REPORT

# DRAIN BROS. PROPOSED HIGHWAY 7 PIT

NORWOOD, ONTARIO

AIR QUALITY ASSESSMENT
RWDI #2404149
June 29, 2026

## SUBMITTED TO

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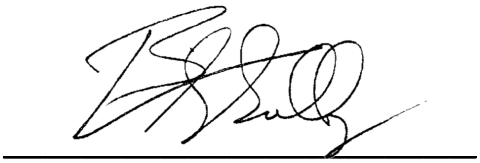
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# REPORT SIGNATURES



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# 1 INTRODUCTION

RWDI was retained by Drains Bros Excavating Limited to complete an air quality assessment in support of an Aggregate Resources Act (ARA) Class A License application for the proposed Highway 7 Pit, located on #1104 Sand Road, in Asphodel-Norwood Township, Ontario. This assessment quantifies and evaluates air quality impacts from the various air emission sources for the proposed pit operations including aggregate material handling and processing, and all associated equipment.

# 2 SITE DESCRIPTION & OPERATIONS

The site is proposed to operate from 6:00 AM – 7:00 PM Monday through Saturday with an annual maximum extraction limit of 350,000 tonnes. Shipping operations will begin at 6:00 AM. The proposed pit will operate primarily during the spring, summer, and fall, with limited operations during the winter months. The production was scaled based on the expected/modelled daily processing/shipping rates for each month are shown in **Appendix C.**

Operations consist of extraction of aggregate via front-end loader or excavator, processing, transportation, stockpiling, and shipping of finished aggregate. Processing activities will follow the working face of the pit at the proposed site and will be conducted using screening and crushing processing plants powered by a diesel-fired generator.

Shipping of aggregate will be done using a combination of 3-axle truck and trailers, 3-axle trucks and 4-axle trucks for an average load of 29 tonnes per shipment.

**Figure 1** illustrates the location of the proposed Highway 7 Road Pit.

# 3 SENSITIVE RECEPTOR LOCATIONS

There are various rural homes located around the site, with the receptors closest to the site located along Sand Road. There are additional residences located along N Asphodel 5$^{th}$ Line, Asphodel 7$^{th}$ Line, and Highway 7; however, these are located further from the proposed operations. Regardless of distance, these residences were considered to be sensitive receptors and were included as the basis for the assessment. **Figure 1** illustrates the location of these sensitive receptors.

# 4 CONTAMINANTS

The primary contaminant of interest is airborne dust generated by operations at the site:

- Suspended particulate matter (PM), consisting of particles with an aerodynamic diameter of 44 micrometres (µm) or less (known as TSP);
- Inhalable PM, consisting of particles with an aerodynamic diameter of 10 µm or less ($PM_{10}$);
- Crystalline silica within the $PM_{10}$ portion of the dust; and,

- Respirable PM, consisting of particles with an aerodynamic diameter of 2.5 µm or less ($PM_{2.5}$).

In addition to dust, on-site vehicles and heavy equipment also emit products of combustion. Nitrogen dioxide gas ($NO_2$), TSP, $PM_{10}$, and $PM_{2.5}$ were modelled as the key representatives of combustion products.

# 5 EMISSION SOURCES

The potential sources of emissions in the pit are as follows:

- Scraping/loading of aggregate from the active pit face;
- Material handling operations (loading, dumping material at the processing plants, and loading highway trucks for shipping);
- Material crushing, screening; and stockpiling;
- Movement of equipment over unpaved surfaces (loaders and highway trucks); and,
- Tailpipe emissions from on-site vehicles and heavy equipment.

Emissions from wind erosion of stockpiles were not included in the analysis. With the application of best management practices for dust, wind erosion of stockpiles at aggregate sites is not a significant contributor to predicted concentrations of 24-hour and annual particulates, especially when compared to fugitive dust from processing, handling and roads. Wind erosion of stockpiles occurs only under high wind events. Conversely, maximum predicted impacts from fugitive dust sources normally occur under low wind conditions, where atmospheric turbulence is diminished. Therefore, modelling of these sources is not expected to materially affect the conclusions of the analysis.

Overburden stripping and rehabilitation operations do not occur during maximum production periods. These operations were therefore considered insignificant and not included in the assessment but are addressed through the Best Management Practice Plan for Fugitive Dust.

**Figures 2, 3, 4,** and **5** presents modelled source locations for operations in representative locations. These locations were selected to represent the highest expected impact on certain receptors based on the active pit face location. All scenarios involve extracting in close proximity to sensitive receptors on Sand Road and then hauling the aggregate to the processing plants further northwest from Sand Road to decrease the impact on nearby sensitive receptors. It is recommended that a set-back distance of 200 m be implemented between the processing plants and any sensitive receptor.

# 6 EMISSION CALCULATIONS

Emissions were estimated in accordance with relevant guidance, using published emission factors. Detailed emission calculations are provided in the appendices to this report. The appendices contain details on assumptions, equipment types, sample calculations and other details that provide clarity as to RWDI's methodology. The emissions from sources that are wind-speed dependent (e.g., material handling) were calculated on an hour-by-hour basis, using the wind speed for each hour in the meteorological record. The emission values shown in the appendices for the wind-speed dependent emissions sources are example values, based on the average wind speed from the meteorological data.

- **Appendix A** provides emission estimates for aggregate processing equipment, using emission factors from Chapter 11.19.2 (Crushed Stone Processing and Pulverized Mineral Processing).
- **Appendix B** provides emission estimates for bulk material handling, using emission factors from Chapter 13.2.4 (Aggregate Handling and Storage Piles). These emissions were calculated on an hour-by-hour basis, using the wind speed for each hour in the meteorological record. The emission values shown in the appendices for the wind-speed-dependent emissions sources are example values based on the average wind speed from the meteorological data used in the assessment.
- **Appendix C** provides emission estimates for fugitive dust emissions from vehicles moving on unpaved roads, using emission factors from Chapter 13.2.2 (Unpaved Road).
- **Appendix D** provides emission estimates for tailpipe emissions from heavy equipment, vehicles, and stationary engines, using emission factors from the U.S EPA MOVES emissions software and the relevant Canadian diesel emission regulation limits for non-road diesel engines. These emissions are added to the fugitive dust emission estimates to provide a total emission estimate for TSP, $PM_{10}$, and $PM_{2.5}$.

# 7 AIR QUALITY THRESHOLDS

This air quality assessment involves predicting maximum and average concentrations of the identified contaminants and comparing those predicted concentrations to thresholds that have been established either provincially or nationally. The relevant objectives are the Ontario Ambient Air Quality Criteria (AAQC), with the exception of $PM_{2.5}$, for which no AAQC exists. For that reason, the Canadian Ambient Air Quality Standard (CAAQS) for $PM_{2.5}$ was used.

It must be stressed that the CAAQS were developed as regional objectives for ambient concentrations of select air pollutants. These values are intended for use in a regional context and were not developed as facility level regulatory standards. While the study considers the CAAQS objective for comparison with predicted concentrations of PM, it is only because there are currently no facility level assessment criteria for $PM_{2.5}$ under Ontario's AAQCs.

In contrast, there is currently an AAQC for $NO_2$, so comparison to the 2025 CAAQS regional objective would be inappropriate in the context of this study.

RWDI's approach is consistent with MECP practice. The "Air Quality in Ontario 2020 Report", published by the MECP follow the same approach by including the CAAQS criteria for PM2.5 but not including the CAAQS criteria NO2.

**Tables 2, 3, 4,** and **5** show the applicable AAQC and CAAQS objectives.

# 8 DISCUSSION OF MITIGATION MEASURES

The volume of truck and heavy equipment movement on unpaved surfaces within some areas of the site require above-average level of control, especially when operations are near sensitive receptors.

The level of control used in the assessment for dust on the internal haul route is an outcome of the modelling, not an input assumption requiring justification. It represents the level of control found to be needed to achieve acceptable results at the nearest receptors. Published studies show that it is achievable. Rosbury (1985)[1] summarized results from various studies showing that levels of control as high as 98% were attained in some cases. Rosbury went on to prescribe a watering rate that would achieve near 100% control (approximately 1.7 L/m²/h). The U.S. EPA (AP-42, Chapter 13.2.2) showed that by maintaining a road surface moisture level of five times that of the ambient soil, a 95% level of control could be achieved through sufficient watering. This finding of the studies is consistent with RWDI's experience in observing the effect of intensive watering programs.

The 95% level of control used for unpaved roads in the air quality assessment reflect the level of control required under peak operating conditions. This reflects a combination of the peak day of the peak year in the entire life of the site (adjusted seasonally as appropriate); the worst-case daily meteorological conditions from a 5-year meteorological data set; and ambient air quality conditions equal to the 90th percentile value on that combination of peak day and worst-case daily meteorological conditions. The likelihood of all these factors occurring concurrently is low.

At lower production or shipping levels, this level of control is not required. Similarly, under wet or rainy conditions, these controls may not be required at all, as such conditions provide natural mitigation of dust emissions. It is critical that the operator be able to achieve this level of control when necessary, and the BMPP must reflect this.

All scenarios involve extracting in close proximity to sensitive receptors on Sand Road and then hauling the aggregate to the processing plants further northwest from Sand Road to decrease the impact on nearby sensitive receptors. It is recommended that a set-back distance of 200 m be implemented between the processing plants and any sensitive receptor.

The dispersion modelling analysis reflects the implementation of controls.

# 9 ATMOSPHERIC DISPERSION MODELLING

The dispersion modelling was conducted to confirm that the proposed dust control recommendations will be sufficient to control off-site impacts at the sensitive impact locations. The modelling was conducted in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Guideline A11: Air Dispersion Modelling Guideline for Ontario, using the U.S. EPA AERMOD dispersion model, version 22112. AERMOD assesses multiple sources of emissions at discrete off-site receptors and is the current state-of-the-art regulatory model accepted for use in Ontario by the MECP.

Site specific meteorological data obtained from the MECP website were used within the model, in accordance with the MECP's Guideline A11. Terrain information for the site was also obtained from the MECP, in accordance with Guideline A11. Base elevations for sources within the site reflect the pit floor or appropriate elevations as provided by the proponent.

[1] Rosbury, Keith D. "Dust Control at Hazardous Waste Sites". Hazardous Waste Engineering Research Laboratory, Office of Research and Development, U.S. EPA. EPA/540/2-85/003,

The model was run using the regulatory default options, without the addition of the dry depletion algorithms for particulate matter. The AERMOD model produced 1-hour, 24-hour, and annual average concentrations, as appropriate for each contaminant. The proposed pit will operate primarily during the spring, summer, and fall, with limited operations during the winter months. Variable emission settings were used to scale all emissions based on the historic distribution for each month, as shown in Section 2.

Handling and processing sources were generally modelled using volume sources, in accordance with guidance from the National Stone Sand and Gravel Association (NSSGA)[2]. Haul routes and heavy equipment movements were modelled using adjacent volume sources, in accordance with guidance from the MECP and NSSGA. Point sources were modelled using the appropriate source parameters.

The dispersion modelling files are available electronically upon request.

# 10 LOCAL EMISSION SOURCES

Environment Canada's National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases. Data for 2023 (the most recent available at the time of this report) were reviewed for locally significant emission sources that would have similar emission profiles to the site. There are no facilities reporting emissions to NPRI within five (5) kilometres of the site. In fact, the closest facility reporting emissions in 2023 was over 17 kilometres from the site.

With respect to other aggregate operations near the subject site, impacts from such operations are more localized, and, in RWDI's experience, are typically indistinguishable from regional background air quality levels at distances beyond one (1) kilometer. As a conservative measure, RWDI used two (2) kilometers for this review. The Ministry of Natural Resources (MNR) Pits and Quarries Online tool, as well as aerial photography for the area, was used to identify other aggregate operations. There are two (2) licensed sites located within two (2) kilometres of the site, but none reported emissions to the NPRI.

The sites are listed below.

- Unnamed pit, licensed to the Corporation of the Township of Asphodel, located on Sand Road. The site entrance is approximately 1,700 metres west of the nearest edge of the proposed pit. This site has an annual license limit of 20,000 tonnes. Based on Google Earth, this site was active in 2021. No more recent aerial imagery was available.
- Unnamed pit, licensed to Amrize Canada Inc., located at 4025 Hwy 7. The nearest edge of the site is approximately 1,500 metres east of the proposed pit. This site has an annual license limit of 273,000 tonnes. The site is currently in operation.

Both of these pits are situated in close enough proximity that they have the potential for cumulative air quality impacts with the proposed Highway 7 Pit at nearby receptors. Their locations relative to the site are shown in

[2] National Stone Sand and Gravel Association, "Modeling Fugitive Dust Sources with AERMOD", January 2007.

**Figure 6**. These pits were modelled by scaling the emissions of the proposed pit by their respective annual license limits and then modelling the pit operations as a volume source. Emission calculations for the nearby pits are provided in **Appendix E**. The next nearest pit or quarry is over 5,000 metres away from the proposed pit; therefore, the combination of size and distance indicates that a reasonable background air quality estimate will provide a sufficient estimate of cumulative impacts.

# 11 BACKGROUND AIR QUALITY

Background ambient air monitoring data was used in conjunction with the emissions from the proposed operations. For the purposes of this assessment, 90$^{th}$ percentile background concentrations of particulate matter, nitrogen dioxide, and ozone were obtained from the nearest MECP monitoring station to the site (MECP Station 59006, located in Peterborough). This data is provided on **Table 1**. TSP and $PM_{10}$ were estimated from station measured $PM_{2.5}$ data using factors derived from the analysis of extensive monitoring data from other sites, as presented by the 2004 report by Lall et. al.[3]. Silica was estimated using published data for cities in the northeast U.S.[4].

The use of historical data from a representative monitoring station operated by the MECP somewhere in the surrounding region is a widely accepted approach to estimating background air quality conditions. In the present case, the most representative station would be one that is in a rural heavily forested location, with a number of aggregate operations nearby. There are no such monitoring stations operating anywhere in Ontario.

Therefore, the decision was made to use monitoring data from the closest station (Peterborough), even though this station is in a more urbanized environment. This is expected to overestimate concentrations of fine particulate matter and combustion by-products in a very rural area and, thereby err on the safe side.

# 12 RESULTS

The results of the assessment are presented in **Tables 2, 3, 4,** and **5**. Maximum predicted concentrations from the proposed pit are below the relevant criteria for all contaminants at the modelled receptors. These receptor locations are shown on **Figure 1**.

Based on these modelling results, the proposed pit is not predicted to cause a significant air quality impact, with appropriate mitigation measures in place.

[3] Lall, R., M. Kendall, K. Ito, and G. D. Thurston (2004). Estimation of Historical Annual $PM_{2.5}$ Exposures for Health Effects Assessments, Atmos. Env., 38, pp. 5217-5226.
[4] United States Environmental Protection Agency (1996). Ambient Levels and Noncancer Health effects of Inhaled Crystalline Silica and Amorphous Silica: Health Issue Assessment. EPA/600/R-95-115.

# 13 RECOMMENDATIONS

This assessment is based on the following recommendations, which are to be included on the Site Plans:

- Dust will be mitigated on site;
- Water or another provincially approved dust suppressant will be applied to internal haul roads as often as required to mitigate dust;
- All processing equipment will be equipped with dust suppressing or collection devices (such as a water spray system); and,
- The site will operate in accordance with a Best Management Practices Plan for Fugitive Dust, which may be amended from time to time, considering actual impacts and operational considerations. A copy of the BMPP is included as **Appendix F**.

# 14 CONCLUSIONS

The modelling results in **Tables 2, 3, 4,** and **5** indicate that future operations at the pit will not cause a significant impact on nearby receptors, with appropriate mitigation measures in place.

# 15 STATEMENT OF LIMITATIONS

This report entitled Drain Bros. Proposed Highway 7 Pit Air Quality Assessment was prepared by RWDI AIR Inc. ("RWDI") for Drains Bros Excavating Limited, ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

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# TABLES

# Table 1: Ambient Air Quality Data [1]

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| Year | TSP [2] | | $PM_{10}$ [2] | Silica | $PM_{2.5}$ | | $NO_2$ [4] | | | | $O_3$ [4] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 90th Percentile 24-hour (µg/m³) | Annual Average (µg/m³) | 90th Percentile 24-hour (µg/m³) | 90th Percentile 24-hour [3] (µg/m³) | 90th Percentile 24-hour (µg/m³) | Annual Average (µg/m³) | 99th Percentile 1-Hour | | 90th Percentile 24-hour | | 99th Percentile 1-Hour | |
| | | | | | | | (ppb) | (µg/m³) | (ppb) | (µg/m³) | (ppb) | (µg/m³) |
| 2019 | 43 | 20 | 24 | 1.4 | 13 | 6 | 25 | 50 | 8 | 17 | 53 | 110 |
| 2020 | 43 | 19 | 24 | 1.4 | 13 | 6 | 24 | 48 | 8 | 17 | 54 | 112 |
| 2021 | 50 | 22 | 28 | 1.7 | 15 | 6 | 24 | 48 | 9 | 17 | 61 | 126 |
| 2022 | 47 | 22 | 26 | 1.6 | 14 | 7 | 28 | 55 | 9 | 17 | 54 | 112 |
| 2023 | 50 | 27 | 28 | 1.7 | 15 | 8 | 24 | 48 | 7 | 14 | 58 | 120 |
| Average | 47 | 22 | 26 | 1.6 | 14 | 6.5 | 25 | 50 | 8 | 16 | 56 | 116 |

Notes:

[1] All data from MECP Station 59006 in Peterborough, Ontario

[2] Estimated from PM2.5 measurements using published factors (Lall et al., 2004)

[3] Estimated as 6% of PM10, from published data for cities in the northeast US (U.S. EPA, 1996)

