FINAL REPORT

STRADA AGGREGATES
STRADA PIT/QUARRY

TOWNSHIP OF MELANCTHON, ONTARIO

AIR QUALITY ASSESSMENT
RWDI # 2300646
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SUBMITTED TO

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1 INTRODUCTION

Strada Aggregates Inc. (Strada) owns and operates the Shelburne Pit, located at 437159 4th Line, Township of Melancthon, Ontario, in the County of Dufferin, which is an above water pit that consists of three licences under the Aggregate Resources Act ("ARA") (Licence #626199, 625155, and #129167). The existing pit licences only allow for the extraction of unconsolidated material above the water table. Strada is undertaking the technical studies required to determine the feasibility of a below the water table aggregate extraction licence to access the consolidated material below the unconsolidated material to operate the site as both a pit and quarry (the "Strada Pit / Quarry"). **Figure 1** shows the location of the site.

The three existing licences will be combined into one licence with below the water quarry extraction occurring in the northern two-thirds (2/3) of the site, and a wash plant with product stockpiles in the southern third (1/3).

Together, the combined licences are referred to as the "Subject Property".

2 SITE DESCRIPTION

Currently, the site is comprised of three licences (Licence # 129167, 625155 and 626199), which operate as an above water gravel pit and is permitted to ship 1.25 million tonnes per annum combined.

Strada is applying for one new licence over the Subject Property, which will be for a pit and quarry. The extraction limit for the pit will remain unchanged and encompass the area identified in **Figure 2**. The extraction limit for the quarry will encompass the area identified in **Figure 2** and only includes Licence # 129167 and 626199. The new licence is proposed to ship 2 million tonnes per annum.

As this Air Quality Assessment must be reviewed in conjunction with the ARA Site Plans that accompany the ARA licence application Existing Features Plan, Operational Plan, Rehabilitation Plan, and Cross Section Plan, the figures in this report focus only on details pertinent to the Air Quality Assessment. The ARA Site Plans provide all necessary details on the Site as it currently exists, the proposed operations, and what the site will look like in the future following final rehabilitation.

3 SITE OPERATIONS

3.1 Hours of Operation & Seasonal Variations

The proposed hours of operations are as follows:

- Extraction and processing occur between 07:00 and 19:00, Monday through Saturday;
- Loading & shipping occur between 06:00 and 19:00, Monday through Friday, and between 06:00 and 17:00 on Saturdays.
- No operations on Sundays and statutory holidays.

- Extraction and processing operations do not occur during the winter, and this was included in the assessment. Shipping activities were considered to be year-round activities.
- Stripping and rehabilitation activities will also occur; however, these generally occur during periods of lower extraction during the shoulder seasons.

These hours of operation and seasonal variations are included in the dispersion modelling analysis. Although there are no operations on Sundays and statutory holidays, these days were included in the dispersion modelling analysis as a conservative simplification and limitations in the modelling software.

3.2 Combined Pit and Quarry Operations

Strada is proposing to complete extraction in the northern portion of the site (existing Licence #626199) at the same time that quarry operations commence in the southern portion of existing Licence #129167. A wash plant shall operate in existing Licence #626155, which is connected to line power.

The site will be operated in four (4) phases, with each phase containing two or three sub-phases (i.e., 1A, 1B, 2A, 2B, 2C, 3A, 3B, 4A, and 4B). Pit and quarry operations will occur concurrently during phases 1A, 1B, 2A, and 2B at which time the pit material will operate on its own for phases 2C, 3A, 3B, 4A, and 4B.

Commencing in Phase 1, pit operations shall consist of aggregate that will be extracted and transferred directly to a portable plant near the working face, which includes crushing, screening, classifying, and stockpiling. A portion of the material will be hauled to the wash plant, while the remainder will be shipped directly from the plant. The extraction limit for the pit operations is expected to be up to 400,000 tonnes per year until the pit material has been exhausted. This is expected to occur by the end of Phase 2B. **Figure 3.1** provides the process flow diagram for the pit operations.

In the quarry portion of the site, aggregate will be extracted and transferred from the muck pile directly to a portable primary crusher by a front-end loader. Material is then conveyed back to a secondary plant, which includes crushing, screening, classifying, and stockpiling. A portion of the material will be hauled to the wash plant, while the remainder will be shipped directly from the plant. The extraction limit for the quarry operations is expected to be 1,600,000 tonnes per year while pit operations are still underway. **Figure 3.2** provides the process flow diagram for the quarry operations.

3.3 Quarry Operations Only

Upon exhausting the pit portion of the site, starting in Phase 2C, quarry operations shall continue while all sources associated with pit operations cease. Quarry operations are the same as described above, except that the extraction limit for the quarry operations will be 2,000,000 tonnes per year. The primary crusher will follow the working face, being fed by front-end loaders. Material shall continue to be conveyed back to the secondary processing plant. This will continue through Phase 4B. **Figure 3.3** provides the process flow diagram for the quarry operations.

4 SENSITIVE RECEPTOR LOCATIONS

There are various rural homes located around the site, located on 3rd Line, 4th Line, Dufferin Road 17, and Side Road 15. Regardless of distance, the closest residences around the proposed Strada Pit / Quarry were included in the assessment. **Figure 4** illustrates the location of the residential receptors included in the assessment. The receptor identification system matches that of the Noise Impact Study prepared by AERCOUSTICS Engineering Ltd.

5 CONTAMINANTS

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

- 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, with 21.7% applied to the sand and gravel deposit and 2.06% applied to the limestone deposit; 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. NO_2 is emitted directly from vehicles and heavy equipment and is also generated when emissions of nitrogen oxide (NO) are transformed through chemical reactions in the atmosphere. Emissions of total nitrogen oxides (NO_X) are estimated and then converted into NO_2 through the process described in **Section 13**. Emissions of NO_X from explosives used for blasting were also included in the assessment.

6 EMISSION SOURCES

The potential sources of emissions in the existing Pit and proposed Pit / Quarry are as follows:

- Overburden stripping and rehabilitation operations;
- Extraction of unconsolidated material from the working face (Pit Only);
- Drilling, blasting, and extraction of shot rock from the muck pile (Quarry Only);
- Material handling (loading the primary hopper at the working face, stacking material on stockpiles, and loading trucks for shipment);
- Material crushing, screening, washing, and stockpiling;
- Movement of equipment over unpaved surfaces (front-end 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. Furthermore, most of the of the Subject Property is already stripped with the exception of the northern-most portion. All overburden that has been or will be stripped, has already been or will be utilized for perimeter berm creation.

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.

Table 7 shows the applicable AAQC and CAAQS objectives.

8 EMISSION CALCULATIONS

Emissions were estimated in accordance with relevant guidance using published emission factors from the U.S. EPA AP-42: Compilation of Air Emissions Factors from Stationary Sources (AP-42). Detailed emission calculations and emission factor references are provided in the appendices to this report. The appendices contain details on assumptions, equipment types, sample calculations, and other details that provide clarity on RWDI's methodology.

- **Appendix A** provides emission estimates for blasting operations, using emission factors from Chapter 11.9 (Western Surface Coal Mining)
- **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 aggregate processing equipment, using emission factors from Chapter 11.19.2 (Crushed Stone Processing and Pulverized Mineral Processing).
- **Appendix D** provides emission estimates for fugitive dust emissions from vehicles moving on unpaved roads, using emission factors from Chapter 13.2.2 (Unpaved Road). As a conservative simplification, the use of reclaimed asphalt on the site entrance was not included explicitly in the analysis. While this surface treatment is not as effective as completely paving the haul route, it does provide a significant reduction in dust emissions when kept clean of excess silt.
- **Appendix E** 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 $PM_{2.5}$.
- **Appendix F** provides data from silica testing performed on the pit material and core samples from the proposed quarry resource.

9 DISCUSSION OF MITIGATION MEASURES

The volume of truck and heavy equipment movement on unpaved surfaces within some areas of the site requires 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. This finding of the studies is consistent with RWDI's experience in observing the effect of intensive watering programs.

For unpaved haul roads further removed from sensitive receptors or with lower traffic volumes, the level of mitigation noted above is often not required. In these cases, the frequency of watering can be reduced, and thus, a supplemental control efficiency of only 75% or 50% was used.

[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,

With respect to the paved road leading into the site, a combination of strict controls on surface silt and watering are required to ensure that potential impacts remain within acceptable levels. The silt loading level assumed for the paved roads reflects this mitigation.

Based on recent guidance provided by the MECP, a control efficiency of 95% may be applied to handling of washed stone and sand products due to the inherently low silt content.

The final dispersion modelling analysis reflects the implementation of controls.

10 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.

Regional meteorological data obtained from the MECP website were used within the model in accordance with the MECP's Guideline A11. Specifically, the data were those applicable to the West Central Ontario Region, which includes surface data from London, Ontario and upper air data from White Lake Michigan. The facility is surrounded by farmland or open areas on all sides, and therefore, the CROPS pre-processed data set was chosen. The meteorological data set was pre-processed by the MECP using the 22112 version of AERMET.

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 or quarry floor.

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. As a conservative simplification, all sources were modelled as operating over the entire year, when in fact, extraction and processing operations do not occur for the entire year.

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. **Appendix G** provides a summary of the dispersion modelling input parameters.

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

Six (6) phases of operations were selected for modelling purposes due to the proximity of operations to nearby receptors, phases where operations at closest to grade level, operations are concentrated in a small area, or a combination of these factors.

- **Figure 10.1** provides the source locations for Phase 1B(1).
- **Figure 10.2** provides the source locations for Phase 1B(3).
- **Figure 10.3** provides the source locations for Phase 2A.
- **Figure 10.4** provides the source locations for Phase 2B.
- **Figure 10.5** provides the source locations for Phase 2C(2).
- **Figure 10.6** provides the source locations for Phase 4B.

The dispersion modelling files are available electronically upon request.

11 LOCAL EMISSION SOURCES

11.1 Review of Available Data

Environment Canada's National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases. Data for 2021 (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 is a single facility reporting emissions to NPRI within ten (10) kilometres of the site, identified as Stella-Jones Inc., Shelburne Wood Protection Limited.

The digital mapping provided by the NPRI erroneously shows the Walker Environmental Group Inc. - Compost Site, known as Gro Bark Dundalk. This site is actually located over ten (10) kilometres to the west of the Quarry and is not discussed further.

With respect to identifying other aggregate operations near the Subject Property, the Ministry of Natural Resources and Forestry (MNRF) Pits and Quarries Online tool, as well as aerial photography for the area, was used. RWDI's extensive experience in modelling aggregate sites, mining sites, ready-mix concrete and cement plants, and other sources of fugitive dust, has consistently shown that impacts from such operations are more localized and are typically indistinguishable from regional background air quality levels at distances beyond one (1) kilometer. RWDI has conducted hundreds of these assessments, as well as a number of ambient monitoring campaigns that support this observation. Therefore, as a conservative measure, RWDI used five (5) kilometres for this review. There are three (3) licenced sites located within this area, as shown in **Figure 11**. A description of each site is provided in **Table 11**.

Finally, the MECP Access Environment system was also reviewed to identify any facilities with current Environmental Compliance Approvals (ECAs) or registrations under the Environmental Activity and Sector Registry (EASR). Within 10 kilometres of the site, RWDI identified nine (9) facilities with approved air emission ECAs and none with current registrations under the EASR. Based on RWDI's review of the remaining ECAs, none are expected to emit similar contaminants as the Pit and Quarry.

This includes Stella-Jones Inc., Shelburne Wood Protection Limited, located at 201 Wellington Street, Shelburne. The facility is located over six (6) kilometres from the Subject Property, and the only sources present are associated with combustion equipment serving the wood-preserving operations. While the site has reported emissions of copper and PM_{10}, these emissions are associated with sources located close to grade that will not affect air quality levels beyond the immediate area around the site Stella-Jones Inc.

Based on this review, the three aggregate sites were selected for additional review, which are discussed in the following sections. Other facilities identified were not carried forward due to distance from the site or the lack of similar emissions relevant to the analysis.

11.2 2006044 Ontario Inc. (Alliston Sand and Gravel)

It is RWDI's understanding that aggregate operations at the Alliston Sand and Gravel pit (Licence 3589) have essentially ceased. Potential emissions from this site were not included in the assessment. RWDI visited the area on November 3, 2023, January 27, 2024, and March 30, 2024, and confirmed that this site is dormant.

11.3 Duivenvoorden Haulage Ltd.

Predicted impacts due to emissions from the Duivenvoorden Haulage (DVH) Ltd. (Licence 3726) were included in the assessment, as this site is immediately west of the Subject Property. The DVH Ltd. site has an annual tonnage limit of 199,550 tonnes per year, slightly less than 50% of the annual limit for the gravel pit operations included in Scenario 1. The site does not have an ECA and does not report emissions to the NPRI, which suggests that only portable processing plants are used at the site. A review of aerial imagery suggests that there has been little processing of aggregates on the site since 2018; however, as these images are only snapshots in time, it is assumed that processing may still occur.

Based on this review, an appropriate simplification would be to estimate emissions for the DVH Ltd. 50% of the overall emissions for the gravel pit operations included in Scenario 1. As a conservative simplification, emissions that vary with wind speed were estimated using the average wind speed from the MECP meteorological data set. This tends to overestimate concentrations as maximum concentrations due to emissions from ground-level fugitive sources normally occur during periods of stable atmospheric conditions, which only occur at low wind speeds (well below the average wind speed of 3.7 m/s). These emission estimates are also provided in **Appendix B** through **Appendix E**. **Appendix A** only deals with blasting and is, therefore, not relevant to operations at a gravel pit. The predicted emissions were modelled using an area source covering the DVH Ltd site.

RWDI is aware that there is a proposed extension to the DVH Ltd. pit that will extend the life of this pit, and shift operations further north. Expansions to pit operations do not normally add new sources of emissions but shift the location of emission sources already present. Instead, this extension will move sources of emissions further north, and further away from the key sources at the Strada Pit / Quarry. As noted above, the manner in which the DVH Ltd. emissions were estimated in the analysis is conservative, based the annual tonnage limits, and therefore provides an adequate of the cumulative impact of this extension with the Strada Pit / Quarry.

11.4 St. Marys Cement Inc. (Canada)

It is RWDI's understanding that the St. Marys Cement Inc. (Canada) pit (Licence 3512) is dormant. RWDI visited the area on November 3, 2023, January 27, 2024, and March 30, 2024, and confirmed that the scale house has been removed, and operations are not currently taking place. RWDI contacted St. Marys Cement Inc. (Canada) who indicated there were no immediate plans to reactivate the site, unless a large project in the area or other market conditions warrants reactivation. In fact, the site was last operated by Strada under agreement with St. Marys Cement Inc. (Canada). As it is unlikely that operations at this site will resume in the near future, potential emissions from this site were not included in the assessment.

12 BACKGROUND AIR QUALITY

Background ambient air monitoring data was used in conjunction with the emissions from the proposed operations at the Strada Pit / Quarry as well as the nearby sites that were modelled explicitly in the assessment. The ambient background air monitoring data represents other background sources in the region, including the transportation network, agricultural sources, long-range pollutant transport, and other ubiquitous sources in the environment. 90th percentile values for $PM_{2.5}$, PM_{10}, TSP, silica (in PM_{10}) and NO_2 are added to the predicted concentration obtained through the dispersion modelling assessment. 99th percentile values for ozone (O_3) are used to estimate the conversion of NO to NO_2, as described in **Section 13**.

