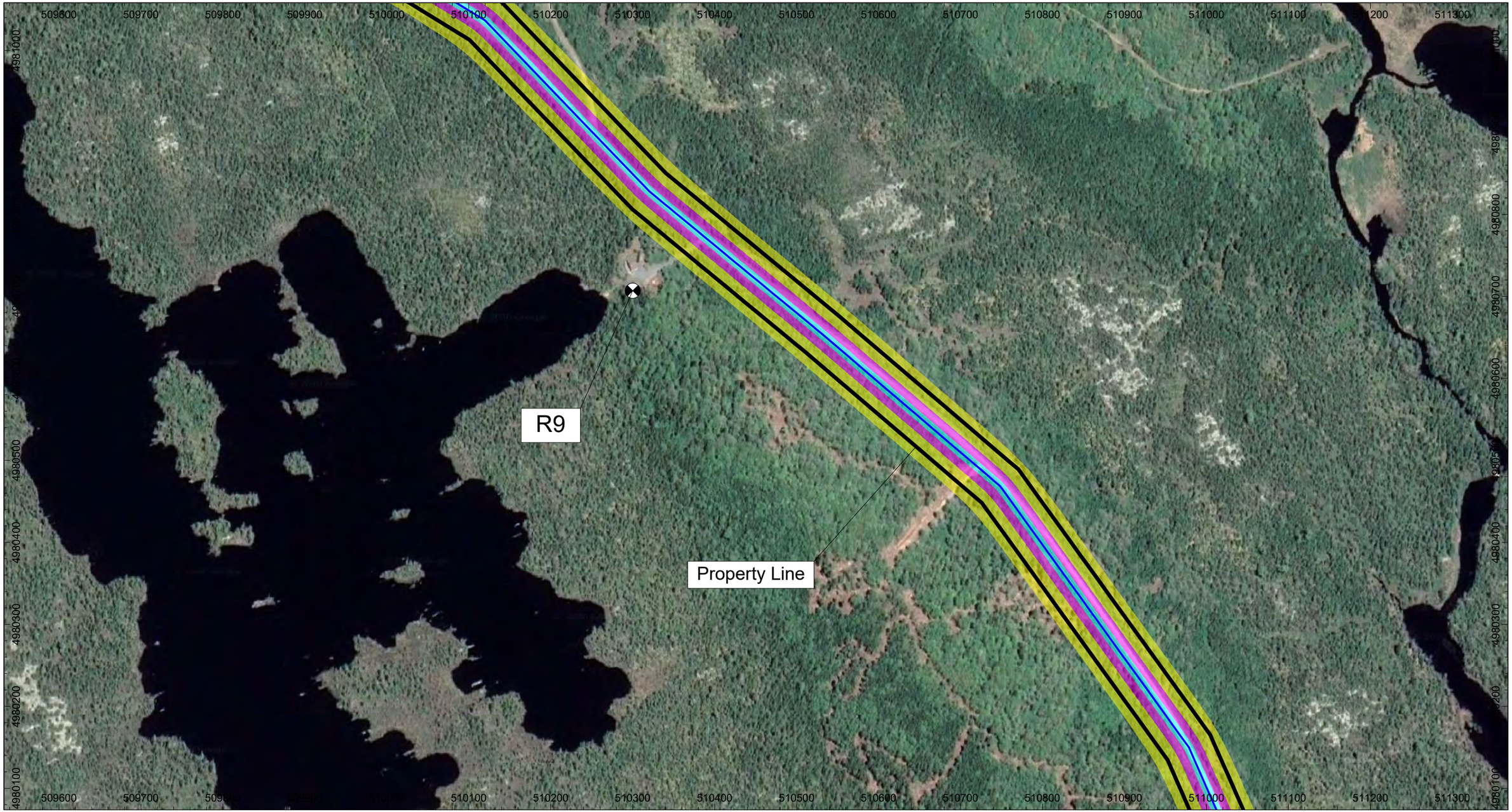
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NOISE CONTOUR PLOT - R7 AND R8 ENLARGED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3D

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

UPDATED NOISE TECHNICAL REPORT
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NOISE CONTOUR PLOT - R9 ENLARGED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3E

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500

4991500 4991000 4990500 4990000 4989500 4989000 4988500

Property Boundary

Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

UPDATED NOISE TECHNICAL REPORT
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NOISE CONTOUR PLOT - BEAVER DAM SITE ENLARGED, OPTION A (DAY/EVENING, 1.5 m A.G.)

FIGURE 3F

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500

4991500 4991000 4990500 4990000 4989500 4989000 4988500

Property Boundary

Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

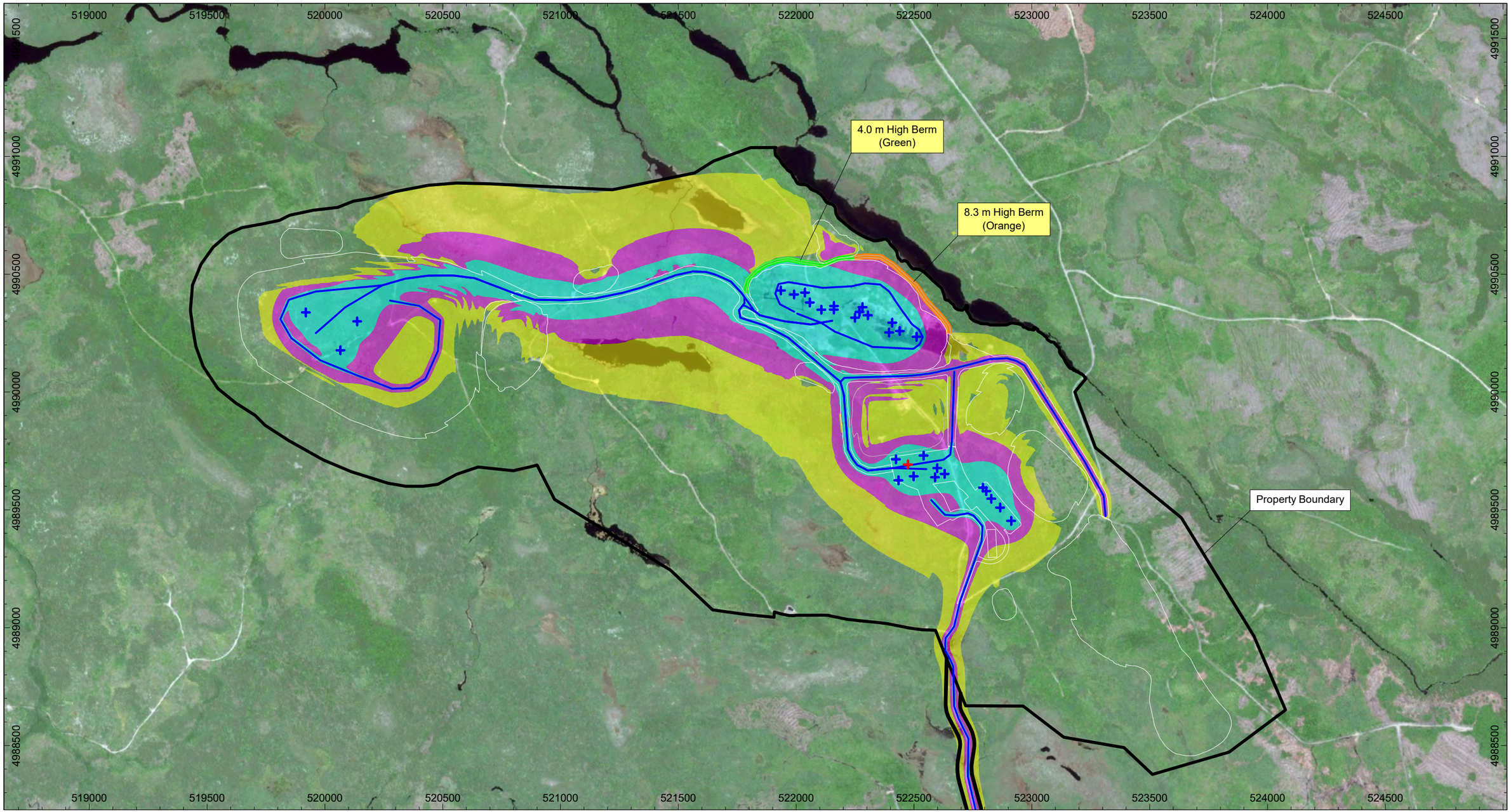
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

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18.11.2021

NOISE CONTOUR PLOT - BEAVER DAM SITE ENLARGED, OPTION A (NIGHT, 1.5 m A.G.)

FIGURE 3G

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

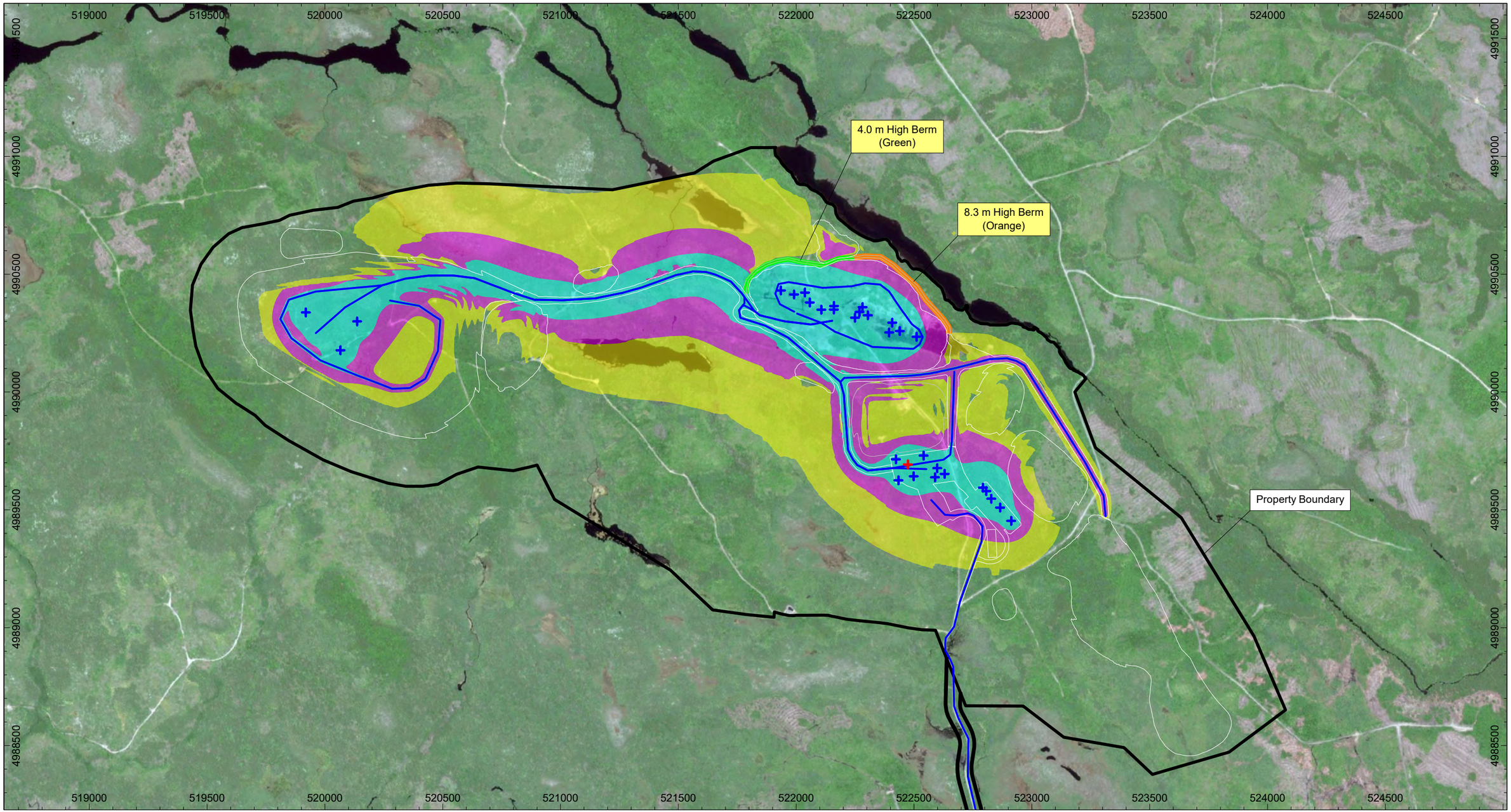
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

NOISE CONTOUR PLOT - BEAVER DAM SITE, OPTION A MITIGATED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3H

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

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NOISE CONTOUR PLOT - BEAVER DAM SITE, OPTION A MITIGATED (NIGHT, 1.5 m A.G.)

FIGURE 3I

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500

4991500 4991000 4990500 4990000 4989500 4989000 4988500

Property Boundary

Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

UPDATED NOISE TECHNICAL REPORT
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NOISE CONTOUR PLOT - BEAVER DAM SITE ENLARGED, OPTION B (DAY/EVENING, 1.5 m A.G.)

FIGURE 3J

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500

4991500 4991000 4990500 4990000 4989500 4989000 4988500

Property Boundary

Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

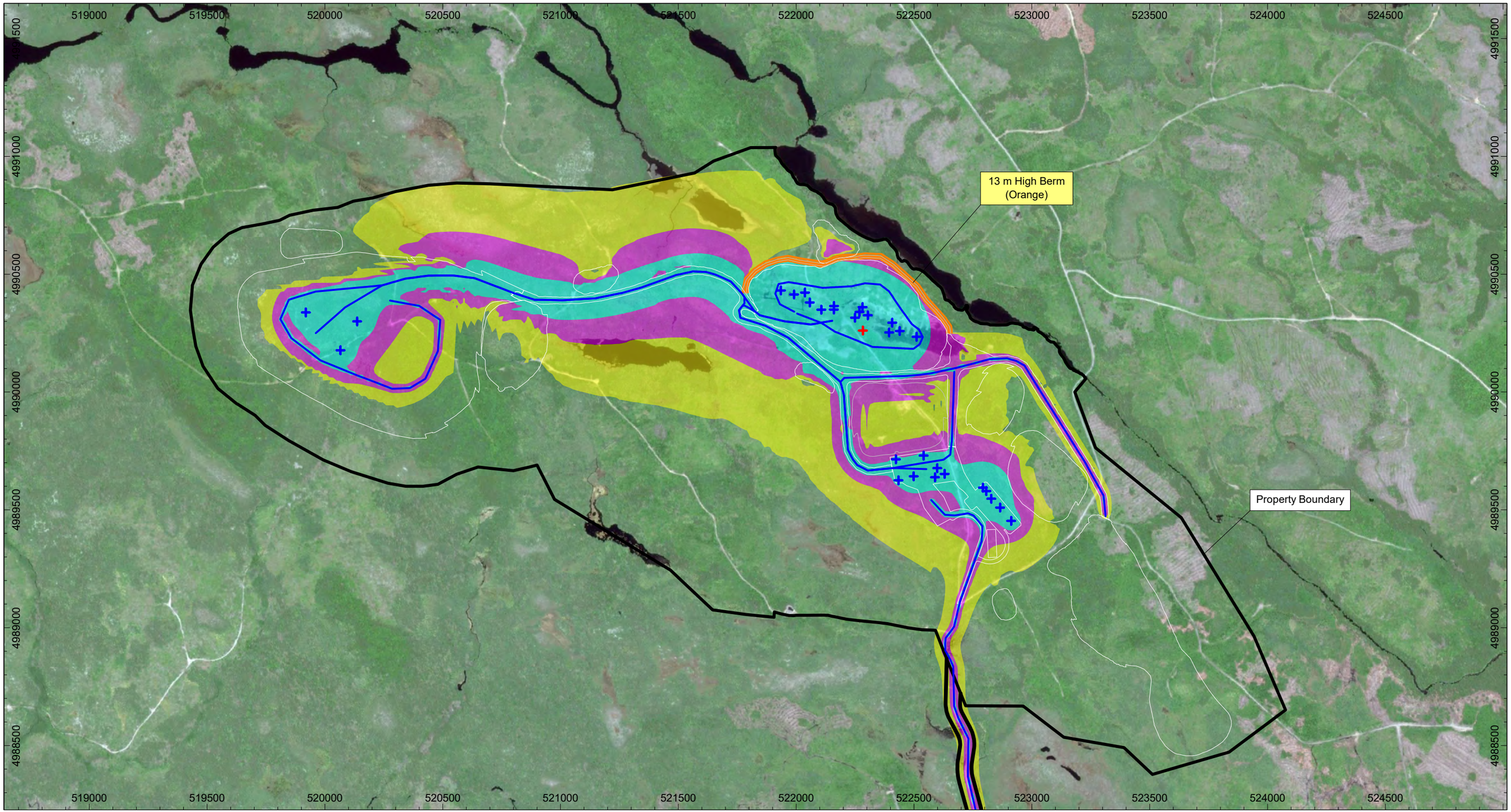
UPDATED NOISE TECHNICAL REPORT
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NOISE CONTOUR PLOT - BEAVER DAM SITE ENLARGED, OPTION B (NIGHT, 1.5 m A.G.)

FIGURE 3K

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

UPDATED NOISE TECHNICAL REPORT
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NOISE CONTOUR PLOT - BEAVER DAM SITE, OPTION B MITIGATED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3L

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

519000 519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500

4991500 4991000 4990500 4990000 4989500 4989000 4988500

13 m High Berm
(Orange)

Property Boundary

Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

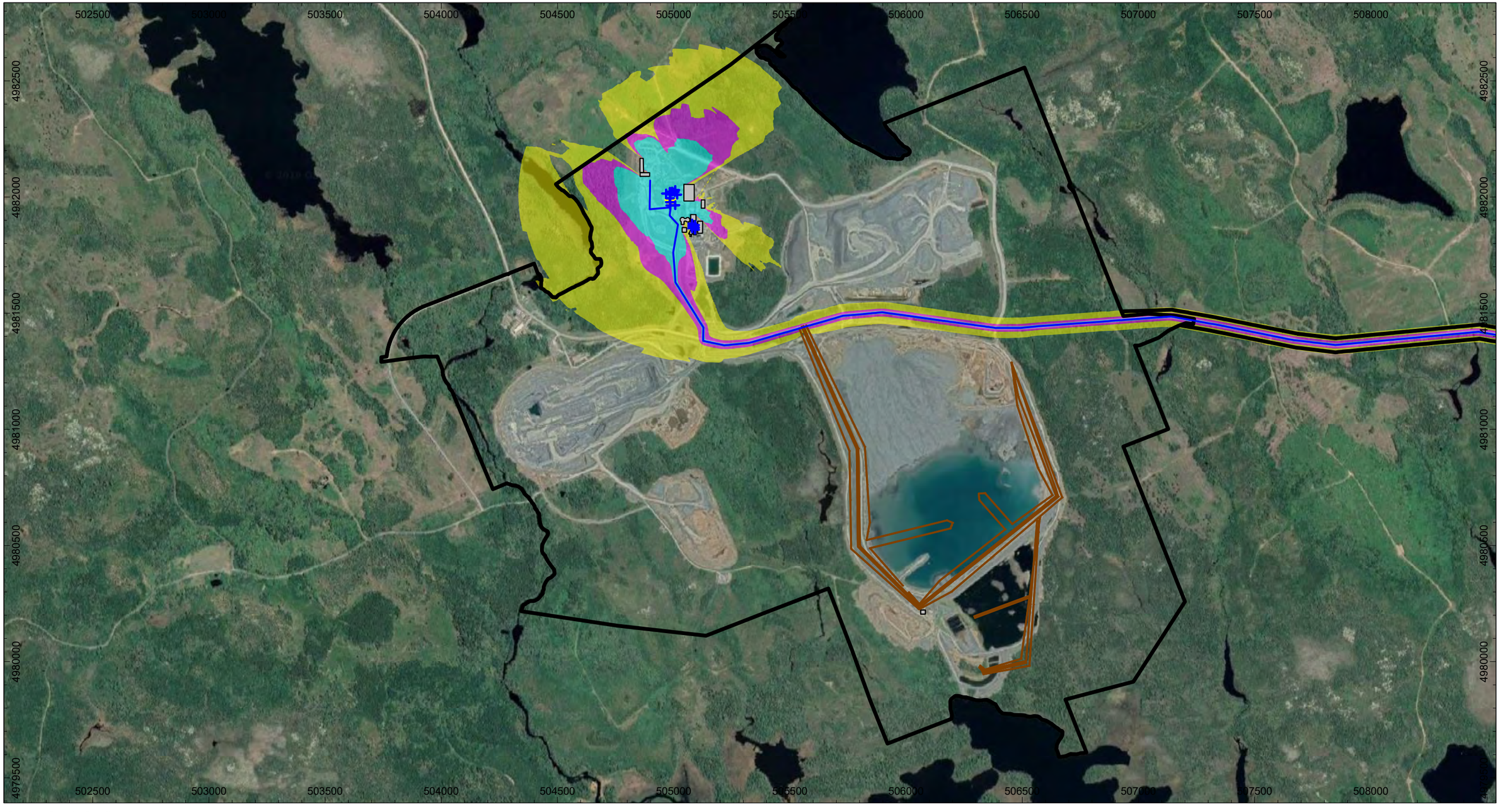
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

NOISE CONTOUR PLOT - BEAVER DAM SITE, OPTION B MITIGATED (NIGHT, 1.5 m A.G.)