[4] Conversion from ppb to µg/m³ based on 10ºC

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Prepared by: JBH

# Table 2: Cumulative Effects Analysis for Operations of Extraction Area 1

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Modelled Values & Frequency of Excursions above the Relevant Criteria

| | | | | | | |
|---|---|---|---|---|---|---|
| Days of Valid Meteorological Data | | 1826 | | | | |
| Hours of Valid Meteorological Data | | 43824 | | | | |
| **Relevant Criteria:** | TSP | 120 | µg/m³ 24h AAQC | TSP | 47 | µg/m³ (24-hour) |
| | | 60 | µg/m³ Annual AAQC | | 22 | µg/m³ (annual) |
| | $PM_{10}$ | 50 | µg/m³ Interim AAQC | $PM_{10}$ | 26 | µg/m³ (24-hour) |
| | $PM_{2.5}$ | 25 | µg/m³ 24-Hour Canada Wide Standard | $PM_{2.5}$ | 14 | µg/m³ (24-hour) |
| | | 8.8 | µg/m³ Annual Canada Wide Standard | | 6.5 | µg/m³ (annual) |
| | Silica | 5 | µg/m³ AAQC | Silica | 1.6 | µg/m³ (24-hour) |
| | $NO_2$ | 400 | µg/m³ 1-Hour AAQC | $NO_2$ | 50 | µg/m³ (1-hour) |
| | | 200 | µg/m³ 24-Hour AAQC | | 16 | µg/m³ (24-hour) |
| | $O_3$ | 165 | µg/m³ 1-Hour AAQC | $O_3$ | 116 | µg/m³ (1-hour) |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 1 | Residence | 737587.18 | 4916520.78 | TSP | 24 | 23.7 | 20% | 70.7 | 59% |
| | | | | | Annual | 1.3 | 2% | 23.3 | 39% |
| | | | | $PM_{10}$ | 24 | 4.7 | 9% | 30.7 | 61% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.0 | 1% | 6.5 | 74% |
| | | | | Silica | 24 | 1.0 | 20% | 2.6 | 52% |
| | | | | $NO_2$ | 1 | 49.4 | 12% | 99.2 | 25% |
| | | | | | 24 | 5.2 | 3% | 21.6 | 11% |
| Receptor 2 | Residence | 738209.21 | 4916863.35 | TSP | 24 | 3.8 | 3% | 50.8 | 42% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 40.2 | 10% | 90.0 | 22% |
| | | | | | 24 | 4.4 | 2% | 20.8 | 10% |
| Receptor 3 | Residence | 738599.87 | 4916674.03 | TSP | 24 | 7.2 | 6% | 54.2 | 45% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 2.2 | 4% | 28.2 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.7 | 3% | 14.7 | 59% |
| | | | | | Annual | 0.0 | 1% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 7% | 2.0 | 39% |
| | | | | $NO_2$ | 1 | 81.2 | 20% | 131.0 | 33% |
| | | | | | 24 | 8.2 | 4% | 24.6 | 12% |
| Receptor 4 | Residence | 738644.08 | 4916445.21 | TSP | 24 | 5.1 | 4% | 52.1 | 43% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 68.6 | 17% | 118.4 | 30% |
| | | | | | 24 | 4.7 | 2% | 21.1 | 11% |
| Receptor 5 | Residence | 738663.73 | 4916375.60 | TSP | 24 | 4.9 | 4% | 51.9 | 43% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 63.6 | 16% | 113.4 | 28% |
| | | | | | 24 | 5.0 | 3% | 21.4 | 11% |
| Receptor 6 | Residence | 738657.18 | 4916400.17 | TSP | 24 | 5.1 | 4% | 52.1 | 43% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 65.2 | 16% | 115.0 | 29% |
| | | | | | 24 | 5.0 | 2% | 21.4 | 11% |
| Receptor 7 | Residence | 738487.17 | 4916003.07 | TSP | 24 | 10.2 | 8% | 57.2 | 48% |
| | | | | | Annual | 1.0 | 2% | 23.0 | 38% |
| | | | | $PM_{10}$ | 24 | 2.8 | 6% | 28.8 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 11% | 2.2 | 43% |
| | | | | $NO_2$ | 1 | 44.8 | 11% | 94.6 | 24% |
| | | | | | 24 | 6.0 | 3% | 22.4 | 11% |
| Receptor 8 | Residence | 737874.44 | 4915787.83 | TSP | 24 | 30.1 | 25% | 77.1 | 64% |
| | | | | | Annual | 3.2 | 5% | 25.2 | 42% |
| | | | | $PM_{10}$ | 24 | 6.3 | 13% | 32.3 | 65% |
| | | | | $PM_{2.5}$ | 24 | 1.4 | 6% | 15.4 | 62% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.2 | 25% | 2.8 | 57% |
| | | | | $NO_2$ | 1 | 107.3 | 27% | 157.1 | 39% |
| | | | | | 24 | 14.5 | 7% | 30.9 | 15% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 9 | Residence | 737924.39 | 4915679.26 | TSP | 24 | 24.1 | 20% | 71.1 | 59% |
| | | | | | Annual | 1.7 | 3% | 23.7 | 40% |
| | | | | $PM_{10}$ | 24 | 6.1 | 12% | 32.1 | 64% |
| | | | | $PM_{2.5}$ | 24 | 1.4 | 5% | 15.4 | 61% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.2 | 24% | 2.8 | 56% |
| | | | | $NO_2$ | 1 | 65.7 | 16% | 115.5 | 29% |
| | | | | | 24 | 15.0 | 7% | 31.4 | 16% |
| Receptor 10 | Residence | 737516.16 | 4915618.46 | TSP | 24 | 16.8 | 14% | 63.8 | 53% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 3.9 | 8% | 29.9 | 60% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.8 | 16% | 2.4 | 48% |
| | | | | $NO_2$ | 1 | 91.9 | 23% | 141.7 | 35% |
| | | | | | 24 | 7.1 | 4% | 23.5 | 12% |
| Receptor 11 | Residence | 737574.79 | 4915492.52 | TSP | 24 | 6.4 | 5% | 53.4 | 45% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 1.5 | 3% | 27.5 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 46.5 | 12% | 96.3 | 24% |
| | | | | | 24 | 4.5 | 2% | 20.9 | 10% |
| Receptor 12 | Residence | 737481.42 | 4915373.10 | TSP | 24 | 4.7 | 4% | 51.7 | 43% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 46.8 | 12% | 96.6 | 24% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 13 | Residence | 737224.70 | 4915280.93 | TSP | 24 | 8.8 | 7% | 55.8 | 47% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 2.2 | 4% | 28.2 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 85.3 | 21% | 135.1 | 34% |
| | | | | | 24 | 5.6 | 3% | 22.0 | 11% |
| Receptor 14 | Residence | 737260.93 | 4915015.68 | TSP | 24 | 2.8 | 2% | 49.8 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.7 | 1% | 26.7 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 42.8 | 11% | 92.6 | 23% |
| | | | | | 24 | 2.7 | 1% | 19.1 | 10% |
| Receptor 15 | Residence | 737157.90 | 4914993.40 | TSP | 24 | 3.8 | 3% | 50.8 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 49.5 | 12% | 99.3 | 25% |
| | | | | | 24 | 3.0 | 2% | 19.4 | 10% |
| Receptor 16 | Residence | 737118.91 | 4914911.25 | TSP | 24 | 3.3 | 3% | 50.3 | 42% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.8 | 2% | 26.8 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 3% | 1.8 | 35% |
| | | | | $NO_2$ | 1 | 49.0 | 12% | 98.8 | 25% |
| | | | | | 24 | 2.7 | 1% | 19.1 | 10% |
| Receptor 17 | Residence | 737206.63 | 4914902.20 | TSP | 24 | 2.5 | 2% | 49.5 | 41% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 42.0 | 10% | 91.8 | 23% |
| | | | | | 24 | 2.5 | 1% | 18.9 | 9% |
| Receptor 18 | Residence | 737161.38 | 4914808.92 | TSP | 24 | 2.3 | 2% | 49.3 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 40.5 | 10% | 90.3 | 23% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 19 | Residence | 737071.57 | 4914644.91 | TSP | 24 | 2.1 | 2% | 49.1 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.5 | 1% | 26.5 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 40.0 | 10% | 89.8 | 22% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |
| Receptor 20 | Residence | 737028.98 | 4914548.26 | TSP | 24 | 2.0 | 2% | 49.0 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.5 | 1% | 26.5 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 39.3 | 10% | 89.1 | 22% |
| | | | | | 24 | 2.3 | 1% | 18.7 | 9% |
| Receptor 21 | Residence | 736979.01 | 4914502.39 | TSP | 24 | 2.2 | 2% | 49.2 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 37.6 | 9% | 87.4 | 22% |
| | | | | | 24 | 2.1 | 1% | 18.5 | 9% |
| Receptor 22 | Residence | 736942.16 | 4914460.62 | TSP | 24 | 2.5 | 2% | 49.5 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 43.4 | 11% | 93.2 | 23% |
| | | | | | 24 | 2.0 | 1% | 18.4 | 9% |
| Receptor 23 | Residence | 736749.68 | 4914444.24 | TSP | 24 | 2.5 | 2% | 49.5 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 46.3 | 12% | 96.1 | 24% |
| | | | | | 24 | 2.1 | 1% | 18.5 | 9% |
| Receptor 24 | Residence | 736338.15 | 4915082.65 | TSP | 24 | 3.3 | 3% | 50.3 | 42% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.8 | 2% | 26.8 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 3% | 1.7 | 35% |
| | | | | $NO_2$ | 1 | 40.3 | 10% | 90.1 | 23% |
| | | | | | 24 | 2.2 | 1% | 18.6 | 9% |
| Receptor 25 | Residence | 736305.80 | 4915178.38 | TSP | 24 | 2.6 | 2% | 49.6 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 42.7 | 11% | 92.5 | 23% |
| | | | | | 24 | 2.1 | 1% | 18.5 | 9% |
| Receptor 26 | Residence | 736327.91 | 4915242.27 | TSP | 24 | 2.2 | 2% | 49.2 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 41.6 | 10% | 91.4 | 23% |
| | | | | | 24 | 2.1 | 1% | 18.5 | 9% |
| Receptor 27 | Residence | 736286.96 | 4915304.52 | TSP | 24 | 2.5 | 2% | 49.5 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.7 | 1% | 26.7 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 39.9 | 10% | 89.7 | 22% |
| | | | | | 24 | 2.5 | 1% | 18.9 | 9% |
| Receptor 28 | Residence | 736220.38 | 4915424.70 | TSP | 24 | 2.6 | 2% | 49.6 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.7 | 1% | 26.7 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 29.0 | 7% | 78.8 | 20% |
| | | | | | 24 | 2.9 | 1% | 19.3 | 10% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 29 | Residence | 736187.23 | 4915484.84 | TSP | 24 | 2.1 | 2% | 49.1 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 29.2 | 7% | 79.0 | 20% |
| | | | | | 24 | 2.8 | 1% | 19.2 | 10% |
| Receptor 30 | Residence | 736304.21 | 4915654.48 | TSP | 24 | 1.8 | 2% | 48.8 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 30.8 | 8% | 80.6 | 20% |
| | | | | | 24 | 3.0 | 2% | 19.4 | 10% |
| Receptor 31 | Residence | 736122.92 | 4915766.42 | TSP | 24 | 1.5 | 1% | 48.5 | 40% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.4 | 1% | 26.4 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 1% | 1.7 | 33% |
| | | | | $NO_2$ | 1 | 27.7 | 7% | 77.5 | 19% |
| | | | | | 24 | 2.2 | 1% | 18.6 | 9% |
| Receptor 32 | Residence | 736387.10 | 4915784.56 | TSP | 24 | 1.7 | 1% | 48.7 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.5 | 1% | 26.5 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 30.9 | 8% | 80.7 | 20% |
| | | | | | 24 | 2.7 | 1% | 19.1 | 10% |
| Receptor 33 | Residence | 736470.36 | 4915884.11 | TSP | 24 | 1.8 | 1% | 48.8 | 41% |
| | | | | | Annual | 0.1 | 0% | 22.1 | 37% |
| | | | | $PM_{10}$ | 24 | 0.5 | 1% | 26.5 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 32.7 | 8% | 82.5 | 21% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |
| Receptor 34 | Residence | 736725.19 | 4916023.98 | TSP | 24 | 2.3 | 2% | 49.3 | 41% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 33.6 | 8% | 83.4 | 21% |
| | | | | | 24 | 2.6 | 1% | 19.0 | 9% |
| Receptor 35 | Residence | 737099.29 | 4916158.30 | TSP | 24 | 4.3 | 4% | 51.3 | 43% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 39.9 | 10% | 89.7 | 22% |
| | | | | | 24 | 3.4 | 2% | 19.8 | 10% |