For the purposes of this assessment, background concentrations of $PM_{2.5}$, NO_2 and O_3 were obtained directly from the National Pollutant Surveillance Program ("NAPS") Station 62601 in Simcoe, Ontario. While this station is located nearly 150 kilometres from the Subject Property, it is reflective of a predominantly rural environment, dominated by emissions from local agricultural sources and the road network. While the MECP operates monitoring stations that are closer to the Subject Property, they are located in urbanized environments that are not reflective of the environment in Melancthon.

This data is provided in **Table 12**. 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 United States.[4].

The use of historical data from a representative monitoring station, either somewhere in the surrounding region or an appropriate surrogate station in a similar environment, 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, predominantly agricultural area with no other significant industries nearby.

[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.

While the effects of the COVID-19 pandemic on ambient air quality levels were most evident in urban areas, data from 2020 was removed from the assessment of background air quality. Rural areas did not see the same dramatic changes as more urbanized areas, but as a conservative measure, removing the 2020 data is considered prudent. Data for 2022 is now available from the National Air Pollution Surveillance Program and has been used to replace the 2020 data in **Table 12**.

13 CHEMICAL REACTIONS AMONG CONTAMINANTS

The only chemical reaction among the emitted contaminants of relevance to local air quality impacts is the conversion of nitric oxide (NO) to nitrogen dioxide (NO_2). Oxides of nitrogen (NO_X) emitted in diesel exhaust are composed primarily of NO. However, once the exhaust is emitted to the atmosphere and begins to mix with outside air, some of the NO is oxidized in reactions with other contaminants, principally ground-level ozone (O_3), to produce NO_2. This is important to the cumulative effects assessment, as the criteria used in this assessment apply only to NO_2, which has a much greater toxicity than NO.

The Ozone Limiting Method (OLM) was used in the cumulative effects assessment to estimate the maximum short-term NO_2 concentrations resulting from emissions of NO_X. The OLM assumes that the conversion of NO to NO_2 is limited only by the amount of O_3 present in the outside air. If the concentration of available O_3 is less than that of the NO contributed by the modelled roadway emissions, then the portion of NO that is converted to NO_2 equals the available O_3. If the concentration of available O_3 exceeds that of the NO contributed by the modelled roadway, then all NO is assumed to be converted to NO_2.

This calculation is performed within the AERMOD dispersion model. A simplified version of the OLM was used to estimate the short-term concentration of NO_2 resulting from emissions of NOX. Concentrations of NO_X predicted by AERMOD are converted to NO_2 based on the background ozone concentration. To represent background ozone conditions, 99th percentile ozone concentrations by hour of day were derived from measurements recorded by the monitoring station described in **Section 12**. The portion of emitted total NO_X that is already in the form of NO_2 before exiting the tailpipe was estimated to be 10%.

14 RESULTS

The results of the dispersion modelling assessment for the modelled phases are presented in **Table 14.1** through **Table 14.6**, respectively. Maximum predicted concentrations from the proposed Strada Pit / Quarry are below the relevant criteria for all contaminants at the modelled receptors. When the 90th percentile background concentration from the MECP ambient monitoring stations was added to the predicted impacts from operations at the proposed Strada Pit / Quarry, the cumulative concentrations remained below the relevant criteria at all receptor locations.

15 RECOMMENDATIONS

The proposed Shelburne Pit / Quarry must operate in accordance with the operating standards pertaining to dust outlined in section 0.12 (2) of Ontario Regulation 244/97, which include:

- The licensee or permittee shall apply water or another provincially approved dust suppressant to internal haul roads and processing areas, as necessary to mitigate dust, if the pit or quarry is located within 1,000 metres of a sensitive receptor.
- The licensee or permittee shall equip any processing equipment that creates dust with dust suppressing or collection devices if it is located within 300 metres of a sensitive receptor.
- The licensee or permittee shall obtain environmental compliance approval under the Environmental Protection Act where required to carry out operations at the pit or quarry.

Furthermore, this assessment is based on the following recommendation, which is to be included on the ARA Site Plans for the Strada Pit / Quarry:

- The site shall operate in accordance with a Best Management Practices Plan for Dust (dated XX, XX, 2024), which may be amended from time to time, considering actual impacts and operational considerations. The recommendations in the Best Management Practices Plan for Dust are based on the maximum daily production rates. At lower production rates, the control measures specified in the Best Management Practices Plan for Dust can be reduced accordingly, provided dust remains mitigated on site.

See **Appendix H** for the BMPP which included mitigation measures for operations at the Strada Pit / Quarry.

A BMPP is meant to be a living document, reflecting operational experience at the site, and shall be reviewed periodically to ensure that mitigation measures are effective. Furthermore, if the site is operating at levels below maximum capacity, the mitigation measures may be adjusted accordingly.

16 CONCLUSIONS

Based on these conservative modelling results, the predicted impacts associated with the proposed Strada Pit / Quarry will remain below the relevant air quality criteria at all receptors. As a result, the proposed Strada Pit / Quarry is not expected to pose a risk of adverse impacts to surrounding sensitive receptors, with the implementation of the BMPP and compliance with the with the operating standards pertaining to dust outlined in section 0.12 (2) of Ontario Regulation 244/97.

17 STATEMENT OF LIMITATION

This report entitled Air Quality Assessment was prepared by RWDI AIR Inc. ("RWDI") for Strada Aggregates, ("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.

TABLES

Table 7: Relevant Air Quality Thresholds

Contaminant	Averaging Period	Numerical Value ($\mu g/m^3$)	Statistical Form
Ontario Ambient Air Quality Criteria			
TSP	24 hours	120	none specified
	Annual	60	none specified
PM_{10}	24 hours	50	none specified
Silica (in PM_{10})	24 hours	5	none specified
NO_2	1 hour	400	none specified
	24 hours	200	none specified
Canadian Ambient Air Quality Standard			
$PM_{2.5}$	24 hours [1]	27	The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
	Annual [2]	8.8	The 3-year average of the annual average concentrations.

Table 11: Nearby Aggregate Licences

ALPS ID	Operator	Site Name	Maximum Annual Tonnage
3589	2006044 Ontario Inc. (Alliston Sand and Gravel)	Not specified	100000
3726	Duivenvoorden Haulage Ltd.	Not specified	199550
3512	St. Marys Cement Inc. (Canada)	Not specified	99999999

Table 12: Ambient Air Quality Data (2020 Data Removed)

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Ambient Air Quality Data for NAPS Station 62601 in Simcoe [1]

Year	TSP [2]		PM_{10} [2]	Silica [3]	$PM_{2.5}$		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 (µg/m³)	90th Percentile 24-hour (µg/m³)	Annual Average (µg/m³)	90th Percentile 1-Hour		90th Percentile 24-Hour		99th Percentile 1-Hour	
							(ppb)	(µg/m³)	(ppb)	(µg/m³)	(ppb)	(µg/m³)
2017	42	23	23	1.4	12.7	6.8	6.0	12	5.2	10	59	122
2018	46	24	26	1.6	13.9	7.3	6.0	12	5.6	11	63	130
2019	36	21	20	1.2	10.9	6.4	6.0	12	5.5	11	57	118
~~2020~~	~~32~~	~~19~~	~~18~~	~~1.1~~	~~9.7~~	~~5.8~~	~~5.0~~	~~10~~	~~4.3~~	~~9.0~~	~~59~~	~~122~~
2021	37	22	20	1.2	11.0	6.5	5.0	10	4.8	9.0	60	124
2022	33	19	19	1.1	10.0	5.6	5.0	10	4.6	9.0	54	112
Average [5]	39	22	22	1.3	12	6.5	5.6	11	5.1	10	59	121

Notes:

[1] All data from NAPS Station 32601 in Simcoe, Ontario, downloaded from:
https://donnees-data.ec.gc.ca/data/air/monitor/national-air-pollution-surveillance-naps-program/Data-Donnees/?lang=en

[2] Estimated from $PM_{2.5}$ measurements using published factors (Lall et al., 2004)

[3] Estimated as 6% of PM_{10}, from published data for cities in the northeast US (U.S. EPA, 1996)

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

[5] Average does not include data from 2020

Table 14.1: Cumulative Effects Assessment - Scenario 1B(1)

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:			
	TSP	120	µg/m³ 24-Hour AAQC
		60	µg/m³ Annual AAQC
	PM_{10}	50	µg/m³ Interim AAQC
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS
		8.8	µg/m³ Annual CAAQS
	Silica	5	µg/m³ AAQC
	NO_2	400	µg/m³ 1-Hour AAQC
		200	µg/m³ 24-Hour AAQC

Background Concentrations (90th Percentile)			
	TSP	39	µg/m³ (24-hour)
		22	µg/m³ (Annual)
	PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	12	µg/m³ (24-hour)
		6.5	µg/m³ (Annual)
	Silica	1.3	µg/m³ (24-hour)
	NO_2	11.0	µg/m³ (1-hour)
		10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	61	51%	0	0.0%	100	83%	0	0.0%
					Annual	10	16%	0	0.0%	32	53%	0	0.0%
				PM10	24	19	38%	0	0.0%	41	82%	0	0.0%
				PM2.5	24	3.5	13%	0	0.0%	15	56%	0	0.0%
					Annual	0.8	9%	0	0.0%	7	83%	0	0.0%
				Silica	24	2.2	44%	0	0.0%	3.5	70%	0	0.0%
				NO2	1	31	8%	0	0.0%	42	10%	0	0.0%
					24	5.5	3%	0	0.0%	16	8%	0	0.0%
R02	Residence	560872	4887458	TSP	24	34	29%	0	0.0%	73	61%	0	0.0%
					Annual	3.7	6%	0	0.0%	26	44%	0	0.0%
				PM10	24	9.0	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.2	25%	0	0.0%	2.5	51%	0	0.0%
				NO2	1	28	7%	0	0.0%	39	10%	0	0.0%
					24	3.6	2%	0	0.0%	13.6	7%	0	0.0%
R03	Residence	561128	4887248	TSP	24	49	41%	0	0.0%	88	74%	0	0.0%
					Annual	5.7	10%	0	0.0%	28	47%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	3.8	14%	0	0.0%	16	57%	0	0.0%
					Annual	0.3	4%	0	0.0%	6.8	78%	0	0.0%
				Silica	24	1.5	30%	0	0.0%	2.8	56%	0	0.0%
				NO2	1	57	14%	0	0.0%	68	17%	0	0.0%
					24	8.8	4%	0	0.0%	19	9%	0	0.0%
R04	Residence	561203	4886816	TSP	24	51	43%	0	0.0%	90	75%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	3.1	12%	0	0.0%	15	55%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.1	23%	0	0.0%	2.4	49%	0	0.0%
				NO2	1	63	16%	0	0.0%	74	19%	0	0.0%
					24	5.6	3%	0	0.0%	16	8%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	40	33%	0	0.0%	79	65%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	19%	0	0.0%	2.3	45%	0	0.0%
				NO2	1	59	15%	0	0.0%	70	17%	0	0.0%
					24	5.7	3%	0	0.0%	16	8%	0	0.0%
R06	Residence	561227	4886661	TSP	24	39	32%	0	0.0%	78	65%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	9.5	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	2.4	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	21%	0	0.0%	2.3	47%	0	0.0%
				NO2	1	53	13%	0	0.0%	64	16%	0	0.0%
					24	4.3	2%	0	0.0%	14	7%	0	0.0%
R07	Residence	561160	4886395	TSP	24	27	23%	0	0.0%	66	55%	0	0.0%
					Annual	1.1	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	7.1	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	11%	0	0.0%
					24	2.8	1%	0	0.0%	12.8	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	23	19%	0	0.0%	62	51%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.2	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	3.9	2%	0	0.0%	13.9	7%	0	0.0%
R09	Residence	561388	4886383	TSP	24	35	29%	0	0.0%	74	61%	0	0.0%
					Annual	1.5	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.2	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	2.3	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	45	11%	0	0.0%	56	14%	0	0.0%
					24	4.8	2%	0	0.0%	15	7%	0	0.0%
R10	Residence	561573	4886429	TSP	24	34	28%	0	0.0%	73	60%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.8	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	45	11%	0	0.0%	56	14%	0	0.0%
					24	5.4	3%	0	0.0%	15	8%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	7.2	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.7	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	5.4	3%	0	0.0%	15	8%	0	0.0%
R12	Residence	562024	4886810	TSP	24	30	25%	0	0.0%	69	57%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	2.3	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	4.0	2%	0	0.0%	14	7%	0	0.0%
R13	Residence	562535	4887071	TSP	24	20	17%	0	0.0%	59	50%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	5.7	11%	0	0.0%	28	55%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
R14	Residence	562459	4887525	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	8.5	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	1.5	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	2.5	1%	0	0.0%	12.5	6%	0	0.0%
R15	Residence	562354	4887691	TSP	24	42	35%	0	0.0%	81	68%	0	0.0%
					Annual	3.3	5%	0	0.0%	26	43%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.6	32%	0	0.0%	2.9	58%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	3.2	2%	0	0.0%	13.2	7%	0	0.0%
R16	Residence	562503	4887866	TSP	24	41	34%	0	0.0%	80	66%	0	0.0%
					Annual	2.7	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.7	33%	0	0.0%	3.0	59%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	3.7	2%	0	0.0%	14	7%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	33	27%	0	0.0%	72	60%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	11	21%	0	0.0%	33	65%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	3.4	2%	0	0.0%	13.4	7%	0	0.0%
R18	Residence	562468	4888095	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	2.9	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8.8	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.1	23%	0	0.0%	2.4	49%	0	0.0%
				NO2	1	26	7%	0	0.0%	37	9%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
R19	Residence	562470	4888205	TSP	24	34	29%	0	0.0%	73	61%	0	0.0%
					Annual	2.7	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	2.9	1%	0	0.0%	12.9	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	47	39%	0	0.0%	86	72%	0	0.0%
					Annual	3.6	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	16	31%	0	0.0%	38	75%	0	0.0%
				PM2.5	24	2.7	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.9	38%	0	0.0%	3.2	64%	0	0.0%
				NO2	1	29	7%	0	0.0%	40	10%	0	0.0%
					24	4.1	2%	0	0.0%	14	7%	0	0.0%
R21	Residence	562437	4888378	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	13	25%	0	0.0%	35	69%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.5	31%	0	0.0%	2.8	57%	0	0.0%
				NO2	1	26	7%	0	0.0%	37	9%	0	0.0%
					24	3.6	2%	0	0.0%	14	7%	0	0.0%
R22	Residence	562393	4888471	TSP	24	34	28%	0	0.0%	73	61%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	11	23%	0	0.0%	33	67%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.3	27%	0	0.0%	2.6	53%	0	0.0%
				NO2	1	26	7%	0	0.0%	37	9%	0	0.0%
					24	3.6	2%	0	0.0%	14	7%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	24	20%	0	0.0%	63	53%	0	0.0%
					Annual	2.1	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	7.4	15%	0	0.0%	29	59%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	3.0	2%	0	0.0%	13.0	7%	0	0.0%
R24	Residence	562277	4889601	TSP	24	12	10%	0	0.0%	51	43%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.7	7%	0	0.0%	26	51%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
R25	Residence	562110	4889488	TSP	24	13	11%	0	0.0%	52	44%	0	0.0%
					Annual	1.1	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.8	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	1.7	1%	0	0.0%	11.7	6%	0	0.0%
R26	Residence	561506	4889533	TSP	24	17	14%	0	0.0%	56	46%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.9	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	12%	0	0.0%
					24	2.5	1%	0	0.0%	12	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	20	17%	0	0.0%	59	49%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	17%	0	0.0%	2.2	43%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	13%	0	0.0%
					24	2.2	1%	0	0.0%	12.2	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	28	23%	0	0.0%	67	56%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.9	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	13	50%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	43	11%	0	0.0%	54	14%	0	0.0%
					24	3.0	2%	0	0.0%	13.0	7%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	33	28%	0	0.0%	72	60%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	10	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	11%	0	0.0%
					24	3.8	2%	0	0.0%	14	7%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	7.0	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	40	10%	0	0.0%	51	13%	0	0.0%
					24	5.1	3%	0	0.0%	15	8%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	41	34%	0	0.0%	80	67%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	13	26%	0	0.0%	35	70%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.6	32%	0	0.0%	2.9	58%	0	0.0%
				NO2	1	27	7%	0	0.0%	38	9%	0	0.0%
					24	3.5	2%	0	0.0%	14	7%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	19	16%	0	0.0%	58	48%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.6	11%	0	0.0%	28	55%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	8%	0	0.0%
					24	2.1	1%	0	0.0%	12.1	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	16	14%	0	0.0%	55	46%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	5.3	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.5	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	13%	0	0.0%	2.0	39%	0	0.0%
				NO2	1	40	10%	0	0.0%	51	13%	0	0.0%
					24	2.4	1%	0	0.0%	12.4	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.9	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	21%	0	0.0%	2.4	47%	0	0.0%
				NO2	1	45	11%	0	0.0%	56	14%	0	0.0%
					24	2.7	1%	0	0.0%	12.7	6%	0	0.0%