FIGURE 3M

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

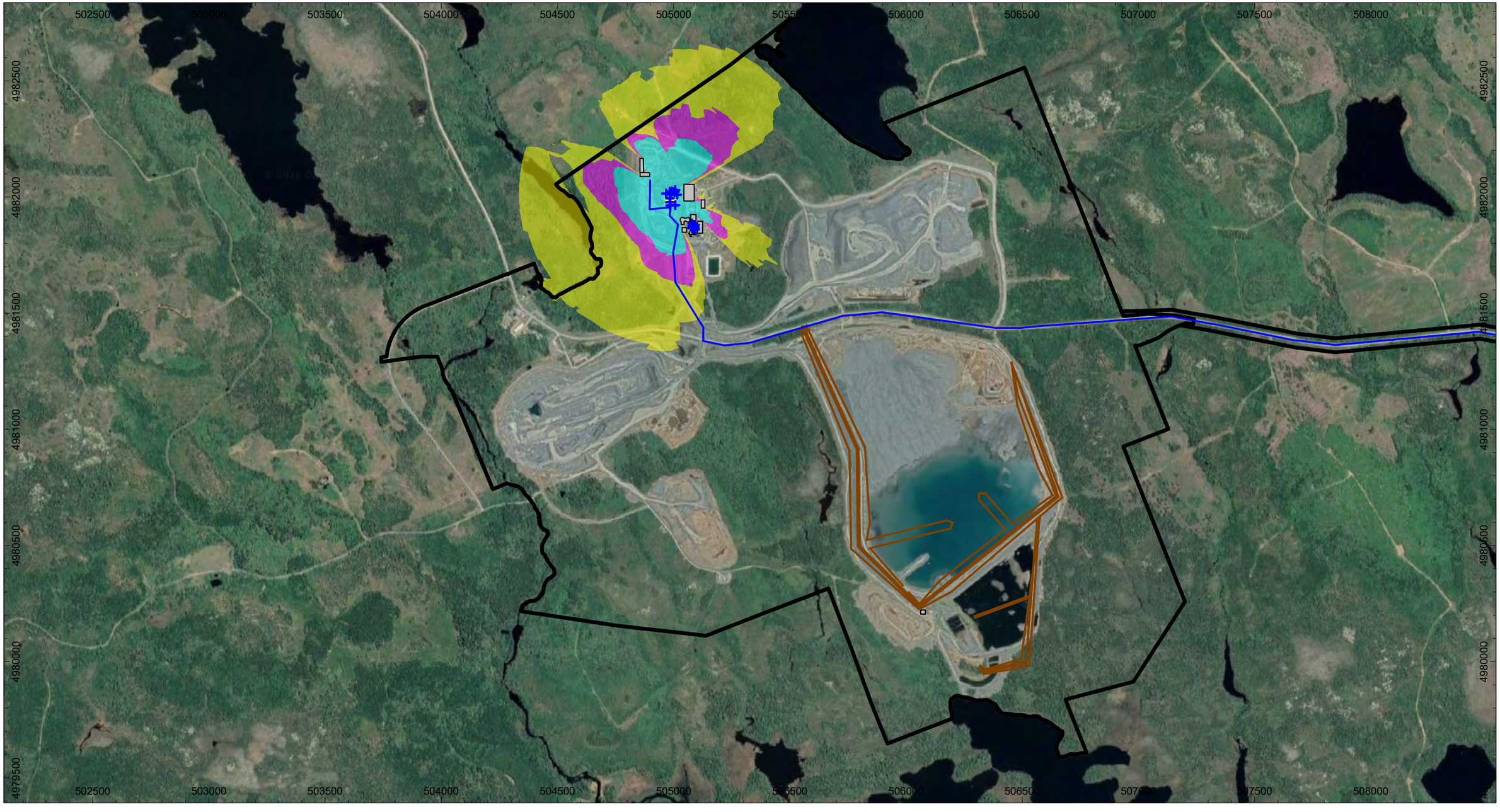
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

NOISE CONTOUR PLOT - TOUQUOY SITE ENLARGED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3N

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

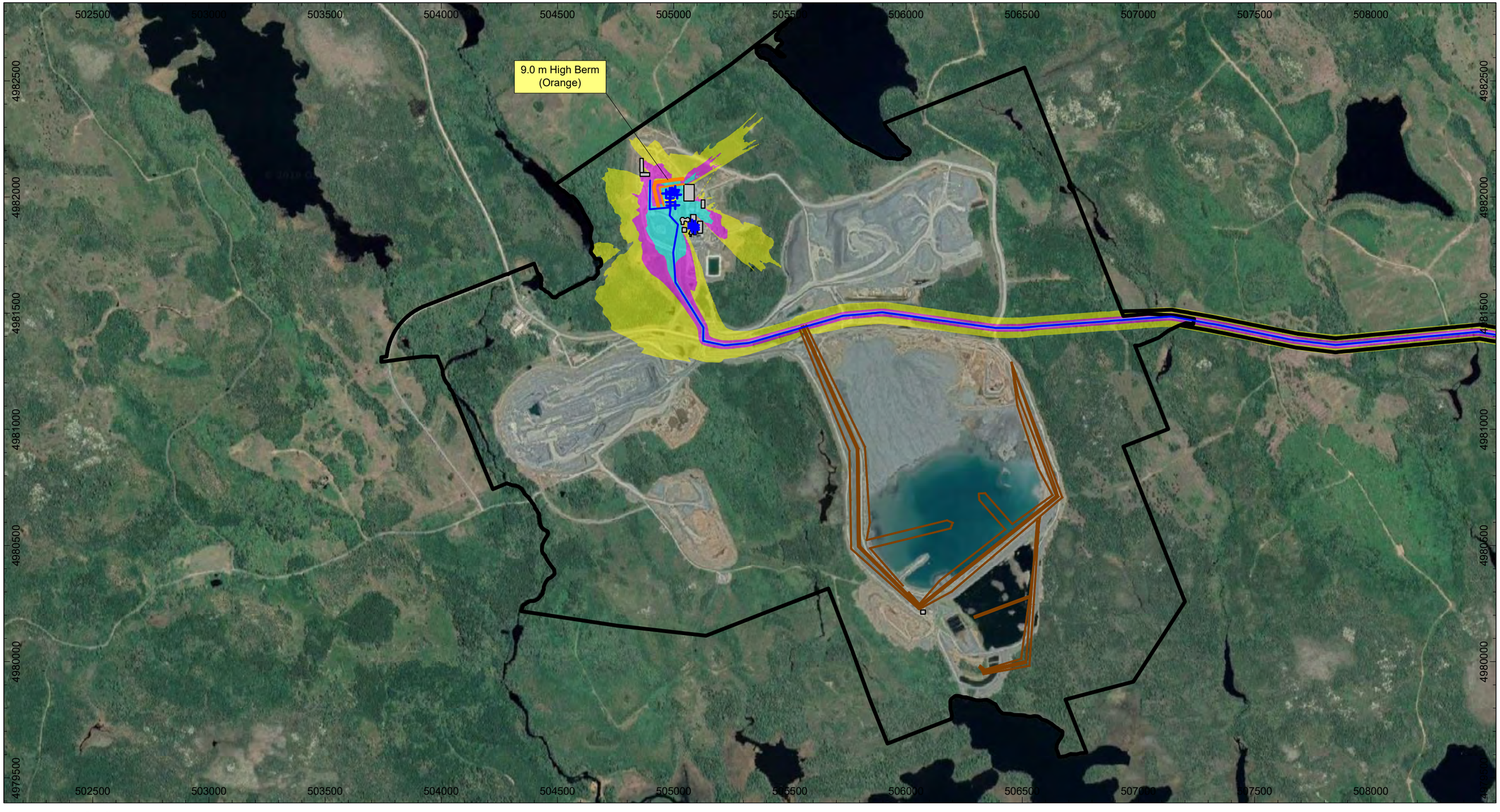
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
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NOISE CONTOUR PLOT - TOUQUOY SITE ENLARGED (NIGHT, 1.5 m A.G.)

FIGURE 3O

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

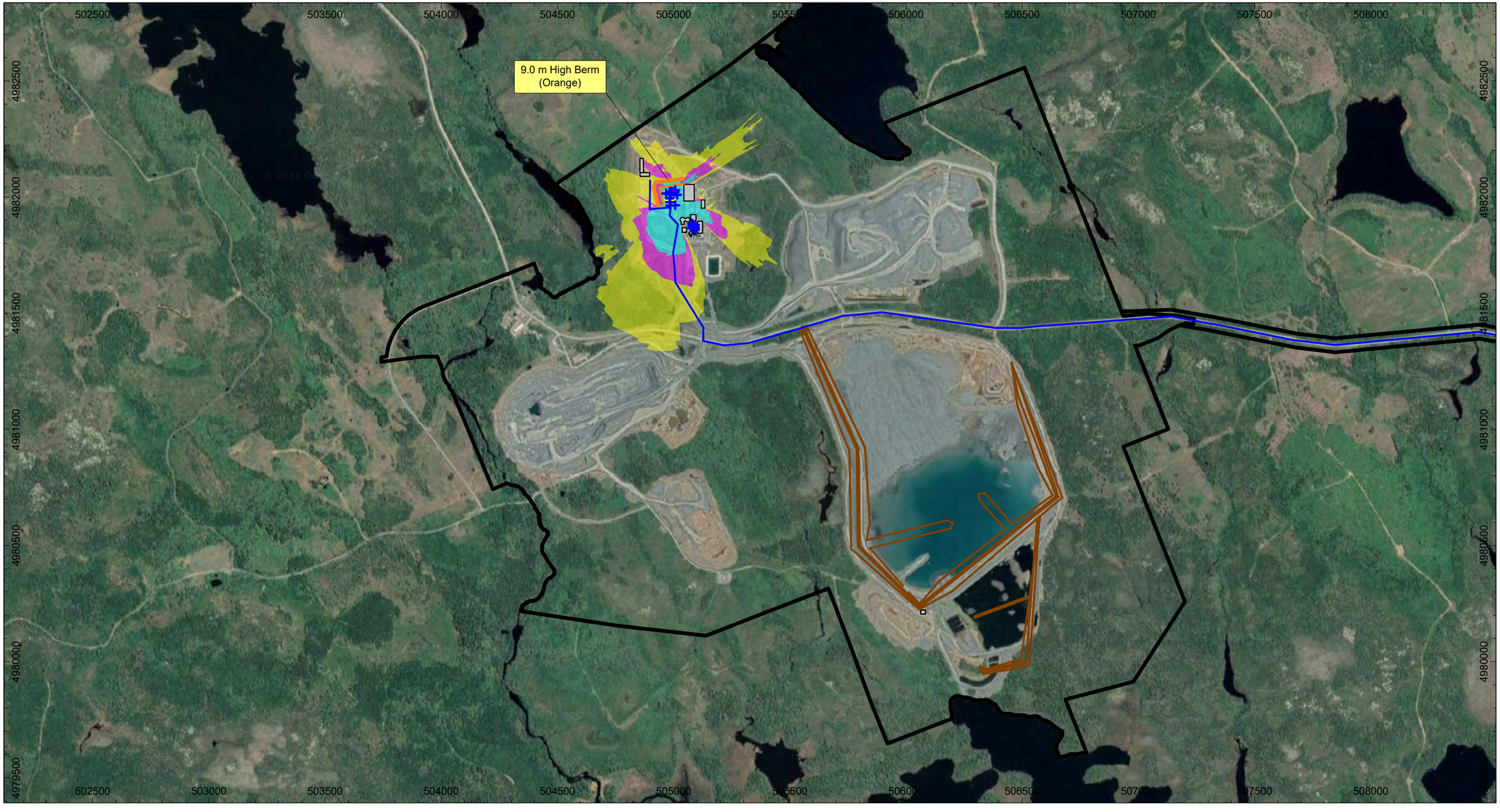
UPDATED NOISE TECHNICAL REPORT
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BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

NOISE CONTOUR PLOT - TOUQUOY SITE MITIGATED (DAY/EVENING, 1.5 m A.G.)

FIGURE 3P

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

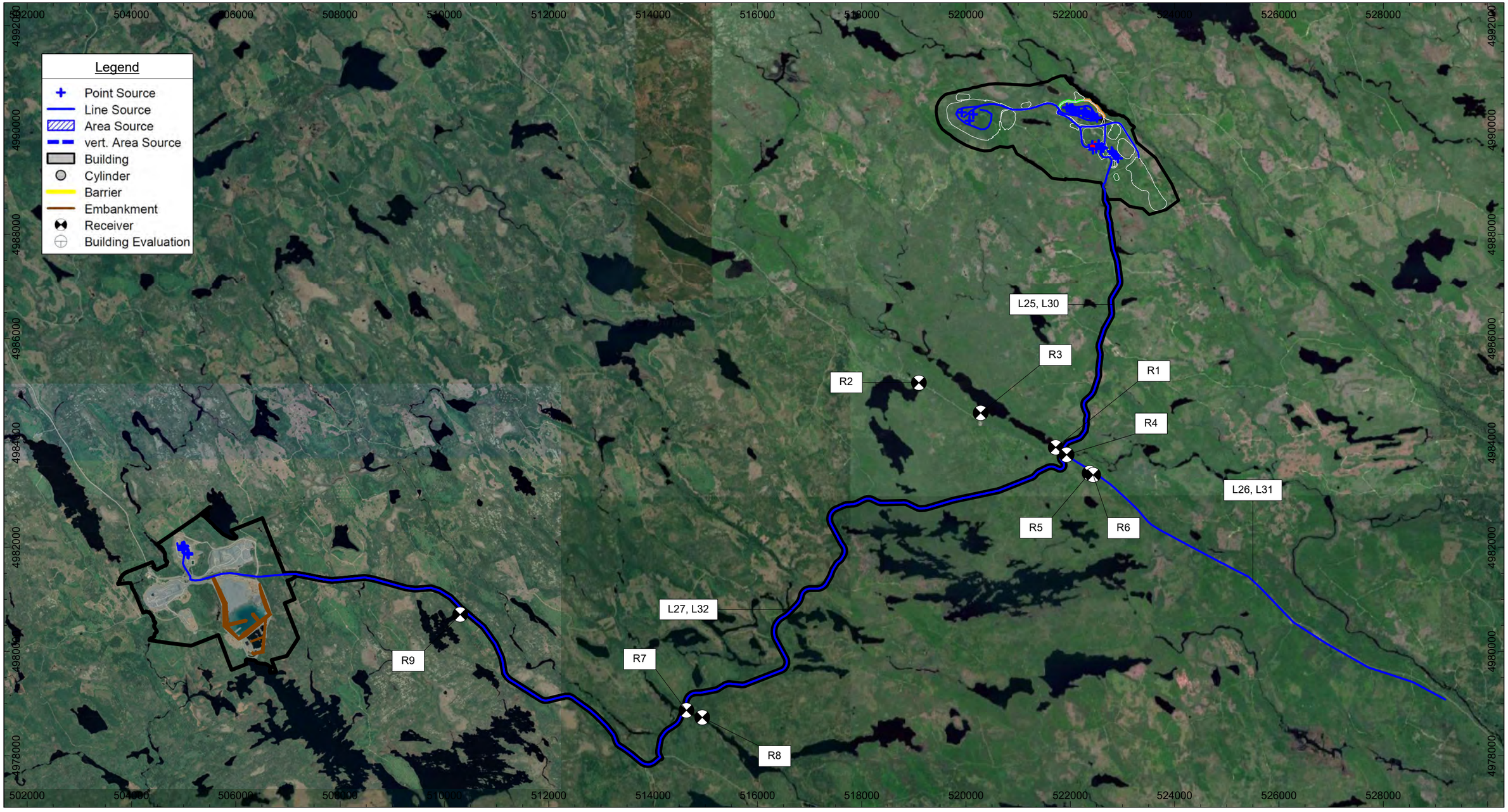
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

088664
18.11.2021

NOISE CONTOUR PLOT - TOUQUOY SITE MITIGATED (NIGHT, 1.5 m A.G.)