# Table 3: Cumulative Effects Analysis for Operations of Extraction Area 2

RWDI Project 2404149

Modelled Values & Frequency of Excursions above the Relevant Criteria

| | | | | | | |
|---|---|---|---|---|---|---|
| Days of Valid Meteorological Data | | 1826 | | | | |
| Hours of Valid Meteorological Data | | 43824 | | | | |
| **Relevant Criteria:** | TSP | 120 | µg/m³ 24h AAQC | | **Background** | |
| | | 60 | µg/m³ Annual AAQC | TSP | 47 | µg/m³ (24-hour) |
| | $PM_{10}$ | 50 | µg/m³ Interim AAQC | | 22 | µg/m³ (annual) |
| | $PM_{2.5}$ | 25 | µg/m³ 24-Hour Canada Wide Standard | $PM_{10}$ | 26 | µg/m³ (24-hour) |
| | | 8.8 | µg/m³ Annual Canada Wide Standard | $PM_{2.5}$ | 14 | µg/m³ (24-hour) |
| | Silica | 5 | µg/m³ AAQC | | 6.5 | µg/m³ (annual) |
| | $NO_2$ | 400 | µg/m³ 1-Hour AAQC | Silica | 1.6 | µg/m³ (24-hour) |
| | | 200 | µg/m³ 24-Hour AAQC | $NO_2$ | 50 | µg/m³ (1-hour) |
| | $O_3$ | 165 | µg/m³ 1-Hour AAQC | | 16 | µg/m³ (24-hour) |
| | | | | $O_3$ | 116 | µg/m³ (1-hour) |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 1 | Residence | 737587.18 | 4916520.78 | TSP | 24 | 19.8 | 16% | 66.8 | 56% |
| | | | | | Annual | 1.4 | 2% | 23.4 | 39% |
| | | | | $PM_{10}$ | 24 | 3.2 | 6% | 29.2 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.7 | 13% | 2.3 | 45% |
| | | | | $NO_2$ | 1 | 41.9 | 10% | 91.7 | 23% |
| | | | | | 24 | 3.8 | 2% | 20.2 | 10% |
| Receptor 2 | Residence | 738209.21 | 4916863.35 | TSP | 24 | 6.3 | 5% | 53.3 | 44% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 41.4 | 10% | 91.2 | 23% |
| | | | | | 24 | 3.0 | 2% | 19.4 | 10% |
| Receptor 3 | Residence | 738599.87 | 4916674.03 | TSP | 24 | 9.6 | 8% | 56.6 | 47% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 2.6 | 5% | 28.6 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.7 | 3% | 14.7 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 9% | 2.0 | 41% |
| | | | | $NO_2$ | 1 | 83.8 | 21% | 133.6 | 33% |
| | | | | | 24 | 8.4 | 4% | 24.8 | 12% |
| Receptor 4 | Residence | 738644.08 | 4916445.21 | TSP | 24 | 5.6 | 5% | 52.6 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 70.7 | 18% | 120.5 | 30% |
| | | | | | 24 | 3.7 | 2% | 20.1 | 10% |
| Receptor 5 | Residence | 738663.73 | 4916375.60 | TSP | 24 | 5.3 | 4% | 52.3 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 65.6 | 16% | 115.4 | 29% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 6 | Residence | 738657.18 | 4916400.17 | TSP | 24 | 5.5 | 5% | 52.5 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 67.2 | 17% | 117.0 | 29% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 7 | Residence | 738487.17 | 4916003.07 | TSP | 24 | 7.8 | 7% | 54.8 | 46% |
| | | | | | Annual | 0.8 | 1% | 22.8 | 38% |
| | | | | $PM_{10}$ | 24 | 1.5 | 3% | 27.5 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 46.3 | 12% | 96.1 | 24% |
| | | | | | 24 | 3.5 | 2% | 19.9 | 10% |
| Receptor 8 | Residence | 737874.44 | 4915787.83 | TSP | 24 | 32.5 | 27% | 79.5 | 66% |
| | | | | | Annual | 3.5 | 6% | 25.5 | 42% |
| | | | | $PM_{10}$ | 24 | 5.3 | 11% | 31.3 | 63% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.1 | 22% | 2.7 | 54% |
| | | | | $NO_2$ | 1 | 53.4 | 13% | 103.2 | 26% |
| | | | | | 24 | 5.1 | 3% | 21.5 | 11% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 9 | Residence | 737924.39 | 4915679.26 | TSP | 24 | 16.9 | 14% | 63.9 | 53% |
| | | | | | Annual | 2.3 | 4% | 24.3 | 41% |
| | | | | $PM_{10}$ | 24 | 3.1 | 6% | 29.1 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.7 | 13% | 2.3 | 45% |
| | | | | $NO_2$ | 1 | 43.0 | 11% | 92.8 | 23% |
| | | | | | 24 | 4.7 | 2% | 21.1 | 11% |
| Receptor 10 | Residence | 737516.16 | 4915618.46 | TSP | 24 | 37.7 | 31% | 84.7 | 71% |
| | | | | | Annual | 8.0 | 13% | 30.0 | 50% |
| | | | | $PM_{10}$ | 24 | 9.4 | 19% | 35.4 | 71% |
| | | | | $PM_{2.5}$ | 24 | 1.9 | 7% | 15.9 | 63% |
| | | | | | Annual | 0.3 | 4% | 6.8 | 77% |
| | | | | Silica | 24 | 1.9 | 39% | 3.5 | 71% |
| | | | | $NO_2$ | 1 | 134.8 | 34% | 184.6 | 46% |
| | | | | | 24 | 18.6 | 9% | 35.0 | 17% |
| Receptor 11 | Residence | 737574.79 | 4915492.52 | TSP | 24 | 38.7 | 32% | 85.7 | 71% |
| | | | | | Annual | 4.9 | 8% | 26.9 | 45% |
| | | | | $PM_{10}$ | 24 | 9.1 | 18% | 35.1 | 70% |
| | | | | $PM_{2.5}$ | 24 | 1.3 | 5% | 15.3 | 61% |
| | | | | | Annual | 0.2 | 2% | 6.7 | 76% |
| | | | | Silica | 24 | 2.0 | 39% | 3.6 | 71% |
| | | | | $NO_2$ | 1 | 80.6 | 20% | 130.4 | 33% |
| | | | | | 24 | 16.3 | 8% | 32.7 | 16% |
| Receptor 12 | Residence | 737481.42 | 4915373.10 | TSP | 24 | 21.6 | 18% | 68.6 | 57% |
| | | | | | Annual | 2.4 | 4% | 24.4 | 41% |
| | | | | $PM_{10}$ | 24 | 6.0 | 12% | 32.0 | 64% |
| | | | | $PM_{2.5}$ | 24 | 1.3 | 5% | 15.3 | 61% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.2 | 24% | 2.8 | 56% |
| | | | | $NO_2$ | 1 | 76.7 | 19% | 126.5 | 32% |
| | | | | | 24 | 13.4 | 7% | 29.8 | 15% |
| Receptor 13 | Residence | 737224.70 | 4915280.93 | TSP | 24 | 16.2 | 13% | 63.2 | 53% |
| | | | | | Annual | 0.8 | 1% | 22.8 | 38% |
| | | | | $PM_{10}$ | 24 | 3.6 | 7% | 29.6 | 59% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.0 | 1% | 6.5 | 74% |
| | | | | Silica | 24 | 0.7 | 15% | 2.3 | 47% |
| | | | | $NO_2$ | 1 | 74.6 | 19% | 124.4 | 31% |
| | | | | | 24 | 10.2 | 5% | 26.6 | 13% |
| Receptor 14 | Residence | 737260.93 | 4915015.68 | TSP | 24 | 8.7 | 7% | 55.7 | 46% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 2.4 | 5% | 28.4 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.7 | 3% | 14.7 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.5 | 10% | 2.1 | 42% |
| | | | | $NO_2$ | 1 | 42.2 | 11% | 92.0 | 23% |
| | | | | | 24 | 9.6 | 5% | 26.0 | 13% |
| Receptor 15 | Residence | 737157.90 | 4914993.40 | TSP | 24 | 8.8 | 7% | 55.8 | 46% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 2.0 | 4% | 28.0 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 40.1 | 10% | 89.9 | 22% |
| | | | | | 24 | 4.8 | 2% | 21.2 | 11% |
| Receptor 16 | Residence | 737118.91 | 4914911.25 | TSP | 24 | 7.7 | 6% | 54.7 | 46% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.8 | 4% | 27.8 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 40.1 | 10% | 89.9 | 22% |
| | | | | | 24 | 3.6 | 2% | 20.0 | 10% |
| Receptor 17 | Residence | 737206.63 | 4914902.20 | TSP | 24 | 7.1 | 6% | 54.1 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.5 | 3% | 27.5 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 36.7 | 9% | 86.5 | 22% |
| | | | | | 24 | 7.0 | 3% | 23.4 | 12% |
| Receptor 18 | Residence | 737161.38 | 4914808.92 | TSP | 24 | 6.0 | 5% | 53.0 | 44% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 36.6 | 9% | 86.4 | 22% |
| | | | | | 24 | 5.3 | 3% | 21.7 | 11% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 19 | Residence | 737071.57 | 4914644.91 | TSP | 24 | 5.1 | 4% | 52.1 | 43% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 31.0 | 8% | 80.8 | 20% |
| | | | | | 24 | 3.1 | 2% | 19.5 | 10% |
| Receptor 20 | Residence | 737028.98 | 4914548.26 | TSP | 24 | 4.6 | 4% | 51.6 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.0 | 2% | 27.0 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 32.5 | 8% | 82.3 | 21% |
| | | | | | 24 | 2.5 | 1% | 18.9 | 9% |
| Receptor 21 | Residence | 736979.01 | 4914502.39 | TSP | 24 | 4.7 | 4% | 51.7 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 29.9 | 7% | 79.7 | 20% |
| | | | | | 24 | 1.9 | 1% | 18.3 | 9% |
| Receptor 22 | Residence | 736942.16 | 4914460.62 | TSP | 24 | 4.6 | 4% | 51.6 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 32.1 | 8% | 81.9 | 20% |
| | | | | | 24 | 1.9 | 1% | 18.3 | 9% |
| Receptor 23 | Residence | 736749.68 | 4914444.24 | TSP | 24 | 4.1 | 3% | 51.1 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 35.0 | 9% | 84.8 | 21% |
| | | | | | 24 | 2.2 | 1% | 18.6 | 9% |
| Receptor 24 | Residence | 736338.15 | 4915082.65 | TSP | 24 | 4.7 | 4% | 51.7 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 36.2 | 9% | 86.0 | 22% |
| | | | | | 24 | 2.7 | 1% | 19.1 | 10% |
| Receptor 25 | Residence | 736305.80 | 4915178.38 | TSP | 24 | 3.7 | 3% | 50.7 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 3% | 1.8 | 35% |
| | | | | $NO_2$ | 1 | 35.9 | 9% | 85.7 | 21% |
| | | | | | 24 | 2.8 | 1% | 19.2 | 10% |
| Receptor 26 | Residence | 736327.91 | 4915242.27 | TSP | 24 | 4.3 | 4% | 51.3 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 36.4 | 9% | 86.2 | 22% |
| | | | | | 24 | 3.4 | 2% | 19.8 | 10% |
| Receptor 27 | Residence | 736286.96 | 4915304.52 | TSP | 24 | 5.6 | 5% | 52.6 | 44% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 38.2 | 10% | 88.0 | 22% |
| | | | | | 24 | 4.4 | 2% | 20.8 | 10% |
| Receptor 28 | Residence | 736220.38 | 4915424.70 | TSP | 24 | 4.8 | 4% | 51.8 | 43% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 35.0 | 9% | 84.8 | 21% |
| | | | | | 24 | 4.1 | 2% | 20.5 | 10% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 29 | Residence | 736187.23 | 4915484.84 | TSP | 24 | 3.3 | 3% | 50.3 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 3% | 1.7 | 35% |
| | | | | $NO_2$ | 1 | 35.5 | 9% | 85.3 | 21% |
| | | | | | 24 | 3.1 | 2% | 19.5 | 10% |
| Receptor 30 | Residence | 736304.21 | 4915654.48 | TSP | 24 | 2.9 | 2% | 49.9 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.8 | 2% | 26.8 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 3% | 1.7 | 35% |
| | | | | $NO_2$ | 1 | 34.1 | 9% | 83.9 | 21% |
| | | | | | 24 | 2.9 | 1% | 19.3 | 10% |
| Receptor 31 | Residence | 736122.92 | 4915766.42 | TSP | 24 | 2.1 | 2% | 49.1 | 41% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.6 | 1% | 26.6 | 53% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 2% | 1.7 | 34% |
| | | | | $NO_2$ | 1 | 34.6 | 9% | 84.4 | 21% |
| | | | | | 24 | 2.5 | 1% | 18.9 | 9% |
| Receptor 32 | Residence | 736387.10 | 4915784.56 | TSP | 24 | 3.0 | 2% | 50.0 | 42% |
| | | | | | Annual | 0.2 | 0% | 22.2 | 37% |
| | | | | $PM_{10}$ | 24 | 0.8 | 2% | 26.8 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.1 | 3% | 1.7 | 35% |
| | | | | $NO_2$ | 1 | 35.9 | 9% | 85.7 | 21% |
| | | | | | 24 | 2.8 | 1% | 19.2 | 10% |
| Receptor 33 | Residence | 736470.36 | 4915884.11 | TSP | 24 | 3.6 | 3% | 50.6 | 42% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 3% | 1.8 | 35% |
| | | | | $NO_2$ | 1 | 36.8 | 9% | 86.6 | 22% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 34 | Residence | 736725.19 | 4916023.98 | TSP | 24 | 6.8 | 6% | 53.8 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.8 | 4% | 27.8 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 7% | 1.9 | 39% |
| | | | | $NO_2$ | 1 | 42.0 | 11% | 91.8 | 23% |
| | | | | | 24 | 4.4 | 2% | 20.8 | 10% |
| Receptor 35 | Residence | 737099.29 | 4916158.30 | TSP | 24 | 8.3 | 7% | 55.3 | 46% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 2.1 | 4% | 28.1 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 44.2 | 11% | 94.0 | 24% |
| | | | | | 24 | 4.3 | 2% | 20.7 | 10% |

# Table 4: Cumulative Effects Analysis for Operations of Extraction Area 3

RWDI Project 2404149

Modelled Values & Frequency of Excursions above the Relevant Criteria

| | | | | | | |
|---|---|---|---|---|---|---|
| Days of Valid Meteorological Data | | 1826 | | | | |
| Hours of Valid Meteorological Data | | 43824 | | | | |
| **Relevant Criteria:** | TSP | 120 | µg/m³ 24h AAQC | | **Background** | |
| | | 60 | µg/m³ Annual AAQC | TSP | 47 | µg/m³ (24-hour) |
| | $PM_{10}$ | 50 | µg/m³ Interim AAQC | | 22 | µg/m³ (annual) |
| | $PM_{2.5}$ | 25 | µg/m³ 24-Hour Canada Wide Standard | $PM_{10}$ | 26 | µg/m³ (24-hour) |
| | | 8.8 | µg/m³ Annual Canada Wide Standard | $PM_{2.5}$ | 14 | µg/m³ (24-hour) |
| | Silica | 5 | µg/m³ AAQC | | 6.5 | µg/m³ (annual) |
| | $NO_2$ | 400 | µg/m³ 1-Hour AAQC | Silica | 1.6 | µg/m³ (24-hour) |
| | | 200 | µg/m³ 24-Hour AAQC | $NO_2$ | 50 | µg/m³ (1-hour) |
| | $O_3$ | 165 | µg/m³ 1-Hour AAQC | | 16 | µg/m³ (24-hour) |
| | | | | $O_3$ | 116 | µg/m³ (1-hour) |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 1 | Residence | 737587.18 | 4916520.78 | TSP | 24 | 18.7 | 16% | 65.7 | 55% |
| | | | | | Annual | 1.4 | 2% | 23.4 | 39% |
| | | | | $PM_{10}$ | 24 | 3.0 | 6% | 29.0 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.6 | 13% | 2.2 | 45% |
| | | | | $NO_2$ | 1 | 42.4 | 11% | 92.2 | 23% |
| | | | | | 24 | 2.8 | 1% | 19.2 | 10% |
| Receptor 2 | Residence | 738209.21 | 4916863.35 | TSP | 24 | 6.2 | 5% | 53.2 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 41.9 | 10% | 91.7 | 23% |
| | | | | | 24 | 3.0 | 1% | 19.4 | 10% |
| Receptor 3 | Residence | 738599.87 | 4916674.03 | TSP | 24 | 11.1 | 9% | 58.1 | 48% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 2.8 | 6% | 28.8 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.5 | 10% | 2.1 | 42% |
| | | | | $NO_2$ | 1 | 84.8 | 21% | 134.6 | 34% |
| | | | | | 24 | 8.5 | 4% | 24.9 | 12% |
| Receptor 4 | Residence | 738644.08 | 4916445.21 | TSP | 24 | 5.9 | 5% | 52.9 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 71.5 | 18% | 121.3 | 30% |
| | | | | | 24 | 3.8 | 2% | 20.2 | 10% |
| Receptor 5 | Residence | 738663.73 | 4916375.60 | TSP | 24 | 5.9 | 5% | 52.9 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 66.4 | 17% | 116.2 | 29% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 6 | Residence | 738657.18 | 4916400.17 | TSP | 24 | 5.9 | 5% | 52.9 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 68.0 | 17% | 117.8 | 29% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 7 | Residence | 738487.17 | 4916003.07 | TSP | 24 | 7.1 | 6% | 54.1 | 45% |
| | | | | | Annual | 0.8 | 1% | 22.8 | 38% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 46.8 | 12% | 96.6 | 24% |
| | | | | | 24 | 3.4 | 2% | 19.8 | 10% |
| Receptor 8 | Residence | 737874.44 | 4915787.83 | TSP | 24 | 35.2 | 29% | 82.2 | 69% |
| | | | | | Annual | 3.5 | 6% | 25.5 | 42% |
| | | | | $PM_{10}$ | 24 | 5.7 | 11% | 31.7 | 63% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 3% | 14.6 | 59% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.2 | 24% | 2.8 | 56% |
| | | | | $NO_2$ | 1 | 54.0 | 14% | 103.8 | 26% |
| | | | | | 24 | 4.3 | 2% | 20.7 | 10% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 9 | Residence | 737924.39 | 4915679.26 | TSP | 24 | 17.5 | 15% | 64.5 | 54% |
| | | | | | Annual | 2.2 | 4% | 24.2 | 40% |
| | | | | $PM_{10}$ | 24 | 3.0 | 6% | 29.0 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 12% | 2.2 | 44% |
| | | | | $NO_2$ | 1 | 40.0 | 10% | 89.8 | 22% |
| | | | | | 24 | 4.5 | 2% | 20.9 | 10% |
| Receptor 10 | Residence | 737516.16 | 4915618.46 | TSP | 24 | 26.7 | 22% | 73.7 | 61% |
| | | | | | Annual | 5.1 | 8% | 27.1 | 45% |
| | | | | $PM_{10}$ | 24 | 4.9 | 10% | 30.9 | 62% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.0 | 20% | 2.6 | 52% |
| | | | | $NO_2$ | 1 | 67.6 | 17% | 117.4 | 29% |
| | | | | | 24 | 6.5 | 3% | 22.9 | 11% |
| Receptor 11 | Residence | 737574.79 | 4915492.52 | TSP | 24 | 15.2 | 13% | 62.2 | 52% |
| | | | | | Annual | 2.7 | 4% | 24.7 | 41% |
| | | | | $PM_{10}$ | 24 | 2.7 | 5% | 28.7 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 11% | 2.2 | 43% |
| | | | | $NO_2$ | 1 | 37.6 | 9% | 87.4 | 22% |
| | | | | | 24 | 4.7 | 2% | 21.1 | 11% |
| Receptor 12 | Residence | 737481.42 | 4915373.10 | TSP | 24 | 15.5 | 13% | 62.5 | 52% |
| | | | | | Annual | 2.6 | 4% | 24.6 | 41% |
| | | | | $PM_{10}$ | 24 | 3.2 | 6% | 29.2 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 13% | 2.2 | 45% |
| | | | | $NO_2$ | 1 | 47.2 | 12% | 97.0 | 24% |
| | | | | | 24 | 6.5 | 3% | 22.9 | 11% |
| Receptor 13 | Residence | 737224.70 | 4915280.93 | TSP | 24 | 44.2 | 37% | 91.2 | 76% |
| | | | | | Annual | 6.8 | 11% | 28.8 | 48% |
| | | | | $PM_{10}$ | 24 | 14.1 | 28% | 40.1 | 80% |
| | | | | $PM_{2.5}$ | 24 | 2.6 | 10% | 16.6 | 66% |
| | | | | | Annual | 0.3 | 3% | 6.8 | 77% |
| | | | | Silica | 24 | 2.9 | 58% | 4.5 | 90% |
| | | | | $NO_2$ | 1 | 124.1 | 31% | 173.9 | 43% |
| | | | | | 24 | 22.7 | 11% | 39.1 | 20% |
| Receptor 14 | Residence | 737260.93 | 4915015.68 | TSP | 24 | 16.2 | 14% | 63.2 | 53% |
| | | | | | Annual | 1.5 | 3% | 23.5 | 39% |
| | | | | $PM_{10}$ | 24 | 4.1 | 8% | 30.1 | 60% |
| | | | | $PM_{2.5}$ | 24 | 0.9 | 4% | 14.9 | 60% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.8 | 16% | 2.4 | 48% |
| | | | | $NO_2$ | 1 | 52.1 | 13% | 101.9 | 25% |
| | | | | | 24 | 9.0 | 4% | 25.4 | 13% |
| Receptor 15 | Residence | 737157.90 | 4914993.40 | TSP | 24 | 19.9 | 17% | 66.9 | 56% |
| | | | | | Annual | 1.2 | 2% | 23.2 | 39% |
| | | | | $PM_{10}$ | 24 | 4.4 | 9% | 30.4 | 61% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.9 | 18% | 2.5 | 50% |
| | | | | $NO_2$ | 1 | 68.9 | 17% | 118.7 | 30% |
| | | | | | 24 | 10.3 | 5% | 26.7 | 13% |
| Receptor 16 | Residence | 737118.91 | 4914911.25 | TSP | 24 | 15.9 | 13% | 62.9 | 52% |
| | | | | | Annual | 0.9 | 1% | 22.9 | 38% |
| | | | | $PM_{10}$ | 24 | 4.2 | 8% | 30.2 | 60% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.0 | 1% | 6.5 | 74% |
| | | | | Silica | 24 | 0.8 | 17% | 2.4 | 49% |
| | | | | $NO_2$ | 1 | 51.9 | 13% | 101.7 | 25% |
| | | | | | 24 | 7.1 | 4% | 23.5 | 12% |
| Receptor 17 | Residence | 737206.63 | 4914902.20 | TSP | 24 | 11.0 | 9% | 58.0 | 48% |
| | | | | | Annual | 0.9 | 2% | 22.9 | 38% |
| | | | | $PM_{10}$ | 24 | 2.4 | 5% | 28.4 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 74% |
| | | | | Silica | 24 | 0.5 | 10% | 2.1 | 42% |
| | | | | $NO_2$ | 1 | 45.4 | 11% | 95.2 | 24% |
| | | | | | 24 | 8.0 | 4% | 24.4 | 12% |
| Receptor 18 | Residence | 737161.38 | 4914808.92 | TSP | 24 | 9.9 | 8% | 56.9 | 47% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 2.5 | 5% | 28.5 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.5 | 11% | 2.1 | 43% |
| | | | | $NO_2$ | 1 | 36.1 | 9% | 85.9 | 21% |
| | | | | | 24 | 5.3 | 3% | 21.7 | 11% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 19 | Residence | 737071.57 | 4914644.91 | TSP | 24 | 8.5 | 7% | 55.5 | 46% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 37% |
| | | | | $PM_{10}$ | 24 | 2.0 | 4% | 28.0 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 2% | 14.6 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 46.5 | 12% | 96.3 | 24% |
| | | | | | 24 | 6.9 | 3% | 23.3 | 12% |
| Receptor 20 | Residence | 737028.98 | 4914548.26 | TSP | 24 | 7.4 | 6% | 54.4 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.9 | 4% | 27.9 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 7% | 1.9 | 39% |
| | | | | $NO_2$ | 1 | 37.5 | 9% | 87.3 | 22% |
| | | | | | 24 | 7.1 | 4% | 23.5 | 12% |
| Receptor 21 | Residence | 736979.01 | 4914502.39 | TSP | 24 | 7.0 | 6% | 54.0 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.8 | 4% | 27.8 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 7% | 2.0 | 39% |
| | | | | $NO_2$ | 1 | 32.6 | 8% | 82.4 | 21% |
| | | | | | 24 | 7.0 | 3% | 23.4 | 12% |
| Receptor 22 | Residence | 736942.16 | 4914460.62 | TSP | 24 | 6.7 | 6% | 53.7 | 45% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 2.0 | 4% | 28.0 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 8% | 2.0 | 40% |
| | | | | $NO_2$ | 1 | 31.7 | 8% | 81.5 | 20% |
| | | | | | 24 | 6.4 | 3% | 22.8 | 11% |
| Receptor 23 | Residence | 736749.68 | 4914444.24 | TSP | 24 | 5.9 | 5% | 52.9 | 44% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 35.2 | 9% | 85.0 | 21% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |
| Receptor 24 | Residence | 736338.15 | 4915082.65 | TSP | 24 | 5.3 | 4% | 52.3 | 44% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 35.8 | 9% | 85.6 | 21% |
| | | | | | 24 | 4.3 | 2% | 20.7 | 10% |
| Receptor 25 | Residence | 736305.80 | 4915178.38 | TSP | 24 | 6.7 | 6% | 53.7 | 45% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.7 | 3% | 27.7 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 37.0 | 9% | 86.8 | 22% |
| | | | | | 24 | 4.8 | 2% | 21.2 | 11% |
| Receptor 26 | Residence | 736327.91 | 4915242.27 | TSP | 24 | 6.4 | 5% | 53.4 | 45% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.6 | 3% | 27.6 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 36.3 | 9% | 86.1 | 22% |
| | | | | | 24 | 4.7 | 2% | 21.1 | 11% |
| Receptor 27 | Residence | 736286.96 | 4915304.52 | TSP | 24 | 6.1 | 5% | 53.1 | 44% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 38.6 | 10% | 88.4 | 22% |
| | | | | | 24 | 4.3 | 2% | 20.7 | 10% |
| Receptor 28 | Residence | 736220.38 | 4915424.70 | TSP | 24 | 4.8 | 4% | 51.8 | 43% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 36.9 | 9% | 86.7 | 22% |
| | | | | | 24 | 3.8 | 2% | 20.2 | 10% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 29 | Residence | 736187.23 | 4915484.84 | TSP | 24 | 3.6 | 3% | 50.6 | 42% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 0.9 | 2% | 26.9 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 3% | 1.8 | 35% |
| | | | | $NO_2$ | 1 | 35.1 | 9% | 84.9 | 21% |
| | | | | | 24 | 3.1 | 2% | 19.5 | 10% |
| Receptor 30 | Residence | 736304.21 | 4915654.48 | TSP | 24 | 4.7 | 4% | 51.7 | 43% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 38.0 | 10% | 87.8 | 22% |
| | | | | | 24 | 4.8 | 2% | 21.2 | 11% |
| Receptor 31 | Residence | 736122.92 | 4915766.42 | TSP | 24 | 3.9 | 3% | 50.9 | 42% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.0 | 2% | 27.0 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 34.8 | 9% | 84.6 | 21% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 32 | Residence | 736387.10 | 4915784.56 | TSP | 24 | 4.5 | 4% | 51.5 | 43% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 40.5 | 10% | 90.3 | 23% |
| | | | | | 24 | 4.4 | 2% | 20.8 | 10% |
| Receptor 33 | Residence | 736470.36 | 4915884.11 | TSP | 24 | 6.2 | 5% | 53.2 | 44% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.5 | 3% | 27.5 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 37.7 | 9% | 87.5 | 22% |
| | | | | | 24 | 3.7 | 2% | 20.1 | 10% |
| Receptor 34 | Residence | 736725.19 | 4916023.98 | TSP | 24 | 5.6 | 5% | 52.6 | 44% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 37% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 38.4 | 10% | 88.2 | 22% |
| | | | | | 24 | 3.7 | 2% | 20.1 | 10% |
| Receptor 35 | Residence | 737099.29 | 4916158.30 | TSP | 24 | 6.6 | 5% | 53.6 | 45% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 38.4 | 10% | 88.2 | 22% |
| | | | | | 24 | 3.6 | 2% | 20.0 | 10% |