Scenario 1B(1)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	32	26%	0	0.0%	71	59%	0	0.0%
					Annual	2.1	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	9.0	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	49	12%	0	0.0%	60	15%	0	0.0%
					24	3.4	2%	0	0.0%	13.4	7%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	31	26%	0	0.0%	70	58%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	40	10%	0	0.0%	51	13%	0	0.0%
					24	3.3	2%	0	0.0%	13.3	7%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	41	34%	0	0.0%	80	67%	0	0.0%
					Annual	4.0	7%	0	0.0%	26	44%	0	0.0%
				PM10	24	13	26%	0	0.0%	35	70%	0	0.0%
				PM2.5	24	2.9	11%	0	0.0%	15	54%	0	0.0%
					Annual	0.3	4%	0	0.0%	6.8	78%	0	0.0%
				Silica	24	1.7	34%	0	0.0%	3.0	60%	0	0.0%
				NO2	1	44	11%	0	0.0%	55	14%	0	0.0%
					24	4.3	2%	0	0.0%	14	7%	0	0.0%

Table 14.2: Cumulative Effects Assessment - Scenario 1B(3)

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:				Background Concentrations (90th Percentile)			
	TSP	120	µg/m³ 24-Hour AAQC		TSP	39	µg/m³ (24-hour)
		60	µg/m³ Annual AAQC			22	µg/m³ (Annual)
	PM_{10}	50	µg/m³ Interim AAQC		PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS		$PM_{2.5}$	12	µg/m³ (24-hour)
		8.8	µg/m³ Annual CAAQS			6.5	µg/m³ (Annual)
	Silica	5	µg/m³ AAQC		Silica	1.3	µg/m³ (24-hour)
	NO_2	400	µg/m³ 1-Hour AAQC		NO_2	11.0	µg/m³ (1-hour)
		200	µg/m³ 24-Hour AAQC			10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	66	55%	0	0.0%	105	87%	0	0.0%
					Annual	12	21%	0	0.0%	35	58%	0	0.0%
				PM10	24	24	49%	0	0.0%	46	93%	0	0.0%
				PM2.5	24	4.9	18%	0	0.0%	17	62%	0	0.0%
					Annual	1.1	12%	0	0.0%	7.6	86%	0	0.0%
				Silica	24	3.2	64%	0	0.0%	4.5	90%	0	0.0%
				NO2	1	58	15%	0	0.0%	69	17%	0	0.0%
					24	6.8	3%	0	0.0%	17	8%	0	0.0%
R02	Residence	560872	4887458	TSP	24	31	26%	0	0.0%	70	58%	0	0.0%
					Annual	3.9	7%	0	0.0%	26	44%	0	0.0%
				PM10	24	9.3	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	2.3	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.3	4%	0	0.0%	7	77%	0	0.0%
				Silica	24	1.1	23%	0	0.0%	2.4	49%	0	0.0%
				NO2	1	29	7%	0	0.0%	40	10%	0	0.0%
					24	3.7	2%	0	0.0%	14	7%	0	0.0%
R03	Residence	561128	4887248	TSP	24	50	41%	0	0.0%	89	74%	0	0.0%
					Annual	6.0	10%	0	0.0%	28	47%	0	0.0%
				PM10	24	14	27%	0	0.0%	36	71%	0	0.0%
				PM2.5	24	3.9	14%	0	0.0%	16	58%	0	0.0%
					Annual	0.4	4%	0	0.0%	6.9	78%	0	0.0%
				Silica	24	1.4	27%	0	0.0%	2.7	53%	0	0.0%
				NO2	1	58	15%	0	0.0%	69	17%	0	0.0%
					24	9.0	5%	0	0.0%	19	10%	0	0.0%
R04	Residence	561203	4886816	TSP	24	49	41%	0	0.0%	88	74%	0	0.0%
					Annual	3.2	5%	0	0.0%	26	43%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	3.0	11%	0	0.0%	15	54%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.0	21%	0	0.0%	2.3	47%	0	0.0%
				NO2	1	67	17%	0	0.0%	78	19%	0	0.0%
					24	5.4	3%	0	0.0%	15	8%	0	0.0%

Scenario 1B(3)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	38	31%	0	0.0%	77	64%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	2.6	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	19%	0	0.0%	2.3	45%	0	0.0%
				NO2	1	58	14%	0	0.0%	69	17%	0	0.0%
					24	5.9	3%	0	0.0%	16	8%	0	0.0%
R06	Residence	561227	4886661	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	9.5	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	2.3	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	50	12%	0	0.0%	61	15%	0	0.0%
					24	3.5	2%	0	0.0%	13	7%	0	0.0%
R07	Residence	561160	4886395	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.8	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	11%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.0	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	13	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	31	8%	0	0.0%	42	10%	0	0.0%
					24	3.8	2%	0	0.0%	13.8	7%	0	0.0%
R09	Residence	561388	4886383	TSP	24	37	31%	0	0.0%	76	64%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.8	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.3	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	12%	0	0.0%
					24	5.0	3%	0	0.0%	15	8%	0	0.0%
R10	Residence	561573	4886429	TSP	24	40	34%	0	0.0%	79	66%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	11	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	2.8	10%	0	0.0%	14	54%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	6.9	3%	0	0.0%	17	8%	0	0.0%

Scenario 1B(3)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	23	19%	0	0.0%	62	52%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	7.2	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.8	10%	0	0.0%	14	54%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	12%	0	0.0%
					24	5.7	3%	0	0.0%	16	8%	0	0.0%
R12	Residence	562024	4886810	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	2.4	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	4.4	2%	0	0.0%	14	7%	0	0.0%
R13	Residence	562535	4887071	TSP	24	21	17%	0	0.0%	60	50%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.9	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	3.1	2%	0	0.0%	13	7%	0	0.0%
R14	Residence	562459	4887525	TSP	24	35	29%	0	0.0%	74	62%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	11	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	18	5%	0	0.0%	29	7%	0	0.0%
					24	3.4	2%	0	0.0%	13	7%	0	0.0%
R15	Residence	562354	4887691	TSP	24	36	30%	0	0.0%	75	63%	0	0.0%
					Annual	2.7	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	12	23%	0	0.0%	34	67%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.5	29%	0	0.0%	2.8	55%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	3.3	2%	0	0.0%	13	7%	0	0.0%
R16	Residence	562503	4887866	TSP	24	22	18%	0	0.0%	61	51%	0	0.0%
					Annual	2.2	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	6.6	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	17%	0	0.0%	2.1	43%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	2.3	1%	0	0.0%	12	6%	0	0.0%

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	20	17%	0	0.0%	59	50%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	2.1	1%	0	0.0%	12	6%	0	0.0%
R18	Residence	562468	4888095	TSP	24	25	21%	0	0.0%	64	54%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	7.9	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	26	7%	0	0.0%	37	9%	0	0.0%
					24	2.7	1%	0	0.0%	13	6%	0	0.0%
R19	Residence	562470	4888205	TSP	24	28	23%	0	0.0%	67	56%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	9.2	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	32	27%	0	0.0%	71	59%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	10.7	21%	0	0.0%	33	65%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	3.3	2%	0	0.0%	13	7%	0	0.0%
R21	Residence	562437	4888378	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	8.3	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	2.8	1%	0	0.0%	13	6%	0	0.0%
R22	Residence	562393	4888471	TSP	24	23	19%	0	0.0%	62	51%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	6.9	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.5	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	22	6%	0	0.0%	33	8%	0	0.0%
					24	2.4	1%	0	0.0%	12	6%	0	0.0%

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	18	15%	0	0.0%	57	47%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.1	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	2.4	1%	0	0.0%	12.4	6%	0	0.0%
R24	Residence	562277	4889601	TSP	24	12	10%	0	0.0%	51	42%	0	0.0%
					Annual	0.8	1%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.5	7%	0	0.0%	25	51%	0	0.0%
				PM2.5	24	0.7	2%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.4	9%	0	0.0%	1.7	35%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	1.4	1%	0	0.0%	11.4	6%	0	0.0%
R25	Residence	562110	4889488	TSP	24	12	10%	0	0.0%	51	43%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.7	7%	0	0.0%	26	51%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
R26	Residence	561506	4889533	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	1.1	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.6	9%	0	0.0%	27	53%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	28	7%	0	0.0%	39	10%	0	0.0%
					24	1.7	1%	0	0.0%	11.7	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	23	19%	0	0.0%	62	52%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	7.1	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	2.5	1%	0	0.0%	12.5	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	26	22%	0	0.0%	65	55%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.7	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	21%	0	0.0%	2.4	47%	0	0.0%
				NO2	1	49	12%	0	0.0%	60	15%	0	0.0%
					24	3.3	2%	0	0.0%	13.3	7%	0	0.0%

Scenario 1B(3)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	24	20%	0	0.0%	63	53%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.3	15%	0	0.0%	29	59%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	37	9%	0	0.0%	48	12%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	3.1	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	6.9	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	13%	0	0.0%
					24	5.2	3%	0	0.0%	15	8%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	30	25%	0	0.0%	69	57%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	3.2	2%	0	0.0%	13.2	7%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	14	12%	0	0.0%	53	44%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.2	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	11%	0	0.0%	1.8	37%	0	0.0%
				NO2	1	15	4%	0	0.0%	26	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	17	14%	0	0.0%	56	46%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.9	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	28	7%	0	0.0%	39	10%	0	0.0%
					24	2.0	1%	0	0.0%	12.0	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	16	14%	0	0.0%	55	46%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	5.2	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	32	8%	0	0.0%	43	11%	0	0.0%
					24	2.2	1%	0	0.0%	12.2	6%	0	0.0%

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	34	29%	0	0.0%	73	61%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.6	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	61	15%	0	0.0%	72	18%	0	0.0%
					24	4.0	2%	0	0.0%	14	7%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	43	36%	0	0.0%	82	68%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.6	32%	0	0.0%	2.9	58%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	4.6	2%	0	0.0%	15	7%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	65	54%	0	0.0%	104	87%	0	0.0%
					Annual	5.2	9%	0	0.0%	28	46%	0	0.0%
				PM10	24	20	40%	0	0.0%	42	84%	0	0.0%
				PM2.5	24	4.0	15%	0	0.0%	16	58%	0	0.0%
					Annual	0.4	5%	0	0.0%	7	79%	0	0.0%
				Silica	24	2.4	49%	0	0.0%	3.7	75%	0	0.0%
				NO2	1	48	12%	0	0.0%	59	15%	0	0.0%
					24	7.5	4%	0	0.0%	17	9%	0	0.0%