FIGURE 3Q

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

GHD

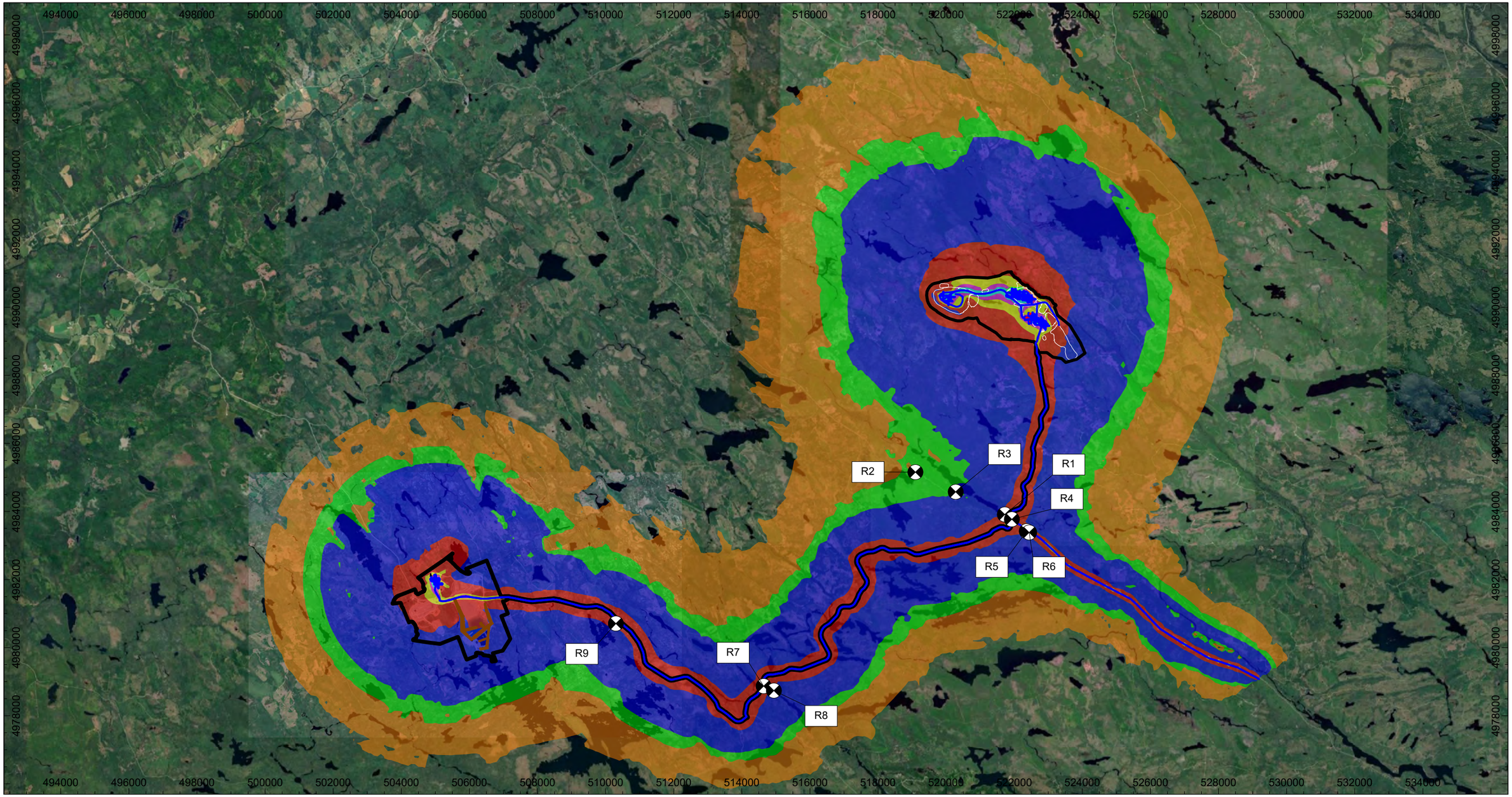
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

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SOURCE LOCATIONS - CUMULATIVE TRUCK TRAFFIC

FIGURE 4A

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

- > 27 dBA
- > 31 dBA
- > 33 dBA
- > 45 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA

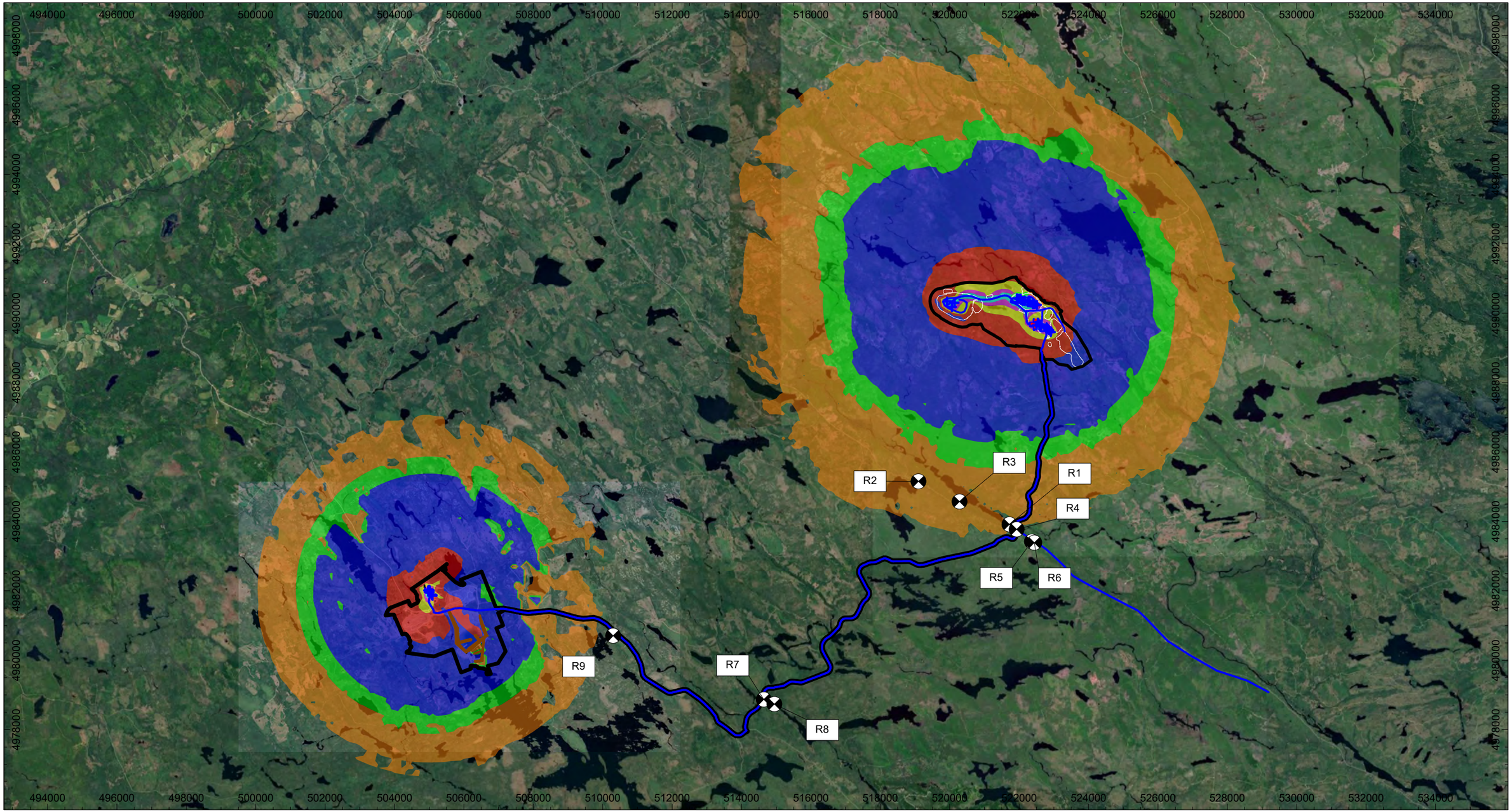
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

CUMULATIVE EFFECTS NOISE CONTOUR PLOT - OVERALL STUDY AREA
(DAY/EVENING, 1.5 m A.G.)

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FIGURE 4B

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

- > 27 dBA
- > 31 dBA
- > 33 dBA
- > 45 dBA
- > 55 dBA
- > 60 dBA
- > 65 dBA

GHD

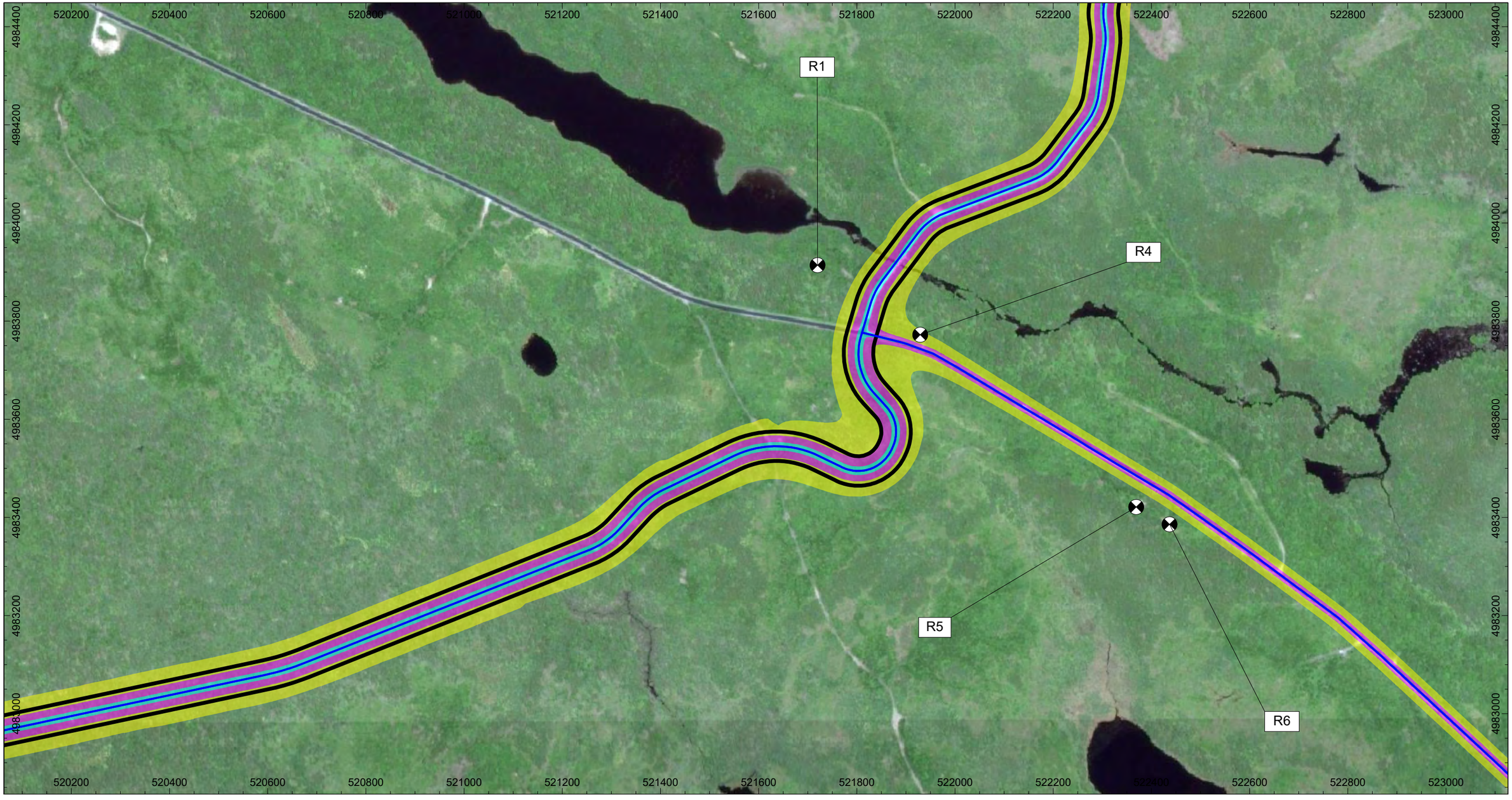
UPDATED NOISE TECHNICAL REPORT
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CUMULATIVE EFFECTS NOISE CONTOUR PLOT - OVERALL STUDY AREA (NIGHT, 1.5 m A.G.)

FIGURE 4C

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

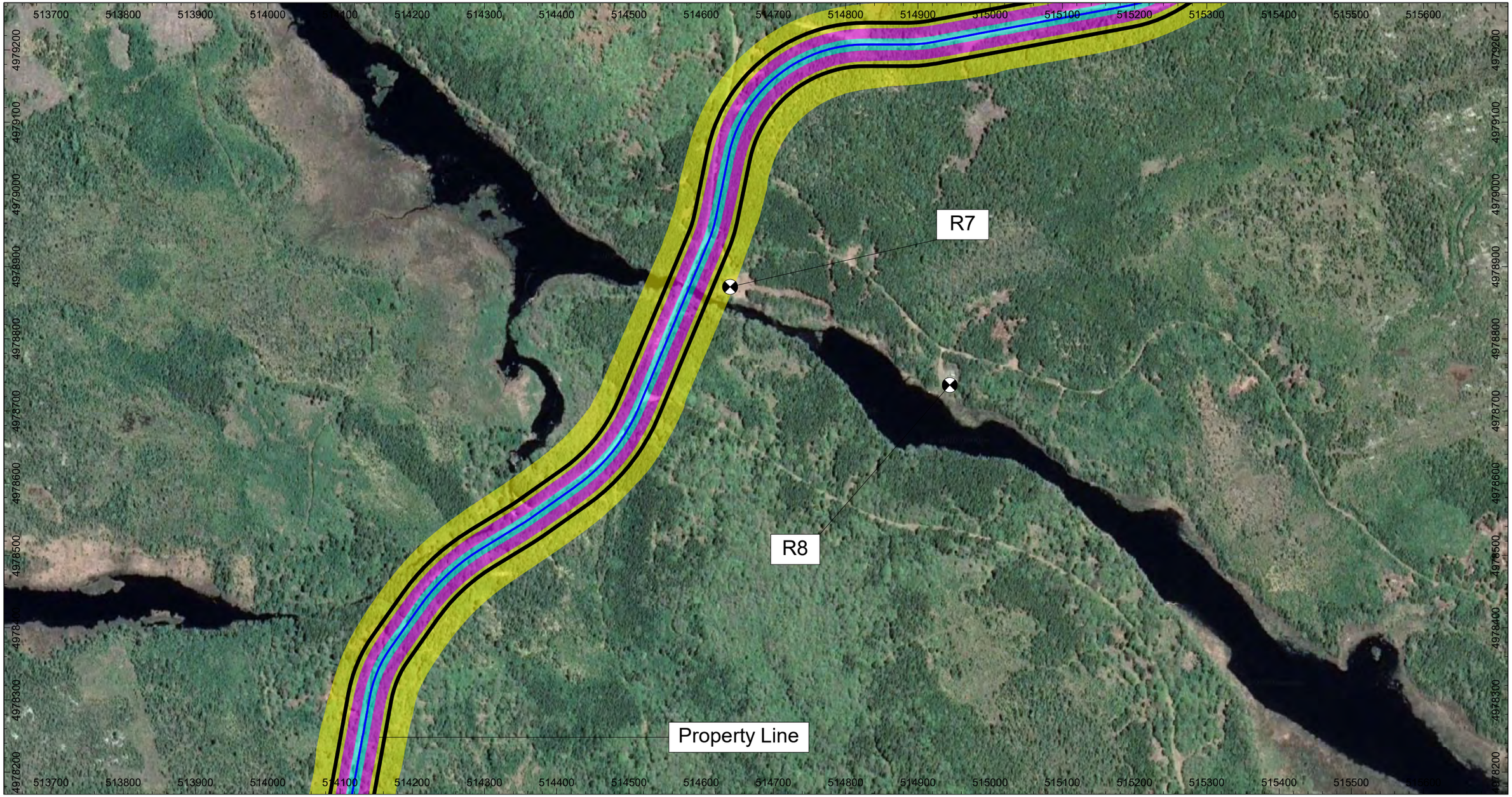
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

CUMULATIVE EFFECTS NOISE CONTOUR PLOT - R1, R4, R5, AND R6 ENLARGED
(DAY/EVENING, 1.5 m A.G.)

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FIGURE 4D

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

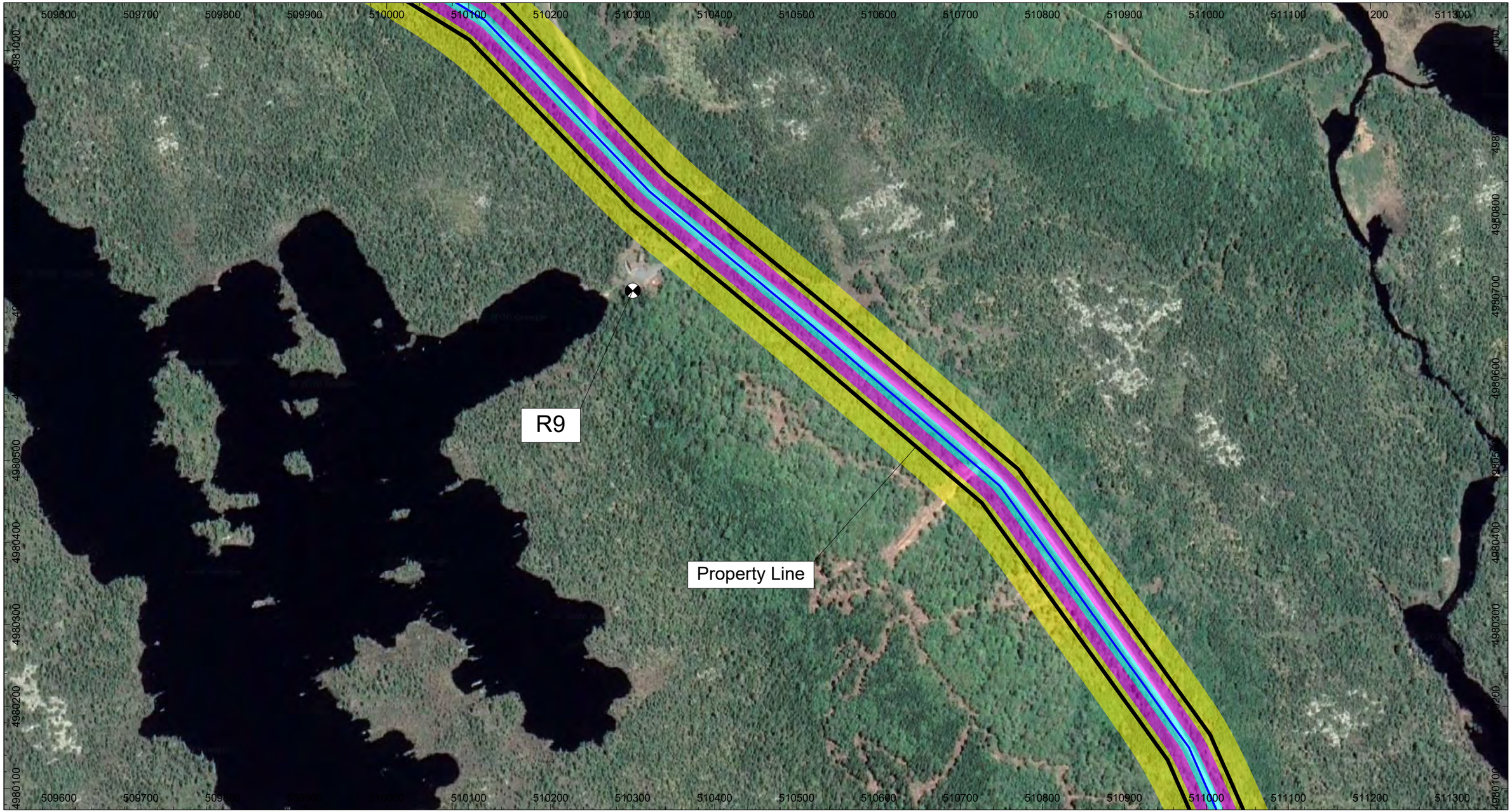
UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
BEAVER DAM MINE, HALIFAX, NS

CUMULATIVE EFFECTS NOISE CONTOUR PLOT - R7 AND R8 ENLARGED
(DAY/EVENING, 1.5 m A.G.)

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FIGURE 4E

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna



Source: Google Satellite

N

> 55 dBA
> 60 dBA
> 65 dBA

GHD

UPDATED NOISE TECHNICAL REPORT
ATLANTIC GOLD
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CUMULATIVE EFFECTS NOISE CONTOUR PLOT - R9 ENLARGED (DAY/EVENING, 1.5 m A.G.)