# Table 5: Cumulative Effects Analysis for Operations of Extraction Area 4

RWDI Project 2404149

Modelled Values & Frequency of Excursions above the Relevant Criteria

| | | | | | | |
|---|---|---|---|---|---|---|
| Days of Valid Meteorological Data | | 1826 | | | | |
| Hours of Valid Meteorological Data | | 43824 | | | | |
| **Relevant Criteria:** | TSP | 120 | µg/m³ 24h AAQC | | **Background** | |
| | | 60 | µg/m³ Annual AAQC | TSP | 47 | µg/m³ (24-hour) |
| | $PM_{10}$ | 50 | µg/m³ Interim AAQC | | 22 | µg/m³ (annual) |
| | $PM_{2.5}$ | 25 | µg/m³ 24-Hour Canada Wide Standard | $PM_{10}$ | 26 | µg/m³ (24-hour) |
| | | 8.8 | µg/m³ Annual Canada Wide Standard | $PM_{2.5}$ | 14 | µg/m³ (24-hour) |
| | Silica | 5 | µg/m³ AAQC | | 6.5 | µg/m³ (annual) |
| | $NO_2$ | 400 | µg/m³ 1-Hour AAQC | Silica | 1.6 | µg/m³ (24-hour) |
| | | 200 | µg/m³ 24-Hour AAQC | $NO_2$ | 50 | µg/m³ (1-hour) |
| | $O_3$ | 165 | µg/m³ 1-Hour AAQC | | 16 | µg/m³ (24-hour) |
| | | | | $O_3$ | 116 | µg/m³ (1-hour) |

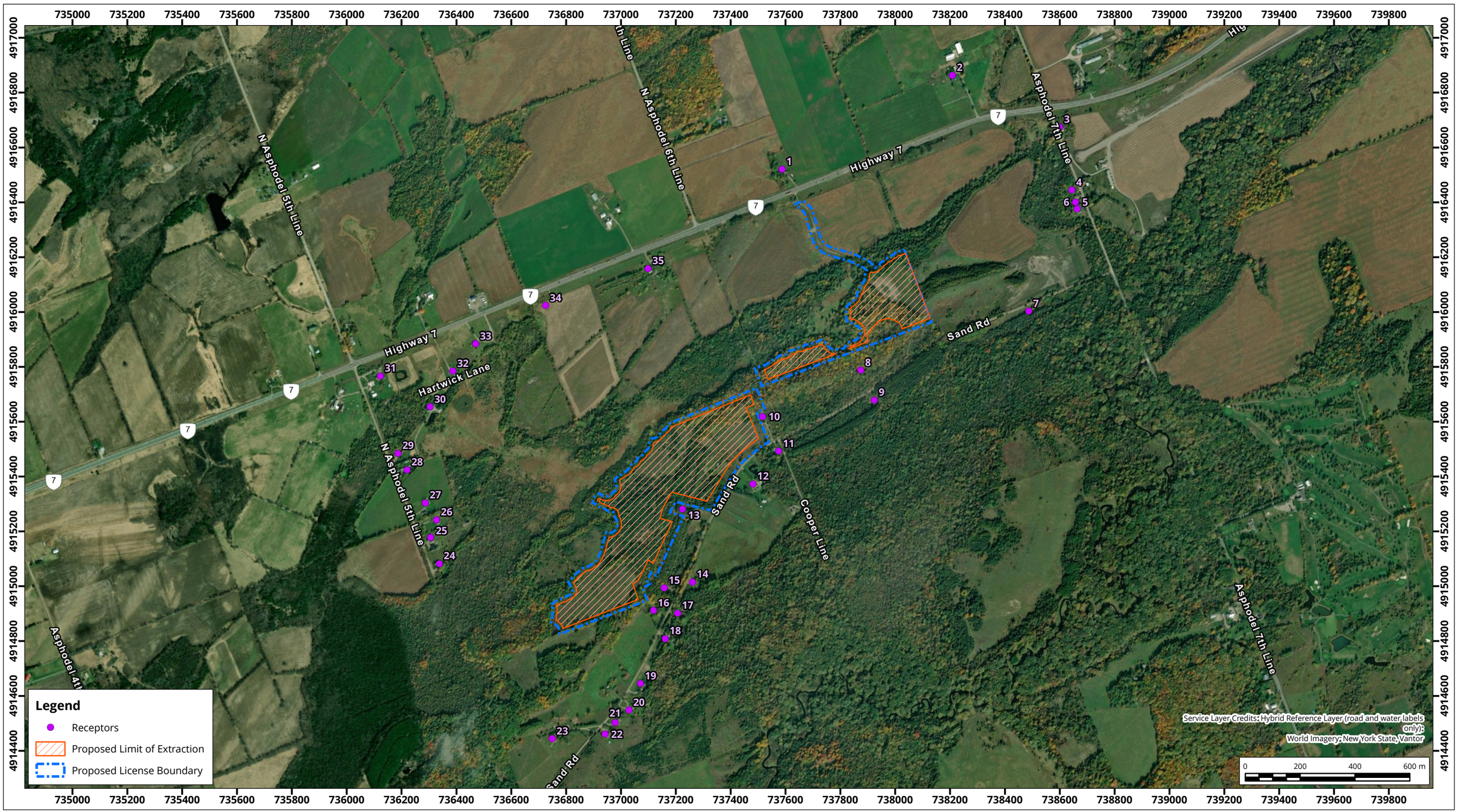
| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 1 | Residence | 737587.18 | 4916520.78 | TSP | 24 | 20.0 | 17% | 67.0 | 56% |
| | | | | | Annual | 1.5 | 2% | 23.5 | 39% |
| | | | | $PM_{10}$ | 24 | 3.3 | 7% | 29.3 | 59% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.7 | 14% | 2.3 | 46% |
| | | | | $NO_2$ | 1 | 43.0 | 11% | 92.8 | 23% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |
| Receptor 2 | Residence | 738209.21 | 4916863.35 | TSP | 24 | 6.7 | 6% | 53.7 | 45% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.2 | 1% | 14.2 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 42.4 | 11% | 92.2 | 23% |
| | | | | | 24 | 2.4 | 1% | 18.8 | 9% |
| Receptor 3 | Residence | 738599.87 | 4916674.03 | TSP | 24 | 12.0 | 10% | 59.0 | 49% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 2.9 | 6% | 28.9 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.8 | 3% | 14.8 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.5 | 11% | 2.1 | 43% |
| | | | | $NO_2$ | 1 | 85.8 | 21% | 135.6 | 34% |
| | | | | | 24 | 8.6 | 4% | 25.0 | 13% |
| Receptor 4 | Residence | 738644.08 | 4916445.21 | TSP | 24 | 6.3 | 5% | 53.3 | 44% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 72.3 | 18% | 122.1 | 31% |
| | | | | | 24 | 3.8 | 2% | 20.2 | 10% |
| Receptor 5 | Residence | 738663.73 | 4916375.60 | TSP | 24 | 6.0 | 5% | 53.0 | 44% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 5% | 1.9 | 37% |
| | | | | $NO_2$ | 1 | 67.2 | 17% | 117.0 | 29% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 6 | Residence | 738657.18 | 4916400.17 | TSP | 24 | 6.0 | 5% | 53.0 | 44% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 68.8 | 17% | 118.6 | 30% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 7 | Residence | 738487.17 | 4916003.07 | TSP | 24 | 8.1 | 7% | 55.1 | 46% |
| | | | | | Annual | 0.9 | 1% | 22.9 | 38% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 47.4 | 12% | 97.2 | 24% |
| | | | | | 24 | 3.0 | 2% | 19.4 | 10% |
| Receptor 8 | Residence | 737874.44 | 4915787.83 | TSP | 24 | 27.8 | 23% | 74.8 | 62% |
| | | | | | Annual | 3.5 | 6% | 25.5 | 43% |
| | | | | $PM_{10}$ | 24 | 4.5 | 9% | 30.5 | 61% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.9 | 19% | 2.5 | 51% |
| | | | | $NO_2$ | 1 | 54.7 | 14% | 104.5 | 26% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 9 | Residence | 737924.39 | 4915679.26 | TSP | 24 | 16.5 | 14% | 63.5 | 53% |
| | | | | | Annual | 2.2 | 4% | 24.2 | 40% |
| | | | | $PM_{10}$ | 24 | 2.9 | 6% | 28.9 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 12% | 2.2 | 44% |
| | | | | $NO_2$ | 1 | 39.3 | 10% | 89.1 | 22% |
| | | | | | 24 | 4.0 | 2% | 20.4 | 10% |
| Receptor 10 | Residence | 737516.16 | 4915618.46 | TSP | 24 | 25.8 | 22% | 72.8 | 61% |
| | | | | | Annual | 4.9 | 8% | 26.9 | 45% |
| | | | | $PM_{10}$ | 24 | 4.6 | 9% | 30.6 | 61% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 3% | 14.6 | 59% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.9 | 19% | 2.5 | 51% |
| | | | | $NO_2$ | 1 | 68.5 | 17% | 118.3 | 30% |
| | | | | | 24 | 5.3 | 3% | 21.7 | 11% |
| Receptor 11 | Residence | 737574.79 | 4915492.52 | TSP | 24 | 15.3 | 13% | 62.3 | 52% |
| | | | | | Annual | 2.6 | 4% | 24.6 | 41% |
| | | | | $PM_{10}$ | 24 | 2.7 | 5% | 28.7 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 11% | 2.2 | 43% |
| | | | | $NO_2$ | 1 | 39.4 | 10% | 89.2 | 22% |
| | | | | | 24 | 4.8 | 2% | 21.2 | 11% |
| Receptor 12 | Residence | 737481.42 | 4915373.10 | TSP | 24 | 14.1 | 12% | 61.1 | 51% |
| | | | | | Annual | 2.4 | 4% | 24.4 | 41% |
| | | | | $PM_{10}$ | 24 | 2.7 | 5% | 28.7 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.6 | 11% | 2.2 | 43% |
| | | | | $NO_2$ | 1 | 38.9 | 10% | 88.7 | 22% |
| | | | | | 24 | 5.5 | 3% | 21.9 | 11% |
| Receptor 13 | Residence | 737224.70 | 4915280.93 | TSP | 24 | 21.0 | 17% | 68.0 | 57% |
| | | | | | Annual | 3.8 | 6% | 25.8 | 43% |
| | | | | $PM_{10}$ | 24 | 4.6 | 9% | 30.6 | 61% |
| | | | | $PM_{2.5}$ | 24 | 1.0 | 4% | 15.0 | 60% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 0.9 | 19% | 2.5 | 51% |
| | | | | $NO_2$ | 1 | 60.3 | 15% | 110.1 | 28% |
| | | | | | 24 | 10.1 | 5% | 26.5 | 13% |
| Receptor 14 | Residence | 737260.93 | 4915015.68 | TSP | 24 | 20.4 | 17% | 67.4 | 56% |
| | | | | | Annual | 2.7 | 5% | 24.7 | 41% |
| | | | | $PM_{10}$ | 24 | 5.7 | 11% | 31.7 | 63% |
| | | | | $PM_{2.5}$ | 24 | 1.1 | 4% | 15.1 | 60% |
| | | | | | Annual | 0.1 | 2% | 6.6 | 75% |
| | | | | Silica | 24 | 1.2 | 23% | 2.8 | 55% |
| | | | | $NO_2$ | 1 | 65.5 | 16% | 115.3 | 29% |
| | | | | | 24 | 12.3 | 6% | 28.7 | 14% |
| Receptor 15 | Residence | 737157.90 | 4914993.40 | TSP | 24 | 34.9 | 29% | 81.9 | 68% |
| | | | | | Annual | 4.2 | 7% | 26.2 | 44% |
| | | | | $PM_{10}$ | 24 | 8.9 | 18% | 34.9 | 70% |
| | | | | $PM_{2.5}$ | 24 | 1.7 | 7% | 15.7 | 63% |
| | | | | | Annual | 0.2 | 2% | 6.7 | 76% |
| | | | | Silica | 24 | 1.8 | 36% | 3.4 | 68% |
| | | | | $NO_2$ | 1 | 101.9 | 25% | 151.7 | 38% |
| | | | | | 24 | 18.2 | 9% | 34.6 | 17% |
| Receptor 16 | Residence | 737118.91 | 4914911.25 | TSP | 24 | 49.0 | 41% | 96.0 | 80% |
| | | | | | Annual | 3.9 | 7% | 25.9 | 43% |
| | | | | $PM_{10}$ | 24 | 11.3 | 23% | 37.3 | 75% |
| | | | | $PM_{2.5}$ | 24 | 1.8 | 7% | 15.8 | 63% |
| | | | | | Annual | 0.2 | 2% | 6.7 | 76% |
| | | | | Silica | 24 | 2.4 | 48% | 4.0 | 80% |
| | | | | $NO_2$ | 1 | 98.7 | 25% | 148.5 | 37% |
| | | | | | 24 | 17.2 | 9% | 33.6 | 17% |
| Receptor 17 | Residence | 737206.63 | 4914902.20 | TSP | 24 | 25.3 | 21% | 72.3 | 60% |
| | | | | | Annual | 2.7 | 4% | 24.7 | 41% |
| | | | | $PM_{10}$ | 24 | 6.7 | 13% | 32.7 | 65% |
| | | | | $PM_{2.5}$ | 24 | 1.0 | 4% | 15.0 | 60% |
| | | | | | Annual | 0.1 | 2% | 6.6 | 75% |
| | | | | Silica | 24 | 1.4 | 29% | 3.0 | 61% |
| | | | | $NO_2$ | 1 | 64.4 | 16% | 114.2 | 29% |
| | | | | | 24 | 11.8 | 6% | 28.2 | 14% |
| Receptor 18 | Residence | 737161.38 | 4914808.92 | TSP | 24 | 21.3 | 18% | 68.3 | 57% |
| | | | | | Annual | 1.8 | 3% | 23.8 | 40% |
| | | | | $PM_{10}$ | 24 | 5.3 | 11% | 31.3 | 63% |
| | | | | $PM_{2.5}$ | 24 | 1.1 | 4% | 15.1 | 60% |
| | | | | | Annual | 0.1 | 1% | 6.6 | 75% |
| | | | | Silica | 24 | 1.0 | 21% | 2.6 | 53% |
| | | | | $NO_2$ | 1 | 50.9 | 13% | 100.7 | 25% |
| | | | | | 24 | 10.1 | 5% | 26.5 | 13% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 19 | Residence | 737071.57 | 4914644.91 | TSP | 24 | 13.3 | 11% | 60.3 | 50% |
| | | | | | Annual | 0.9 | 1% | 22.9 | 38% |
| | | | | $PM_{10}$ | 24 | 3.0 | 6% | 29.0 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 1% | 6.5 | 74% |
| | | | | Silica | 24 | 0.6 | 13% | 2.2 | 45% |
| | | | | $NO_2$ | 1 | 45.9 | 11% | 95.7 | 24% |
| | | | | | 24 | 6.8 | 3% | 23.2 | 12% |
| Receptor 20 | Residence | 737028.98 | 4914548.26 | TSP | 24 | 9.8 | 8% | 56.8 | 47% |
| | | | | | Annual | 0.7 | 1% | 22.7 | 38% |
| | | | | $PM_{10}$ | 24 | 2.5 | 5% | 28.5 | 57% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.5 | 10% | 2.1 | 42% |
| | | | | $NO_2$ | 1 | 43.0 | 11% | 92.8 | 23% |
| | | | | | 24 | 5.8 | 3% | 22.2 | 11% |
| Receptor 21 | Residence | 736979.01 | 4914502.39 | TSP | 24 | 13.0 | 11% | 60.0 | 50% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 38% |
| | | | | $PM_{10}$ | 24 | 3.0 | 6% | 29.0 | 58% |
| | | | | $PM_{2.5}$ | 24 | 0.6 | 3% | 14.6 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.6 | 12% | 2.2 | 44% |
| | | | | $NO_2$ | 1 | 48.1 | 12% | 97.9 | 24% |
| | | | | | 24 | 7.1 | 4% | 23.5 | 12% |
| Receptor 22 | Residence | 736942.16 | 4914460.62 | TSP | 24 | 15.0 | 13% | 62.0 | 52% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 37% |
| | | | | $PM_{10}$ | 24 | 3.5 | 7% | 29.5 | 59% |
| | | | | $PM_{2.5}$ | 24 | 0.7 | 3% | 14.7 | 59% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.7 | 14% | 2.3 | 46% |
| | | | | $NO_2$ | 1 | 41.8 | 10% | 91.6 | 23% |
| | | | | | 24 | 8.3 | 4% | 24.7 | 12% |
| Receptor 23 | Residence | 736749.68 | 4914444.24 | TSP | 24 | 9.5 | 8% | 56.5 | 47% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 2.1 | 4% | 28.1 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 9% | 2.0 | 41% |
| | | | | $NO_2$ | 1 | 39.9 | 10% | 89.7 | 22% |
| | | | | | 24 | 4.6 | 2% | 21.0 | 11% |
| Receptor 24 | Residence | 736338.15 | 4915082.65 | TSP | 24 | 7.5 | 6% | 54.5 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.8 | 4% | 27.8 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 7% | 2.0 | 39% |
| | | | | $NO_2$ | 1 | 39.6 | 10% | 89.4 | 22% |
| | | | | | 24 | 5.7 | 3% | 22.1 | 11% |
| Receptor 25 | Residence | 736305.80 | 4915178.38 | TSP | 24 | 7.4 | 6% | 54.4 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.9 | 4% | 27.9 | 56% |
| | | | | $PM_{2.5}$ | 24 | 0.5 | 2% | 14.5 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.4 | 7% | 2.0 | 39% |
| | | | | $NO_2$ | 1 | 37.8 | 9% | 87.6 | 22% |
| | | | | | 24 | 4.4 | 2% | 20.8 | 10% |
| Receptor 26 | Residence | 736327.91 | 4915242.27 | TSP | 24 | 6.5 | 5% | 53.5 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.6 | 3% | 27.6 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 42.5 | 11% | 92.3 | 23% |
| | | | | | 24 | 4.9 | 2% | 21.3 | 11% |
| Receptor 27 | Residence | 736286.96 | 4915304.52 | TSP | 24 | 6.6 | 6% | 53.6 | 45% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.6 | 3% | 27.6 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 39.4 | 10% | 89.2 | 22% |
| | | | | | 24 | 4.9 | 2% | 21.3 | 11% |
| Receptor 28 | Residence | 736220.38 | 4915424.70 | TSP | 24 | 5.4 | 5% | 52.4 | 44% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 2% | 14.4 | 58% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 36.9 | 9% | 86.7 | 22% |
| | | | | | 24 | 4.7 | 2% | 21.1 | 11% |