Table 14.3: Cumulative Effects Assessment - Scenario 2A

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:				Background Concentrations (90th Percentile)			
	TSP	120	µg/m³ 24-Hour AAQC		TSP	39	µg/m³ (24-hour)
		60	µg/m³ Annual AAQC			22	µg/m³ (Annual)
	PM_{10}	50	µg/m³ Interim AAQC		PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS		$PM_{2.5}$	12	µg/m³ (24-hour)
		8.8	µg/m³ Annual CAAQS			6.5	µg/m³ (Annual)
	Silica	5	µg/m³ AAQC		Silica	1.3	µg/m³ (24-hour)
	NO_2	400	µg/m³ 1-Hour AAQC		NO_2	11.0	µg/m³ (1-hour)
		200	µg/m³ 24-Hour AAQC			10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	59	49%	0	0.0%	98	82%	0	0.0%
					Annual	10	16%	0	0.0%	32	53%	0	0.0%
				PM10	24	18	37%	0	0.0%	40	81%	0	0.0%
				PM2.5	24	3.3	12%	0	0.0%	15	55%	0	0.0%
					Annual	0.8	9%	0	0.0%	7.3	83%	0	0.0%
				Silica	24	2.1	42%	0	0.0%	3.4	68%	0	0.0%
				NO2	1	32	8%	0	0.0%	43	11%	0	0.0%
					24	5.2	3%	0	0.0%	15	8%	0	0.0%
R02	Residence	560872	4887458	TSP	24	28	23%	0	0.0%	67	55%	0	0.0%
					Annual	3.7	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	8.5	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.3	3%	0	0.0%	7	77%	0	0.0%
				Silica	24	1.0	21%	0	0.0%	2.3	47%	0	0.0%
				NO2	1	29	7%	0	0.0%	40	10%	0	0.0%
					24	3.6	2%	0	0.0%	14	7%	0	0.0%
R03	Residence	561128	4887248	TSP	24	49	41%	0	0.0%	88	74%	0	0.0%
					Annual	5.7	10%	0	0.0%	28	47%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	3.9	14%	0	0.0%	16	58%	0	0.0%
					Annual	0.3	4%	0	0.0%	6.8	78%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	58	15%	0	0.0%	69	17%	0	0.0%
					24	9.0	4%	0	0.0%	19	9%	0	0.0%
R04	Residence	561203	4886816	TSP	24	51	42%	0	0.0%	90	75%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	3.0	11%	0	0.0%	15	55%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	66	17%	0	0.0%	77	19%	0	0.0%
					24	5.3	3%	0	0.0%	15	8%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	39	33%	0	0.0%	78	65%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.6	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	58	14%	0	0.0%	69	17%	0	0.0%
					24	5.8	3%	0	0.0%	16	8%	0	0.0%
R06	Residence	561227	4886661	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	9.4	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	2.4	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	50	13%	0	0.0%	61	15%	0	0.0%
					24	3.8	2%	0	0.0%	14	7%	0	0.0%
R07	Residence	561160	4886395	TSP	24	27	22%	0	0.0%	66	55%	0	0.0%
					Annual	1.1	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	7.0	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	12%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	22	18%	0	0.0%	61	51%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.0	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	13%	0	0.0%	2.0	39%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	4.0	2%	0	0.0%	14.0	7%	0	0.0%
R09	Residence	561388	4886383	TSP	24	36	30%	0	0.0%	75	62%	0	0.0%
					Annual	1.5	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.5	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	2.3	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	44	11%	0	0.0%	55	14%	0	0.0%
					24	4.8	2%	0	0.0%	15	7%	0	0.0%
R10	Residence	561573	4886429	TSP	24	35	29%	0	0.0%	74	62%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	9	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	43	11%	0	0.0%	54	14%	0	0.0%
					24	5.6	3%	0	0.0%	16	8%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	25	21%	0	0.0%	64	53%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	7.2	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.7	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	12%	0	0.0%
					24	5.3	3%	0	0.0%	15	8%	0	0.0%
R12	Residence	562024	4886810	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	2.3	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	12%	0	0.0%
					24	3.9	2%	0	0.0%	14	7%	0	0.0%
R13	Residence	562535	4887071	TSP	24	20	16%	0	0.0%	59	49%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	5.4	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	3.1	2%	0	0.0%	13	7%	0	0.0%
R14	Residence	562459	4887525	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	19%	0	0.0%	2.3	45%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	2.3	1%	0	0.0%	12	6%	0	0.0%
R15	Residence	562354	4887691	TSP	24	36	30%	0	0.0%	75	62%	0	0.0%
					Annual	3.3	5%	0	0.0%	26	43%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.3	25%	0	0.0%	2.6	51%	0	0.0%
				NO2	1	27	7%	0	0.0%	38	9%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R16	Residence	562503	4887866	TSP	24	42	35%	0	0.0%	81	67%	0	0.0%
					Annual	2.7	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	14.1	28%	0	0.0%	36	72%	0	0.0%
				PM2.5	24	2.0	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.8	35%	0	0.0%	3.1	61%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	8%	0	0.0%
					24	3.9	2%	0	0.0%	14	7%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	36	30%	0	0.0%	75	63%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	12.4	25%	0	0.0%	34	69%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.6	31%	0	0.0%	2.9	57%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	3.8	2%	0	0.0%	14	7%	0	0.0%
R18	Residence	562468	4888095	TSP	24	33	28%	0	0.0%	72	60%	0	0.0%
					Annual	2.9	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	10.8	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.3	27%	0	0.0%	2.6	53%	0	0.0%
				NO2	1	22	6%	0	0.0%	33	8%	0	0.0%
					24	3.6	2%	0	0.0%	14	7%	0	0.0%
R19	Residence	562470	4888205	TSP	24	30	25%	0	0.0%	69	58%	0	0.0%
					Annual	2.7	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8.7	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	9%	0	0.0%
					24	3.0	1%	0	0.0%	13	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	45	38%	0	0.0%	84	70%	0	0.0%
					Annual	3.6	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	15.0	30%	0	0.0%	37	74%	0	0.0%
				PM2.5	24	2.7	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.8	35%	0	0.0%	3.1	61%	0	0.0%
				NO2	1	31	8%	0	0.0%	42	11%	0	0.0%
					24	4.1	2%	0	0.0%	14	7%	0	0.0%
R21	Residence	562437	4888378	TSP	24	39	32%	0	0.0%	78	65%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	13.1	26%	0	0.0%	35	70%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.5	31%	0	0.0%	2.8	57%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	3.7	2%	0	0.0%	14	7%	0	0.0%
R22	Residence	562393	4888471	TSP	24	41	34%	0	0.0%	80	66%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	14.1	28%	0	0.0%	36	72%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	1.6	33%	0	0.0%	2.9	59%	0	0.0%
				NO2	1	29	7%	0	0.0%	40	10%	0	0.0%
					24	4.2	2%	0	0.0%	14	7%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	27	22%	0	0.0%	66	55%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	8.3	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
R24	Residence	562277	4889601	TSP	24	13	11%	0	0.0%	52	43%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.9	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	17	4%	0	0.0%	28	7%	0	0.0%
					24	1.4	1%	0	0.0%	11.4	6%	0	0.0%
R25	Residence	562110	4889488	TSP	24	13	11%	0	0.0%	52	44%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	3.9	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
R26	Residence	561506	4889533	TSP	24	17	14%	0	0.0%	56	46%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.4	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	1.2	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	11%	0	0.0%	1.9	37%	0	0.0%
				NO2	1	33	8%	0	0.0%	44	11%	0	0.0%
					24	2.1	1%	0	0.0%	12.1	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	20	16%	0	0.0%	59	49%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	17%	0	0.0%	2.2	43%	0	0.0%
				NO2	1	38	10%	0	0.0%	49	12%	0	0.0%
					24	2.4	1%	0	0.0%	12.4	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	31	26%	0	0.0%	70	58%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	9.8	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	49	12%	0	0.0%	60	15%	0	0.0%
					24	3.4	2%	0	0.0%	13.4	7%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	1.5	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	11.6	23%	0	0.0%	34	67%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.5	30%	0	0.0%	2.8	56%	0	0.0%
				NO2	1	45	11%	0	0.0%	56	14%	0	0.0%
					24	4.3	2%	0	0.0%	14.3	7%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	6.8	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	13%	0	0.0%
					24	5.0	2%	0	0.0%	15	7%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	35	29%	0	0.0%	74	62%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	11	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	27%	0	0.0%	2.6	53%	0	0.0%
				NO2	1	27	7%	0	0.0%	38	9%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	19	16%	0	0.0%	58	48%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.5	11%	0	0.0%	28	55%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	13%	0	0.0%	2.0	39%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	8%	0	0.0%
					24	2.0	1%	0	0.0%	12.0	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.6	9%	0	0.0%	27	53%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	34	9%	0	0.0%	45	11%	0	0.0%
					24	2.1	1%	0	0.0%	12.1	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	23	19%	0	0.0%	62	52%	0	0.0%
					Annual	1.5	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.9	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	2.6	1%	0	0.0%	12.6	6%	0	0.0%

Scenario 2A

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	35	29%	0	0.0%	74	62%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	21%	0	0.0%	32	65%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	63	16%	0	0.0%	74	18%	0	0.0%
					24	3.7	2%	0	0.0%	14	7%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	38	31%	0	0.0%	77	64%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	13	25%	0	0.0%	35	69%	0	0.0%
				PM2.5	24	2.6	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.6	33%	0	0.0%	2.9	59%	0	0.0%
				NO2	1	48	12%	0	0.0%	59	15%	0	0.0%
					24	4.1	2%	0	0.0%	14	7%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	49	41%	0	0.0%	88	73%	0	0.0%
					Annual	4.3	7%	0	0.0%	27	44%	0	0.0%
				PM10	24	12	25%	0	0.0%	34	69%	0	0.0%
				PM2.5	24	3.1	11%	0	0.0%	15	55%	0	0.0%
					Annual	0.3	4%	0	0.0%	7	78%	0	0.0%
				Silica	24	1.6	32%	0	0.0%	2.9	58%	0	0.0%
				NO2	1	43	11%	0	0.0%	54	13%	0	0.0%
					24	5.1	3%	0	0.0%	15	8%	0	0.0%

Table 14.4: Cumulative Effects Assessment - Scenario 2B

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:				Background Concentrations (90th Percentile)			
	TSP	120	µg/m³ 24-Hour AAQC		TSP	39	µg/m³ (24-hour)
		60	µg/m³ Annual AAQC			22	µg/m³ (Annual)
	PM_{10}	50	µg/m³ Interim AAQC		PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS		$PM_{2.5}$	12	µg/m³ (24-hour)
		8.8	µg/m³ Annual CAAQS			6.5	µg/m³ (Annual)
	Silica	5	µg/m³ AAQC		Silica	1.3	µg/m³ (24-hour)
	NO_2	400	µg/m³ 1-Hour AAQC		NO_2	11.0	µg/m³ (1-hour)
		200	µg/m³ 24-Hour AAQC			10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	50	41%	0	0.0%	89	74%	0	0.0%
					Annual	10	16%	0	0.0%	32	53%	0	0.0%
				PM10	24	16	32%	0	0.0%	38	76%	0	0.0%
				PM2.5	24	3.4	13%	0	0.0%	15	56%	0	0.0%
					Annual	0.8	9%	0	0.0%	7.3	83%	0	0.0%
				Silica	24	1.9	37%	0	0.0%	3.2	63%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	5.1	3%	0	0.0%	15	8%	0	0.0%
R02	Residence	560872	4887458	TSP	24	30	25%	0	0.0%	69	57%	0	0.0%
					Annual	3.7	6%	0	0.0%	26	44%	0	0.0%
				PM10	24	8.7	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.3	3%	0	0.0%	7	77%	0	0.0%
				Silica	24	1.2	25%	0	0.0%	2.5	51%	0	0.0%
				NO2	1	29	7%	0	0.0%	40	10%	0	0.0%
					24	3.7	2%	0	0.0%	14	7%	0	0.0%
R03	Residence	561128	4887248	TSP	24	49	41%	0	0.0%	88	74%	0	0.0%
					Annual	5.8	10%	0	0.0%	28	47%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	3.6	13%	0	0.0%	15	57%	0	0.0%
					Annual	0.4	4%	0	0.0%	6.9	78%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	57	14%	0	0.0%	68	17%	0	0.0%
					24	8.9	4%	0	0.0%	19	9%	0	0.0%
R04	Residence	561203	4886816	TSP	24	49	41%	0	0.0%	88	73%	0	0.0%
					Annual	3.1	5%	0	0.0%	26	43%	0	0.0%
				PM10	24	11	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	3.5	13%	0	0.0%	15	56%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	66	17%	0	0.0%	77	19%	0	0.0%
					24	5.2	3%	0	0.0%	15	8%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	38	31%	0	0.0%	77	64%	0	0.0%
					Annual	2.2	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	9	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.9	17%	0	0.0%	2.2	43%	0	0.0%
				NO2	1	57	14%	0	0.0%	68	17%	0	0.0%
					24	5.7	3%	0	0.0%	16	8%	0	0.0%
R06	Residence	561227	4886661	TSP	24	36	30%	0	0.0%	75	63%	0	0.0%
					Annual	2.1	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	8.5	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	2.2	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	49	12%	0	0.0%	60	15%	0	0.0%
					24	3.5	2%	0	0.0%	13	7%	0	0.0%
R07	Residence	561160	4886395	TSP	24	25	21%	0	0.0%	64	54%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.2	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	11%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	22	19%	0	0.0%	61	51%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.0	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	30	7%	0	0.0%	41	10%	0	0.0%
					24	3.7	2%	0	0.0%	13.7	7%	0	0.0%
R09	Residence	561388	4886383	TSP	24	37	30%	0	0.0%	76	63%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.7	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	12%	0	0.0%
					24	5.0	2%	0	0.0%	15	7%	0	0.0%
R10	Residence	561573	4886429	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	10	21%	0	0.0%	32	65%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	39	10%	0	0.0%	50	13%	0	0.0%
					24	6.4	3%	0	0.0%	16	8%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	23	19%	0	0.0%	62	51%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	3.2	12%	0	0.0%	15	55%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	37	9%	0	0.0%	48	12%	0	0.0%
					24	5.4	3%	0	0.0%	15	8%	0	0.0%
R12	Residence	562024	4886810	TSP	24	29	24%	0	0.0%	68	56%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	2.6	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	12%	0	0.0%
					24	4.0	2%	0	0.0%	14	7%	0	0.0%
R13	Residence	562535	4887071	TSP	24	20	17%	0	0.0%	59	49%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.4	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R14	Residence	562459	4887525	TSP	24	28	23%	0	0.0%	67	56%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	7	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.0	20%	0	0.0%	2.3	46%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	2.1	1%	0	0.0%	12	6%	0	0.0%
R15	Residence	562354	4887691	TSP	24	37	31%	0	0.0%	76	63%	0	0.0%
					Annual	2.9	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	10	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	8%	0	0.0%
					24	2.7	1%	0	0.0%	13	6%	0	0.0%
R16	Residence	562503	4887866	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	11.6	23%	0	0.0%	34	67%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.6	31%	0	0.0%	2.9	57%	0	0.0%
				NO2	1	15	4%	0	0.0%	26	7%	0	0.0%
					24	3.2	2%	0	0.0%	13	7%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	33	27%	0	0.0%	72	60%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10.2	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	27%	0	0.0%	2.7	53%	0	0.0%
				NO2	1	17	4%	0	0.0%	28	7%	0	0.0%
					24	3.1	2%	0	0.0%	13	7%	0	0.0%
R18	Residence	562468	4888095	TSP	24	29	24%	0	0.0%	68	56%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	8.9	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R19	Residence	562470	4888205	TSP	24	26	21%	0	0.0%	65	54%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	6.5	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	8%	0	0.0%
					24	2.4	1%	0	0.0%	12	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	35	30%	0	0.0%	74	62%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	9.6	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	3.4	2%	0	0.0%	13	7%	0	0.0%
R21	Residence	562437	4888378	TSP	24	32	27%	0	0.0%	71	59%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	9.2	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	13	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	2.8	1%	0	0.0%	13	6%	0	0.0%
R22	Residence	562393	4888471	TSP	24	35	29%	0	0.0%	74	62%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	11.1	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	28%	0	0.0%	2.7	54%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	9%	0	0.0%
					24	3.3	2%	0	0.0%	13	7%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	29	24%	0	0.0%	68	56%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	9.5	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	23%	0	0.0%	2.5	49%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	8%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%
R24	Residence	562277	4889601	TSP	24	14	11%	0	0.0%	53	44%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.8	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
R25	Residence	562110	4889488	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	4.5	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	1.7	1%	0	0.0%	11.7	6%	0	0.0%
R26	Residence	561506	4889533	TSP	24	18	15%	0	0.0%	57	47%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.8	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	34	9%	0	0.0%	45	11%	0	0.0%
					24	2.0	1%	0	0.0%	12.0	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	27	23%	0	0.0%	66	55%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.3	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.8	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	48	12%	0	0.0%	59	15%	0	0.0%
					24	2.9	1%	0	0.0%	12.9	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	31	25%	0	0.0%	70	58%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	9.1	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	2.3	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.3	25%	0	0.0%	2.6	51%	0	0.0%
				NO2	1	55	14%	0	0.0%	66	16%	0	0.0%
					24	3.1	2%	0	0.0%	13.1	7%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	31	26%	0	0.0%	70	58%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	8.2	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	44	11%	0	0.0%	55	14%	0	0.0%
					24	3.0	2%	0	0.0%	13.0	7%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	25	21%	0	0.0%	64	54%	0	0.0%
					Annual	3.0	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	6.7	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	3.1	12%	0	0.0%	15	55%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	38	9%	0	0.0%	49	12%	0	0.0%
					24	5.1	3%	0	0.0%	15	8%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	2.2	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	8	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.1	21%	0	0.0%	2.4	47%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	2.5	1%	0	0.0%	12.5	6%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	19	16%	0	0.0%	58	48%	0	0.0%
					Annual	1.5	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.5	11%	0	0.0%	28	55%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	1.8	1%	0	0.0%	11.8	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	20	16%	0	0.0%	59	49%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.1	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	34	8%	0	0.0%	45	11%	0	0.0%
					24	2.2	1%	0	0.0%	12.2	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	19	16%	0	0.0%	58	48%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.2	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	38	10%	0	0.0%	49	12%	0	0.0%
					24	2.7	1%	0	0.0%	12.7	6%	0	0.0%

Scenario 2B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	47	39%	0	0.0%	86	72%	0	0.0%
					Annual	3.3	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	3.3	12%	0	0.0%	15	56%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.9	37%	0	0.0%	3.2	63%	0	0.0%
				NO2	1	68	17%	0	0.0%	79	20%	0	0.0%
					24	6.0	3%	0	0.0%	16	8%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	50	42%	0	0.0%	89	74%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	14	29%	0	0.0%	36	73%	0	0.0%
				PM2.5	24	3.0	11%	0	0.0%	15	54%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.9	38%	0	0.0%	3.2	64%	0	0.0%
				NO2	1	49	12%	0	0.0%	60	15%	0	0.0%
					24	5.1	3%	0	0.0%	15	8%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	61	51%	0	0.0%	100	83%	0	0.0%
					Annual	5.4	9%	0	0.0%	28	46%	0	0.0%
				PM10	24	19	38%	0	0.0%	41	82%	0	0.0%
				PM2.5	24	4.1	15%	0	0.0%	16	59%	0	0.0%
					Annual	0.5	5%	0	0.0%	7	79%	0	0.0%
				Silica	24	2.5	50%	0	0.0%	3.8	76%	0	0.0%
				NO2	1	48	12%	0	0.0%	59	15%	0	0.0%
					24	6.7	3%	0	0.0%	17	8%	0	0.0%