FIGURE 4F

CadnaA File: \\ghdnet\ghd\CA\Halifax\Projects\661\088664\Tech\Noise\CadnaA\088664_Beaver Dam Mine_v2021.05.cna

Appendices

Appendix A

Noise Source Summary

Table 1

Noise Source Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Source Description	Sound Power Level[1] (dBA)	Source Characteristics[2]	Source Location[3]	Noise Control Measures[4]	Source Type
Touquoy Mine Site						
S41	Loader - Transport of Material	116.0	S	O	U	Point
S42	Truck - Unloading Ore	110.2	S	O	U	Point
S43	Loader - Face Shovel	120.9	S	O	U	Point
S44	Truck - Hopper Discharge	115.5	S	O	U	Point
S45	Heavy Duty Hopper	121.5	S	O	U	Point
S46	Jaw Crusher	121.1	S	O	U	Point
S47	Heavy Duty Belt Feeder Hopper	100.2	S	O	U	Point
S48	Cone Crusher	121.1	S	O	U	Point
S49	Twin Screen Plant	112.1	S	O	U	Point
S50	Tunnel Conveyor	107.8	S	O	U	Point
S51	Cone Crusher	121.1	S	O	U	Point
S52	CIL Tank - Electric Motor	97.4	S	O	U	Point
S53	CIL Tank - Electric Motor	97.4	S	O	U	Point
S54	CIL Tank - Electric Motor	97.4	S	O	U	Point
S55	CIL Tank - Electric Motor	97.4	S	O	U	Point
S56	CIL Tank - Electric Motor	97.4	S	O	U	Point
S57	CIL Tank - Electric Motor	97.4	S	O	U	Point
Haul Road						
L24	Truck - Project Traffic on Ore Transport Route	120.8	S	O	U	Line
L25	Truck - Cumulative Traffic on Ore Transport Route	120.8	S	O	U	Line
L26	Truck - Cumulative Traffic on Ore Transport Route	120.8	S	O	U	Line
L27	Truck - Cumulative Traffic on Ore Transport Route	120.8	S	O	U	Line
L30	3/4 Ton Service Truck - Cumulative Traffic	115.8	S	O	U	Line
L31	3/4 Ton Service Truck - Cumulative Traffic	115.8	S	O	U	Line
L32	3/4 Ton Service Truck - Cumulative Traffic	115.8	S	O	U	Line
Beaver Dam Mine Site						
L6	Truck - Haul Roads	120.8	S	O	U	Line
L21	Grader - Haul Roads	119.6	S	O	U	Line
L22	Grader - Haul Roads	119.6	S	O	U	Line
L23	Grader - Haul Roads	119.6	S	O	U	Line
S57	Tracked Mobile Drill	117.8	S	O	U	Point
S60	Tracked Mobile Drill	117.8	S	O	U	Point
S61	Tracked Mobile Drill	117.8	S	O	U	Point
S62	Tracked Mobile Drill	117.8	S	O	U	Point
S104	Tracked Dozer	115.1	S	O	U	Point
S105	Tracked Dozer	115.1	S	O	U	Point
S106	Tracked Dozer	115.1	S	O	U	Point
S107	3m Light Tower	96.5	S	O	U	Point
S108	Hydraulic Excavator	109.8	S	O	U	Point
S109	Wheel Loader	114.2	S	O	U	Point
S110	Dewatering Pump	110.4	S	O	U	Point
S111	Dewatering Pump	110.4	S	O	U	Point
S112	Hydraulic Excavator	109.8	S	O	U	Point
S113	3m Light Tower	96.5	S	O	U	Point
S114	Hydraulic Excavator	109.8	S	O	U	Point
S115	Wheel Loader	114.2	S	O	U	Point
S116	Hydraulic Excavator	109.8	S	O	U	Point
S117	3m Light Tower	96.5	S	O	U	Point
S118	8m Light Tower	96.5	S	O	U	Point
S119	8m Light Tower	96.5	S	O	U	Point
S120	Jaw Crusher	114.7	S	O	U	Point
S121	Wheel Loader	114.2	S	O	U	Point
S122	8m Light Tower	96.5	S	O	U	Point
S123	Truck Unloading	110.2	S	O	U	Point
S124	Wheeled Backhoe Loader	97.8	S	O	U	Point
S125	Skid Steer	109.1	S	O	U	Point
S126	Generator	118.1	S	O	U	Point
S127	Mobile_Crane	112.5	S	O	U	Point
S128	Forklift	99.5	S	O	U	Point
S129	Fuel & Lube Truck	107.5	S	O	U	Point
S130	Fuel & Lube Truck	107.5	S	O	U	Point
S131	Excavator-Mounted Breaker	124.0	S	O	U	Point

Notes:

[1] Sound Power Level (PWL) in dBA, excludes +5 dBA total penalty if applicable.
[2] Sound characteristics:
- S – Steady
- Q – Quasi-steady impulsive
- I – Impulsive
- B – Buzzing
- T – Tonal
- C – Cyclic

[3] Source location:
- O – Outside of building
- I – Inside of building

[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

Appendix B

Point of Reception Noise Impact – Direct Effects and Cumulative Effects for Option A and Option B

Table 2a

Point of Reception Noise Impact – Direct Effects, Option A
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Source Description	Beaver Dam Mine Road (Marlborough Propert R1				4112 Highway 224 (Beaver Lake IR 17) R2				4115 Highway 224 (Cottage on Crown Land) R3				3492 Highway 224 (Hobbs Property) R4				3379 Highway 224 (McLeod Property) R5				3373 Highway 224 (Smith Property) R6				Tangier River (Deepwood Estate Property) R7				Musqudoboit Lumber Co Ltd. Property/John D R8				5579 Mooseland Road (Lloy Property) R9			
		Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am
Touquoy Mine Site																																			
S41	Loader - Transport of Material	16896	—	—	—	14499	1.8	1.8	1.8	15555	0.6	0.6	0.6	17090	—	—	—	17498	—	—	—	17563	—	—	—	10249	7.9	7.9	7.9	10581	7.3	7.3	7.3	5564	14.1	14.1	14.1
S42	Truck - Unloading Ore	16921	—	—	—	14536	—	—	—	15586	—	—	—	17113	—	—	—	17519	—	—	—	17584	—	—	—	10223	2.2	2.2	2.2	10554	1.7	1.7	1.7	5545	5.6	5.6	5.6
S43	Loader - Face Shovel	16956	—	—	—	14574	1.4	1.4	1.4	15623	0.4	0.4	0.4	17148	—	—	—	17553	—	—	—	17618	—	—	—	10242	6.7	6.7	6.7	10573	6.2	6.2	6.2	5567	12.0	12.0	12.0
S44	Truck - Hopper Discharge	16907	—	—	—	14526	—	—	—	15574	—	—	—	17099	—	—	—	17504	—	—	—	17569	—	—	—	10195	3.2	3.2	3.2	10526	2.7	2.7	2.7	5520	7.7	7.7	7.7
S45	Heavy Duty Hopper	16878	—	—	—	14501	—	—	—	15548	—	—	—	17070	—	—	—	17474	—	—	—	17538	—	—	—	10152	5.8	5.8	5.8	10483	4.9	4.9	4.9	5479	20.2	20.2	20.2
S46	Jaw Crusher	16880	1.0	1.0	1.0	14505	3.0	3.0	3.0	15550	2.1	2.1	2.1	17071	0.8	0.8	0.8	17475	0.5	0.5	0.5	17540	0.5	0.5	0.5	10147	8.0	8.0	8.0	10478	7.6	7.6	7.6	5475	17.6	17.6	17.6
S47	Heavy Duty Belt Feeder Hopper	16880	—	—	—	14505	—	—	—	15551	—	—	—	17071	—	—	—	17475	—	—	—	17540	—	—	—	10146	—	—	—	10477	—	—	—	5474	—	—	—
S48	Cone Crusher	16870	0.3	0.3	0.3	14495	2.8	2.8	2.8	15540	0.9	0.9	0.9	17061	0.4	0.4	0.4	17465	0.3	0.3	0.3	17529	0.3	0.3	0.3	10135	7.8	7.8	7.8	10466	7.3	7.3	7.3	5464	17.3	17.3	17.3
S49	Twin Screen Plant	16879	—	—	—	14505	—	—	—	15550	—	—	—	17070	—	—	—	17473	—	—	—	17538	—	—	—	10140	—	—	—	10471	—	—	—	5469	9.1	9.1	9.1
S50	Tunnel Conveyor	16859	—	—	—	14486	—	—	—	15530	—	—	—	17050	—	—	—	17453	—	—	—	17518	—	—	—	10121	—	—	—	10452	—	—	—	5450	—	—	—
S51	Cone Crusher	16881	0.4	0.4	0.4	14508	2.8	2.8	2.8	15552	1.1	1.1	1.1	17072	0.5	0.5	0.5	17475	0.3	0.3	0.3	17540	0.3	0.3	0.3	10139	7.7	7.7	7.7	10470	7.3	7.3	7.3	5469	17.3	17.3	17.3
S52	CIL Tank - Electric Motor	16788	—	—	—	14429	—	—	—	15467	—	—	—	16979	—	—	—	17379	—	—	—	17443	—	—	—	10005	—	—	—	10335	—	—	—	5341	—	—	—
S53	CIL Tank - Electric Motor	16777	—	—	—	14419	—	—	—	15456	—	—	—	16967	—	—	—	17367	—	—	—	17431	—	—	—	9991	—	—	—	10322	—	—	—	5328	—	—	—
S54	CIL Tank - Electric Motor	16790	—	—	—	14432	—	—	—	15469	—	—	—	16980	—	—	—	17380	—	—	—	17444	—	—	—	10002	—	—	—	10332	—	—	—	5340	—	—	—
S55	CIL Tank - Electric Motor	16778	—	—	—	14421	—	—	—	15458	—	—	—	16968	—	—	—	17368	—	—	—	17432	—	—	—	9988	—	—	—	10318	—	—	—	5326	—	—	—
S56	CIL Tank - Electric Motor	16791	—	—	—	14434	—	—	—	15470	—	—	—	16981	—	—	—	17381	—	—	—	17445	—	—	—	9999	—	—	—	10330	—	—	—	5338	—	—	—
S57	CIL Tank - Electric Motor	16780	—	—	—	14424	—	—	—	15459	—	—	—	16969	—	—	—	17369	—	—	—	17434	—	—	—	9985	—	—	—	10316	—	—	—	5324	—	—	—
Haul Road																																			
L24	Truck - Project Traffic on Ore Transport Route	137	48.2	48.2	—	2306	26.4	26.4	—	1441	29.5	29.5	—	112	49.8	49.8	—	660	38.3	38.3	38.3	736	36.3	36.3	36.3	56	53.3	53.3	53.3	389	42.1	42.1	42.1	106	49.7	49.7	49.7
Beaver Dam Mine Site																																			
L21	Grader - Haul Roads	5784	5.0	5.0	5.0	5007	6.9	6.9	6.9	5441	6.5	6.5	6.5	5908	4.7	4.7	4.7	6247	4.7	4.7	4.7	6283	4.5	4.5	4.5	12465	—	—	—	12462	—	—	—	13496	—	—	—
L22	Grader - Haul Roads	6307	—	—	—	5938	—	—	—	5978	0.1	0.1	0.1	6432	—	—	—	6764	—	—	—	6798	—	—	—	13617	—	—	—	13573	—	—	—	15123	—	—	—
L23	Grader - Haul Roads	5786	—	—	—	5795	—	—	—	5765	0.2	0.2	0.2	5870	0.2	0.2	0.2	6129	—	—	—	6153	—	—	—	13493	—	—	—	13440	—	—	—	15127	—	—	—
L33	Truck - Haul Roads	5784	14.8	14.8	14.8	5529	15.7	15.7	15.7	5482	15.9	15.9	15.9	5908	15.0	15.0	15.0	6247	14.4	14.4	14.4	6283	14.3	14.3	14.3	13233	6.2	6.2	6.2	13173	6.5	6.5	6.5	14957	5.3	5.3	5.3
L6	Truck - Haul Roads	6382	23.8	23.8	23.8	5225	25.2	25.2	25.2	5731	25.3	25.3	25.3	6517	23.8	23.8	23.8	6874	23.7	23.7	23.7	6912	23.7	23.7	23.7	12628	15.7	15.7	15.7	12626	16.4	16.4	16.4	13652	15.6	15.6	15.6
S104	Tracked Dozer	6672	12.6	12.6	12.6	5248	15.8	15.8	15.8	5776	14.5	14.5	14.5	6867	12.2	12.2	12.2	7338	13.2	13.2	13.2	7394	13.1	13.1	13.1	12623	3.6	3.6	3.6	12624	3.6	3.6	3.6	13612	2.5	2.5	2.5
S105	Tracked Dozer	6580	12.8	12.8	12.8	5250	15.8	15.8	15.8	5728	14.6	14.6	14.6	6770	12.4	12.4	12.4	7232	13.4	13.4	13.4	7287	13.3	13.3	13.3	12682	3.6	3.6	3.6	12677	3.6	3.6	3.6	13740	2.4	2.4	2.4
S106	Tracked Dozer	6479	13.0	13.0	13.0	5116	16.1	16.1	16.1	5608	14.9	14.9	14.9	6671	12.6	12.6	12.6	7138	13.6	13.6	13.6	7194	13.5	13.5	13.5	12541	3.7	3.7	3.7	12536	3.7	3.7	3.7	13604	2.6	2.6	2.6
S107	3m Light Tower	6506	—	—	—	6003	—	—	—	6086	—	—	—	6643	—	—	—	7003	—	—	—	7042	—	—	—	13684	—	—	—	13640	—	—	—	15196	—	—	—
S108	Hydraulic Excavator	6516	4.6	4.6	4.6	6032	5.7	5.7	5.7	6107	5.5	5.5	5.5	6651	4.5	4.5	4.5	7009	3.8	3.8	3.8	7047	3.7	3.7	3.7	13716	—	—	—	13671	—	—	—	15237	—	—	—
S109	Wheel Loader	6447	9.7	9.7	9.7	6003	11.4	11.4	11.4	6057	11.3	11.3	11.3	6580	9.9	9.9	9.9	6933	9.1	9.1	9.1	6971	9.0	9.0	9.0	13692	—	—	—	13644	—	—	—	15244	—	—	—
S110	Dewatering Pump	6466	1.0	1.0	1.0	6044	1.8	1.8	1.8	6089	1.8	1.8	1.8	6597	0.9	0.9	0.9	6947	0.3	0.3	0.3	6985	0.3	0.3	0.3	13735	—	—	—	13686	—	—	—	15295	—	—	—
S111	Dewatering Pump	6451	0.9	0.9	0.9	6031	1.8	1.8	1.8	6074	1.8	1.8	1.8	6582	0.9	0.9	0.9	6932	0.3	0.3	0.3	6969	0.3	0.3	0.3	13722	—	—	—	13673	—	—	—	15285	—	—	—
S112	Hydraulic Excavator	6449	4.7	4.7	4.7	6078	5.5	5.5	5.5	6099	5.5	5.5	5.5	6577	4.6	4.6	4.6	6920	3.9	3.9	3.9	6956	3.9	3.9	3.9	13773	—	—	—	13722	—	—	—	15363	—	—	—
S113	3m Light Tower	6471	—	—	—	6102	—	—	—	6123	—	—	—	6598	—	—	—	6940	—	—	—	6976	—	—	—	13797	—	—	—	13746	—	—	—	15386	—	—	—
S114	Hydraulic Excavator	6438	4.7	4.7	4.7	6084	5.4	5.4	5.4	6097	5.5	5.5	5.5	6564	4.6	4.6	4.6	6905	4.0	4.0	4.0	6941	3.9	3.9	3.9	13781	—	—	—	13729	—	—	—	15382	—	—	—
S115	Wheel Loader	6417	8.2	8.2	8.2	6113	10.6	10.6	10.6	6103	11.1	11.1	11.1	6540	10.1	10.1	10.1	6874	9.3	9.3	9.3	6909	9.2	9.2	9.2	13813	—	—	—	13759	—	—	—	15444	—	—	—
S116	Hydraulic Excavator	6386	2.9	2.9	2.9	6101	5.1	5.1	5.1	6081	5.4	5.4	5.4	6507	4.7	4.7	4.7	6838	4.1	4.1	4.1	6873	4.0	4.0	4.0	13802	—	—	—	13746	—	—	—	15447	—	—	—
S117	3m Light Tower	6370	—	—	—	6120	—	—	—	6084	—	—	—	6488	—	—	—	6815	—	—	—	6849	—	—	—	13822	—	—	—	13765	—	—	—	15488	—	—	—
S118	8m Light Tower	5843	—	—	—	5644	—	—	—	5570	—	—	—	5963	—	—	—	6294	—	—	—	6329	—	—	—	13347	—	—	—	13284	—	—	—	15103	—	—	—
S119	8m Light Tower	5757	—	—	—	5579	—	—	—	5492	—	—	—	5876	—	—	—	6205	—	—	—	6240	—	—	—	13281	—	—	—	13217	—	—	—	15059	—	—	—
S120	Jaw Crusher	5828	11.8	11.8	11.8	5657	12.2	12.2	12.2	5569	12.5	12.5	12.5	5946	11.5	11.5	11.5	6273	10.7	10.7	10.7	6307	10.6	10.6	10.6	13359	—	—	—	13295	—	—	—	15131	—	—	—
S121	Wheel Loader	5781	12.3	12.3	12.3	5631	12.7	12.7	12.7	5533	13.0	13.0	13.0	5898	12.0	12.0	12.0	6223	11.1	11.1	11.1	6257	11.0	11.0	11.0	13333	—	—	—	13267	0.0	0.0	0.0	15121	—	—	—
S122	8m Light Tower	5874	—	—	—	5727	—	—	—	5631	—	—	—	5990	—	—	—	6312	—	—	—	6345	—	—	—	13429	—	—	—	13364	—	—	—	15207	—	—	—
S123	Truck Unloading	5830	8.7	8.7	8.7	5719	8.9	8.9	8.9	5605	9.2	9.2	9.2	5943	8.5	8.5	8.5	6260	7.8	7.8	7.8	6293	7.8	7.8	7.8	13420	—	—	—	13353	—	—	—	15222	—	—	—
S124	Wheeled Backhoe Loader	5790	—	—	—	5683	—	—	—	5566	—	—	—	5904	—	—	—	6221	—	—	—	6254	—	—	—	13383	—	—	—	13316	—	—	—	15192	—	—	—
S125	Skid Steer	5811	3.4	3.4	3.4	5720	3.7	3.7	3.7	5596	4.0	4.0	4.0	5923	3.1	3.1	3.1	6237	2.3	2.3	2.3	6270	2.2	2.2	2.2	13419	—	—	—	13351	—	—	—	15233	—	—	—
S126	Generator	5781	8.4	8.4	8.4	5776	8.4	8.4	8.4	5614	8.9	8.9	8.9	5886	8.0	8.0	8.0	6188	7.1	7.1	7.1	6218	7.0	7.0	7.0	13470	—	—	—	13398	—	—	—	15331	—	—	—
S127	Mobile_Crane	5769	10.3	10.3	10.3	5774	10.3	10.3	10.3	5608	10.6	10.6	10.6	5874	10.0	10.0	10.0	6174	9.5	9.5	9.5	6205	9.4	9.4	9.4	13467	1.1	1.1	1.1	13395	1.1	1.1	1.1	15335	—	—	—
S128	Forklift	5742	—	—	—	5763	—	—	—	5588	—	—	—	5845	—	—	—	6144	—	—	—	6174	—	—	—	13454	—	—	—	13381	—	—	—	15333	—	—	—
S129	Fuel & Lube Truck	5712	3.2	3.2	3.2	5759	3.1	3.1	3.1	5572	3.6	3.6	3.6	5814	2.9	2.9	2.9	6109	2.1	2.1	2.1	6139	2.0	2.0	2.0	13447	—	—	—	13373	—	—	—	15342	—	—	—
S130	Fuel & Lube Truck	5667	3.3	3.3	3.3	5748	3.1	3.1	3.1	5545	3.7	3.7	3.7	5766	3.1	3.1	3.1	6057	2.3	2.3	2.3	6086	2.2	2.2	2.2	13431	—	—	—	13355	—	—	—	15348	—	—	—
S59	Tracked Mobile Drill	6475	9.1	9.1	9.1	6005	11.0	11.0	11.0	6072	10.8	10.8	10.8	6609	9.3	9.3	9.3	6966	8.3	8.3	8.3	7004	8.2	8.2	8.2	13691	—	—	—	13645	—	—	—	15225	—	—	—
S60	Tracked Mobile Drill	6375	5.8	5.8	5.8	6071	9.0	9.0	9.0	6060	10.7	10.7	10.7	6497	9.6	9.6	9.6	6832	8.6	8.6	8.6	6867	8.5	8.5	8.5	13772	—	—	—	13717	—	—	—	15408	—	—	—
S61	Tracked Mobile Drill	6423	9.0	9.0	9.0	6047	10.0	10.0	10.0	6070	10.8	10.8	10.8	6551	9.4	9.4	9.4	6895	8.4	8.4	8.4	6932	8.3	8.3	8.3	13742	—	—	—	13691	—	—	—	15333	—	—	—
S62	Tracked Mobile Drill	6521	9.5	9.5	9.5	5991	11.1	11.1	11.1	6086	10.8	10.8	10.8	6659	9.1	9.1	9.1	7023	8.1	8.1	8.1	7063	8.0	8.0	8.0	13669	—	—	—	13625	—	—	—	15164	—	—	—
Total Facility Sound Level (1-hour Leq):			**48.2**	**48.2**	**26.6**		**30.4**	**30.4**	**28.2**		**31.9**	**31.9**	**28.1**		**50.5**	**50.5**	**26.7**		**39.7**	**39.7**	**26.5**		**37.9**	**37.9**	**26.4**		**53.8**	**53.8**	**19.4**		**42.2**	**42.2**	**19.7**		**49.8**	**49.8**	**25.8**