| Receptor | | UTM Coordinates | | Contaminant | Averaging Period | With No Background Concentration | | With Additional Background Concentrations | |
|---|---|---|---|---|---|---|---|---|---|
| ID | Type | X (m) | Y (m) | | (hours) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) | Maximum Predicted 24-Hour Concentration (µg/m³) | Percentage of Relevant Criteria (%) |
| Receptor 29 | Residence | 736187.23 | 4915484.84 | TSP | 24 | 4.4 | 4% | 51.4 | 43% |
| | | | | | Annual | 0.3 | 1% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 36.3 | 9% | 86.1 | 22% |
| | | | | | 24 | 4.2 | 2% | 20.6 | 10% |
| Receptor 30 | Residence | 736304.21 | 4915654.48 | TSP | 24 | 5.9 | 5% | 52.9 | 44% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.5 | 3% | 27.5 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.4 | 1% | 14.4 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 35.7 | 9% | 85.5 | 21% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 31 | Residence | 736122.92 | 4915766.42 | TSP | 24 | 4.4 | 4% | 51.4 | 43% |
| | | | | | Annual | 0.3 | 0% | 22.3 | 37% |
| | | | | $PM_{10}$ | 24 | 1.2 | 2% | 27.2 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 35.2 | 9% | 85.0 | 21% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 32 | Residence | 736387.10 | 4915784.56 | TSP | 24 | 5.6 | 5% | 52.6 | 44% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.4 | 3% | 27.4 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.3 | 6% | 1.9 | 38% |
| | | | | $NO_2$ | 1 | 38.4 | 10% | 88.2 | 22% |
| | | | | | 24 | 3.9 | 2% | 20.3 | 10% |
| Receptor 33 | Residence | 736470.36 | 4915884.11 | TSP | 24 | 4.9 | 4% | 51.9 | 43% |
| | | | | | Annual | 0.4 | 1% | 22.4 | 37% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 37.2 | 9% | 87.0 | 22% |
| | | | | | 24 | 4.1 | 2% | 20.5 | 10% |
| Receptor 34 | Residence | 736725.19 | 4916023.98 | TSP | 24 | 5.1 | 4% | 52.1 | 43% |
| | | | | | Annual | 0.5 | 1% | 22.5 | 37% |
| | | | | $PM_{10}$ | 24 | 1.3 | 3% | 27.3 | 55% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 5% | 1.8 | 37% |
| | | | | $NO_2$ | 1 | 35.3 | 9% | 85.1 | 21% |
| | | | | | 24 | 3.5 | 2% | 19.9 | 10% |
| Receptor 35 | Residence | 737099.29 | 4916158.30 | TSP | 24 | 6.6 | 5% | 53.6 | 45% |
| | | | | | Annual | 0.6 | 1% | 22.6 | 38% |
| | | | | $PM_{10}$ | 24 | 1.1 | 2% | 27.1 | 54% |
| | | | | $PM_{2.5}$ | 24 | 0.3 | 1% | 14.3 | 57% |
| | | | | | Annual | 0.0 | 0% | 6.5 | 74% |
| | | | | Silica | 24 | 0.2 | 4% | 1.8 | 36% |
| | | | | $NO_2$ | 1 | 38.0 | 9% | 87.8 | 22% |
| | | | | | 24 | 2.9 | 1% | 19.3 | 10% |

# FIGURES




# Site Location and Phasing

Map Projection: NAD 1983 UTM Zone 17N

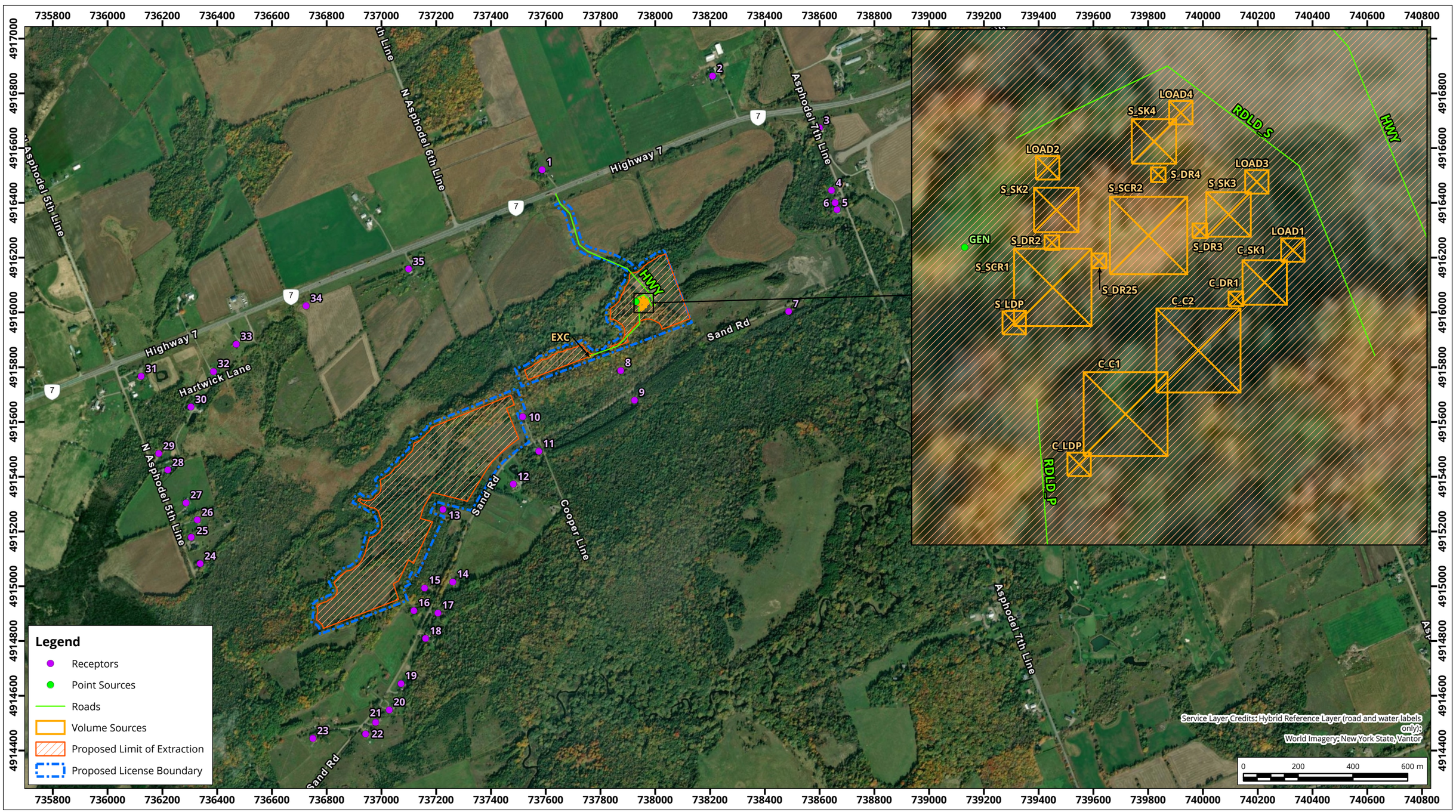
Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 1 |
| Approx. Scale: | | 1:13,000 | |
| Date Revised: | | May 27, 2026 | |

Map Document: C:\Working\Folder\Jobs.AMER\P2404149\P2404149.aprx




Map Document: C:\Working Folder\Jobs_AME\RJP\2404149\P2404149.aprx

## Source Locations: Pit Extraction Area 1

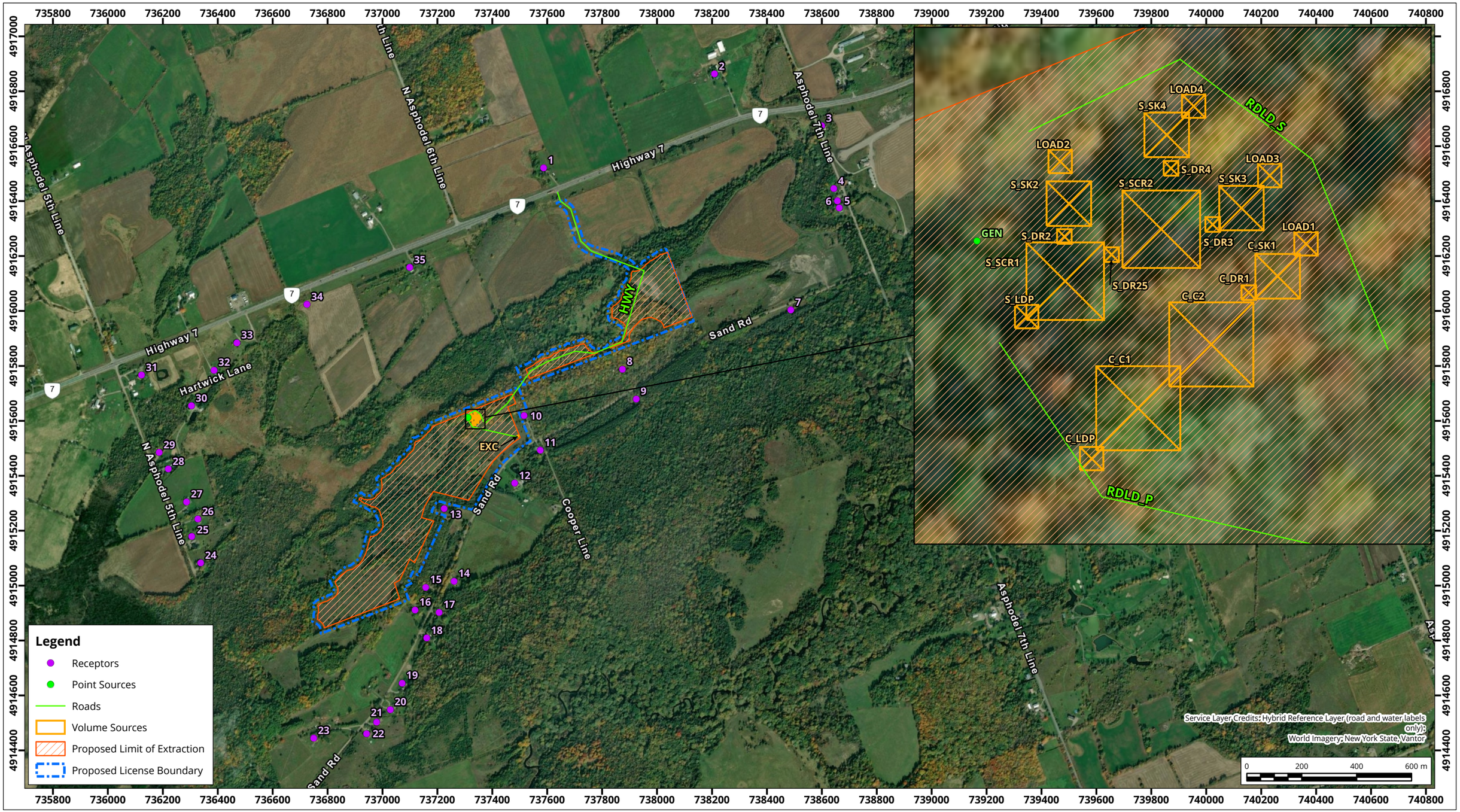
Map Projection: NAD 1983 UTM Zone 17N

Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 2 |
| Approx. Scale: | 1:13,000 | | |
| Date Revised: | May 27, 2026 | | |




Map Document: C:\Working\Folder\Jobs_AMER\P2404149\P2404149.aprx

## Source Locations: Pit Extraction Area 2

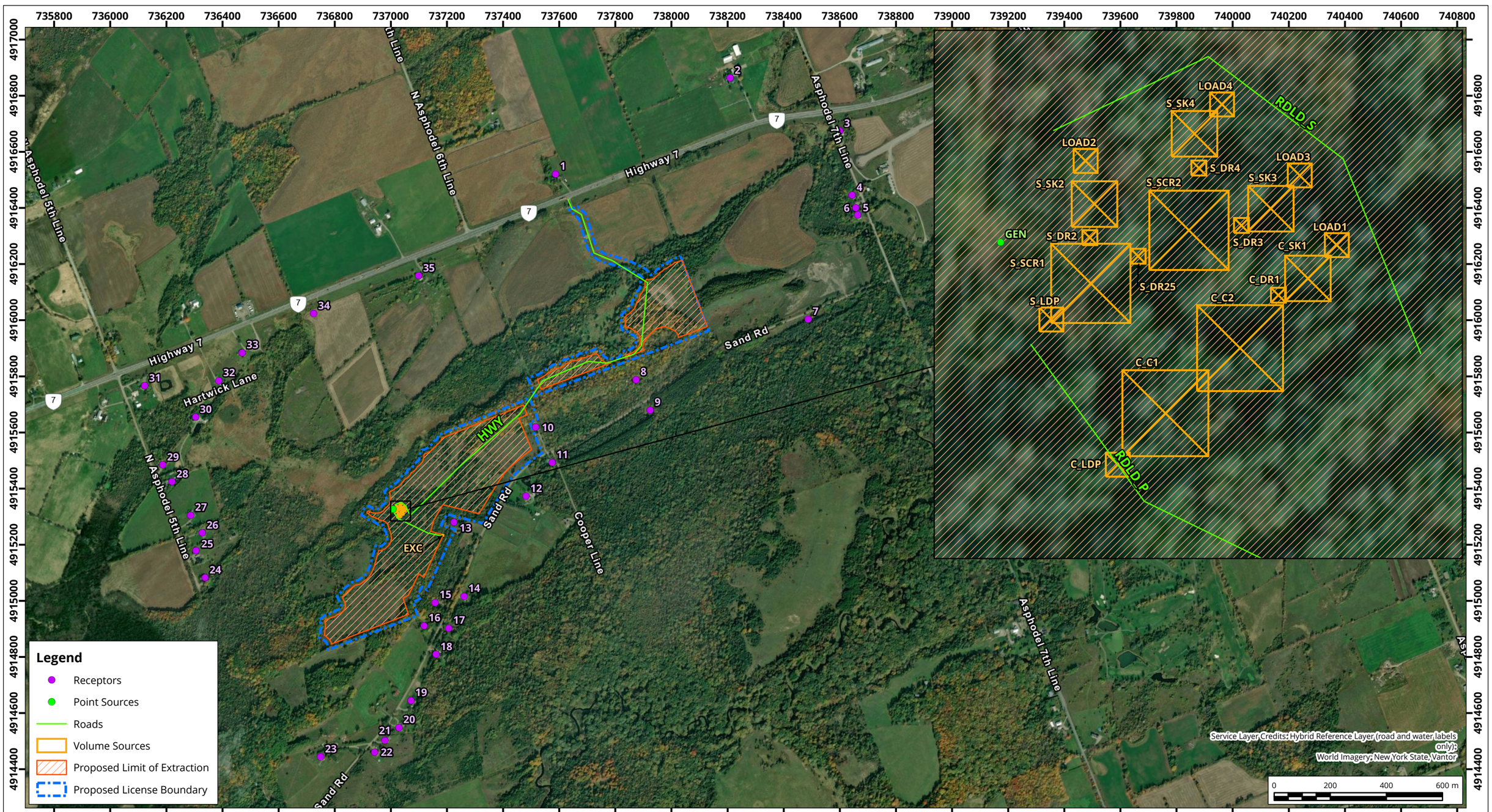
Map Projection: NAD 1983 UTM Zone 17N

Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 3 |
| Approx. Scale: | | 1:13,000 | |
| Date Revised: | | May 27, 2026 | |