Table 14.5: Cumulative Effects Assessment - Scenario 2C(2)

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:				Background Concentrations (90th Percentile)			
	TSP	120	µg/m³ 24-Hour AAQC		TSP	39	µg/m³ (24-hour)
		60	µg/m³ Annual AAQC			22	µg/m³ (Annual)
	PM_{10}	50	µg/m³ Interim AAQC		PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS		$PM_{2.5}$	12	µg/m³ (24-hour)
		8.8	µg/m³ Annual CAAQS			6.5	µg/m³ (Annual)
	Silica	5	µg/m³ AAQC		Silica	1.3	µg/m³ (24-hour)
	NO_2	400	µg/m³ 1-Hour AAQC		NO_2	11.0	µg/m³ (1-hour)
		200	µg/m³ 24-Hour AAQC			10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	32	27%	0	0.0%	71	60%	0	0.0%
					Annual	9	14%	0	0.0%	31	52%	0	0.0%
				PM10	24	11	23%	0	0.0%	33	67%	0	0.0%
				PM2.5	24	2.7	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.7	8%	0	0.0%	7.2	82%	0	0.0%
				Silica	24	1.2	23%	0	0.0%	2.5	49%	0	0.0%
				NO2	1	28	7%	0	0.0%	39	10%	0	0.0%
					24	3.9	2%	0	0.0%	14	7%	0	0.0%
R02	Residence	560872	4887458	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	3.2	5%	0	0.0%	26	43%	0	0.0%
				PM10	24	7.2	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.6	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	3%	0	0.0%	7	76%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	2.6	1%	0	0.0%	13	6%	0	0.0%
R03	Residence	561128	4887248	TSP	24	77	64%	0	0.0%	116	97%	0	0.0%
					Annual	5.2	9%	0	0.0%	28	46%	0	0.0%
				PM10	24	16	31%	0	0.0%	38	75%	0	0.0%
				PM2.5	24	2.3	8%	0	0.0%	14	52%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.8	17%	0	0.0%	2.1	43%	0	0.0%
				NO2	1	32	8%	0	0.0%	43	11%	0	0.0%
					24	3.4	2%	0	0.0%	13	7%	0	0.0%
R04	Residence	561203	4886816	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	2.8	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	9	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	28	7%	0	0.0%	39	10%	0	0.0%
					24	2.6	1%	0	0.0%	13	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	32	27%	0	0.0%	71	59%	0	0.0%
					Annual	2.0	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	8	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	2.2	1%	0	0.0%	12	6%	0	0.0%
R06	Residence	561227	4886661	TSP	24	32	27%	0	0.0%	71	59%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.3	15%	0	0.0%	29	59%	0	0.0%
				PM2.5	24	1.2	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	15%	0	0.0%	2.0	41%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	1.5	1%	0	0.0%	11	6%	0	0.0%
R07	Residence	561160	4886395	TSP	24	22	19%	0	0.0%	61	51%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	5.4	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	11%	0	0.0%	1.9	37%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	1.3	1%	0	0.0%	11	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	17	15%	0	0.0%	56	47%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.8	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.4	9%	0	0.0%	1.7	35%	0	0.0%
				NO2	1	14	3%	0	0.0%	25	6%	0	0.0%
					24	2.1	1%	0	0.0%	12.1	6%	0	0.0%
R09	Residence	561388	4886383	TSP	24	30	25%	0	0.0%	69	58%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.7	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	3.0	1%	0	0.0%	13	6%	0	0.0%
R10	Residence	561573	4886429	TSP	24	32	27%	0	0.0%	71	59%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	3.0	1%	0	0.0%	13	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	22	18%	0	0.0%	61	51%	0	0.0%
					Annual	2.2	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	6.0	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	76%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	3.2	2%	0	0.0%	13	7%	0	0.0%
R12	Residence	562024	4886810	TSP	24	24	20%	0	0.0%	63	53%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	6	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	9%	0	0.0%
					24	2.2	1%	0	0.0%	12	6%	0	0.0%
R13	Residence	562535	4887071	TSP	24	18	15%	0	0.0%	57	47%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	4.3	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	9	2%	0	0.0%	20	5%	0	0.0%
					24	1.7	1%	0	0.0%	12	6%	0	0.0%
R14	Residence	562459	4887525	TSP	24	18	15%	0	0.0%	57	47%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	4	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	11%	0	0.0%	1.9	37%	0	0.0%
				NO2	1	11	3%	0	0.0%	22	5%	0	0.0%
					24	1.5	1%	0	0.0%	11	6%	0	0.0%
R15	Residence	562354	4887691	TSP	24	18	15%	0	0.0%	57	48%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	5	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	12	3%	0	0.0%	23	6%	0	0.0%
					24	1.4	1%	0	0.0%	11	6%	0	0.0%
R16	Residence	562503	4887866	TSP	24	20	17%	0	0.0%	59	49%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	14%	0	0.0%	2.0	40%	0	0.0%
				NO2	1	14	4%	0	0.0%	25	6%	0	0.0%
					24	1.3	1%	0	0.0%	11	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.9	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	17%	0	0.0%	2.1	43%	0	0.0%
				NO2	1	13	3%	0	0.0%	24	6%	0	0.0%
					24	1.7	1%	0	0.0%	12	6%	0	0.0%
R18	Residence	562468	4888095	TSP	24	31	26%	0	0.0%	70	58%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	10.1	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	13	3%	0	0.0%	24	6%	0	0.0%
					24	2.0	1%	0	0.0%	12	6%	0	0.0%
R19	Residence	562470	4888205	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	9.0	18%	0	0.0%	31	62%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	19%	0	0.0%	2.2	45%	0	0.0%
				NO2	1	12	3%	0	0.0%	23	6%	0	0.0%
					24	1.8	1%	0	0.0%	12	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	30	25%	0	0.0%	69	57%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10.5	21%	0	0.0%	32	65%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	76%	0	0.0%
				Silica	24	1.1	21%	0	0.0%	2.4	47%	0	0.0%
				NO2	1	14	3%	0	0.0%	25	6%	0	0.0%
					24	2.1	1%	0	0.0%	12	6%	0	0.0%
R21	Residence	562437	4888378	TSP	24	19	16%	0	0.0%	58	49%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.1	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	11%	0	0.0%	1.9	37%	0	0.0%
				NO2	1	12	3%	0	0.0%	23	6%	0	0.0%
					24	1.9	1%	0	0.0%	12	6%	0	0.0%
R22	Residence	562393	4888471	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.3	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	11%	0	0.0%	1.8	37%	0	0.0%
				NO2	1	15	4%	0	0.0%	26	6%	0	0.0%
					24	2.0	1%	0	0.0%	12	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	1.5	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.4	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	13%	0	0.0%	1.9	39%	0	0.0%
				NO2	1	12	3%	0	0.0%	23	6%	0	0.0%
					24	2.2	1%	0	0.0%	12.2	6%	0	0.0%
R24	Residence	562277	4889601	TSP	24	16	13%	0	0.0%	55	46%	0	0.0%
					Annual	0.9	1%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.4	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	0.7	2%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	15	4%	0	0.0%	26	6%	0	0.0%
					24	1.2	1%	0	0.0%	11.2	6%	0	0.0%
R25	Residence	562110	4889488	TSP	24	16	13%	0	0.0%	55	46%	0	0.0%
					Annual	1.0	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.6	9%	0	0.0%	27	53%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	1.2	1%	0	0.0%	11.2	6%	0	0.0%
R26	Residence	561506	4889533	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	5.5	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	9%	0	0.0%
					24	1.6	1%	0	0.0%	11.6	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	20	16%	0	0.0%	59	49%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	7.4	15%	0	0.0%	29	59%	0	0.0%
				PM2.5	24	1.2	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	1.9	1%	0	0.0%	11.9	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	9.4	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	76%	0	0.0%
				Silica	24	1.0	21%	0	0.0%	2.3	47%	0	0.0%
				NO2	1	32	8%	0	0.0%	43	11%	0	0.0%
					24	2.6	1%	0	0.0%	12.6	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	36	30%	0	0.0%	75	62%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	13.9	28%	0	0.0%	36	72%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.5	31%	0	0.0%	2.8	57%	0	0.0%
				NO2	1	32	8%	0	0.0%	43	11%	0	0.0%
					24	2.5	1%	0	0.0%	12.5	6%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	22	18%	0	0.0%	61	51%	0	0.0%
					Annual	2.6	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	5.5	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.5	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.5	9%	0	0.0%	1.8	35%	0	0.0%
				NO2	1	22	5%	0	0.0%	33	8%	0	0.0%
					24	3.0	2%	0	0.0%	13	7%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	18	15%	0	0.0%	57	48%	0	0.0%
					Annual	1.7	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	7	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	14	3%	0	0.0%	25	6%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	13	11%	0	0.0%	52	44%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	5.4	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	9%	0	0.0%	1.8	35%	0	0.0%
				NO2	1	12	3%	0	0.0%	23	6%	0	0.0%
					24	1.3	1%	0	0.0%	11.3	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	5.6	11%	0	0.0%	28	55%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	1.9	1%	0	0.0%	11.9	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	16	13%	0	0.0%	55	46%	0	0.0%
					Annual	1.5	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.9	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.2	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	23	6%	0	0.0%	34	9%	0	0.0%
					24	1.9	1%	0	0.0%	11.9	6%	0	0.0%

Scenario 2C(2)

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	38	32%	0	0.0%	77	64%	0	0.0%
					Annual	3.4	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	14	29%	0	0.0%	36	73%	0	0.0%
				PM2.5	24	2.6	10%	0	0.0%	14	53%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	1.5	31%	0	0.0%	2.8	57%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	4.0	2%	0	0.0%	14	7%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	50	41%	0	0.0%	89	74%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	18	37%	0	0.0%	40	81%	0	0.0%
				PM2.5	24	2.8	11%	0	0.0%	15	54%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	2.1	43%	0	0.0%	3.4	69%	0	0.0%
				NO2	1	48	12%	0	0.0%	59	15%	0	0.0%
					24	3.5	2%	0	0.0%	13	7%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	41	34%	0	0.0%	80	66%	0	0.0%
					Annual	4.3	7%	0	0.0%	27	45%	0	0.0%
				PM10	24	20	40%	0	0.0%	42	84%	0	0.0%
				PM2.5	24	3.0	11%	0	0.0%	15	54%	0	0.0%
					Annual	0.4	4%	0	0.0%	7	78%	0	0.0%
				Silica	24	2.2	45%	0	0.0%	3.5	71%	0	0.0%
				NO2	1	34	8%	0	0.0%	45	11%	0	0.0%
					24	4.3	2%	0	0.0%	14	7%	0	0.0%

Table 14.6: Cumulative Effects Assessment - Scenario 4B

RWDI# 2300646

Modelled Values & Frequency of Excursions above the Relevant Criteria

Days of Valid Meteorological Data: 1785

Relevant Criteria:				Background Concentrations (90th Percentile)			
	TSP	120	µg/m³ 24-Hour AAQC		TSP	39	µg/m³ (24-hour)
		60	µg/m³ Annual AAQC			22	µg/m³ (Annual)
	PM_{10}	50	µg/m³ Interim AAQC		PM_{10}	22	µg/m³ (24-hour)
	$PM_{2.5}$	27	µg/m³ 24-Hour CAAQS		$PM_{2.5}$	12	µg/m³ (24-hour)
		8.8	µg/m³ Annual CAAQS			6.5	µg/m³ (Annual)
	Silica	5	µg/m³ AAQC		Silica	1.3	µg/m³ (24-hour)
	NO_2	400	µg/m³ 1-Hour AAQC		NO_2	11.0	µg/m³ (1-hour)
		200	µg/m³ 24-Hour AAQC			10.0	µg/m³ (24-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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R01	Residence	560987	4887822	TSP	24	49	41%	0	0.0%	88	73%	0	0.0%
					Annual	11	18%	0	0.0%	33	55%	0	0.0%
				PM10	24	18	37%	0	0.0%	40	81%	0	0.0%
				PM2.5	24	3.8	14%	0	0.0%	16	58%	0	0.0%
					Annual	0.9	10%	0	0.0%	7.4	84%	0	0.0%
				Silica	24	2.3	46%	0	0.0%	3.6	72%	0	0.0%
				NO2	1	35	9%	0	0.0%	46	11%	0	0.0%
					24	6.7	3%	0	0.0%	17	8%	0	0.0%
R02	Residence	560872	4887458	TSP	24	41	34%	0	0.0%	80	67%	0	0.0%
					Annual	4.4	7%	0	0.0%	27	45%	0	0.0%
				PM10	24	13.6	27%	0	0.0%	36	71%	0	0.0%
				PM2.5	24	2.0	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.3	3%	0	0.0%	7	77%	0	0.0%
				Silica	24	1.5	30%	0	0.0%	2.8	56%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	3.0	2%	0	0.0%	13	7%	0	0.0%
R03	Residence	561128	4887248	TSP	24	75	62%	0	0.0%	114	95%	0	0.00%
					Annual	7.6	13%	0	0.0%	30	50%	0	0.0%
				PM10	24	16	32%	0	0.0%	38	76%	0	0.0%
				PM2.5	24	3.5	13%	0	0.0%	15	56%	0	0.0%
					Annual	0.4	5%	0	0.0%	6.9	79%	0	0.0%
				Silica	24	1.4	27%	0	0.0%	2.7	53%	0	0.0%
				NO2	1	40	10%	0	0.0%	51	13%	0	0.0%
					24	4.7	2%	0	0.0%	15	7%	0	0.0%
R04	Residence	561203	4886816	TSP	24	68	57%	0	0.0%	107	89%	0	0.0%
					Annual	4.0	7%	0	0.0%	26	44%	0	0.0%
				PM10	24	15	31%	0	0.0%	37	75%	0	0.0%
				PM2.5	24	3.9	14%	0	0.0%	16	58%	0	0.0%
					Annual	0.3	3%	0	0.0%	6.8	77%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	45	11%	0	0.0%	56	14%	0	0.0%
					24	5.3	3%	0	0.0%	15	8%	0	0.0%

Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R05	Residence	561200	4886714	TSP	24	51	42%	0	0.0%	90	75%	0	0.0%
					Annual	2.7	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	3.1	12%	0	0.0%	15	55%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	41	10%	0	0.0%	52	13%	0	0.0%
					24	4.5	2%	0	0.0%	15	7%	0	0.0%
R06	Residence	561227	4886661	TSP	24	44	36%	0	0.0%	83	69%	0	0.0%
					Annual	2.4	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	11.1	22%	0	0.0%	33	66%	0	0.0%
				PM2.5	24	2.5	9%	0	0.0%	14	53%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	36	9%	0	0.0%	47	12%	0	0.0%
					24	3.1	2%	0	0.0%	13	7%	0	0.0%
R07	Residence	561160	4886395	TSP	24	33	28%	0	0.0%	72	60%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	7.7	15%	0	0.0%	30	59%	0	0.0%
				PM2.5	24	1.7	6%	0	0.0%	13	50%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.7	13%	0	0.0%	2.0	39%	0	0.0%
				NO2	1	24	6%	0	0.0%	35	9%	0	0.0%
					24	2.5	1%	0	0.0%	12	6%	0	0.0%
R08	Residence	561327	4886224	TSP	24	28	24%	0	0.0%	67	56%	0	0.0%
					Annual	1.3	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6.5	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.5	6%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	2.9	1%	0	0.0%	12.9	6%	0	0.0%
R09	Residence	561388	4886383	TSP	24	46	39%	0	0.0%	85	71%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	10.0	20%	0	0.0%	32	64%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	22	6%	0	0.0%	33	8%	0	0.0%
					24	4.6	2%	0	0.0%	15	7%	0	0.0%
R10	Residence	561573	4886429	TSP	24	58	48%	0	0.0%	97	81%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	13	27%	0	0.0%	35	71%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.9	19%	0	0.0%	2.2	45%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	4.2	2%	0	0.0%	14	7%	0	0.0%

Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R11	Residence	561765	4886584	TSP	24	37	31%	0	0.0%	76	63%	0	0.0%
					Annual	3.1	5%	0	0.0%	25	42%	0	0.0%
				PM10	24	8.7	17%	0	0.0%	31	61%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	0.7	13%	0	0.0%	2.0	39%	0	0.0%
				NO2	1	26	7%	0	0.0%	37	9%	0	0.0%
					24	4.0	2%	0	0.0%	14	7%	0	0.0%
R12	Residence	562024	4886810	TSP	24	36	30%	0	0.0%	75	62%	0	0.0%
					Annual	3.6	6%	0	0.0%	26	43%	0	0.0%
				PM10	24	9	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.9	18%	0	0.0%	2.2	44%	0	0.0%
				NO2	1	27	7%	0	0.0%	38	9%	0	0.0%
					24	2.9	1%	0	0.0%	13	6%	0	0.0%
R13	Residence	562535	4887071	TSP	24	29	24%	0	0.0%	68	57%	0	0.0%
					Annual	2.1	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	7.2	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	1.5	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.0	21%	0	0.0%	2.3	47%	0	0.0%
				NO2	1	15	4%	0	0.0%	26	7%	0	0.0%
					24	2.5	1%	0	0.0%	13	6%	0	0.0%
R14	Residence	562459	4887525	TSP	24	26	22%	0	0.0%	65	54%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	10	19%	0	0.0%	32	63%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.4	27%	0	0.0%	2.7	53%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	2.7	1%	0	0.0%	13	6%	0	0.0%
R15	Residence	562354	4887691	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	2.5	4%	0	0.0%	25	42%	0	0.0%
				PM10	24	8	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	49%	0	0.0%
					Annual	0.2	2%	0	0.0%	6.7	76%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	2.3	1%	0	0.0%	12	6%	0	0.0%
R16	Residence	562503	4887866	TSP	24	20	16%	0	0.0%	59	49%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	41%	0	0.0%
				PM10	24	5.5	11%	0	0.0%	27	55%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	17	4%	0	0.0%	28	7%	0	0.0%
					24	1.9	1%	0	0.0%	12	6%	0	0.0%

Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R17	Residence	562495	4887990	TSP	24	22	18%	0	0.0%	61	51%	0	0.0%
					Annual	1.8	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.6	13%	0	0.0%	29	57%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	17	4%	0	0.0%	28	7%	0	0.0%
					24	1.7	1%	0	0.0%	12	6%	0	0.0%
R18	Residence	562468	4888095	TSP	24	25	21%	0	0.0%	64	53%	0	0.0%
					Annual	1.7	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.4	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	21%	0	0.0%	2.4	47%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	2.1	1%	0	0.0%	12	6%	0	0.0%
R19	Residence	562470	4888205	TSP	24	23	19%	0	0.0%	62	52%	0	0.0%
					Annual	1.6	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.2	16%	0	0.0%	30	60%	0	0.0%
				PM2.5	24	1.3	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	23%	0	0.0%	2.4	49%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	2.5	1%	0	0.0%	12	6%	0	0.0%
R20	Residence	562294	4888277	TSP	24	21	18%	0	0.0%	60	50%	0	0.0%
					Annual	1.9	3%	0	0.0%	24	40%	0	0.0%
				PM10	24	8.3	17%	0	0.0%	30	61%	0	0.0%
				PM2.5	24	1.4	5%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	2%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.2	24%	0	0.0%	2.5	50%	0	0.0%
				NO2	1	20	5%	0	0.0%	31	8%	0	0.0%
					24	2.7	1%	0	0.0%	13	6%	0	0.0%
R21	Residence	562437	4888378	TSP	24	17	14%	0	0.0%	56	46%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	6.3	13%	0	0.0%	28	57%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.0	19%	0	0.0%	2.3	45%	0	0.0%
				NO2	1	18	5%	0	0.0%	29	7%	0	0.0%
					24	2.1	1%	0	0.0%	12	6%	0	0.0%
R22	Residence	562393	4888471	TSP	24	13	11%	0	0.0%	52	43%	0	0.0%
					Annual	1.4	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	4.7	9%	0	0.0%	27	53%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.8	16%	0	0.0%	2.1	42%	0	0.0%
				NO2	1	16	4%	0	0.0%	27	7%	0	0.0%
					24	1.7	1%	0	0.0%	12	6%	0	0.0%

Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R23	Residence	562462	4888662	TSP	24	12	10%	0	0.0%	51	43%	0	0.0%
					Annual	1.1	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.0	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.7	2%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	13	3%	0	0.0%	24	6%	0	0.0%
					24	1.0	0%	0	0.0%	11.0	5%	0	0.0%
R24	Residence	562277	4889601	TSP	24	9	8%	0	0.0%	48	40%	0	0.0%
					Annual	0.6	1%	0	0.0%	23	38%	0	0.0%
				PM10	24	2.9	6%	0	0.0%	25	50%	0	0.0%
				PM2.5	24	0.5	2%	0	0.0%	12	45%	0	0.0%
					Annual	0.0	0%	0	0.0%	6.5	74%	0	0.0%
				Silica	24	0.4	8%	0	0.0%	1.7	34%	0	0.0%
				NO2	1	10	3%	0	0.0%	21	5%	0	0.0%
					24	0.8	0%	0	0.0%	10.8	5%	0	0.0%
R25	Residence	562110	4889488	TSP	24	8	7%	0	0.0%	47	39%	0	0.0%
					Annual	0.6	1%	0	0.0%	23	38%	0	0.0%
				PM10	24	2.7	5%	0	0.0%	25	49%	0	0.0%
				PM2.5	24	0.5	2%	0	0.0%	12	45%	0	0.0%
					Annual	0.0	1%	0	0.0%	6.5	74%	0	0.0%
				Silica	24	0.4	7%	0	0.0%	1.7	33%	0	0.0%
				NO2	1	10	3%	0	0.0%	21	5%	0	0.0%
					24	0.8	0%	0	0.0%	10.8	5%	0	0.0%
R26	Residence	561506	4889533	TSP	24	12	10%	0	0.0%	51	42%	0	0.0%
					Annual	0.7	1%	0	0.0%	23	38%	0	0.0%
				PM10	24	3.5	7%	0	0.0%	26	51%	0	0.0%
				PM2.5	24	0.7	3%	0	0.0%	12	46%	0	0.0%
					Annual	0.0	1%	0	0.0%	6.5	74%	0	0.0%
				Silica	24	0.5	9%	0	0.0%	1.8	35%	0	0.0%
				NO2	1	17	4%	0	0.0%	28	7%	0	0.0%
					24	1.1	1%	0	0.0%	11.1	6%	0	0.0%
R27	Residence	561068	4889494	TSP	24	15	13%	0	0.0%	54	45%	0	0.0%
					Annual	0.7	1%	0	0.0%	23	39%	0	0.0%
				PM10	24	5.2	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	13	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	74%	0	0.0%
				Silica	24	0.6	12%	0	0.0%	1.9	38%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	1.3	1%	0	0.0%	11.3	6%	0	0.0%
R28	Residence	560937	4889197	TSP	24	14	12%	0	0.0%	53	45%	0	0.0%
					Annual	1.0	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.9	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.4	9%	0	0.0%	1.7	35%	0	0.0%
				NO2	1	18	5%	0	0.0%	29	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%

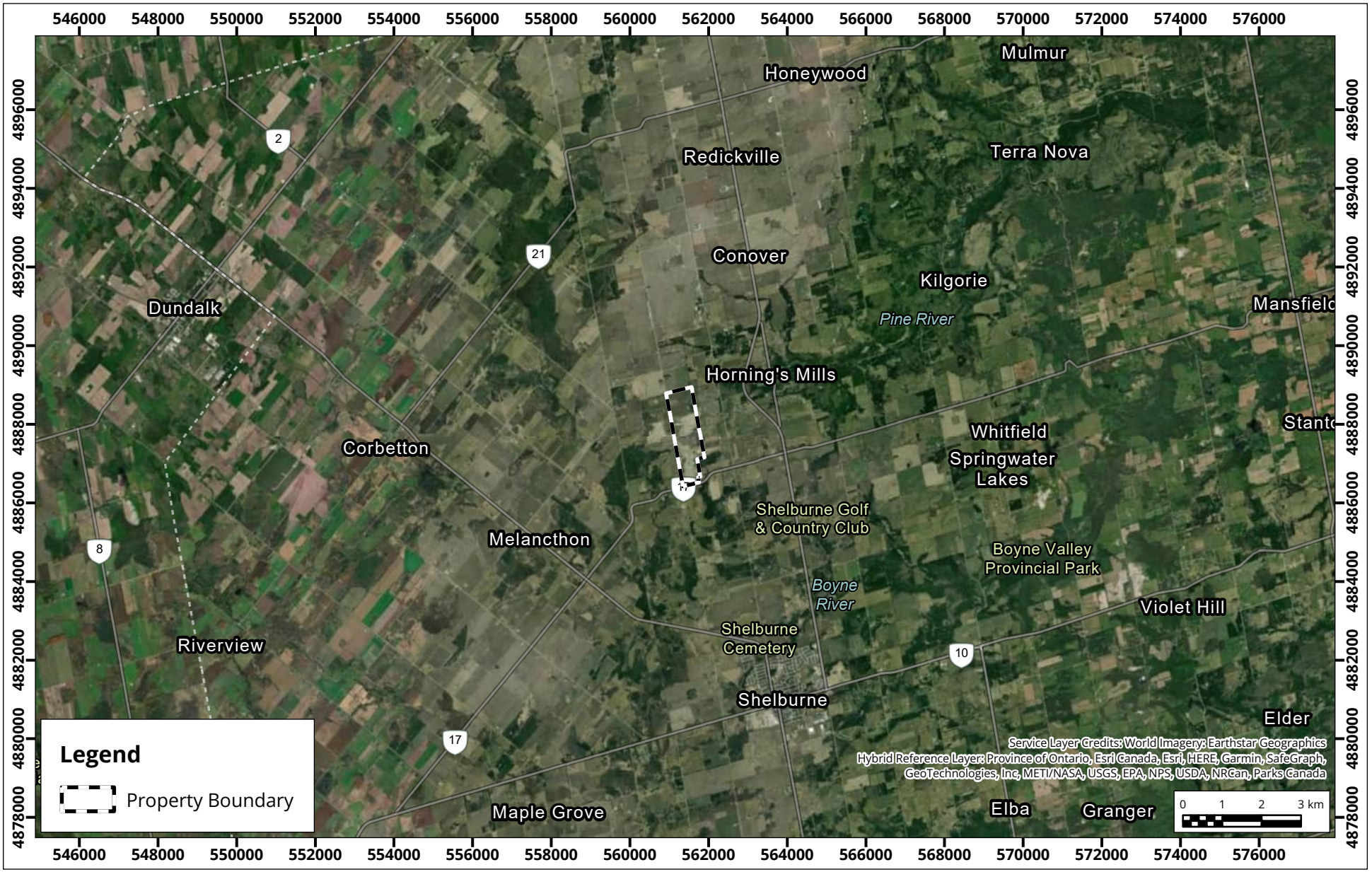
Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
R29	Residence	560769	4889100	TSP	24	14	11%	0	0.0%	53	44%	0	0.0%
					Annual	0.9	2%	0	0.0%	23	39%	0	0.0%
				PM10	24	4.3	9%	0	0.0%	26	53%	0	0.0%
				PM2.5	24	1.0	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	1.8	1%	0	0.0%	11.8	6%	0	0.0%
VL30	Vacant Land	561886	4886708	TSP	24	39	33%	0	0.0%	78	65%	0	0.0%
					Annual	3.7	6%	0	0.0%	26	44%	0	0.0%
				PM10	24	9.5	19%	0	0.0%	31	63%	0	0.0%
				PM2.5	24	2.1	8%	0	0.0%	14	51%	0	0.0%
					Annual	0.2	3%	0	0.0%	6.7	77%	0	0.0%
				Silica	24	0.8	15%	0	0.0%	2.1	41%	0	0.0%
				NO2	1	25	6%	0	0.0%	36	9%	0	0.0%
					24	3.9	2%	0	0.0%	14	7%	0	0.0%
VL31	Vacant Land	562473	4888310	TSP	24	20	17%	0	0.0%	59	49%	0	0.0%
					Annual	1.5	2%	0	0.0%	24	40%	0	0.0%
				PM10	24	7	15%	0	0.0%	29	59%	0	0.0%
				PM2.5	24	1.2	4%	0	0.0%	13	48%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	1.1	22%	0	0.0%	2.4	48%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	2.4	1%	0	0.0%	12.4	6%	0	0.0%
VL32	Vacant Land	562367	4889054	TSP	24	13	10%	0	0.0%	52	43%	0	0.0%
					Annual	0.8	1%	0	0.0%	23	39%	0	0.0%
				PM10	24	3.3	7%	0	0.0%	25	51%	0	0.0%
				PM2.5	24	0.6	2%	0	0.0%	12	46%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	9%	0	0.0%	1.8	35%	0	0.0%
				NO2	1	10	3%	0	0.0%	21	5%	0	0.0%
					24	1.0	1%	0	0.0%	11.0	6%	0	0.0%
VL33	Vacant Land	561431	4889496	TSP	24	15	12%	0	0.0%	54	45%	0	0.0%
					Annual	0.7	1%	0	0.0%	23	38%	0	0.0%
				PM10	24	3.8	8%	0	0.0%	26	52%	0	0.0%
				PM2.5	24	0.8	3%	0	0.0%	12	46%	0	0.0%
					Annual	0.0	1%	0	0.0%	6.5	74%	0	0.0%
				Silica	24	0.4	8%	0	0.0%	1.7	34%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	1.5	1%	0	0.0%	11.5	6%	0	0.0%
VL34	Vacant Land	561270	4889442	TSP	24	17	14%	0	0.0%	56	47%	0	0.0%
					Annual	0.7	1%	0	0.0%	23	39%	0	0.0%
				PM10	24	6.9	14%	0	0.0%	29	58%	0	0.0%
				PM2.5	24	0.9	3%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	74%	0	0.0%
				Silica	24	0.4	8%	0	0.0%	1.7	34%	0	0.0%
				NO2	1	19	5%	0	0.0%	30	7%	0	0.0%
					24	1.2	1%	0	0.0%	11.2	6%	0	0.0%