Note:

[1] Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Table 2b

Point of Reception Noise Impact – Direct Effects, Option B
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Source Description	Beaver Dam Mine Road (Marlborough Property) R1				4112 Highway 224 (Beaver Lake IR 17) R2				4115 Highway 224 (Cottage on Crown Land) R3				3492 Highway 224 (Hobbs Property) R4				3379 Highway 224 (McLeod Property) R5				3373 Highway 224 (Smith Property) R6				Tangier River (Deepwood Estates Property) R7				Tangier River/Musquodoboit Lumber Co Ltd. Property/John D R8				5579 Mooseland Road (Lloy Property) R9			
		Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am
Touquoy Mine Site																																			
S41	Loader - Transport of Material	16896	—	—	—	14499	1.8	1.8	1.8	15555	0.6	0.6	0.6	17090	—	—	—	17498	—	—	—	17563	—	—	—	10249	7.9	7.9	7.9	10581	7.3	7.3	7.3	5564	14.1	14.1	14.1
S42	Truck - Unloading Ore	16921	—	—	—	14536	—	—	—	15586	—	—	—	17113	—	—	—	17519	—	—	—	17584	—	—	—	10223	2.2	2.2	2.2	10554	1.7	1.7	1.7	5545	5.6	5.6	5.6
S43	Loader - Face Shovel	16956	—	—	—	14574	1.4	1.4	1.4	15623	0.4	0.4	0.4	17148	—	—	—	17553	—	—	—	17618	—	—	—	10242	6.7	6.7	6.7	10573	6.2	6.2	6.2	5567	12.0	12.0	12.0
S44	Truck - Hopper Discharge	16907	—	—	—	14526	—	—	—	15574	—	—	—	17099	—	—	—	17504	—	—	—	17569	—	—	—	10195	3.2	3.2	3.2	10526	2.7	2.7	2.7	5520	7.7	7.7	7.7
S45	Heavy Duty Hopper	16878	—	—	—	14501	—	—	—	15548	—	—	—	17070	—	—	—	17474	—	—	—	17538	—	—	—	10152	5.8	5.8	5.8	10483	4.9	4.9	4.9	5479	20.2	20.2	20.2
S46	Jaw Crusher	16880	1.0	1.0	1.0	14505	3.0	3.0	3.0	15550	2.1	2.1	2.1	17071	0.8	0.8	0.8	17475	0.5	0.5	0.5	17540	0.5	0.5	0.5	10147	8.0	8.0	8.0	10478	7.6	7.6	7.6	5475	17.6	17.6	17.6
S47	Heavy Duty Belt Feeder Hopper	16880	—	—	—	14505	—	—	—	15551	—	—	—	17071	—	—	—	17475	—	—	—	17540	—	—	—	10146	—	—	—	10477	—	—	—	5474	—	—	—
S48	Cone Crusher	16870	0.3	0.3	0.3	14495	2.8	2.8	2.8	15540	0.9	0.9	0.9	17061	0.4	0.4	0.4	17465	0.3	0.3	0.3	17529	0.3	0.3	0.3	10135	7.8	7.8	7.8	10466	7.3	7.3	7.3	5464	17.3	17.3	17.3
S49	Twin Screen Plant	16879	—	—	—	14505	—	—	—	15550	—	—	—	17070	—	—	—	17473	—	—	—	17538	—	—	—	10140	—	—	—	10471	—	—	—	5469	9.1	9.1	9.1
S50	Tunnel Conveyor	16859	—	—	—	14486	—	—	—	15530	—	—	—	17050	—	—	—	17453	—	—	—	17518	—	—	—	10121	—	—	—	10452	—	—	—	5450	—	—	—
S51	Cone Crusher	16881	0.4	0.4	0.4	14508	2.8	2.8	2.8	15552	1.1	1.1	1.1	17072	0.5	0.5	0.5	17475	0.3	0.3	0.3	17540	0.3	0.3	0.3	10139	7.7	7.7	7.7	10470	7.3	7.3	7.3	5469	17.3	17.3	17.3
S52	CIL Tank - Electric Motor	16788	—	—	—	14429	—	—	—	15467	—	—	—	16979	—	—	—	17379	—	—	—	17443	—	—	—	10005	—	—	—	10335	—	—	—	5341	—	—	—
S53	CIL Tank - Electric Motor	16777	—	—	—	14419	—	—	—	15456	—	—	—	16967	—	—	—	17367	—	—	—	17431	—	—	—	9991	—	—	—	10322	—	—	—	5328	—	—	—
S54	CIL Tank - Electric Motor	16790	—	—	—	14432	—	—	—	15469	—	—	—	16980	—	—	—	17380	—	—	—	17444	—	—	—	10002	—	—	—	10332	—	—	—	5340	—	—	—
S55	CIL Tank - Electric Motor	16778	—	—	—	14421	—	—	—	15458	—	—	—	16968	—	—	—	17368	—	—	—	17432	—	—	—	9988	—	—	—	10318	—	—	—	5326	—	—	—
S56	CIL Tank - Electric Motor	16791	—	—	—	14434	—	—	—	15470	—	—	—	16981	—	—	—	17381	—	—	—	17445	—	—	—	9999	—	—	—	10330	—	—	—	5338	—	—	—
S57	CIL Tank - Electric Motor	16780	—	—	—	14424	—	—	—	15459	—	—	—	16969	—	—	—	17369	—	—	—	17434	—	—	—	9985	—	—	—	10316	—	—	—	5324	—	—	—
Haul Road																																			
L24	Truck - Project Traffic on Ore Transport Route	137	48.2	48.2	—	2306	26.4	26.4	—	1441	29.5	29.5	—	112	49.8	49.8	—	660	38.3	38.3	—	736	36.3	36.3	—	56	53.3	53.3	—	389	42.1	42.1	—	106	49.7	49.7	—
Beaver Dam Mine Site																																			
L6	Truck - Haul Roads	6382	23.8	23.8	23.8	5225	25.2	25.2	25.2	5731	25.3	25.3	25.3	6517	23.8	23.8	23.8	6874	23.7	23.7	23.7	6912	23.7	23.7	23.7	12628	15.7	15.7	15.7	12626	16.4	16.4	16.4	13652	15.6	15.6	15.6
L21	Grader - Haul Roads	5784	5.0	5.0	5.0	5007	6.9	6.9	6.9	5441	6.5	6.5	6.5	5908	4.7	4.7	4.7	6247	4.7	4.7	4.7	6283	4.5	4.5	4.5	12465	—	—	—	12462	—	—	—	13496	—	—	—
L22	Grader - Haul Roads	6307	—	—	—	5938	—	—	—	5978	0.1	0.1	0.1	6432	—	—	—	6764	—	—	—	6798	—	—	—	13617	—	—	—	13573	—	—	—	15123	—	—	—
L23	Grader - Haul Roads	5786	—	—	—	5795	—	—	—	5765	0.2	0.2	0.2	5870	0.2	0.2	0.2	6129	—	—	—	6153	—	—	—	13493	—	—	—	13440	—	—	—	15127	—	—	—
L33	Truck - Haul Roads	5784	14.8	14.8	14.8	5529	15.7	15.7	15.7	5482	15.9	15.9	15.9	5908	15.0	15.0	15.0	6247	14.4	14.4	14.4	6283	14.3	14.3	14.3	13233	6.2	6.2	6.2	13173	6.5	6.5	6.5	14957	5.3	5.3	5.3
S59	Tracked Mobile Drill	6475	9.1	9.1	9.1	6005	11.0	11.0	11.0	6072	10.8	10.8	10.8	6609	9.3	9.3	9.3	6966	8.3	8.3	8.3	7004	8.2	8.2	8.2	13691	—	—	—	13645	—	—	—	15225	—	—	—
S60	Tracked Mobile Drill	6375	5.8	5.8	5.8	6071	9.0	9.0	9.0	6060	10.7	10.7	10.7	6497	9.6	9.6	9.6	6832	8.6	8.6	8.6	6867	8.5	8.5	8.5	13772	—	—	—	13717	—	—	—	15408	—	—	—
S61	Tracked Mobile Drill	6423	9.0	9.0	9.0	6047	10.0	10.0	10.0	6070	10.8	10.8	10.8	6551	9.4	9.4	9.4	6895	8.4	8.4	8.4	6932	8.3	8.3	8.3	13742	—	—	—	13691	—	—	—	15333	—	—	—
S62	Tracked Mobile Drill	6521	9.5	9.5	9.5	5991	11.1	11.1	11.1	6086	10.8	10.8	10.8	6659	9.1	9.1	9.1	7023	8.1	8.1	8.1	7063	8.0	8.0	8.0	13669	—	—	—	13625	—	—	—	15164	—	—	—
S104	Tracked Dozer	6672	12.6	12.6	12.6	5248	15.8	15.8	15.8	5776	14.5	14.5	14.5	6867	12.2	12.2	12.2	7338	13.2	13.2	13.2	7394	13.1	13.1	13.1	12623	3.6	3.6	3.6	12624	3.6	3.6	3.6	13612	2.5	2.5	2.5
S105	Tracked Dozer	6580	12.8	12.8	12.8	5250	15.8	15.8	15.8	5728	14.6	14.6	14.6	6770	12.4	12.4	12.4	7232	13.4	13.4	13.4	7287	13.3	13.3	13.3	12682	3.6	3.6	3.6	12677	3.6	3.6	3.6	13740	2.4	2.4	2.4
S106	Tracked Dozer	6479	13.0	13.0	13.0	5116	16.1	16.1	16.1	5608	14.9	14.9	14.9	6671	12.6	12.6	12.6	7138	13.6	13.6	13.6	7194	13.5	13.5	13.5	12541	3.7	3.7	3.7	12536	3.7	3.7	3.7	13604	2.6	2.6	2.6
S107	3m Light Tower	6506	—	—	—	6003	—	—	—	6086	—	—	—	6643	—	—	—	7003	—	—	—	7042	—	—	—	13684	—	—	—	13640	—	—	—	15196	—	—	—
S108	Hydraulic Excavator	6516	4.6	4.6	4.6	6032	5.7	5.7	5.7	6107	5.5	5.5	5.5	6651	4.5	4.5	4.5	7009	3.8	3.8	3.8	7047	3.7	3.7	3.7	13716	—	—	—	13671	—	—	—	15237	—	—	—
S109	Wheel Loader	6447	9.7	9.7	9.7	6003	11.4	11.4	11.4	6057	11.3	11.3	11.3	6580	9.9	9.9	9.9	6933	9.1	9.1	9.1	6971	9.0	9.0	9.0	13692	—	—	—	13644	—	—	—	15244	—	—	—
S110	Dewatering Pump	6466	1.0	1.0	1.0	6044	1.8	1.8	1.8	6089	1.8	1.8	1.8	6597	0.9	0.9	0.9	6947	0.3	0.3	0.3	6985	0.3	0.3	0.3	13735	—	—	—	13686	—	—	—	15295	—	—	—
S111	Dewatering Pump	6451	0.9	0.9	0.9	6031	1.8	1.8	1.8	6074	1.8	1.8	1.8	6582	0.9	0.9	0.9	6932	0.3	0.3	0.3	6969	0.3	0.3	0.3	13722	—	—	—	13673	—	—	—	15285	—	—	—
S112	Hydraulic Excavator	6449	4.7	4.7	4.7	6078	5.5	5.5	5.5	6099	5.5	5.5	5.5	6577	4.6	4.6	4.6	6920	3.9	3.9	3.9	6956	3.9	3.9	3.9	13773	—	—	—	13722	—	—	—	15363	—	—	—
S113	3m Light Tower	6471	—	—	—	6102	—	—	—	6123	—	—	—	6598	—	—	—	6940	—	—	—	6976	—	—	—	13797	—	—	—	13746	—	—	—	15386	—	—	—
S114	Hydraulic Excavator	6438	4.7	4.7	4.7	6084	5.4	5.4	5.4	6097	5.5	5.5	5.5	6564	4.6	4.6	4.6	6905	4.0	4.0	4.0	6941	3.9	3.9	3.9	13781	—	—	—	13729	—	—	—	15382	—	—	—
S115	Wheel Loader	6417	8.2	8.2	8.2	6113	10.6	10.6	10.6	6103	11.1	11.1	11.1	6540	10.1	10.1	10.1	6874	9.3	9.3	9.3	6909	9.2	9.2	9.2	13813	—	—	—	13759	—	—	—	15444	—	—	—
S116	Hydraulic Excavator	6386	2.9	2.9	2.9	6101	5.1	5.1	5.1	6081	5.4	5.4	5.4	6507	4.7	4.7	4.7	6838	4.1	4.1	4.1	6873	4.0	4.0	4.0	13802	—	—	—	13746	—	—	—	15447	—	—	—
S117	3m Light Tower	6370	—	—	—	6120	—	—	—	6084	—	—	—	6488	—	—	—	6815	—	—	—	6849	—	—	—	13822	—	—	—	13765	—	—	—	15488	—	—	—
S118	8m Light Tower	5843	—	—	—	5644	—	—	—	5570	—	—	—	5963	—	—	—	6294	—	—	—	6329	—	—	—	13347	—	—	—	13284	—	—	—	15103	—	—	—
S119	8m Light Tower	5757	—	—	—	5579	—	—	—	5492	—	—	—	5876	—	—	—	6205	—	—	—	6240	—	—	—	13281	—	—	—	13217	—	—	—	15059	—	—	—
S121	Wheel Loader	5781	12.3	12.3	12.3	5631	12.7	12.7	12.7	5533	13.0	13.0	13.0	5898	12.0	12.0	12.0	6223	11.1	11.1	11.1	6257	11.0	11.0	11.0	13333	—	—	—	13267	0.0	0.0	0.0	15121	—	—	—
S122	8m Light Tower	5874	—	—	—	5727	—	—	—	5631	—	—	—	5990	—	—	—	6312	—	—	—	6345	—	—	—	13429	—	—	—	13364	—	—	—	15207	—	—	—
S123	Truck Unloading	5830	8.7	8.7	8.7	5719	8.9	8.9	8.9	5605	9.2	9.2	9.2	5943	8.5	8.5	8.5	6260	7.8	7.8	7.8	6293	7.8	7.8	7.8	13420	—	—	—	13353	—	—	—	15222	—	—	—
S124	Wheeled Backhoe Loader	5790	—	—	—	5683	—	—	—	5566	—	—	—	5904	—	—	—	6221	—	—	—	6254	—	—	—	13383	—	—	—	13316	—	—	—	15192	—	—	—
S125	Skid Steer	5811	3.4	3.4	3.4	5720	3.7	3.7	3.7	5596	4.0	4.0	4.0	5923	3.1	3.1	3.1	6237	2.3	2.3	2.3	6270	2.2	2.2	2.2	13419	—	—	—	13351	—	—	—	15233	—	—	—
S126	Generator	5781	8.4	8.4	8.4	5776	8.4	8.4	8.4	5614	8.9	8.9	8.9	5886	8.0	8.0	8.0	6188	7.1	7.1	7.1	6218	7.0	7.0	7.0	13470	—	—	—	13398	—	—	—	15331	—	—	—
S127	Mobile_Crane	5769	10.3	10.3	10.3	5774	10.3	10.3	10.3	5608	10.6	10.6	10.6	5874	10.0	10.0	10.0	6174	9.5	9.5	9.5	6205	9.4	9.4	9.4	13467	1.1	1.1	1.1	13395	1.1	1.1	1.1	15335	—	—	—
S128	Forklift	5742	—	—	—	5763	—	—	—	5588	—	—	—	5845	—	—	—	6144	—	—	—	6174	—	—	—	13454	—	—	—	13381	—	—	—	15333	—	—	—
S129	Fuel & Lube Truck	5712	3.2	3.2	3.2	5759	3.1	3.1	3.1	5572	3.6	3.6	3.6	5814	2.9	2.9	2.9	6109	2.1	2.1	2.1	6139	2.0	2.0	2.0	13447	—	—	—	13373	—	—	—	15342	—	—	—
S130	Fuel & Lube Truck	5667	3.3	3.3	3.3	5748	3.1	3.1	3.1	5545	3.7	3.7	3.7	5766	3.1	3.1	3.1	6057	2.3	2.3	2.3	6086	2.2	2.2	2.2	13431	—	—	—	13355	—	—	—	15348	—	—	—
S131	Excavator-Mounted Breaker	6372	13.0	13.0	13.0	6019	14.1	14.1	14.1	6030	15.9	15.9	15.9	6499	14.6	14.6	14.6	6841	13.7	13.7	13.7	6877	13.7	13.7	13.7	13716	2.4	2.4	2.4	13664	2.9	2.9	2.9	15326	1.4	1.4	1.4
Total Facility Sound Level (1-hour Leq):			**48.2**	**48.2**	**26.7**		**30.4**	**30.4**	**28.2**		**31.8**	**31.8**	**28.2**		**50.5**	**50.5**	**26.8**		**39.7**	**39.7**	**26.6**		**37.9**	**37.9**	**26.6**		**53.8**	**53.8**	**19.9**		**42.2**	**42.2**	**19.7**		**49.8**	**49.8**	**25.9**

Note:

[1] Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Table 2c

Point of Reception Noise Impact – Cumulative Effects, Option A
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Source Description	Beaver Dam Mine Road (Marlborough Propert R1				4112 Highway 224 (Beaver Lake IR 17) R2				4115 Highway 224 (Cottage on Crown Land) R3				3492 Highway 224 (Hobbs Property) R4				3379 Highway 224 (McLeod Property) R5				3373 Highway 224 (Smith Property) R6				Tangier River (Deepwood Estates Property) R7				Tangier River/Musqudoboit Lumber Co Ltd. Property/John D R8				5579 Mooseland Road (Lloy Property) R9			
		Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am
Touquoy Mine Site																																			
S41	Loader - Transport of Material	16896	—	—	—	14499	1.8	1.8	1.8	15555	0.6	0.6	0.6	17090	—	—	—	17498	—	—	—	17563	—	—	—	10249	7.9	7.9	7.9	10581	7.3	7.3	7.3	5564	14.1	14.1	14.1
S42	Truck - Unloading Ore	16921	—	—	—	14536	—	—	—	15586	—	—	—	17113	—	—	—	17519	—	—	—	17584	—	—	—	10223	2.2	2.2	2.2	10554	1.7	1.7	1.7	5545	5.6	5.6	5.6
S43	Loader - Face Shovel	16956	—	—	—	14574	1.4	1.4	1.4	15623	0.4	0.4	0.4	17148	—	—	—	17553	—	—	—	17618	—	—	—	10242	6.7	6.7	6.7	10573	6.2	6.2	6.2	5567	12.0	12.0	12.0
S44	Truck - Hopper Discharge	16907	—	—	—	14526	—	—	—	15574	—	—	—	17099	—	—	—	17504	—	—	—	17569	—	—	—	10195	3.2	3.2	3.2	10526	2.7	2.7	2.7	5520	7.7	7.7	7.7
S45	Heavy Duty Hopper	16878	—	—	—	14501	—	—	—	15548	—	—	—	17070	—	—	—	17474	—	—	—	17538	—	—	—	10152	5.8	5.8	5.8	10483	4.9	4.9	4.9	5479	20.2	20.2	20.2
S46	Jaw Crusher	16880	1.0	1.0	1.0	14505	3.0	3.0	3.0	15550	2.1	2.1	2.1	17071	0.8	0.8	0.8	17475	0.5	0.5	0.5	17540	0.5	0.5	0.5	10147	8.0	8.0	8.0	10478	7.6	7.6	7.6	5475	17.6	17.6	17.6
S47	Heavy Duty Belt Feeder Hopper	16880	—	—	—	14505	—	—	—	15551	—	—	—	17071	—	—	—	17475	—	—	—	17540	—	—	—	10146	—	—	—	10477	—	—	—	5474	—	—	—
S48	Cone Crusher	16870	0.3	0.3	0.3	14495	2.8	2.8	2.8	15540	0.9	0.9	0.9	17061	0.4	0.4	0.4	17465	0.3	0.3	0.3	17529	0.3	0.3	0.3	10135	7.8	7.8	7.8	10466	7.3	7.3	7.3	5464	17.3	17.3	17.3
S49	Twin Screen Plant	16879	—	—	—	14505	—	—	—	15550	—	—	—	17070	—	—	—	17473	—	—	—	17538	—	—	—	10140	—	—	—	10471	—	—	—	5469	9.1	9.1	9.1
S50	Tunnel Conveyor	16859	—	—	—	14486	—	—	—	15530	—	—	—	17050	—	—	—	17453	—	—	—	17518	—	—	—	10121	—	—	—	10452	—	—	—	5450	—	—	—
S51	Cone Crusher	16881	0.4	0.4	0.4	14508	2.8	2.8	2.8	15552	1.1	1.1	1.1	17072	0.5	0.5	0.5	17475	0.3	0.3	0.3	17540	0.3	0.3	0.3	10139	7.7	7.7	7.7	10470	7.3	7.3	7.3	5469	17.3	17.3	17.3
S52	CIL Tank - Electric Motor	16788	—	—	—	14429	—	—	—	15467	—	—	—	16979	—	—	—	17379	—	—	—	17443	—	—	—	10005	—	—	—	10335	—	—	—	5341	—	—	—
S53	CIL Tank - Electric Motor	16777	—	—	—	14419	—	—	—	15456	—	—	—	16967	—	—	—	17367	—	—	—	17431	—	—	—	9991	—	—	—	10322	—	—	—	5328	—	—	—
S54	CIL Tank - Electric Motor	16790	—	—	—	14432	—	—	—	15469	—	—	—	16980	—	—	—	17380	—	—	—	17444	—	—	—	10002	—	—	—	10332	—	—	—	5340	—	—	—
S55	CIL Tank - Electric Motor	16778	—	—	—	14421	—	—	—	15458	—	—	—	16968	—	—	—	17368	—	—	—	17432	—	—	—	9988	—	—	—	10318	—	—	—	5326	—	—	—
S56	CIL Tank - Electric Motor	16791	—	—	—	14434	—	—	—	15470	—	—	—	16981	—	—	—	17381	—	—	—	17445	—	—	—	9999	—	—	—	10330	—	—	—	5338	—	—	—
S57	CIL Tank - Electric Motor	16780	—	—	—	14424	—	—	—	15459	—	—	—	16969	—	—	—	17369	—	—	—	17434	—	—	—	9985	—	—	—	10316	—	—	—	5324	—	—	—
Haul Road																																			
L25	Truck - Cumulative Traffic on Ore Transport Route	137	46.9	46.9	—	3037	20.2	20.2	—	1719	25.4	25.4	—	113	48.6	48.6	—	665	36.3	36.3	—	741	33.7	33.7	—	8704	6.3	6.3	—	8535	6.5	6.5	—	11925	3.6	3.6	—
L26	Truck - Cumulative Traffic on Ore Transport Route	186	37.1	37.1	—	3071	11.1	11.1	—	1753	16.5	16.5	—	27	51.8	51.8	—	55	48.4	48.4	—	48	49.0	49.0	—	8706	2.3	2.3	—	8536	2.4	2.4	—	11937	—	—	—
L27	Truck - Cumulative Traffic on Ore Transport Route	168	44.1	44.1	—	2306	26.4	26.4	—	1441	28.7	28.7	—	118	45.7	45.7	—	660	35.5	35.5	—	736	34.3	34.3	—	56	54.5	54.5	—	389	43.3	43.3	—	106	50.9	50.9	—
L30	3/4 Ton Service Truck - Cumulative Traffic	137	38.9	38.9	—	3037	9.2	9.2	—	1719	15.8	15.8	—	113	40.6	40.6	—	665	27.9	27.9	—	741	25.1	25.1	—	8704	—	—	—	8535	—	—	—	11925	—	—	—
L31	3/4 Ton Service Truck - Cumulative Traffic	186	34.5	34.5	—	3071	4.6	4.6	—	1753	11.8	11.8	—	27	49.4	49.4	—	55	46.0	46.0	—	48	46.6	46.6	—	8706	—	—	—	8536	—	—	—	11937	—	—	—
L32	3/4 Ton Service Truck - Cumulative Traffic	168	36.2	36.2	—	2306	18.5	18.5	—	1441	20.7	20.7	—	118	37.7	37.7	—	660	27.6	27.6	—	736	26.4	26.4	—	56	46.6	46.6	—	389	35.3	35.3	—	106	43.0	43.0	—
Beaver Dam Mine Site																																			
L6	Truck - Haul Roads	6382	23.8	23.8	23.8	5225	25.2	25.2	25.2	5731	25.3	25.3	25.3	6517	23.8	23.8	23.8	6874	23.7	23.7	23.7	6912	23.7	23.7	23.7	12628	15.7	15.7	15.7	12626	16.4	16.4	16.4	13652	15.6	15.6	15.6
L21	Grader - Haul Roads	5784	5.0	5.0	5.0	5007	6.9	6.9	6.9	5441	6.5	6.5	6.5	5908	4.7	4.7	4.7	6247	4.7	4.7	4.7	6283	4.5	4.5	4.5	12465	—	—	—	12462	—	—	—	13496	—	—	—
L22	Grader - Haul Roads	6307	—	—	—	5938	—	—	—	5978	0.1	0.1	0.1	6432	—	—	—	6764	—	—	—	6798	—	—	—	13617	—	—	—	13573	—	—	—	15123	—	—	—
L23	Grader - Haul Roads	5786	—	—	—	5795	—	—	—	5765	0.2	0.2	0.2	5870	0.2	0.2	0.2	6129	—	—	—	6153	—	—	—	13493	—	—	—	13440	—	—	—	15127	—	—	—
L33	Truck - Haul Roads	5784	14.8	14.8	14.8	5529	15.7	15.7	15.7	5482	15.9	15.9	15.9	5908	15.0	15.0	15.0	6247	14.4	14.4	14.4	6283	14.3	14.3	14.3	13233	6.2	6.2	6.2	13173	6.5	6.5	6.5	14957	5.3	5.3	5.3
S59	Tracked Mobile Drill	6475	9.1	9.1	9.1	6005	11.0	11.0	11.0	6072	10.8	10.8	10.8	6609	9.3	9.3	9.3	6966	8.3	8.3	8.3	7004	8.2	8.2	8.2	13691	—	—	—	13645	—	—	—	15225	—	—	—
S60	Tracked Mobile Drill	6375	5.8	5.8	5.8	6071	9.0	9.0	9.0	6060	10.7	10.7	10.7	6497	9.6	9.6	9.6	6832	8.6	8.6	8.6	6867	8.5	8.5	8.5	13772	—	—	—	13717	—	—	—	15408	—	—	—
S61	Tracked Mobile Drill	6423	9.0	9.0	9.0	6047	10.0	10.0	10.0	6070	10.8	10.8	10.8	6551	9.4	9.4	9.4	6895	8.4	8.4	8.4	6932	8.3	8.3	8.3	13742	—	—	—	13691	—	—	—	15333	—	—	—
S62	Tracked Mobile Drill	6521	9.5	9.5	9.5	5991	11.1	11.1	11.1	6086	10.8	10.8	10.8	6659	9.1	9.1	9.1	7023	8.1	8.1	8.1	7063	8.0	8.0	8.0	13669	—	—	—	13625	—	—	—	15164	—	—	—
S104	Tracked Dozer	6672	12.6	12.6	12.6	5248	15.8	15.8	15.8	5776	14.5	14.5	14.5	6867	12.2	12.2	12.2	7338	13.2	13.2	13.2	7394	13.1	13.1	13.1	12623	3.6	3.6	3.6	12624	3.6	3.6	3.6	13612	2.5	2.5	2.5
S105	Tracked Dozer	6580	12.8	12.8	12.8	5250	15.8	15.8	15.8	5728	14.6	14.6	14.6	6770	12.4	12.4	12.4	7232	13.4	13.4	13.4	7287	13.3	13.3	13.3	12682	3.6	3.6	3.6	12677	3.6	3.6	3.6	13740	2.4	2.4	2.4
S106	Tracked Dozer	6479	13.0	13.0	13.0	5116	16.1	16.1	16.1	5608	14.9	14.9	14.9	6671	12.6	12.6	12.6	7138	13.6	13.6	13.6	7194	13.5	13.5	13.5	12541	3.7	3.7	3.7	12536	3.7	3.7	3.7	13604	2.6	2.6	2.6
S107	3m Light Tower	6506	—	—	—	6003	—	—	—	6086	—	—	—	6643	—	—	—	7003	—	—	—	7042	—	—	—	13684	—	—	—	13640	—	—	—	15196	—	—	—
S108	Hydraulic Excavator	6516	4.6	4.6	4.6	6032	5.7	5.7	5.7	6107	5.5	5.5	5.5	6651	4.5	4.5	4.5	7009	3.8	3.8	3.8	7047	3.7	3.7	3.7	13716	—	—	—	13671	—	—	—	15237	—	—	—
S109	Wheel Loader	6447	9.7	9.7	9.7	6003	11.4	11.4	11.4	6057	11.3	11.3	11.3	6580	9.9	9.9	9.9	6933	9.1	9.1	9.1	6971	9.0	9.0	9.0	13692	—	—	—	13644	—	—	—	15244	—	—	—
S110	Dewatering Pump	6466	1.0	1.0	1.0	6044	1.8	1.8	1.8	6089	1.8	1.8	1.8	6597	0.9	0.9	0.9	6947	0.3	0.3	0.3	6985	0.3	0.3	0.3	13735	—	—	—	13686	—	—	—	15295	—	—	—
S111	Dewatering Pump	6451	0.9	0.9	0.9	6031	1.8	1.8	1.8	6074	1.8	1.8	1.8	6582	0.9	0.9	0.9	6932	0.3	0.3	0.3	6969	0.3	0.3	0.3	13722	—	—	—	13673	—	—	—	15285	—	—	—
S112	Hydraulic Excavator	6449	4.7	4.7	4.7	6078	5.5	5.5	5.5	6099	5.5	5.5	5.5	6577	4.6	4.6	4.6	6920	3.9	3.9	3.9	6956	3.9	3.9	3.9	13773	—	—	—	13722	—	—	—	15363	—	—	—
S113	3m Light Tower	6471	—	—	—	6102	—	—	—	6123	—	—	—	6598	—	—	—	6940	—	—	—	6976	—	—	—	13797	—	—	—	13746	—	—	—	15386	—	—	—
S114	Hydraulic Excavator	6438	4.7	4.7	4.7	6084	5.4	5.4	5.4	6097	5.5	5.5	5.5	6564	4.6	4.6	4.6	6905	4.0	4.0	4.0	6941	3.9	3.9	3.9	13781	—	—	—	13729	—	—	—	15382	—	—	—
S115	Wheel Loader	6417	8.2	8.2	8.2	6113	10.6	10.6	10.6	6103	11.1	11.1	11.1	6540	10.1	10.1	10.1	6874	9.3	9.3	9.3	6909	9.2	9.2	9.2	13813	—	—	—	13759	—	—	—	15444	—	—	—
S116	Hydraulic Excavator	6386	2.9	2.9	2.9	6101	5.1	5.1	5.1	6081	5.4	5.4	5.4	6507	4.7	4.7	4.7	6838	4.1	4.1	4.1	6873	4.0	4.0	4.0	13802	—	—	—	13746	—	—	—	15447	—	—	—
S117	3m Light Tower	6370	—	—	—	6120	—	—	—	6084	—	—	—	6488	—	—	—	6815	—	—	—	6849	—	—	—	13822	—	—	—	13765	—	—	—	15488	—	—	—
S118	8m Light Tower	5843	—	—	—	5644	—	—	—	5570	—	—	—	5963	—	—	—	6294	—	—	—	6329	—	—	—	13347	—	—	—	13284	—	—	—	15103	—	—	—
S119	8m Light Tower	5757	—	—	—	5579	—	—	—	5492	—	—	—	5876	—	—	—	6205	—	—	—	6240	—	—	—	13281	—	—	—	13217	—	—	—	15059	—	—	—
S120	Jaw Crusher	5828	11.8	11.8	11.8	5657	12.2	12.2	12.2	5569	12.5	12.5	12.5	5946	11.5	11.5	11.5	6273	10.7	10.7	10.7	6307	10.6	10.6	10.6	13359	—	—	—	13295	—	—	—	15131	—	—	—
S121	Wheel Loader	5781	12.3	12.3	12.3	5631	12.7	12.7	12.7	5533	13.0	13.0	13.0	5898	12.0	12.0	12.0	6223	11.1	11.1	11.1	6257	11.0	11.0	11.0	13333	—	—	—	13267	0.0	0.0	0.0	15121	—	—	—
S122	8m Light Tower	5874	—	—	—	5727	—	—	—	5631	—	—	—	5990	—	—	—	6312	—	—	—	6345	—	—	—	13429	—	—	—	13364	—	—	—	15207	—	—	—
S123	Truck Unloading	5830	8.7	8.7	8.7	5719	8.9	8.9	8.9	5605	9.2	9.2	9.2	5943	8.5	8.5	8.5	6260	7.8	7.8	7.8	6293	7.8	7.8	7.8	13420	—	—	—	13353	—	—	—	15222	—	—	—
S124	Wheeled Backhoe Loader	5790	—	—	—	5683	—	—	—	5566	—	—	—	5904	—	—	—	6221	—	—	—	6254	—	—	—	13383	—	—	—	13316	—	—	—	15192	—	—	—
S125	Skid Steer	5811	3.4	3.4	3.4	5720	3.7	3.7	3.7	5596	4.0	4.0	4.0	5923	3.1	3.1	3.1	6237	2.3	2.3	2.3	6270	2.2	2.2	2.2	13419	—	—	—	13351	—	—	—	15233	—	—	—
S126	Generator	5781	8.4	8.4	8.4	5776	8.4	8.4	8.4	5614	8.9	8.9	8.9	5886	8.0	8.0	8.0	6188	7.1	7.1	7.1	6218	7.0	7.0	7.0	13470	—	—	—	13398	—	—	—	15331	—	—	—
S127	Mobile_Crane	5769	10.3	10.3	10.3	5774	10.3	10.3	10.3	5608	10.6	10.6	10.6	5874	10.0	10.0	10.0	6174	9.5	9.5	9.5	6205	9.4	9.4	9.4	13467	1.1	1.1	1.1	13395	1.1	1.1	1.1	15335	—	—	—
S128	Forklift	5742	—	—	—	5763	—	—	—	5588	—	—	—	5845	—	—	—	6144	—	—	—	6174	—	—	—	13454	—	—	—	13381	—	—	—	15333	—	—	—
S129	Fuel & Lube Truck	5712	3.2	3.2	3.2	5759	3.1	3.1	3.1	5572	3.6	3.6	3.6	5814	2.9	2.9	2.9	6109	2.1	2.1	2.1	6139	2.0	2.0	2.0	13447	—	—	—	13373	—	—	—	15342	—	—	—
S130	Fuel & Lube Truck	5667	3.3	3.3	3.3	5748	3.1	3.1	3.1	5545	3.7	3.7	3.7	5766	3.1	3.1	3.1	6057	2.3	2.3	2.3	6086	2.2	2.2	2.2	13431	—	—	—	13355	—	—	—	15348	—	—	—
Total Facility Sound Level (1-hour Leq):			**49.7**	**49.7**	**26.6**		**31.0**	**31.0**	**28.2**		**32.7**	**32.7**	**28.1**		**55.9**	**55.9**	**26.7**		**50.7**	**50.7**	**26.5**		**51.3**	**51.3**	**26.4**		**55.5**	**55.5**	**19.4**		**43.9**	**43.9**	**19.7**		**51.4**	**51.4**	**25.8**

Note:

[1] Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Table 2d

Point of Reception Noise Impact – Cumulative Effects, Option B
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Source Description	Beaver Dam Mine Road (Marlborough Property) R1				4112 Highway 224 (Beaver Lake IR 17) R2				4115 Highway 224 (Cottage on Crown Land) R3				3492 Highway 224 (Hobbs Property) R4				3379 Highway 224 (McLeod Property) R5				3373 Highway 224 (Smith Property) R6				Tangier River (Deepwood Estates Property) R7				Tangier River/Musquodoboit Lumber Co Ltd. Property/John D R8				5579 Mooseland Road (Lloy Property) R9			
		Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am	Distance (m)	Partial Sound Levels[1] (dBA) Day 7am–7pm	Evening 7pm–11pm	Night 11pm–7am
Touquoy Mine Site																																			
S41	Loader - Transport of Material	16896	—	—	—	14499	1.8	1.8	1.8	15555	0.6	0.6	0.6	17090	—	—	—	17498	—	—	—	17563	—	—	—	10249	7.9	7.9	7.9	10581	7.3	7.3	7.3	5564	14.1	14.1	14.1
S42	Truck - Unloading Ore	16921	—	—	—	14536	—	—	—	15586	—	—	—	17113	—	—	—	17519	—	—	—	17584	—	—	—	10223	2.2	2.2	2.2	10554	1.7	1.7	1.7	5545	5.6	5.6	5.6
S43	Loader - Face Shovel	16956	—	—	—	14574	1.4	1.4	1.4	15623	0.4	0.4	0.4	17148	—	—	—	17553	—	—	—	17618	—	—	—	10242	6.7	6.7	6.7	10573	6.2	6.2	6.2	5567	12.0	12.0	12.0
S44	Truck - Hopper Discharge	16907	—	—	—	14526	—	—	—	15574	—	—	—	17099	—	—	—	17504	—	—	—	17569	—	—	—	10195	3.2	3.2	3.2	10526	2.7	2.7	2.7	5520	7.7	7.7	7.7
S45	Heavy Duty Hopper	16878	—	—	—	14501	—	—	—	15548	—	—	—	17070	—	—	—	17474	—	—	—	17538	—	—	—	10152	5.8	5.8	5.8	10483	4.9	4.9	4.9	5479	20.2	20.2	20.2
S46	Jaw Crusher	16880	1.0	1.0	1.0	14505	3.0	3.0	3.0	15550	2.1	2.1	2.1	17071	0.8	0.8	0.8	17475	0.5	0.5	0.5	17540	0.5	0.5	0.5	10147	8.0	8.0	8.0	10478	7.6	7.6	7.6	5475	17.6	17.6	17.6
S47	Heavy Duty Belt Feeder Hopper	16880	—	—	—	14505	—	—	—	15551	—	—	—	17071	—	—	—	17475	—	—	—	17540	—	—	—	10146	—	—	—	10477	—	—	—	5474	—	—	—
S48	Cone Crusher	16870	0.3	0.3	0.3	14495	2.8	2.8	2.8	15540	0.9	0.9	0.9	17061	0.4	0.4	0.4	17465	0.3	0.3	0.3	17529	0.3	0.3	0.3	10135	7.8	7.8	7.8	10466	7.3	7.3	7.3	5464	17.3	17.3	17.3
S49	Twin Screen Plant	16879	—	—	—	14505	—	—	—	15550	—	—	—	17070	—	—	—	17473	—	—	—	17538	—	—	—	10140	—	—	—	10471	—	—	—	5469	9.1	9.1	9.1
S50	Tunnel Conveyor	16859	—	—	—	14486	—	—	—	15530	—	—	—	17050	—	—	—	17453	—	—	—	17518	—	—	—	10121	—	—	—	10452	—	—	—	5450	—	—	—
S51	Cone Crusher	16881	0.4	0.4	0.4	14508	2.8	2.8	2.8	15552	1.1	1.1	1.1	17072	0.5	0.5	0.5	17475	0.3	0.3	0.3	17540	0.3	0.3	0.3	10139	7.7	7.7	7.7	10470	7.3	7.3	7.3	5469	17.3	17.3	17.3
S52	CIL Tank - Electric Motor	16788	—	—	—	14429	—	—	—	15467	—	—	—	16979	—	—	—	17379	—	—	—	17443	—	—	—	10005	—	—	—	10335	—	—	—	5341	—	—	—
S53	CIL Tank - Electric Motor	16777	—	—	—	14419	—	—	—	15456	—	—	—	16967	—	—	—	17367	—	—	—	17431	—	—	—	9991	—	—	—	10322	—	—	—	5328	—	—	—
S54	CIL Tank - Electric Motor	16790	—	—	—	14432	—	—	—	15469	—	—	—	16980	—	—	—	17380	—	—	—	17444	—	—	—	10002	—	—	—	10332	—	—	—	5340	—	—	—
S55	CIL Tank - Electric Motor	16778	—	—	—	14421	—	—	—	15458	—	—	—	16968	—	—	—	17368	—	—	—	17432	—	—	—	9988	—	—	—	10318	—	—	—	5326	—	—	—
S56	CIL Tank - Electric Motor	16791	—	—	—	14434	—	—	—	15470	—	—	—	16981	—	—	—	17381	—	—	—	17445	—	—	—	9999	—	—	—	10330	—	—	—	5338	—	—	—
S57	CIL Tank - Electric Motor	16780	—	—	—	14424	—	—	—	15459	—	—	—	16969	—	—	—	17369	—	—	—	17434	—	—	—	9985	—	—	—	10316	—	—	—	5324	—	—	—
Haul Road																																			
L25	Truck - Cumulative Traffic on Ore Transport Route	137	46.9	46.9	—	3037	20.2	20.2	—	1719	25.4	25.4	—	113	48.6	48.6	—	665	36.3	36.3	—	741	33.7	33.7	—	8704	6.3	6.3	—	8535	6.5	6.5	—	11925	3.6	3.6	—
L26	Truck - Cumulative Traffic on Ore Transport Route	186	37.1	37.1	—	3071	11.1	11.1	—	1753	16.5	16.5	—	27	51.8	51.8	—	55	48.4	48.4	—	48	49.0	49.0	—	8706	2.3	2.3	—	8536	2.4	2.4	—	11937	—	—	—
L27	Truck - Cumulative Traffic on Ore Transport Route	168	44.1	44.1	—	2306	26.4	26.4	—	1441	28.7	28.7	—	118	45.7	45.7	—	660	35.5	35.5	—	736	34.3	34.3	—	56	54.5	54.5	—	389	43.3	43.3	—	106	50.9	50.9	—
L30	3/4 Ton Service Truck - Cumulative Traffic	137	38.9	38.9	—	3037	9.2	9.2	—	1719	15.8	15.8	—	113	40.6	40.6	—	665	27.9	27.9	—	741	25.1	25.1	—	8704	—	—	—	8535	—	—	—	11925	—	—	—
L31	3/4 Ton Service Truck - Cumulative Traffic	186	34.5	34.5	—	3071	4.6	4.6	—	1753	11.8	11.8	—	27	49.4	49.4	—	55	46.0	46.0	—	48	46.6	46.6	—	8706	—	—	—	8536	—	—	—	11937	—	—	—
L32	3/4 Ton Service Truck - Cumulative Traffic	168	36.2	36.2	—	2306	18.5	18.5	—	1441	20.7	20.7	—	118	37.7	37.7	—	660	27.6	27.6	—	736	26.4	26.4	—	56	46.6	46.6	—	389	35.3	35.3	—	106	43.0	43.0	—
Beaver Dam Mine Site																																			
L6	Truck - Haul Roads	6382	23.8	23.8	23.8	5225	25.2	25.2	25.2	5731	25.3	25.3	25.3	6517	23.8	23.8	23.8	6874	23.7	23.7	23.7	6912	23.7	23.7	23.7	12628	15.7	15.7	15.7	12626	16.4	16.4	16.4	13652	15.6	15.6	15.6
L21	Grader - Haul Roads	5784	5.0	5.0	5.0	5007	6.9	6.9	6.9	5441	6.5	6.5	6.5	5908	4.7	4.7	4.7	6247	4.7	4.7	4.7	6283	4.5	4.5	4.5	12465	—	—	—	12462	—	—	—	13496	—	—	—
L22	Grader - Haul Roads	6307	—	—	—	5938	—	—	—	5978	0.1	0.1	0.1	6432	—	—	—	6764	—	—	—	6798	—	—	—	13617	—	—	—	13573	—	—	—	15123	—	—	—
L23	Grader - Haul Roads	5786	—	—	—	5795	—	—	—	5765	0.2	0.2	0.2	5870	0.2	0.2	0.2	6129	—	—	—	6153	—	—	—	13493	—	—	—	13440	—	—	—	15127	—	—	—
L33	Truck - Haul Roads	5784	14.8	14.8	14.8	5529	15.7	15.7	15.7	5482	15.9	15.9	15.9	5908	15.0	15.0	15.0	6247	14.4	14.4	14.4	6283	14.3	14.3	14.3	13233	6.2	6.2	6.2	13173	6.5	6.5	6.5	14957	5.3	5.3	5.3
S59	Tracked Mobile Drill	6475	9.1	9.1	9.1	6005	11.0	11.0	11.0	6072	10.8	10.8	10.8	6609	9.3	9.3	9.3	6966	8.3	8.3	8.3	7004	8.2	8.2	8.2	13691	—	—	—	13645	—	—	—	15225	—	—	—
S60	Tracked Mobile Drill	6375	5.8	5.8	5.8	6071	9.0	9.0	9.0	6060	10.7	10.7	10.7	6497	9.6	9.6	9.6	6832	8.6	8.6	8.6	6867	8.5	8.5	8.5	13772	—	—	—	13717	—	—	—	15408	—	—	—
S61	Tracked Mobile Drill	6423	9.0	9.0	9.0	6047	10.0	10.0	10.0	6070	10.8	10.8	10.8	6551	9.4	9.4	9.4	6895	8.4	8.4	8.4	6932	8.3	8.3	8.3	13742	—	—	—	13691	—	—	—	15333	—	—	—
S62	Tracked Mobile Drill	6521	9.5	9.5	9.5	5991	11.1	11.1	11.1	6086	10.8	10.8	10.8	6659	9.1	9.1	9.1	7023	8.1	8.1	8.1	7063	8.0	8.0	8.0	13669	—	—	—	13625	—	—	—	15164	—	—	—
S104	Tracked Dozer	6672	12.6	12.6	12.6	5248	15.8	15.8	15.8	5776	14.5	14.5	14.5	6867	12.2	12.2	12.2	7338	13.2	13.2	13.2	7394	13.1	13.1	13.1	12623	3.6	3.6	3.6	12624	3.6	3.6	3.6	13612	2.5	2.5	2.5
S105	Tracked Dozer	6580	12.8	12.8	12.8	5250	15.8	15.8	15.8	5728	14.6	14.6	14.6	6770	12.4	12.4	12.4	7232	13.4	13.4	13.4	7287	13.3	13.3	13.3	12682	3.6	3.6	3.6	12677	3.6	3.6	3.6	13740	2.4	2.4	2.4
S106	Tracked Dozer	6479	13.0	13.0	13.0	5116	16.1	16.1	16.1	5608	14.9	14.9	14.9	6671	12.6	12.6	12.6	7138	13.6	13.6	13.6	7194	13.5	13.5	13.5	12541	3.7	3.7	3.7	12536	3.7	3.7	3.7	13604	2.6	2.6	2.6
S107	3m Light Tower	6506	—	—	—	6003	—	—	—	6086	—	—	—	6643	—	—	—	7003	—	—	—	7042	—	—	—	13684	—	—	—	13640	—	—	—	15196	—	—	—
S108	Hydraulic Excavator	6516	4.6	4.6	4.6	6032	5.7	5.7	5.7	6107	5.5	5.5	5.5	6651	4.5	4.5	4.5	7009	3.8	3.8	3.8	7047	3.7	3.7	3.7	13716	—	—	—	13671	—	—	—	15237	—	—	—
S109	Wheel Loader	6447	9.7	9.7	9.7	6003	11.4	11.4	11.4	6057	11.3	11.3	11.3	6580	9.9	9.9	9.9	6933	9.1	9.1	9.1	6971	9.0	9.0	9.0	13692	—	—	—	13644	—	—	—	15244	—	—	—
S110	Dewatering Pump	6466	1.0	1.0	1.0	6044	1.8	1.8	1.8	6089	1.8	1.8	1.8	6597	0.9	0.9	0.9	6947	0.3	0.3	0.3	6985	0.3	0.3	0.3	13735	—	—	—	13686	—	—	—	15295	—	—	—
S111	Dewatering Pump	6451	0.9	0.9	0.9	6031	1.8	1.8	1.8	6074	1.8	1.8	1.8	6582	0.9	0.9	0.9	6932	0.3	0.3	0.3	6969	0.3	0.3	0.3	13722	—	—	—	13673	—	—	—	15285	—	—	—
S112	Hydraulic Excavator	6449	4.7	4.7	4.7	6078	5.5	5.5	5.5	6099	5.5	5.5	5.5	6577	4.6	4.6	4.6	6920	3.9	3.9	3.9	6956	3.9	3.9	3.9	13773	—	—	—	13722	—	—	—	15363	—	—	—
S113	3m Light Tower	6471	—	—	—	6102	—	—	—	6123	—	—	—	6598	—	—	—	6940	—	—	—	6976	—	—	—	13797	—	—	—	13746	—	—	—	15386	—	—	—
S114	Hydraulic Excavator	6438	4.7	4.7	4.7	6084	5.4	5.4	5.4	6097	5.5	5.5	5.5	6564	4.6	4.6	4.6	6905	4.0	4.0	4.0	6941	3.9	3.9	3.9	13781	—	—	—	13729	—	—	—	15382	—	—	—
S115	Wheel Loader	6417	8.2	8.2	8.2	6113	10.6	10.6	10.6	6103	11.1	11.1	11.1	6540	10.1	10.1	10.1	6874	9.3	9.3	9.3	6909	9.2	9.2	9.2	13813	—	—	—	13759	—	—	—	15444	—	—	—
S116	Hydraulic Excavator	6386	2.9	2.9	2.9	6101	5.1	5.1	5.1	6081	5.4	5.4	5.4	6507	4.7	4.7	4.7	6838	4.1	4.1	4.1	6873	4.0	4.0	4.0	13802	—	—	—	13746	—	—	—	15447	—	—	—
S117	3m Light Tower	6370	—	—	—	6120	—	—	—	6084	—	—	—	6488	—	—	—	6815	—	—	—	6849	—	—	—	13822	—	—	—	13765	—	—	—	15488	—	—	—
S118	8m Light Tower	5843	—	—	—	5644	—	—	—	5570	—	—	—	5963	—	—	—	6294	—	—	—	6329	—	—	—	13347	—	—	—	13284	—	—	—	15103	—	—	—
S119	8m Light Tower	5757	—	—	—	5579	—	—	—	5492	—	—	—	5876	—	—	—	6205	—	—	—	6240	—	—	—	13281	—	—	—	13217	—	—	—	15059	—	—	—
S121	Wheel Loader	5781	12.3	12.3	12.3	5631	12.7	12.7	12.7	5533	13.0	13.0	13.0	5898	12.0	12.0	12.0	6223	11.1	11.1	11.1	6257	11.0	11.0	11.0	13333	—	—	—	13267	0.0	0.0	0.0	15121	—	—	—
S122	8m Light Tower	5874	—	—	—	5727	—	—	—	5631	—	—	—	5990	—	—	—	6312	—	—	—	6345	—	—	—	13429	—	—	—	13364	—	—	—	15207	—	—	—
S123	Truck Unloading	5830	8.7	8.7	8.7	5719	8.9	8.9	8.9	5605	9.2	9.2	9.2	5943	8.5	8.5	8.5	6260	7.8	7.8	7.8	6293	7.8	7.8	7.8	13420	—	—	—	13353	—	—	—	15222	—	—	—
S124	Wheeled Backhoe Loader	5790	—	—	—	5683	—	—	—	5566	—	—	—	5904	—	—	—	6221	—	—	—	6254	—	—	—	13383	—	—	—	13316	—	—	—	15192	—	—	—
S125	Skid Steer	5811	3.4	3.4	3.4	5720	3.7	3.7	3.7	5596	4.0	4.0	4.0	5923	3.1	3.1	3.1	6237	2.3	2.3	2.3	6270	2.2	2.2	2.2	13419	—	—	—	13351	—	—	—	15233	—	—	—
S126	Generator	5781	8.4	8.4	8.4	5776	8.4	8.4	8.4	5614	8.9	8.9	8.9	5886	8.0	8.0	8.0	6188	7.1	7.1	7.1	6218	7.0	7.0	7.0	13470	—	—	—	13398	—	—	—	15331	—	—	—
S127	Mobile_Crane	5769	10.3	10.3	10.3	5774	10.3	10.3	10.3	5608	10.6	10.6	10.6	5874	10.0	10.0	10.0	6174	9.5	9.5	9.5	6205	9.4	9.4	9.4	13467	1.1	1.1	1.1	13395	1.1	1.1	1.1	15335	—	—	—
S128	Forklift	5742	—	—	—	5763	—	—	—	5588	—	—	—	5845	—	—	—	6144	—	—	—	6174	—	—	—	13454	—	—	—	13381	—	—	—	15333	—	—	—
S129	Fuel & Lube Truck	5712	3.2	3.2	3.2	5759	3.1	3.1	3.1	5572	3.6	3.6	3.6	5814	2.9	2.9	2.9	6109	2.1	2.1	2.1	6139	2.0	2.0	2.0	13447	—	—	—	13373	—	—	—	15342	—	—	—
S130	Fuel & Lube Truck	5667	3.3	3.3	3.3	5748	3.1	3.1	3.1	5545	3.7	3.7	3.7	5766	3.1	3.1	3.1	6057	2.3	2.3	2.3	6086	2.2	2.2	2.2	13431	—	—	—	13355	—	—	—	15348	—	—	—
S131	Excavator-Mounted Breaker	6372	13.0	13.0	13.0	6019	14.1	14.1	14.1	6030	15.9	15.9	15.9	6499	14.6	14.6	14.6	6841	13.7	13.7	13.7	6877	13.7	13.7	13.7	13716	2.4	2.4	2.4	13664	2.9	2.9	2.9	15326	1.4	1.4	1.4
Total Facility Sound Level (1-hour Leq):			**49.7**	**49.7**	**26.7**		**31.0**	**31.0**	**28.2**		**32.7**	**32.7**	**28.2**		**55.9**	**55.9**	**26.8**		**50.8**	**50.8**	**26.6**		**51.3**	**51.3**	**26.6**		**55.5**	**55.5**	**19.5**		**43.8**	**43.8**	**19.7**		**51.4**	**51.4**	**25.9**

Note:

[1] Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Appendix C

Acoustic Assessment Summary

Table 3

Acoustic Assessment Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Point of Reception ID	Point of Reception Description	Time of Day	Predicted Sound Levels (L_{EQ}) (dBA)	Performance Limit[1] (L_{EQ}) (dBA)	Compliance with Performance Limit (Yes/No)
Direct Effects, Option A					
R1	9 Beaver Dam Mine Road (Marlborough Property)	07:00–19:00	48	65	Yes
		19:00–23:00	48	60	Yes
		23:00–07:00	27	55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	07:00–19:00	30	65	Yes
		19:00–23:00	30	60	Yes
		23:00–07:00	28	55	Yes
R3	4115 Highway 224 (Cottage on Crown Land)	07:00–19:00	32	65	Yes
		19:00–23:00	32	60	Yes
		23:00–07:00	28	55	Yes
R4	3492 Highway 224 (Hobbs Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	27	55	Yes
R5	3379 Highway 224 (McLeod Property)	07:00–19:00	40	65	Yes
		19:00–23:00	40	60	Yes
		23:00–07:00	27	55	Yes
R6	3373 Highway 224 (Smith Property)	07:00–19:00	38	65	Yes
		19:00–23:00	38	60	Yes
		23:00–07:00	26	55	Yes
R7	Tangier River (Deepwood Estates Property)	07:00–19:00	54	65	Yes
		19:00–23:00	54	60	Yes
		23:00–07:00	20	55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson Lease)	07:00–19:00	42	65	Yes
		19:00–23:00	42	60	Yes
		23:00–07:00	20	55	Yes
R9	5579 Mooseland Road (Lloy Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	26	55	Yes
Direct Effects, Option B					
R1	9 Beaver Dam Mine Road (Marlborough Property)	07:00–19:00	48	65	Yes
		19:00–23:00	48	60	Yes
		23:00–07:00	27	55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	07:00–19:00	30	65	Yes
		19:00–23:00	30	60	Yes
		23:00–07:00	28	55	Yes
R3	4115 Highway 224 (Cottage on Crown Land)	07:00–19:00	32	65	Yes
		19:00–23:00	32	60	Yes
		23:00–07:00	28	55	Yes
R4	3492 Highway 224 (Hobbs Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	27	55	Yes

Table 3

Acoustic Assessment Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Point of Reception ID	Point of Reception Description	Time of Day	Predicted Sound Levels (L_{EQ}) (dBA)	Performance Limit[1] (L_{EQ}) (dBA)	Compliance with Performance Limit (Yes/No)
R5	3379 Highway 224 (McLeod Property)	07:00–19:00	40	65	Yes
		19:00–23:00	40	60	Yes
		23:00–07:00	27	55	Yes
R6	3373 Highway 224 (Smith Property)	07:00–19:00	38	65	Yes
		19:00–23:00	38	60	Yes
		23:00–07:00	27	55	Yes
R7	Tangier River (Deepwood Estates Property)	07:00–19:00	54	65	Yes
		19:00–23:00	54	60	Yes
		23:00–07:00	20	55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson Lease)	07:00–19:00	42	65	Yes
		19:00–23:00	42	60	Yes
		23:00–07:00	20	55	Yes
R9	5579 Mooseland Road (Lloy Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	27	55	Yes
Cumulative Effects, Option A					
R1	9 Beaver Dam Mine Road (Marlborough Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	27	55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	07:00–19:00	31	65	Yes
		19:00–23:00	31	60	Yes
		23:00–07:00	28	55	Yes
R3	4115 Highway 224 (Cottage on Crown Land)	07:00–19:00	33	65	Yes
		19:00–23:00	33	60	Yes
		23:00–07:00	28	55	Yes
R4	3492 Highway 224 (Hobbs Property)	07:00–19:00	56	65	Yes
		19:00–23:00	56	60	Yes
		23:00–07:00	27	55	Yes
R5	3379 Highway 224 (McLeod Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	27	55	Yes
R6	3373 Highway 224 (Smith Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	26	55	Yes
R7	Tangier River (Deepwood Estates Property)	07:00–19:00	55	65	Yes
		19:00–23:00	55	60	Yes
		23:00–07:00	20	55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson Lease)	07:00–19:00	44	65	Yes
		19:00–23:00	44	60	Yes
		23:00–07:00	20	55	Yes