Map Document: C:\Working\Folder\Jobs_AMER\P2404149\P2404149.aprx

## Source Locations: Pit Extraction Area 3

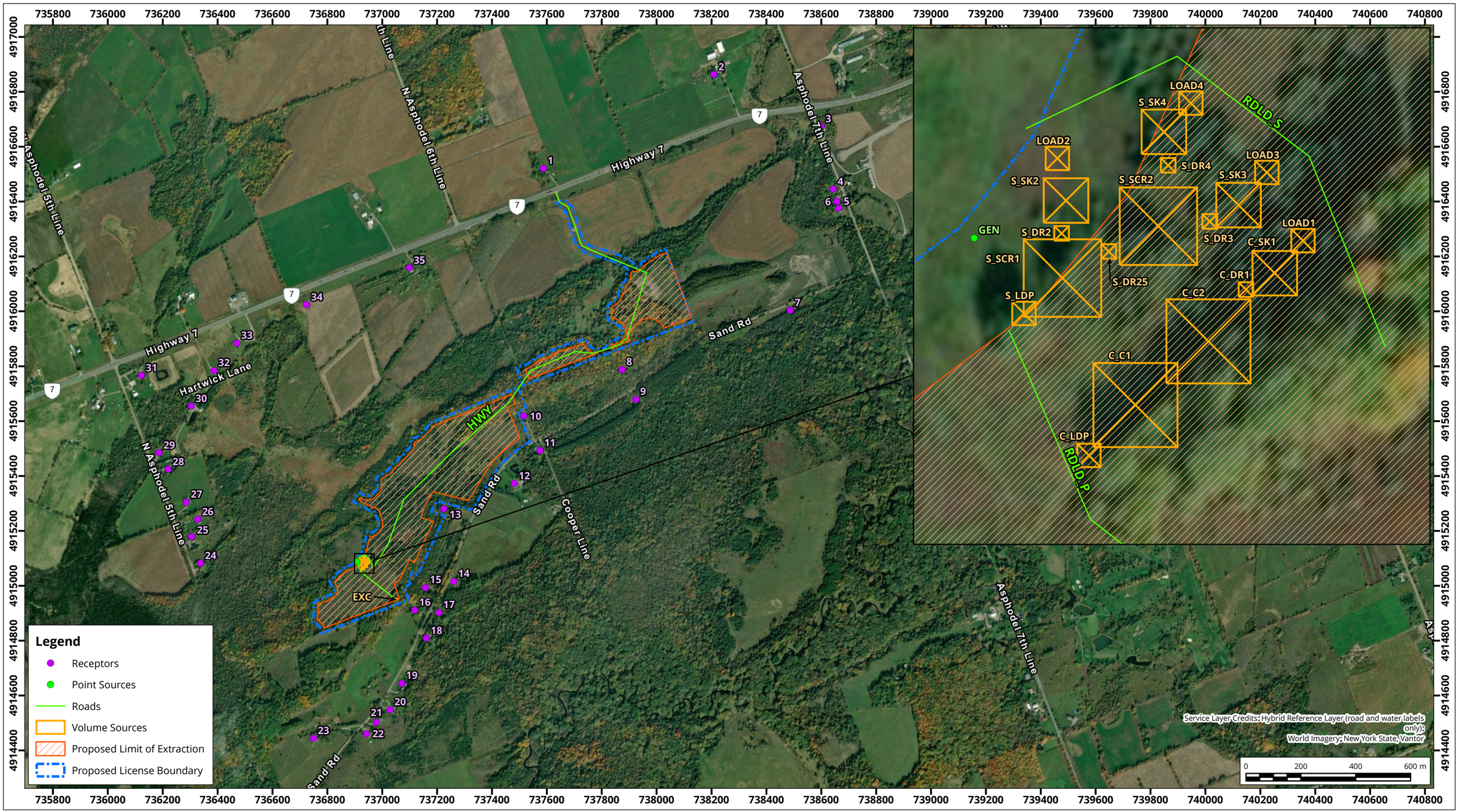
Map Projection: NAD 1983 UTM Zone 17N

Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 4 |
| Approx. Scale: | | 1:13,000 | |
| Date Revised: | | May 27, 2026 | |




Map Document: C:\Work\ing\Folder\Jobs_AMEND\P2404149\P2404149.aprx

## Source Locations: Pit Extraction Area 4

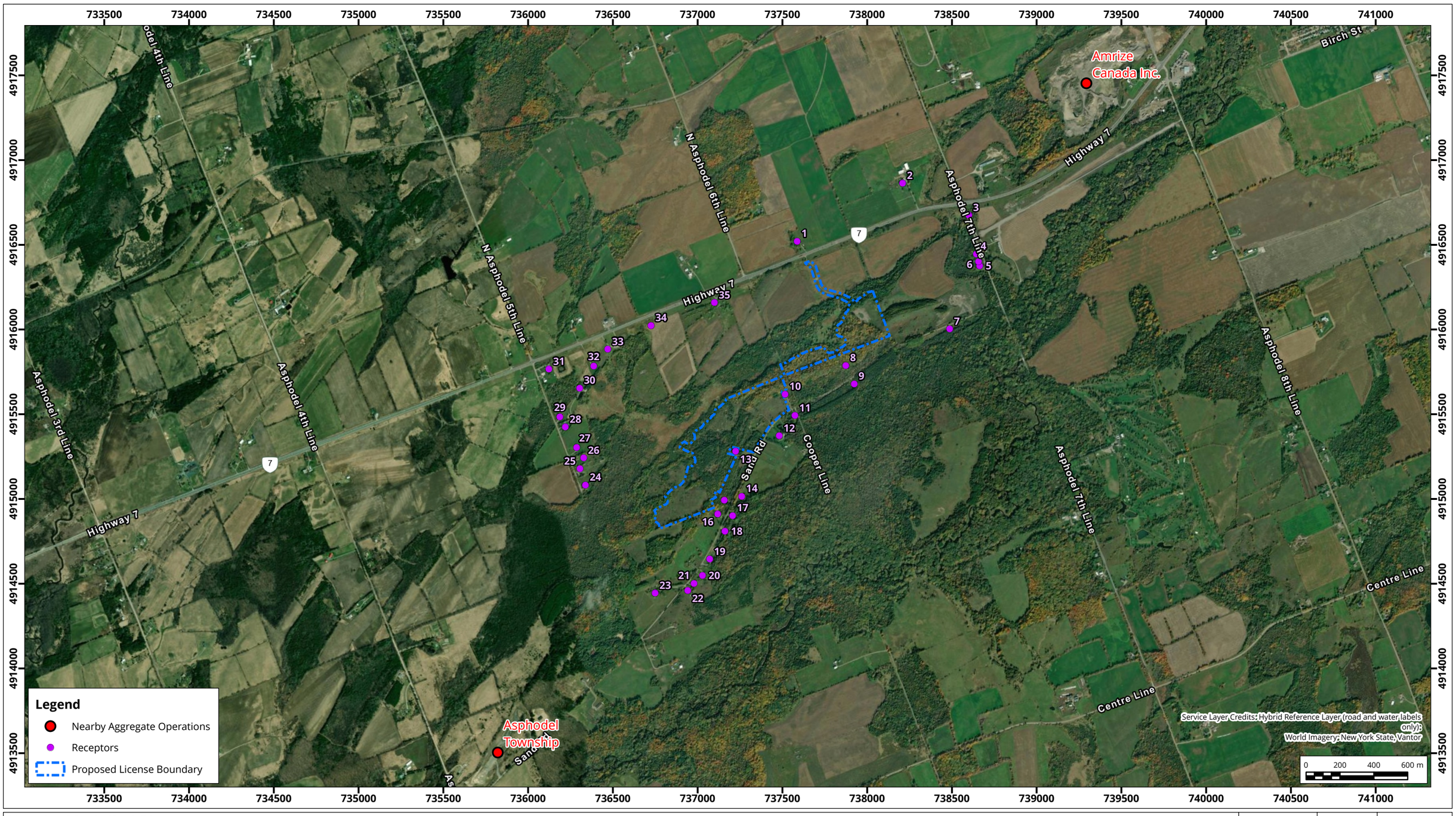
Map Projection: NAD 1983 UTM Zone 17N

Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 5 |
| Approx. Scale: | | 1:13,000 | |
| Date Revised: | | May 27, 2026 | |




## Nearby Modelled Pits

Map Projection: NAD 1983 UTM Zone 17N

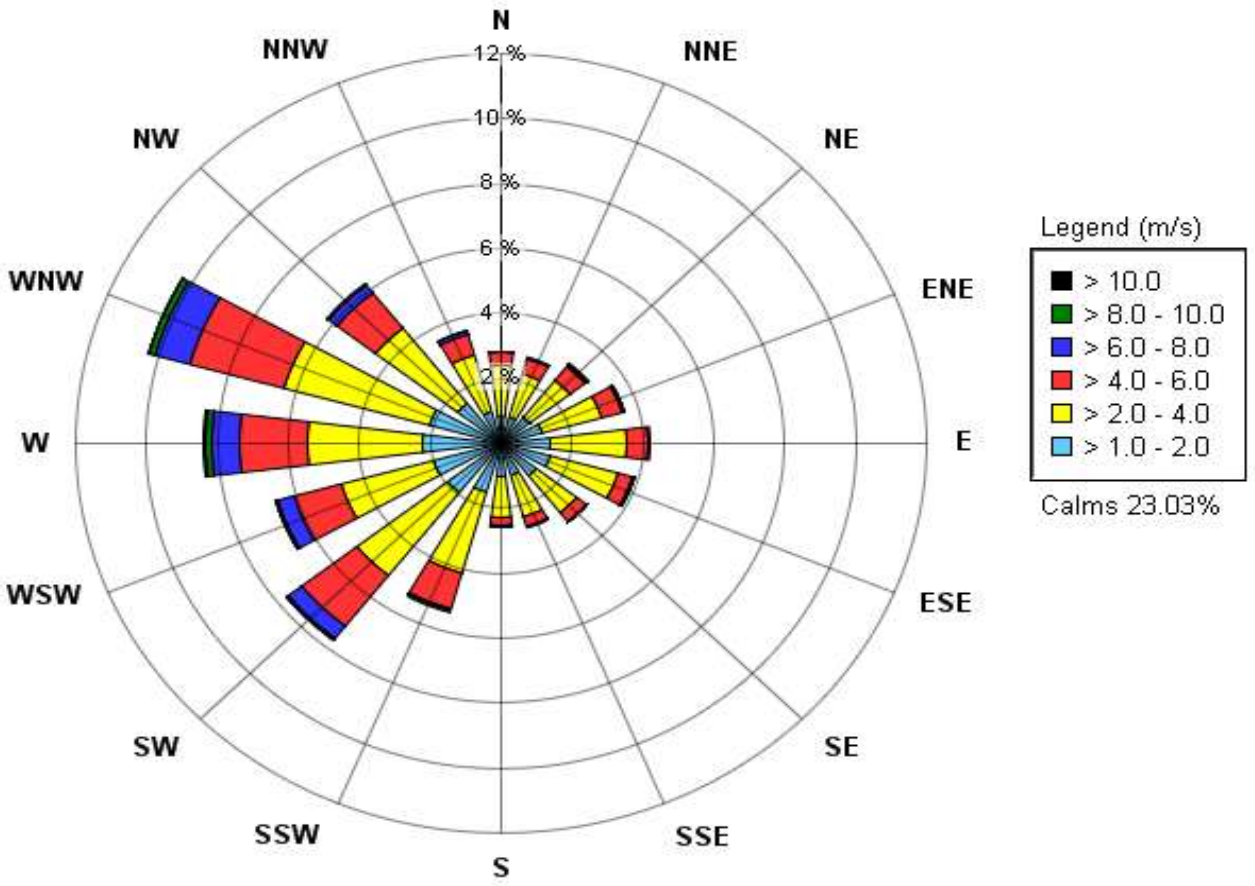
Sand Road Pit – Township of Asphodel-Norwood, Ontario

True North

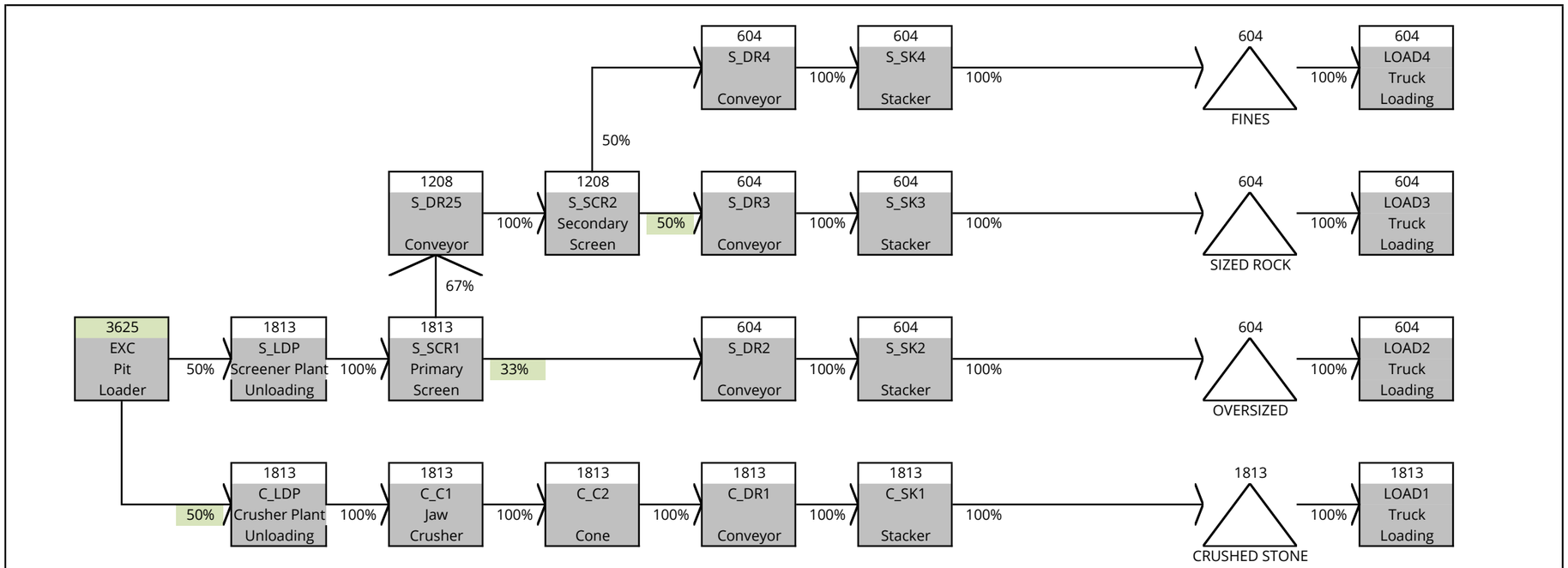
Project #: 2404149

| | | | |
|---|---|---|---|
| Drawn by: | PIP | Figure: | 6 |
| Approx. Scale: | | 1:21,000 | |
| Date Revised: | | May 27, 2026 | |

Map Document: C:\Working\Folder\Jobs,AMER\P2404149\P2404149.aprx




| | | | |
|---|---|---|---|
| **Windrose** | Drawn by: JBH | Figure: **7** | |
| | | | |
| Drain Bros Proposed Highway 7 Pit 2404149 | Date Revised: Jul 21, 2025 | | |