Scenario 4B

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 Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)	Maximum Predicted 24-Hour Concentration (µg/m³)	Percentage of Revelant Criteria (%)	Number of Predicted Excursions Above Criteria over 5 Years	Frequency of Predicted Excursions Above Criteria (%)
VL35	Vacant Land	560997	4888972	TSP	24	17	14%	0	0.0%	56	47%	0	0.0%
					Annual	1.2	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	6	12%	0	0.0%	28	56%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	11%	0	0.0%	1.8	37%	0	0.0%
				NO2	1	21	5%	0	0.0%	32	8%	0	0.0%
					24	1.7	1%	0	0.0%	12	6%	0	0.0%
VL36	Vacant Land	560793	4888922	TSP	24	17	14%	0	0.0%	56	46%	0	0.0%
					Annual	1.1	2%	0	0.0%	24	39%	0	0.0%
				PM10	24	5	10%	0	0.0%	27	54%	0	0.0%
				PM2.5	24	1.1	4%	0	0.0%	13	47%	0	0.0%
					Annual	0.1	1%	0	0.0%	6.6	75%	0	0.0%
				Silica	24	0.5	10%	0	0.0%	1.8	36%	0	0.0%
				NO2	1	18	4%	0	0.0%	29	7%	0	0.0%
					24	1.9	1%	0	0.0%	12	6%	0	0.0%
VL37	Vacant Land	560863	4888387	TSP	24	30	25%	0	0.0%	69	58%	0	0.0%
					Annual	2.3	4%	0	0.0%	25	41%	0	0.0%
				PM10	24	12	24%	0	0.0%	34	68%	0	0.0%
				PM2.5	24	1.9	7%	0	0.0%	14	50%	0	0.0%
					Annual	0.2	2%	0	0.0%	7	76%	0	0.0%
				Silica	24	1.3	26%	0	0.0%	2.6	52%	0	0.0%
				NO2	1	26	6%	0	0.0%	37	9%	0	0.0%
					24	2.7	1%	0	0.0%	13	6%	0	0.0%

FIGURES



Site Location

True North

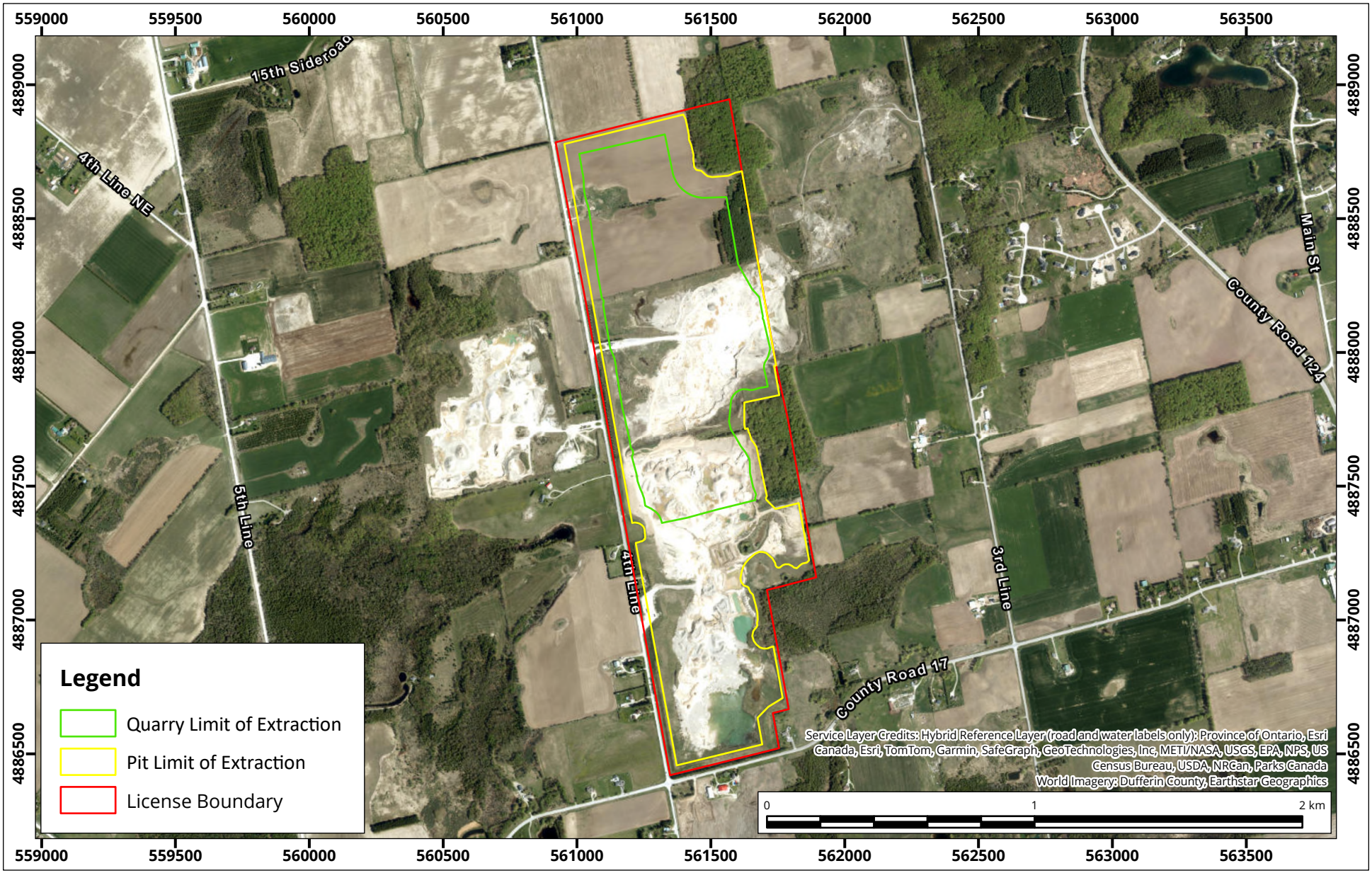
Drawn by: PIP	Figure: 1
Approx. Scale:	1:136,000
Date Revised: Jun 13, 2024	

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry - Melancthon, Ontario

Project #: 2300646

Map Document: C:\WorkingFolder\Jobs_Guelph_1\P2300646_StradaMiningPlan\P2300646_StradaMiningPlan.aprx



Site Plan showing License Boundary and Limits of Extraction

True North

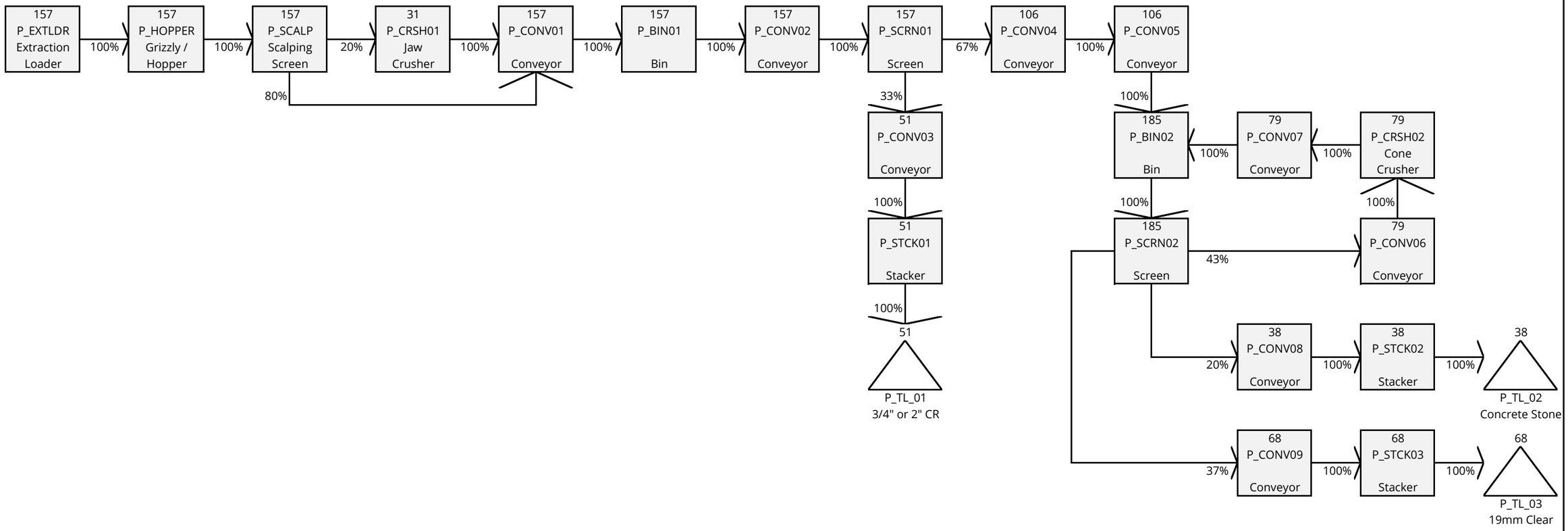
Drawn by: PIP	Figure:	2
Approx. Scale:		1:20,000
Date Revised:		Jan 21, 2025

Map Projection: NAD 1983 UTM Zone 17N

Strada Mining Plan - Melancthon, Ontario

Project #: 2300646

Map Document: C:\WorkingFolder\Jobs_America\P2300646\P2300646_StradaMiningPlan.aprx

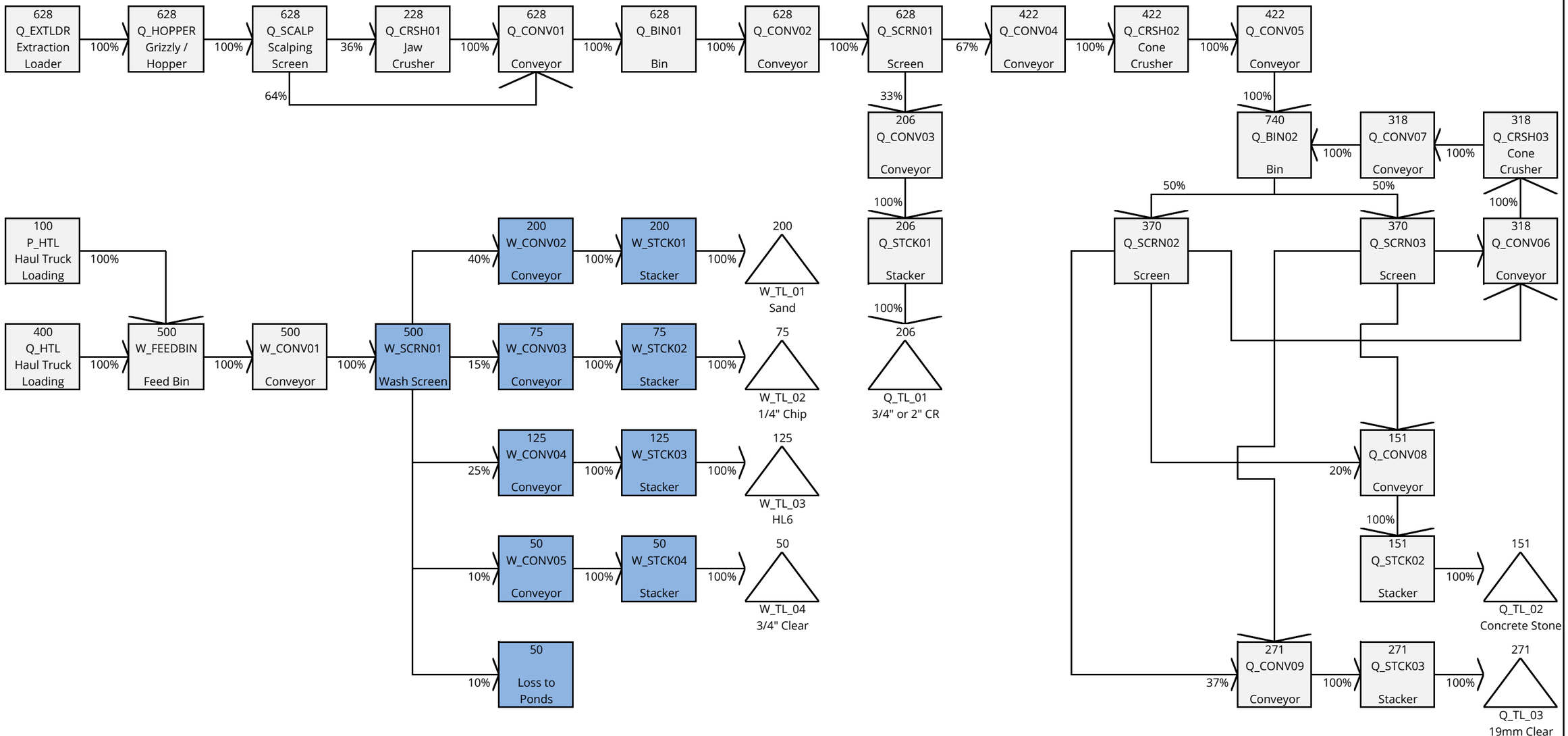


Denotes Dry Process
Denotes Wet Process

Aggregate Processing Plant Process Flow Diagram
Pit Operations during Phases 1B(1), 1B(3), 2A and 2B

Strada Pit / Quarry, Melancthon, Ontario — RWDI Project 2300646

Drawn by: BGS | Figure: **3.1**
Approx. Scale: not to scale
Date Revised: Jun 13, 2024

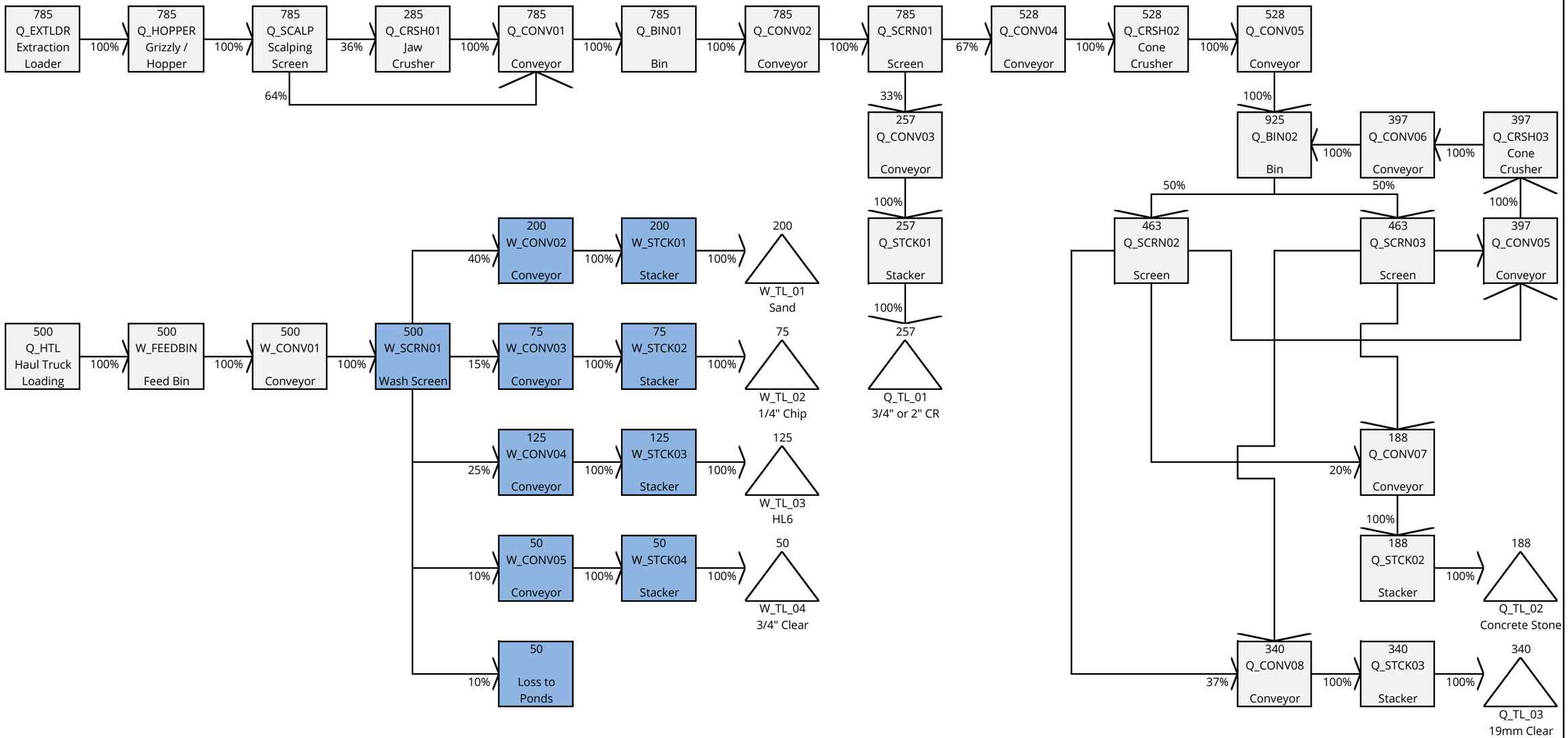


Denotes Dry Process
Denotes Wet Process

Aggregate Processing Plant Process Flow Diagram
Quarry & Wash Plant Operations during Phases 1B(1), 1B(3), 2A and 2B