Table 3

Acoustic Assessment Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Point of Reception ID	Point of Reception Description	Time of Day	Predicted Sound Levels (L_{EQ}) (dBA)	Performance Limit[1] (L_{EQ}) (dBA)	Compliance with Performance Limit (Yes/No)
R9	5579 Mooseland Road (Lloy Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	26	55	Yes
Cumulative Effects, Option B					
R1	9 Beaver Dam Mine Road (Marlborough Property)	07:00–19:00	50	65	Yes
		19:00–23:00	50	60	Yes
		23:00–07:00	27	55	Yes
R2	4112 Highway 224 (Beaver Lake IR 17)	07:00–19:00	31	65	Yes
		19:00–23:00	31	60	Yes
		23:00–07:00	28	55	Yes
R3	4115 Highway 224 (Cottage on Crown Land)	07:00–19:00	33	65	Yes
		19:00–23:00	33	60	Yes
		23:00–07:00	28	55	Yes
R4	3492 Highway 224 (Hobbs Property)	07:00–19:00	56	65	Yes
		19:00–23:00	56	60	Yes
		23:00–07:00	27	55	Yes
R5	3379 Highway 224 (McLeod Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	27	55	Yes
R6	3373 Highway 224 (Smith Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	27	55	Yes
R7	Tangier River (Deepwood Estates Property)	07:00–19:00	55	65	Yes
		19:00–23:00	55	60	Yes
		23:00–07:00	20	55	Yes
R8	Tangier River (Musqudoboit Lumber Co Ltd. Property/John Dickson Lease)	07:00–19:00	44	65	Yes
		19:00–23:00	44	60	Yes
		23:00–07:00	20	55	Yes
R9	5579 Mooseland Road (Lloy Property)	07:00–19:00	51	65	Yes
		19:00–23:00	51	60	Yes
		23:00–07:00	26	55	Yes

Note:

[1] Minimum NSEL sound level limits as defined in "Guidelines for Environmental Noise Measurement and Assessment"

Appendix D

Noise Source Sound Level Summary

Table 4

Noise Source Sound Level Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Noise Source Description		1/1 Octave Band Data									Unadjusted Total Sound Power Level	Tonal Penalty Assessment		Height Absolute	Operating Time Day	Operating Time Evening	Operating Time Night	Speed	Vehicles Per Hour Day	Vehicles Per Hour Evening	Vehicles Per Hour Night	Reference/Comments
			32	63	125	250	500	1000	2000	4000	8000	(dBA)		(dBA)	(m)	(min)	(min)	(min)	(km/h)	(min)	(min)	(min)	
L6	Truck - Haul Roads	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	188.0	—	—	—	40	66.2	66.2	66.2	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
L21	Grader - Haul Roads	PWL (dB)	-6.1	81.9	80.9	76.9	72.9	77.9	71.9	77.9	58.9	86.8											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-45.5	55.7	64.8	68.3	69.7	77.9	73.1	78.9	57.8	**82.5**	No	0	188.0	—	—	—	15	1.0	1.0	1.0	GHD Reference Spectra
L22	Grader - Haul Roads	PWL (dB)	-3.0	85.0	84.0	80.0	76.0	81.0	75.0	81.0	62.0	90.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-42.4	58.8	67.9	71.4	72.8	81.0	76.2	82.0	60.9	**85.7**	No	0	132.9	—	—	—	15	1.0	1.0	1.0	GHD Reference Spectra
L23	Grader - Haul Roads	PWL (dB)	1.1	89.1	88.1	84.1	80.1	85.1	79.1	85.1	66.1	94.1											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-38.3	62.9	72.0	75.5	76.9	85.1	80.3	86.1	65.0	**89.8**	No	0	146.2	—	—	—	15	1.0	1.0	1.0	GHD Reference Spectra
L24	Truck - Project Traffic on Ore Transport Route	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	97.0	—	—	—	70	11.9	11.9	—	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
L25	Truck - Cumulative Traffic on Ore Transport Route	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	97.0	—	—	—	70	12.7	12.7	—	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
L26	Truck - Cumulative Traffic on Ore Transport Route	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	100.6	—	—	—	70	3.6	3.6	—	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
L27	Truck - Cumulative Traffic on Ore Transport Route	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	100.6	—	—	—	70	15.5	15.5	—	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
L30	3/4 Ton Service Truck - Cumulative Traffic	PWL (dB)	47.4	54.4	71.4	72.4	82.4	82.4	79.4	75.4	66.4	87.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	8.0	28.2	55.3	63.8	79.2	82.4	80.6	76.4	65.3	**86.2**	No	0	97.0	—	—	—	70	2.5	2.5	—	GHD Reference Spectra
L31	3/4 Ton Service Truck - Cumulative Traffic	PWL (dB)	47.7	54.7	71.7	72.7	82.7	82.7	79.7	75.7	66.7	87.4											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	8.3	28.5	55.6	64.1	79.5	82.7	80.9	76.7	65.6	**86.6**	No	0	100.6	—	—	—	70	2.5	2.5	—	GHD Reference Spectra
L32	3/4 Ton Service Truck - Cumulative Traffic	PWL (dB)	7.4	98.4	97.4	90.4	90.4	88.4	86.4	77.4	68.4	102.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-32.0	72.2	81.3	81.8	87.2	88.4	87.6	78.4	67.3	**93.4**	No	0	119.1	—	—	—	70	2.5	2.5	—	GHD Reference Spectra
L33	Truck - Haul Roads	PWL (dB)	31.0	117.0	112.0	105.0	107.0	104.0	103.0	100.0	91.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												Noise Database for Construction Noise document
		PWL (dBA)	—	90.8	95.9	96.4	103.8	104.0	104.2	101.0	89.9	**109.9**	No	0	171.6	—	—	—	40	10.0	10.0	10.0	Transport Truck Route - 26ton 235kw - DEFRA Table 1(c)#16
S41	Loader - Transport of Material	PWL (dB)	31.0	114.0	120.0	123.0	111.0	102.0	100.0	95.0	89.0	125.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	87.8	103.9	114.4	107.8	102.0	101.2	96.0	87.9	**116.0**	No	0	163.0	60	60	60	—	—	—	—	GHD Reference Spectra
S42	Truck - Unloading Ore	PWL (dB)	31.0	119.0	115.0	106.0	104.0	106.0	103.0	99.0	91.0	120.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	98.9	97.4	100.8	106.0	104.2	100.0	89.9	**110.2**	No	0	149.7	60	60	60	—	—	—	—	GHD Reference Spectra
S43	Loader - Face Shovel	PWL (dB)	31.0	119.0	119.0	118.0	116.0	117.0	114.0	108.0	101.0	125.4											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	102.9	109.4	112.8	117.0	115.2	109.0	99.9	**120.9**	No	0	163.0	60	60	60	—	—	—	—	GHD Reference Spectra
S44	Truck - Hopper Discharge	PWL (dB)	31.0	119.0	113.0	108.0	110.0	111.0	110.0	104.0	98.0	121.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	96.9	99.4	106.8	111.0	111.2	105.0	96.9	**115.5**	No	0	163.0	60	60	60	—	—	—	—	GHD Reference Spectra
S45	Heavy Duty Hopper	PWL (dB)	—	—	—	—	124.7	—	—	—	—	124.7											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	—	—	—	—	121.5	—	—	—	—	**121.5**	No	0	147.8	60	60	60	—	—	—	—	GHD Reference Spectra
S46	Jaw Crusher	PWL (dB)	31.0	122.0	122.0	119.0	118.0	116.0	114.0	109.0	100.0	127.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	95.8	105.9	110.4	114.8	116.0	115.2	110.0	98.9	**121.1**	No	0	148.2	60	60	60	—	—	—	—	GHD Reference Spectra
S47	Heavy Duty Belt Feeder Hopper	PWL (dB)	31.0	102.0	99.0	93.0	94.0	97.0	93.0	89.0	82.0	105.6											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	75.8	82.9	84.4	90.8	97.0	94.2	90.0	80.9	**100.2**	No	0	147.0	60	60	60	—	—	—	—	GHD Reference Spectra
S48	Cone Crusher	PWL (dB)	31.0	122.0	122.0	119.0	118.0	116.0	114.0	109.0	100.0	127.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	95.8	105.9	110.4	114.8	116.0	115.2	110.0	98.9	**121.1**	No	0	146.7	60	60	60	—	—	—	—	GHD Reference Spectra
S49	Twin Screen Plant	PWL (dB)	31.0	115.0	113.0	110.0	110.0	105.0	105.0	102.0	95.0	119.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	88.8	96.9	101.4	106.8	105.0	106.2	103.0	93.9	**112.1**	No	0	146.5	60	60	60	—	—	—	—	GHD Reference Spectra
S50	Tunnel Conveyor	PWL (dB)	31.0	102.0	100.0	99.0	102.0	106.0	98.0	94.0	88.0	110.0											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	75.8	83.9	90.4	98.8	106.0	99.2	95.0	86.9	**107.8**	No	0	144.0	60	60	60	—	—	—	—	GHD Reference Spectra
S51	Cone Crusher	PWL (dB)	31.0	122.0	122.0	119.0	118.0	116.0	114.0	109.0	100.0	127.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	95.8	105.9	110.4	114.8	116.0	115.2	110.0	98.9	**121.1**	No	0	146.1	60	60	60	—	—	—	—	GHD Reference Spectra
S52	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra
S53	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra

Table 4

Noise Source Sound Level Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Noise Source Description		1/1 Octave Band Data									Unadjusted Total Sound Power Level	Tonal Penalty Assessment		Height Absolute	Operating Time Day	Operating Time Evening	Operating Time Night	Speed	Vehicles Per Hour Day	Vehicles Per Hour Evening	Vehicles Per Hour Night	Reference/Comments
			32	63	125	250	500	1000	2000	4000	8000	(dBA)		(dBA)	(m)	(min)	(min)	(min)	(km/h)	(min)	(min)	(min)	
S54	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra
S55	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra
S56	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra
S57	CIL Tank - Electric Motor	PWL (dB)	10.1	80.1	83.1	85.1	94.1	88.1	94.1	82.1	74.1	98.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-29.3	53.9	67.0	76.5	90.9	88.1	95.3	83.1	73.0	**97.4**	No	0	165.5	60	60	60	—	—	—	—	GHD Reference Spectra
S59	Tracked Mobile Drill	PWL (dB)	31.0	114.0	115.0	110.0	116.0	113.0	110.0	106.0	102.0	121.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	87.8	98.9	101.4	112.8	113.0	111.2	107.0	100.9	**117.8**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S60	Tracked Mobile Drill	PWL (dB)	31.0	114.0	115.0	110.0	116.0	113.0	110.0	106.0	102.0	121.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	87.8	98.9	101.4	112.8	113.0	111.2	107.0	100.9	**117.8**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S61	Tracked Mobile Drill	PWL (dB)	31.0	114.0	115.0	110.0	116.0	113.0	110.0	106.0	102.0	121.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	87.8	98.9	101.4	112.8	113.0	111.2	107.0	100.9	**117.8**	No	0	132.8	60	60	60	—	—	—	—	GHD Reference Spectra
S62	Tracked Mobile Drill	PWL (dB)	31.0	114.0	115.0	110.0	116.0	113.0	110.0	106.0	102.0	121.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	87.8	98.9	101.4	112.8	113.0	111.2	107.0	100.9	**117.8**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S104	Tracked Dozer	PWL (dB)	31.0	120.0	121.0	122.0	104.0	105.0	101.0	99.0	95.0	125.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	93.8	104.9	113.4	100.8	105.0	102.2	100.0	93.9	**115.1**	No	0	189.0	60	60	60	—	—	—	—	GHD Reference Spectra
S105	Tracked Dozer	PWL (dB)	31.0	120.0	121.0	122.0	104.0	105.0	101.0	99.0	95.0	125.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	93.8	104.9	113.4	100.8	105.0	102.2	100.0	93.9	**115.1**	No	0	189.0	60	60	60	—	—	—	—	GHD Reference Spectra
S106	Tracked Dozer	PWL (dB)	31.0	120.0	121.0	122.0	104.0	105.0	101.0	99.0	95.0	125.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	93.8	104.9	113.4	100.8	105.0	102.2	100.0	93.9	**115.1**	No	0	189.0	60	60	60	—	—	—	—	GHD Reference Spectra
S107	3m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S108	Hydraulic Excavator	PWL (dB)	31.0	116.0	109.0	108.0	108.0	104.0	102.0	96.0	94.0	118.1											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	89.8	92.9	99.4	104.8	104.0	103.2	97.0	92.9	**109.8**	No	0	132.0	60	60	60	—	—	—	—	GHD Reference Spectra
S109	Wheel Loader	PWL (dB)	31.0	119.0	115.0	112.0	115.0	107.0	101.0	99.0	92.0	122.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	98.9	103.4	111.8	107.0	102.2	100.0	90.9	**114.2**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S110	Dewatering Pump	PWL (dB)	31.0	112.0	113.0	98.0	103.0	102.0	105.0	104.0	97.0	116.6											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	85.8	96.9	89.4	99.8	102.0	106.2	105.0	95.9	**110.4**	No	0	131.0	60	60	60	—	—	—	—	GHD Reference Spectra
S111	Dewatering Pump	PWL (dB)	31.0	112.0	113.0	98.0	103.0	102.0	105.0	104.0	97.0	116.6											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	85.8	96.9	89.4	99.8	102.0	106.2	105.0	95.9	**110.4**	No	0	131.0	60	60	60	—	—	—	—	GHD Reference Spectra
S112	Hydraulic Excavator	PWL (dB)	31.0	116.0	109.0	108.0	108.0	104.0	102.0	96.0	94.0	118.1											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	89.8	92.9	99.4	104.8	104.0	103.2	97.0	92.9	**109.8**	No	0	131.6	60	60	60	—	—	—	—	GHD Reference Spectra
S113	3m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	132.5	60	60	60	—	—	—	—	GHD Reference Spectra
S114	Hydraulic Excavator	PWL (dB)	31.0	116.0	109.0	108.0	108.0	104.0	102.0	96.0	94.0	118.1											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	89.8	92.9	99.4	104.8	104.0	103.2	97.0	92.9	**109.8**	No	0	131.3	60	60	60	—	—	—	—	GHD Reference Spectra
S115	Wheel Loader	PWL (dB)	31.0	119.0	115.0	112.0	115.0	107.0	101.0	99.0	92.0	122.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	98.9	103.4	111.8	107.0	102.2	100.0	90.9	**114.2**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S116	Hydraulic Excavator	PWL (dB)	31.0	116.0	109.0	108.0	108.0	104.0	102.0	96.0	94.0	118.1											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	89.8	92.9	99.4	104.8	104.0	103.2	97.0	92.9	**109.8**	No	0	132.0	60	60	60	—	—	—	—	GHD Reference Spectra
S117	3m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	133.0	60	60	60	—	—	—	—	GHD Reference Spectra
S118	8m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	178.0	60	60	60	—	—	—	—	GHD Reference Spectra
S119	8m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	176.5	60	60	60	—	—	—	—	GHD Reference Spectra
S120	Jaw Crusher	PWL (dB)	109.9	118.0	117.0	114.4	113.5	108.6	105.6	100.3	93.8	122.7											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	70.5	91.8	100.9	105.8	110.3	108.6	106.8	101.3	92.7	**114.7**	No	0	173.4	60	60	60	—	—	—	—	GHD Reference Spectra
S121	Wheel Loader	PWL (dB)	31.0	119.0	115.0	112.0	115.0	107.0	101.0	99.0	92.0	122.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	98.9	103.4	111.8	107.0	102.2	100.0	90.9	**114.2**	No	0	172.5	60	60	60	—	—	—	—	GHD Reference Spectra
S122	8m Light Tower	PWL (dB)	31.0	109.0	102.0	97.0	93.0	90.0	86.0	87.0	80.0	110.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	82.8	85.9	88.4	89.8	90.0	87.2	88.0	78.9	**96.5**	No	0	176.4	60	60	60	—	—	—	—	GHD Reference Spectra
S123	Truck Unloading	PWL (dB)	31.0	119.0	115.0	106.0	104.0	106.0	103.0	99.0	91.0	120.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	92.8	98.9	97.4	100.8	106.0	104.2	100.0	89.9	**110.2**	No	0	170.9	60	60	60	—	—	—	—	GHD Reference Spectra

Table 4

Noise Source Sound Level Summary
Atlantic Mining NS Inc.
Beaver Dam Mine, Halifax, NS

Cadna A ID	Noise Source Description		1/1 Octave Band Data									Unadjusted Total Sound Power Level	Tonal Penalty Assessment		Height Absolute	Operating Time Day	Operating Time Evening	Operating Time Night	Speed	Vehicles Per Hour Day	Vehicles Per Hour Evening	Vehicles Per Hour Night	Reference/Comments
			32	63	125	250	500	1000	2000	4000	8000	(dBA)		(dBA)	(m)	(min)	(min)	(min)	(km/h)	(min)	(min)	(min)	
S124	Wheeled Backhoe Loader	PWL (dB)	31.0	99.0	98.0	94.0	93.0	93.0	92.0	85.0	78.0	103.6											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	72.8	81.9	85.4	89.8	93.0	93.2	86.0	76.9	**97.8**	No	0	169.7	60	60	60	—	—	—	—	GHD Reference Spectra
S125	Skid Steer	PWL (dB)	—	103.0	115.0	106.0	107.0	103.0	101.0	97.0	87.0	116.7											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-39.4	76.8	98.9	97.4	103.8	103.0	102.2	98.0	85.9	**109.1**	No	0	168.1	60	60	60	—	—	—	—	GHD Reference Spectra
S126	Generator	PWL (dB)	103.3	110.5	115.2	116.0	114.9	112.8	110.7	108.1	95.1	121.9											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	63.9	84.3	99.1	107.4	111.7	112.8	111.9	109.1	94.0	**118.1**	No	0	165.7	60	60	60	—	—	—	—	GHD Reference Spectra
S127	Mobile_Crane	PWL (dB)	31.0	121.0	112.0	109.0	105.0	108.0	107.0	100.0	92.0	122.2											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	94.8	95.9	100.4	101.8	108.0	108.2	101.0	90.9	**112.5**	No	0	168.3	60	60	60	—	—	—	—	GHD Reference Spectra
S128	Forklift	PWL (dB)	87.8	101.1	97.2	98.7	95.1	93.3	93.8	87.9	83.4	105.4											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	48.4	74.9	81.1	90.1	91.9	93.3	95.0	88.9	82.3	**99.5**	No	0	166.6	60	60	60	—	—	—	—	GHD Reference Spectra
S129	Fuel & Lube Truck	PWL (dB)	31.0	110.0	104.0	102.0	106.0	103.0	100.0	90.0	81.0	113.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	83.8	87.9	93.4	102.8	103.0	101.2	91.0	79.9	**107.5**	No	0	167.5	60	60	60	—	—	—	—	GHD Reference Spectra
S130	Fuel & Lube Truck	PWL (dB)	31.0	110.0	104.0	102.0	106.0	103.0	100.0	90.0	81.0	113.3											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	83.8	87.9	93.4	102.8	103.0	101.2	91.0	79.9	**107.5**	No	0	167.4	60	60	60	—	—	—	—	GHD Reference Spectra
S131	Excavator-Mounted Breaker	PWL (dB)	31.0	122.0	120.0	116.0	120.0	118.0	118.0	115.0	111.0	127.5											
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1												
		PWL (dBA)	-8.4	95.8	103.9	107.4	116.8	118.0	119.2	116.0	109.9	**124.0**	No	0	132.5	60	60	60	—	—	—	—	GHD Reference Spectra


GHD