**Process Flow Diagram**

**Portable Crushing Plant**

Drain Bros Proposed Highway 7 Pit 2404149

Drawn by: JBH | Figure: **8**

Approx. Scale: not to scale

Date Revised: Jun 24, 2025

# APPENDIX A

# Appendix A: Processing Emissions Spreadsheet

Drain Bros Proposed Highway 7 Pit

Project #2404149

| Source ID | Source Description / Process Decription | AP-42 Process Description | AP-42 Chapter | Processing Rate | | | Base AP-42 Emission Factor | | | | Base Emission Rate | | | | Additional Control Efficiency Applied (%) | Final Controlled Emission Rate | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Hourly | Daily | Annual | TSP [1] | $PM_{10}$ | $PM_{2.5}$ | Silica | TSP | $PM_{10}$ | $PM_{2.5}$ | Silica | | TSP | Data Quality Rating | $PM_{10}$ | Data Quality Rating | $PM_{2.5}$ | Data Quality Rating | Silica | Data Quality Rating |
| | | | | (Mg/h) | (Mg/d) | (Mg/a) | (kg/Mg) | (kg/Mg) | (kg/Mg) | (kg/Mg) | (g/s) | (g/s) | (g/s) | (g/s) | | (g/s) | | (g/s) | | (g/s) | | (g/s) | |
| EXC | Loading at pit | Truck unloading - fragmented stone | 11.19.2-1 | 279 | 3625 | 350000 | 1.7E-05 | 8.00E-06 | 1.2E-06 | 1.8E-06 | 1.3E-03 | 6.2E-04 | 9.3E-05 | 1.4E-04 | | 1.3E-03 | E | 6.2E-04 | E | 9.3E-05 | E | 1.4E-04 | E |
| C_LDP | Unloading at Crusher Plant | Secondary crushing (controlled) | 11.19.2-1 | 139 | 1813 | 175000 | 4.8E-04 | 2.70E-04 | 5.0E-05 | 5.9E-05 | 1.9E-02 | 1.0E-02 | 1.9E-03 | 2.3E-03 | | 1.9E-02 | E | 1.0E-02 | E | 1.9E-03 | E | 2.3E-03 | E |
| C_C1 | Jaw Crusher | Primary crushing (controlled) | 11.19.2-1 | 139 | 1813 | 175000 | 4.8E-04 | 2.70E-04 | 5.0E-05 | 5.9E-05 | 1.9E-02 | 1.0E-02 | 1.9E-03 | 2.3E-03 | | 1.9E-02 | E | 1.0E-02 | E | 1.9E-03 | E | 2.3E-03 | E |
| C_C2 | Cone Crusher | Secondary crushing (controlled) | 11.19.2-1 | 139 | 1813 | 175000 | 4.8E-04 | 2.70E-04 | 5.0E-05 | 5.9E-05 | 1.9E-02 | 1.0E-02 | 1.9E-03 | 2.3E-03 | | 1.9E-02 | E | 1.0E-02 | E | 1.9E-03 | E | 2.3E-03 | E |
| C_DR1 | Conveyor Drop Point (Crushed Stone) | Conveyor transfer point (controlled) | 11.19.2-1 | 139 | 1813 | 175000 | 5.4E-05 | 2.30E-05 | 6.5E-06 | 5.0E-06 | 2.1E-03 | 8.9E-04 | 2.5E-04 | 2.0E-04 | | 2.1E-03 | E | 8.9E-04 | D | 2.5E-04 | E | 2.0E-04 | D |
| S_LDP | Unloading at Screener Plant | Truck unloading - fragmented stone | 11.19.2-1 | 139 | 1813 | 175000 | 1.7E-05 | 8.00E-06 | 1.2E-06 | 1.8E-06 | 6.6E-04 | 3.1E-04 | 4.6E-05 | 6.8E-05 | | 6.6E-04 | E | 3.1E-04 | E | 4.6E-05 | E | 6.8E-05 | E |
| S_SCR1 | Primary Screen | Screening (controlled) | 11.19.2-1 | 139 | 1813 | 175000 | 8.4E-04 | 3.70E-04 | 2.5E-05 | 8.1E-05 | 3.3E-02 | 1.4E-02 | 9.7E-04 | 3.1E-03 | | 3.3E-02 | E | 1.4E-02 | C | 9.7E-04 | E | 3.1E-03 | C |
| S_DR2 | Conveyor Drop Point (Oversized) | Conveyor transfer point (controlled) | 11.19.2-1 | 46 | 604 | 58333 | 5.4E-05 | 2.30E-05 | 6.5E-06 | 5.0E-06 | 7.0E-04 | 3.0E-04 | 8.4E-05 | 6.5E-05 | | 7.0E-04 | E | 3.0E-04 | D | 8.4E-05 | E | 6.5E-05 | D |
| S_DR25 | Conveyor Drop Point | Conveyor transfer point (controlled) | 11.19.2-1 | 93 | 1208 | 116667 | 5.4E-05 | 2.30E-05 | 6.5E-06 | 5.0E-06 | 1.4E-03 | 5.9E-04 | 1.7E-04 | 1.3E-04 | | 1.4E-03 | E | 5.9E-04 | D | 1.7E-04 | E | 1.3E-04 | D |
| S_SCR2 | Secondary Screen | Fines screening (controlled) | 11.19.2-1 | 93 | 1208 | 116667 | 1.5E-03 | 1.10E-03 | 1.7E-04 | 2.4E-04 | 3.9E-02 | 2.8E-02 | 4.3E-03 | 6.2E-03 | | 3.9E-02 | E | 2.8E-02 | E | 4.3E-03 | E | 6.2E-03 | E |
| S_DR3 | Conveyor Drop Point (Sized Rock) | Conveyor transfer point (controlled) | 11.19.2-1 | 46 | 604 | 58333 | 5.4E-05 | 2.30E-05 | 6.5E-06 | 5.0E-06 | 7.0E-04 | 3.0E-04 | 8.4E-05 | 6.5E-05 | | 7.0E-04 | E | 3.0E-04 | D | 8.4E-05 | E | 6.5E-05 | D |
| S_DR4 | Conveyor Drop Point (Fines) | Conveyor transfer point (controlled) | 11.19.2-1 | 46 | 604 | 58333 | 5.4E-05 | 2.30E-05 | 6.5E-06 | 5.0E-06 | 7.0E-04 | 3.0E-04 | 8.4E-05 | 6.5E-05 | | 7.0E-04 | E | 3.0E-04 | D | 8.4E-05 | E | 6.5E-05 | D |

Notes:

[1] AP-42 Chapter 11.19-2 provides factors for PM2.5, PM10 and PM100. The emission factors for PM44 are obtained from a logarithmic interpolation
Using the factor for "screening (controlled)" as an example, the factors are 0.0011, 0.00037, and 0.000025 kg/MG for PM100, PM10 and PM2.5, respectively.
Interpolating using the natural logarithm of the particle diameters gives 0.00084 kg/Mg

Sample calculation for TSP emissions from Source EXC:

$$\frac{279\ Mg_{processed}}{1\ h} \times \frac{1.7E\text{-}05\ kg_{TSP}}{1\ Mg_{processed}} \times \frac{1\ h}{3600\ s} \times \frac{1000}{1} \times \frac{100\%\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 1.3E\text{-}03\ g_{TSP}/s$$

**Comments**

A silica content of: 22% was used in the assessment, based on SGS Canada Inc. silica analysis - December 17, 2024
AP-42 Emission Factor for TSP is based on PM100. The values have been corrected to reflect PM44.
The percentages are as follows: crushing 50%, oversized screening 16.7%, sized rock screening 16.7%, fines screening 16.7%

# APPENDIX B

# Appendix B: Bulk Material Handling Emissions Spreadsheet

Project #2404149

Drain Bros Proposed Highway 7 Pit

**Material handling emissions:** $E = 0.0016\ k\ (U / 2.2)^{1.3} / (M / 2)^{1.4}$

**E** emission factor
**k** particle size multiplier (0.8, 0.74, 0.35 and 0.053 for TSP, $PM_{30}$, $PM_{10}$ and $PM_{2.5}$, respectively) [3]
**U** mean wind speed, meters per second (m/s)
**M** material moisture content (%)

**AGGREGATE HANDLING AND STORAGE PILES - AP-42 Section 13.2.4**

**Average recorded hourly wind speed (m/s):** 2.62
**(used for sample calculations & factor validation)**

| Source ID [1] | Description | Processing Rate | | | Site Data | | | | Base AP-42 Emission Factor | | | | Base Emission Rate | | | | Additional Control Efficiency Applied | Final Controlled Emission Rate at 2.62 m/s | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hourly | Daily | Annual | Site Specific Data? | Silt Content | Moisture Content | Source Conditions Valid [2] | TSP | $PM_{10}$ | $PM_{2.5}$ | Silica | TSP | $PM_{10}$ | $PM_{2.5}$ | Silica | | TSP | Data Quality Rating | $PM_{10}$ | Data Quality Rating | $PM_{2.5}$ | Data Quality Rating | Silica | Data Quality Rating |
| | | (Mg/h) | (Mg/d) | (Mg/y) | (y/n) | (%) | (%) | | (kg/Mg) | (kg/Mg) | (kg/Mg) | (kg/Mg) | (g/s) | (g/s) | (g/s) | (g/s) | (%) | (g/s) | | (g/s) | | (g/s) | | (g/s) | |
| C_SK1 | Stacker (Crushed Stone) | 139 | 1813 | 175000 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 9.3E-02 | 4.1E-02 | 6.2E-03 | 8.9E-03 | | 9.3E-02 | A | 4.1E-02 | A | 6.2E-03 | A | 8.9E-03 | A |
| S_SK2 | Stacker (Oversized) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |
| S_SK3 | Stacker (Sized Rock) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |
| S_SK4 | Stacker (Fines) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |
| LOAD1 | Truck Loading (Crushed Stone) | 139 | 1813 | 175000 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 9.3E-02 | 4.1E-02 | 6.2E-03 | 8.9E-03 | | 9.3E-02 | A | 4.1E-02 | A | 6.2E-03 | A | 8.9E-03 | A |
| LOAD2 | Truck Loading (Oversized) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |
| LOAD3 | Truck Loading (Sized Rock) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |
| LOAD4 | Truck Loading (Fines) | 46 | 604 | 58333 | y | 4.0% | 1.5% | valid | 2.4E-03 | 1.1E-03 | 1.6E-04 | 2.3E-04 | 3.1E-02 | 1.4E-02 | 2.1E-03 | 3.0E-03 | | 3.1E-02 | A | 1.4E-02 | A | 2.1E-03 | A | 3.0E-03 | A |

**[1]** ID corresponds to process flow diagram for facility and / or material
**[2]** Relates to AP-42 Section 13.2.4-4
**[3]** k-factor for TSP (PM44) scaled up logarithmically to 0.8 from published k-factor of 0.74 which refers to PM30.

Sample calculation for uncontrolled TSP emission factor for Source C_SK1: Stacker (Crushed Stone), at a sample wind speed of 2.62 m/s

EF = 0.0016 x (0.8) x ((2.62 m/s) / 2.2)^1.3 / ((1.5%) / 2) 2.4E-03 kg TSP / Mg handled

Sample calculation for TSP emission rate for Source C_SK1: Stacker (Crushed Stone), at a sample wind speed of 2.62 m/s

$$\frac{139\ Mg_{handled}}{1\ h} \times \frac{2.4E\text{-}03\ kg_{TSP}}{1\ Mg_{handled}} \times \frac{1\ h}{3600\ s} \times \frac{1000\ g_{TSP}}{1\ kg_{TSP}} \times \frac{1\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 9.3E\text{-}02\ g_{TSP} / s$$

**Comments**

Maximum shipping rate from production is:
- 3,625 tonnes of total processed aggregate per day
A silica content of: 22% was used in the assessment, based on SGS Canada Inc. silica analysis - December 17, 2024
Silt and moisute content of the particulate matter is conservatively based on similar site (Uhthoff Quarry)
Shipping occurs between 6 am and 7pm per day.
For simplicity, total production was split evenly between the crushing and screening processing plants.

# APPENDIX C

# Appendix C: On-Site Mobile Equipment Emissions Spreadsheet - Fugitive Dust

Project #2404149

Drain Bros Proposed Highway 7 Pit

**UNPAVED ROAD SECTIONS - AP-42 Section 13.2.2**

**PAVED ROAD SECTIONS - AP-42 Section 13.2.1**

**Paved Roads:** $E = k\ (sL)^{0.91}\ (W)^{1.02}$

**Unpaved Roads - Industrial:** $E = 281.9\ k\ (s / 12)^{a}\ (W / 3)^{b}$

**Unpaved Roads - Public:** $E = 281.9\ k\ (s / 12)^{a}\ (S / 30)^{d} / (M / 0.5)^{c} - C$

**E** particulate emission factor (g/VKT)
**k** particle size multiplier (see below)
**sL** road surface silt loading (g/m$^2$)
**W** average weight of the vehicles traveling the road (US short tons)
**s** surface material silt content (%)
**C** emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear
**M** surface material moisture content (%)
**S** mean vehicle speed (mph)
**a,b,c,d** constants (see below)

| Route ID [1] | Route Description | Traffic Passes [2] Hourly (#/h) | Daily (#/d) | Annual (#/a) | Segment Length [2] (m) | Road Surface [3] | Roadway Type [4] | Mean Vehicle Speed (km/h) | (mph) | Average Vehicle Weight [5] (tons) | Surface Material Moisture Content [6] (%) | Surface Silt Content [7] (%) | Road Surface Silt Loading [8] (g/m$^2$) | Base AP-42 Emission Factor TSP (g/VKT) | $PM_{10}$ (g/VKT) | $PM_{2.5}$ (g/VKT) | Silica (g/VKT) | Base Emission Rate TSP (g/s) | $PM_{10}$ (g/s) | $PM_{2.5}$ (g/s) | Silica (g/s) | Additional Control Efficiency Applied (%) | Final Controlled Emission Rate TSP (g/s) | Data Quality Rating | $PM_{10}$ (g/s) | Data Quality Rating | $PM_{2.5}$ (g/s) | Data Quality Rating | Silica (g/s) | Data Quality Rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HWY | Shipping off site | 19 | 250 | 24000 | 2040 | Unpaved | Industrial | 20 | 12 | 34.2 | | 4.8% | | 3.6E+03 | 5.5E+02 | 5.5E+01 | 1.2E+02 | 3.9E+01 | 6.0E+00 | 6.0E-01 | 1.3E+00 | 95% | 1.9E+00 | C | 3.0E-01 | B | 3.0E-02 | B | 6.6E-02 | B |
| RDLD_P | Loader traffic to plants | 28 | 363 | 35000 | 179 | Unpaved | Industrial | 20 | 12 | 38.6 | | 4.8% | | 3.8E+03 | 5.9E+02 | 5.9E+01 | 1.3E+02 | 5.2E+00 | 8.1E-01 | 8.1E-02 | 1.8E-01 | 95% | 2.6E-01 | C | 4.0E-02 | B | 4.0E-03 | B | 8.9E-03 | B |
| RDLD_S | Loader traffic at stockpiles | 28 | 363 | 35000 | 74 | Unpaved | Industrial | 20 | 12 | 38.6 | | 4.8% | | 3.8E+03 | 5.9E+02 | 5.9E+01 | 1.3E+02 | 2.1E+00 | 3.3E-01 | 3.3E-02 | 7.3E-02 | 95% | 1.1E-01 | C | 1.7E-02 | B | 1.7E-03 | B | 3.7E-03 | B |

**Constants for Mobile Emission Equations**

| Roadway Type | Contaminant | k | a | b | c | d | Quality |
|---|---|---|---|---|---|---|---|
| **Paved Roads:** | **$PM_{2.5}$** | 0.15 | - | - | - | - | - |
| | **$PM_{10}$** | 0.62 | - | - | - | - | - |
| | **$PM_{30}$** | 3.23 | - | - | - | - | - |
| | **TSP** | 4.79 | - | - | - | - | - |
| **Unpaved Roads - Industrial:** | **$PM_{2.5}$** | 0.15 | 0.9 | 0.45 | - | - | C |
| | **$PM_{10}$** | 1.5 | 0.9 | 0.45 | - | - | B |
| | **$PM_{30}$** | 4.9 | 0.7 | 0.45 | - | - | B |
| | **TSP** | 7.32 | 0.6 | 0.45 | - | - | C |
| **Unpaved Roads - Public:** | **$PM_{2.5}$** | 0.18 | 1 | - | 0.2 | 0.5 | C |
| | **$PM_{10}$** | 1.8 | 1 | - | 0.2 | 0.5 | B |
| | **$PM_{30}$** | 6 | 1 | - | 0.3 | 0.3 | B |
| | **TSP** | 8.96 | 1 | - | 0.49 | 0.2 | C |

**[1]** Route ID numbers provided on site plan.
**[2]** Length of a specific road segment. A separate segment should be used whenever one or more parameters change.
**[3]** Paved surfaces include asphalt, concrete, and recycled asphalt (if it forms a relatively consistent surface).
**[4]** Publicly accessible and dominated by light vehicles, or industrial, and dominated by heavy vehicles.
**[5]** The average vehicle weight reflects the average of the empty and loaded vehicle weight, for travel in both directions.
**[6]** Required only for publicly accessible unpaved roads.
**[7]** Required only for unpaved roads (public and industrial).
**[8]** Required only for industrial paved roads.

Sample calculation for uncontrolled TSP emission factor for Source HWY: Shipping off site

EF = 281.9 x (4.9) x [(4.8% / 12)]^(0.7) x [(34.175 tons) / 3]^(0.45) = 3559 g TSP / vehicle kilometer travelled (vkt)

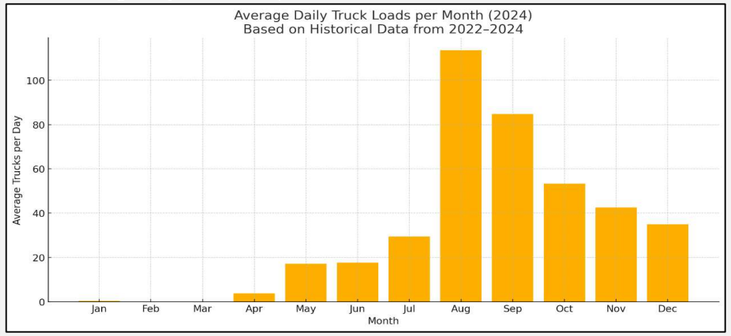
Sample calculation for TSP emission rate for Source HWY: Shipping off site

$$\frac{19\ \text{vehicles}}{1\ \text{h}} \times \frac{2040\ \text{m}}{} \times \frac{1\ \text{km}}{1000\ \text{m}} \times \frac{3559\ g_{TSP}}{1\ \text{vehicle km}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{0.05\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 1.9E{+}00\ g_{TSP} / \text{s}$$

**Comments**

A silica content of: 22% was used in the assessment, based on SGS Canada Inc. silica analysis - December 17, 2024
Constants for TSP (PM44) extrapolated from published factors for PM30, PM10 and PM2.5. Data quality downgraded by one step.
Hourly shipping traffic is based on a daily peak of 125.
Loaders are 980 Wheel Loaders (313 kW, 20 tonne bucket capacity, 30 tonne vehicle operating weight).
Shipping trucks distribution is assumed to be:
- 50% 3-axle truck and trailer (41 tonne payload, 21 tonne tare weight)
- 25% 3-axle single unit aggregate vehicle or similar (15 tonne payload, 10 tonne tare weight)
- 25% 4-axle single unit aggregate vehicle or similar (23 tonne payload, 12 tonne tare weight)

Extraction, processing, and shipping (6 am - 7 pm: Mon - Sat).
Control applied to unpaved roads based on watering, in accordance with the recommended dust controls.
Provided Average Daily Truck Loads per Month:




The historical trends were used to model monthly variation for convervative daily truck loads and daily tonnage, as shown:

| Month | Modelled Daily Trucks | Modelled Daily Tonnage |
|---|---|---|
| **January** | 1 | 36 |
| **February** | 1 | 36 |
| **March** | 1 | 36 |
| **April** | 5 | 145 |
| **May** | 20 | 580 |
| **June** | 125 | 3625 |
| **July** | 125 | 3625 |
| **August** | 125 | 3625 |
| **September** | 125 | 3625 |
| **October** | 125 | 3625 |
| **November** | 48 | 1375 |
| **December** | 39 | 1125 |

# APPENDIX D

# Appendix D: Summary of Combustion Exhaust Emissions (Mobile and Stationary Sources)

Project #2404149

Drain Bros Proposed Highway 7 Pit

| Source ID | Description | Gross Power Rating (kW) | Number Of Units | Traffic Passes [2] Hourly (#/h) | Traffic Passes [2] Daily (#/d) | Segment Length [3] (m) | Mean Vehicle Speed (km/h) | Load Factor [4] (%) | Tailpipe Emission Factor [5] TSP (g/vkt) | TSP (g/kW-h) | PM10 (g/vkt) | PM10 (g/kW-h) | PM2.5 (g/vkt) | PM2.5 (g/kW-h) | NOx (g/vkt) | NOx (g/kW-h) | Tailpipe Emission Rate TSP (g/s) | PM10 (g/s) | PM2.5 (g/s) | NOx (g/s) | Tailpipe + Fugitive Emission Rate [6] TSP (g/s) | PM10 (g/s) | PM2.5 (g/s) | Silica (g/s) | NOx (g/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **On-Site Mobile Equipment** | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWY | Shipping off site | n/a | 1 | 19 | 250 | 2040 | 20 | | 1.53 | | 1.53 | | 0.44 | | 13.8 | | 1.7E-02 | 1.7E-02 | 4.8E-03 | 1.5E-01 | 2.0E+00 | 3.2E-01 | 3.5E-02 | 6.6E-02 | 1.5E-01 |
| RDLD_P | Loader traffic to plants | 313 | 1 | 28 | 363 | 179 | 20 | 48% | | 0.02 | | 0.02 | | 0.02 | | 0.4 | 8.3E-04 | 8.3E-04 | 8.3E-04 | 1.7E-02 | 2.6E-01 | 4.1E-02 | 4.9E-03 | 8.9E-03 | 1.7E-02 |
| RDLD_S | Loader traffic at stockpiles | 313 | 1 | 28 | 363 | 74 | 20 | 48% | | 0.02 | | 0.02 | | 0.02 | | 0.4 | 8.3E-04 | 8.3E-04 | 8.3E-04 | 1.7E-02 | 1.1E-01 | 1.8E-02 | 2.5E-03 | 3.7E-03 | 1.7E-02 |
| **Stationary Combustion Equipment** | | | | | | | | | | | | | | | | | | | | | | | | | |
| GEN | Genset at Crusher Plant | 800 | 1 | | | | | 100% | | 0.54 | | 0.54 | | 0.54 | | 9.2 | 1.2E-01 | 1.2E-01 | 1.2E-01 | 2.0E+00 | 1.2E-01 | 1.2E-01 | 1.2E-01 | 0.0E+00 | 2.0E+00 |

**[1]** ID should reflect Source ID or Route ID, as approprite.
**[2]** Where applicable, this value reflects travel in both directions (e.g., 1 round-trip = 2 passes)
**[3]** Length of a specific road segment. A separate segment should be used whenever one or more parameters change.
**[4]** Load Factors from "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", EPA-420-R-10-016, NR-005d, July 2010
**[5]** Emissions are input on either a vehicle distance or power rating basis. Load factor applies only to emissions based on power ratings.
**[6]** Applicable only for TSP, PM10 and PM2.5 emissions from mobile equipment. Emissions rates for NOx and stationary sources do not change.

| Comments |
|---|
| Extraction, processing, and shipping (6 am - 7 pm: Mon - Sat). |
| Hourly shipping traffic is based on a daily peak of 125. |
| Loaders are 980 Wheel Loaders (313 kW, 20 tonne bucket capacity, 30 tonne vehicle operating weight). |

Sample Calculations

Pit Loader Exhaust TSP Emissions:

$$\frac{313\ \text{kW}}{1\ \text{kW h}} \times \frac{0.02\ \text{g}}{\ } \times \frac{48\%\ \text{Load}}{\ } \times \frac{1\ \text{h}}{3600\ \text{s}} = 1.0\text{E-}03\ g_{TSP}\ /\ \text{s}$$

Highway Truck Exhaust TSP Emissions:

$$\frac{19.23\ \text{Vehicles}}{1\ \text{h}} \times \frac{2040\ \text{m}}{\ } \times \frac{1.53\ \text{g}}{1\ \text{Veh. Km}} \times \frac{1\ \text{km}}{1000\ \text{m}} \times \frac{1\ \text{h}}{3600\ \text{s}} = 1.7\text{E-}02\ g_{TSP}\ /\ \text{s}$$

# APPENDIX E

# Appendix E: Summary of Scaled Emissions From Nearby Pits/Quarries

Project #2404149

Drain Bros Proposed Highway 7 Pit

| Source Information | | | | | | | Expected Contaminants | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pit/Quarry Description | | | | Approximate Location (UTM 17T) | | Distance to Pit/Quarry (km) | TSP (g/s) | $PM_{10}$ (g/s) | $PM_{2.5}$ (g/s) | Silica (g/s) | $NO_X$ (g/s) |
| Pit/Quarry Name | Pit/Quarry Size (ha) | General Direction to Drain Bros | Max Annual Tonnage t/y | X | Y | | | | | | |
| Drain Bros - Proposed Highway 7 Pit | 37.3 | NA | 350,000 | 737959 | 4915999 | NA | 2.95E+00 | 7.38E-01 | 1.99E-01 | 1.31E-01 | 2.23E+00 |
| Amrize Canada Inc. | 34.5 | East | 273,000 | 739180 | 4917150 | 1.7 | 2.30E+00 | 5.75E-01 | 1.55E-01 | 1.02E-01 | 1.74E+00 |
| Asphodel Township | 11.35 | West | 20,000 | 735821 | 4913504 | 3.3 | 1.69E-01 | 4.22E-02 | 1.14E-02 | 7.50E-03 | 1.27E-01 |

| Comments |
|---|
| Data on nearby quarries identified using the Ministry of Natural Resources and Forestry (MNRF) Pits and Quarries Online tool |
| The total calculated contaminants for the Drain Bros Proposed Highway 7 Pit were scaled by max annual tonnage for each pit/quarry |
| For modelling purposes, the other quarries were modelled as volume sources centered visually on the pit/quarry |

Sample Calculations

Asphodel Township $g_{TSP}$ / s

$$\frac{2.95E+00 \text{ g/s}}{\frac{20000.00 \text{ t/y}}{350{,}000 \text{ t/y}}} = 1.7E-01 \ g_{TSP} / s$$

# APPENDIX F

REPORT

# DRAIN BROS. PROPOSED HIGHWAY 7 PIT

NORWOOD, ONTARIO

BEST MANAGEMENT PRACTICES PLAN FOR DUST
RWDI #2404149
June 16, 2026

## SUBMITTED TO

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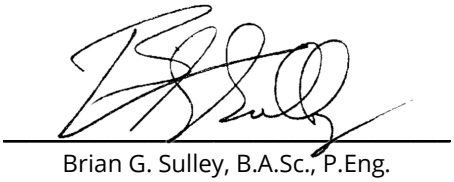
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# VERSION HISTORY

| Index | Date | Pages | Author |
|---|---|---|---|
| **1** | June 16, 2026 | All | Brian G. Sulley |

# REPORT SIGNATURES



Brian G. Sulley, B.A.Sc., P.Eng.
Technical Director, Principal

# 1 INTRODUCTION

## 1.1 Overview

This Best Management Practice Plan ("BMPP") for dust was prepared for Drain Bros. Proposed Highway 7 Pit for implementation at their site in the Township of Asphodel-Norwood, in Peterborough County. This plan includes dust control measures that meet and/or exceed the current industry standards. Implementation of these measures will ensure that dust is effectively controlled and impacts to neighbouring residents are minimized.

## 1.2 Components of A Best Management Practices Plan

A BMPP is a detailed document that outlines the fugitive dust sources at a given site and describes the measures that shall be used to control emissions from these sources. The BMPP is used to manage fugitive dust emissions from sources such as on-site haul routes, material processing, material handling, and wind erosion. The Ontario Ministry of the Environment, Conservation and Parks ("MECP") recommends that the BMPP be based on a process of "Plan, Do, Check Act", as described in the Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources[1]. This BMPP is designed to meet the recommendations of the MECP in a form that provides clear and concise procedures for site personnel.

## 1.3 Size and Composition of Fugitive Dust at Aggregate Operations Facilities

Typically, the dust at a sand and gravel operation has the following characteristics:

- Primarily composed of calcium carbonate, oxides of iron, magnesium, and aluminum and/or silicon;
- Fraction of dust smaller than 10 micrometres (PM10), 19-55%[2];
- Fraction of dust smaller than 2.5 micrometres (PM2.5), 3-14%[2]; and,
- Crystalline silica content of onsite material, measured as 22%.

## 1.4 Overview of the Best Management Practices Plan

This document provides a separate section for fugitive dust sources at the pit, including a description of each source, complete with control measures applicable to each particular source.

[1] Standards Development Branch, Local Air Quality Section, Ontario Ministry of the Environment and Climate Change (MOECC)
[2] Based on data from the AP-42 Compilation of Air Pollutant Emission Factors, published by the United States Environmental Protection Agency.

# 2 SITE PREPARATION & REHABILITATION

## 2.1 Activities Included

- Overburden removal using excavators, loaders, and haul trucks.
- Berm construction using loaders, haul trucks and bulldozers.
- Rehabilitation using loaders, haul trucks and bulldozers.

## 2.2 Controls

- Avoid, if possible, overburden removal, berm construction and rehabilitation operations, if possible, during dry months, such as July, August, and September and during peak periods of extraction and processing of aggregates.
- Stripping, berm construction and rehabilitation shall be monitored hourly when all of the following criteria are met:
  - Dry weather is anticipated;
  - Excavation and loading activities are within 200 m of a residence; and
  - Winds are anticipated to be blowing towards the residence.
- If visible dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible dust is prevented from leaving the site.

# 3 AGGREGATE EXTRACTION

## 3.1 Activities Included

- Excavation of sand and gravel at the pit face; and,
- Transfer of virgin aggregate to haul trucks or directly to the screening/crushing processing plants by excavators.

## 3.2 Controls

- Extraction operations shall be visually monitored when the following criteria are met:
  - Extraction is occurring within 200 meters of a residence;
  - Winds are blowing from the operations towards those residences; and,
  - Dry weather is anticipated (operations can proceed at full production under rainy conditions);
- If visible dust is observed blowing towards residences adjacent to the site, water should be applied as quickly as possible. Activities may need to be reduced or stopped completely if the dust cannot be mitigated.

# 4 AGGREGATE PROCESSING

## 4.1 Activities Included

- Crushing and screening of virgin aggregate in the crushing/screening processing plants; and,
- Aggregate stockpile area and loading of trucks around the stockpiles.

## 4.2 Controls

- The processing plants shall be located at least 200 m away from the nearest residence.
- All processing equipment shall be equipped with dust suppressing or collection devices (such as a water spray system). If a water spray system is used, spray bars shall be located at crushers and screen decks.
- The dust suppressing or collection devices will be operated at a level sufficient to suppress visible dust.
- If water sprays are used for dust suppression, watering is not technically feasible due to possible icing of the equipment when the temperature is below 4°C. Under these conditions, operations may need to be reduced, or other mitigation measures implemented.
- For screenings and other high-fines materials, stackers will be kept as close to the tops of stockpiles as is feasible, to achieve a drop height of approximately 1m or less.
- The processing rate shall not exceed 3,625 tonnes/day during peak months.

# 5 UNPAVED HAUL ROUTES

## 5.1 Activities Included

- Unpaved haul routes for loader traffic from the pit working face to the processing plants.
- Unpaved haul routes for loader traffic from the stockpiles to the haul trucks.
- Unpaved haul routes for aggregate traffic from the processing plants to the site entrance.

## 5.2 Controls

- A watering system (spray truck or suitable alternative) and sufficient water supply shall be available to provide water to all significant unpaved traffic areas.
- The watering system shall be able to deliver the water evenly over the haul route surface and shall have the capacity to deploy water on all active haul routes at a rate of at least 1.5 L/m²/hour.
- The actual watering rate shall vary, depending on surface moisture conditions and traffic conditions, and shall be triggered by the Operational Watering Forecasting guidance provided in Section 9 of this BMP Plan.
- At the start of each day, prior to trucks accessing the haul routes, the travel surfaces will be inspected, and water will be applied if dry conditions are found.
- A speed limit of 20 km/h shall be posted near the site entrance. Haul truck and highway truck operators will be directed to observe the speed limit.
- Application of chemical dust suppressants may be used in conjunction with application of water. The rate of watering may be reduced below the trigger levels in the Operational Watering Forecasting guidance provided in Section 8 of this BMPP, subject to the condition that no visible dust shall migrate off-site.

# 6 WIND EROSION

## 6.1 Activities Included

- Wind erosion may occur at disturbed areas, or at stockpiles that have relatively high silt contents, such as screenings.
- Wind erosion of these piles will only occur when winds exceed a threshold wind speed level, which is typically on the order of 5-7 metres per second (18-25 km/h).

## 6.2 Controls

- Stockpiles of finer-grained material will be located on the eastern side of the processing plant area so as to be sheltered from prevailing winds by other piles.
- The Operational Watering Forecasting guidance provided in Section 7 of this BMPP may also be used to proactively apply water to the stockpiles.
- Where possible, existing forested areas should be maintained between the limit of extraction and the surrounding receptors.

# 7 OPERATIONAL WATERING FORECASTING

## 7.1 Activities Included

- The decision of when to conduct watering of haul routes and stockpiles requires the operator to use observations of meteorological conditions to ensure that dust is mitigated.

## 7.2 Conditions Under Which Watering is Required

- The site operator should monitor local weather conditions using local weather forecasts.
- The frequency of watering shall be determined approximately using the guidance provided in the table below:

| Temperature | Relative Humidity | Hours Between Watering @ 1.5 L/m² |
|---|---|---|
| **Below 4°C** | Any | Watering not recommended |
| **4°C - 10°C** | 75% or less | 3 |
| | 75-90% | 7 |
| | 90-100% | 15 |
| | Wet Weather (e.g., rain, drizzle) | Not required |
| **10°C – 20°C** | 75% or less | 1.5 |
| | 75-90% | 3 |
| | 90-100% | 7 |
| | Wet Weather (e.g., rain, drizzle) | Not required |
| **Above 20°C** | 75% or less | 1 |
| | 75-90% | 1.5 |
| | 90-100% | 3 |
| | Wet Weather (e.g., rain, drizzle) | Not required |

- Regardless of the criteria above, watering will be implemented immediately if dust is observed to be blowing toward the residences adjacent to the site.
- When the temperature is below 4°C, watering is not recommended for safety reasons. Under these conditions, operations may need to be reduced, or other mitigation measures implemented.

# 8 ADMINISTRATION

## 8.1 Implementation Schedule

- All control measures should be in a state of readiness before operations commence.

## 8.2 Implementation Plan

- Formal training on new and existing operating procedures shall be provided to relevant new and existing staff at a minimum of once every 3 years, and in the event of changes to the BMPP.
- The company's management shall communicate the BMPP to responsible supervisors, who shall ensure personnel are following operating procedures defined in the BMPP.
- The Site Manager shall be responsible for ensuring the BMPP is followed.
- Management shall ensure the controls described in the BMPP are reviewed annually to maintain the levels of control outlined in the Air Quality Assessments for Drain Bros. Proposed Highway 7 Pit, and to ensure operations will have not have a negative environmental impact on the surrounding area.
- The BMPP shall be kept on file at scale house (or with other health and safety information and procedures on site).

# 9 INSPECTION & MONITORING

## 9.1 Inspection and Maintenance

- The water spray system for processing equipment should be inspected weekly.

## 9.2 Monitoring

- Weather forecasts will be checked daily, to plan for current and next-day watering needs according to the Operation Weather Forecasting procedure described in Section 9.
- Visual inspection for dusty conditions shall occur at a minimum of twice daily.
- In accordance with Sections 2 and 3 of this BMPP, visual inspections shall be carried out hourly when overburden removal, berm construction, rehabilitation, excavation and loading operations are near a residence; dry weather is anticipated; and winds are anticipated to be blowing towards the residence.
- The Site Manager or their delegate will be responsible for monitoring current conditions and weather forecasts from Environment & Climate Change Canada, to subsequently help plan for current and next day watering needs and other measures.

## 9.3 Record Keeping

- Records shall be kept of when and how dust control measures are implemented and when complaints are received, if any. As a minimum, the following activities or events shall be recorded:
- Watering is applied on paved roads, unpaved roads and regularly travelled areas;
- Visible dust is observed; and,
- A complaint is received.

In addition, records shall also be kept of the results of all Inspection, Maintenance and Monitoring activities, including the following:

- Inspection and maintenance of the water spray system for the processing plant;
- Inspection and maintenance of the water truck, if applicable, and water delivery system;
- Inspection and maintenance of the paved road surfaces; and,
- Results of visual inspections including the time of the inspection and meteorological conditions at the time of the inspection.

# 10 COMPLAINT TRACKING AND RESOLUTION

## 10.1 Complaint Tracking

- A sign posted at the site entrance, and on the Company website, shall include a phone number for neighbours to call if they have concerns.
- The Company shall request that the local MECP office and the Township of Asphodel-Norwood notify them immediately if they receive a complaint, to allow for prompt response and follow-up.
- Complainants shall be requested to identify the location of the incident as well as the time of day that it was detected and any other information that they feel is relevant.

## 10.2 Complaint Resolution

When a complaint is received, the Site Manager shall ensure the following steps are undertaken:

1. Inspect the site and surrounding area to identify possible sources of visible dust.
2. Obtain weather data for the time of the event.
3. Note all on-site activities at the time that the complaint was made.
4. If the information indicates that the facility is not the source of the dust complaint, the complainant shall be notified of this finding.
5. If it is determined that the complaint may, in fact, have been related to the facility operations, the following response procedures shall be followed, in the order provided below:
    - **Level 1** - Correction of operations as soon as practical. The Site Manager shall ensure that all element of the BMPP are being followed. Control measures shall be stepped up or operations may be curtailed, as required.
    - **Level 2** – Review of Best Management Practice Plan. If the Level 1 response does not adequately resolve the problem, the BMPP shall be reviewed to look for additional control measures to address the source of the dust complaint.
    - **Level 3** – Operational modifications. If the Level 2 response does not adequately resolve the problem, the operator shall commit to making physical changes to the facility to address the source of the dust complaint, such as additional enclosures, relocation of equipment, or additional paving.