Strada Pit / Quarry, Melancthon, Ontario — RWDI Project 2300646

Drawn by: BGS | Figure: **3.2**
Approx. Scale: not to scale
Date Revised: June 13, 2024

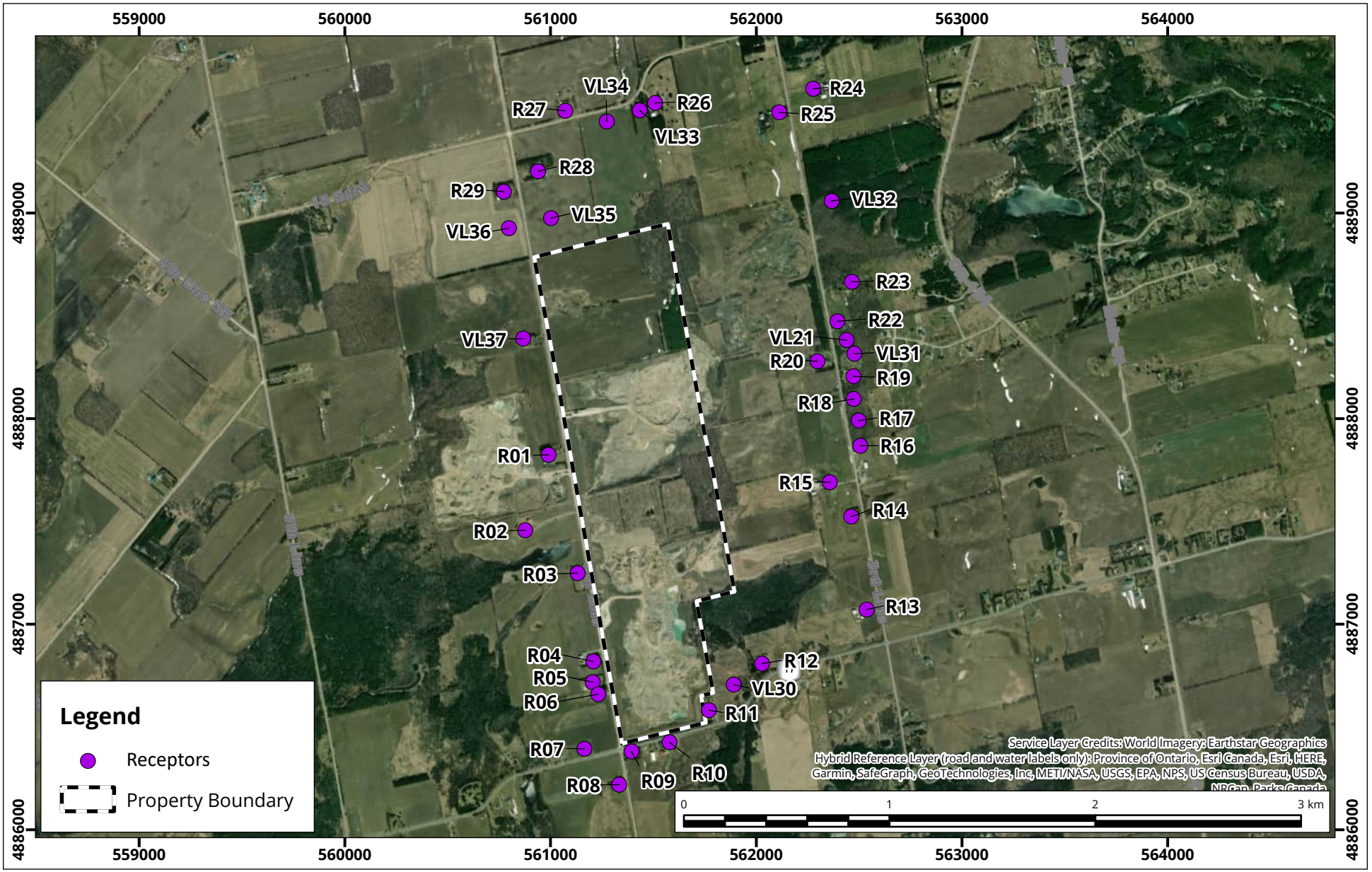


Denotes Dry Process
Denotes Wet Process

Aggregate Processing Plant Process Flow Diagram
Quarry & Wash Plant Operations during Phases 2C through 4B

Strada Pit / Quarry, Melancthon, Ontario — RWDI Project 2300646

Drawn by: BGS | Figure: **3.3**
Approx. Scale: not to scale
Date Revised: Jun 13, 2024



Receptor Locations

True North

Drawn by: PIP | Figure: 4

Approx. Scale: 1:26,000

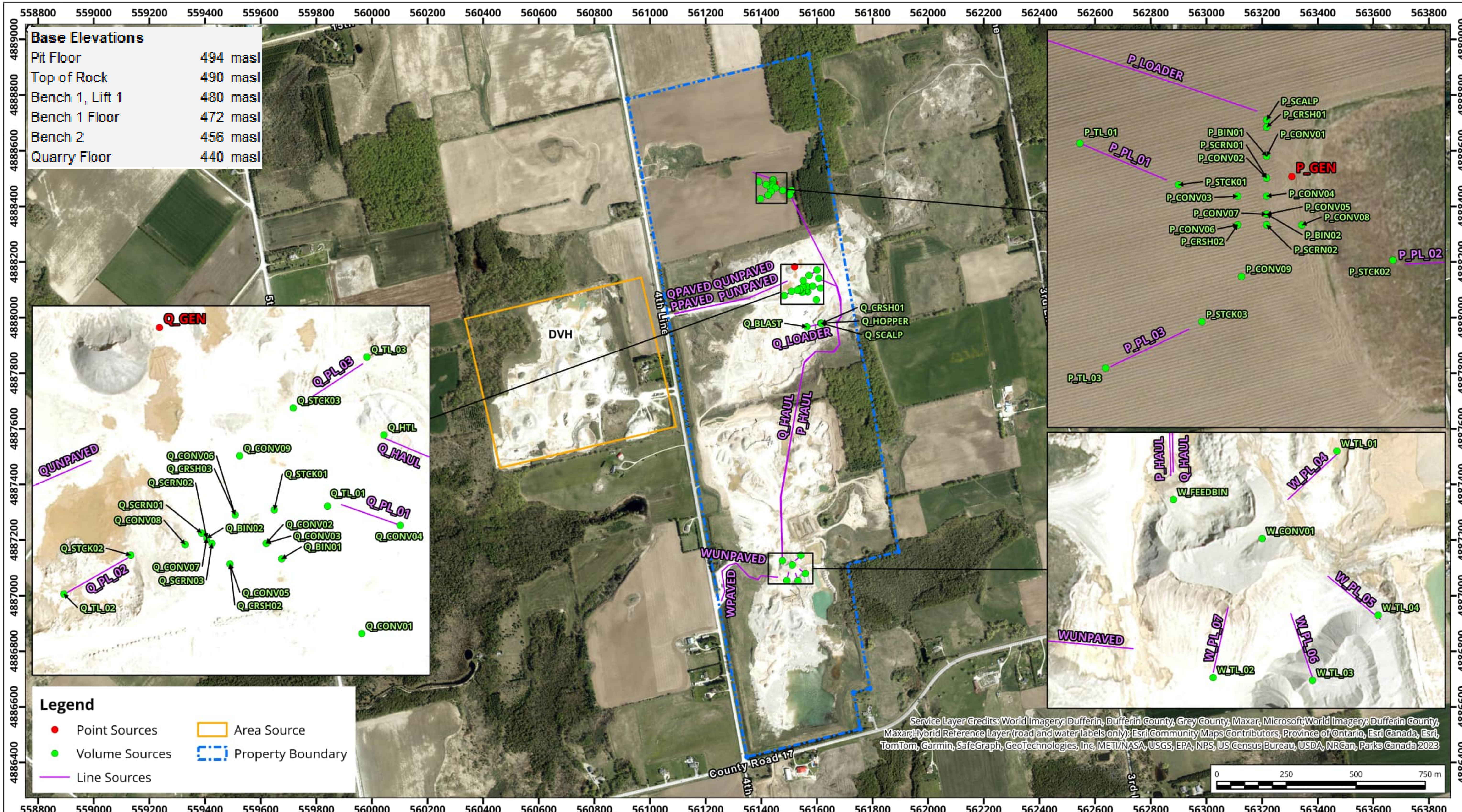
Date Revised: Jun 13, 2024

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry - Melancthon, Ontario

Project #: 2300646

Map Document: C:\WorkingFolder\Jobs_Guelph_\1\P2300646_StradaMiningPlan\P2300646_StradaMiningPlan.aprx



Base Elevations
Pit Floor 494 masl
Top of Rock 490 masl
Bench 1, Lift 1 480 masl
Bench 1 Floor 472 masl
Bench 2 456 masl
Quarry Floor 440 masl
DVH
4th Line
County Road 17
Q_GEN
Q_TL_03
Q_PL_03
Q_STCK03
Q_HTL
Q_HAUL
QUNPAVED
Q_CONV06
Q_CRSH03
Q_CONV09
Q_STCK01
Q_SCRN02
Q_SCRN01
Q_CONV08
Q_BIN02
Q_TL_01
Q_PL_01
Q_CONV02
Q_CONV03
Q_BIN01
Q_CONV04
Q_STCK02
Q_PL_02
Q_CONV07
Q_SCRN03
Q_TL_02
Q_CONV05
Q_CRSH02
Q_CONV01
QPAVED QUNPAVED
PPAVED PUNPAVED
Q_CRSH01
Q_BLAST
Q_HOPPER
Q_SCALP
Q_LOADER
Q_HAUL
P_HAUL
WUNPAVED
WPAVED
P_LOADER
P_SCALP
P_CRSH01
P_TL_01
P_BIN01
P_CONV01
P_SCRN01
P_PL_01
P_CONV02
P_GEN
P_STCK01
P_CONV03
P_CONV04
P_CONV05
P_CONV07
P_CONV08
P_CONV06
P_BIN02
P_CRSH02
P_SCRN02
P_PL_02
P_STCK02
P_CONV09
P_STCK03
P_PL_03
P_TL_03
W_TL_01
W_PL_04
W_FEEDBIN
W_CONV01
W_PL_05
W_TL_04
WUNPAVED
W_PL_07
W_PL_06
W_TL_02
W_TL_03
Legend
Point Sources
Volume Sources
Line Sources
Area Source
Property Boundary
Service Layer Credits: World Imagery: Dufferin, Dufferin County, Grey County, Maxar, Microsoft;World Imagery: Dufferin County, Maxar;Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada 2023
0 250 500 750 m

Source Locations - Phase 1B(1)

True North

Drawn by:	PIP	Figure: 10.1
Approx. Scale:		1:13,000
Date Revised:		Jun 12, 2024

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry – Melancthon, Ontario

Project #: 2300646

Base Elevations	
Pit Floor	494 masl
Top of Rock	490 masl
Bench 1, Lift 1	480 masl
Bench 1 Floor	472 masl
Bench 2	456 masl
Quarry Floor	440 masl

Legend

- Point Sources
- Volume Sources
- Line Sources
- Area Source
- Property Boundary

Service Layer Credits: World Imagery: Dufferin, Dufferin County, Grey County, Maxar, Microsoft;World Imagery: Dufferin County, Maxar;Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada 2023

0 250 500 750 m

Source Locations - Phase 1B(3)

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry – Melancthon, Ontario

True North

Project #: 2300646

Drawn by:	PIP	Figure: 10.2
Approx. Scale:		1:13,000
Date Revised:		Jun 12, 2024

Map Document: C:\Working\Folder\jobs_Americas\P2300646\P2300646_StradaMiningPlan.aprx

Base Elevations	
Pit Floor	494 masl
Top of Rock	490 masl
Bench 1, Lift 1	480 masl
Bench 1 Floor	472 masl
Bench 2	456 masl
Quarry Floor	440 masl

DVH

Q_BLAST
Q_HOPPER
Q_CRSH01
Q_SCALP
Q_LOADER
PUNPAVED
PPAVED
QPAVED
QUNPAVED
Q_HAUL
P_HAUL

P_LOADER
P_TL_01
P_PL_01
P_CONV01
P_BIN01
P_SCALP
P_CRSH01
P_STCK01
P_CONV02
P_SCRN01
P_CONV03
P_GEN
P_CONV07
P_CONV05
P_BIN02
P_CONV04
P_STCK02
P_TL_02
P_CRSH02
P_CONV06
P_PL_02
P_SCRN02
P_CONV09
P_CONV08
P_STCK03
P_HTL
P_HAUL
P_PL_03
P_TL_03

Q_CONV01
Q_CONV04
Q_TL_01
Q_PL_01
Q_BIN01
Q_CONV02
Q_CONV03
Q_GEN
Q_CRSH02
Q_CONV05
Q_SCRN03
Q_SCRN02
Q_STCK01
Q_CONV06
Q_CONV08
Q_CRSH03
Q_STCK02
Q_CONV09
Q_CONV07
Q_SCRN01
Q_BIN02
Q_PL_02
Q_STCK03
Q_TL_02
Q_PL_03
Q_TL_03
Q_HTL
Q_HAUL

P_HAUL
Q_HAUL
W_TL_01
W_PL_04
W_FEEDBIN
W_CONV01
W_PL_05
W_TL_04
W_PL_07
W_PL_06
W_TL_02
W_TL_03
WUNPAVED

WPAVED
County Road 17
4th
3rd

Legend

- Point Sources
- Volume Sources
- Line Sources
- Area Source
- Property Boundary

0 250 500 750 m

Map Document: C:\Working\Folder\Jobs_American\2300646\2300646_StradaMining\Plan.aprx

Source Locations - Phase 2A

Map Projection: NAD 1983 UTM Zone 17N
Strada Pit / Quarry – Melancthon, Ontario

True North

Project #: 2300646

Drawn by:	PIP	Figure: 10.3
Approx. Scale:		1:13,000
Date Revised:		Jun 12, 2024

Base Elevations	
Pit Floor	494 masl
Top of Rock	490 masl
Bench 1, Lift 1	480 masl
Bench 1 Floor	472 masl
Bench 2	456 masl
Quarry Floor	440 masl

Legend

- Point Sources
- Volume Sources
- Line Sources
- Area Source
- Property Boundary

Service Layer Credits: World Imagery: Dufferin, Dufferin County, Grey County, Maxar, Microsoft;World Imagery: Dufferin County, Maxar;Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada 2023

0 250 500 750 m

Source Locations - Phase 2B

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry – Melancthon, Ontario

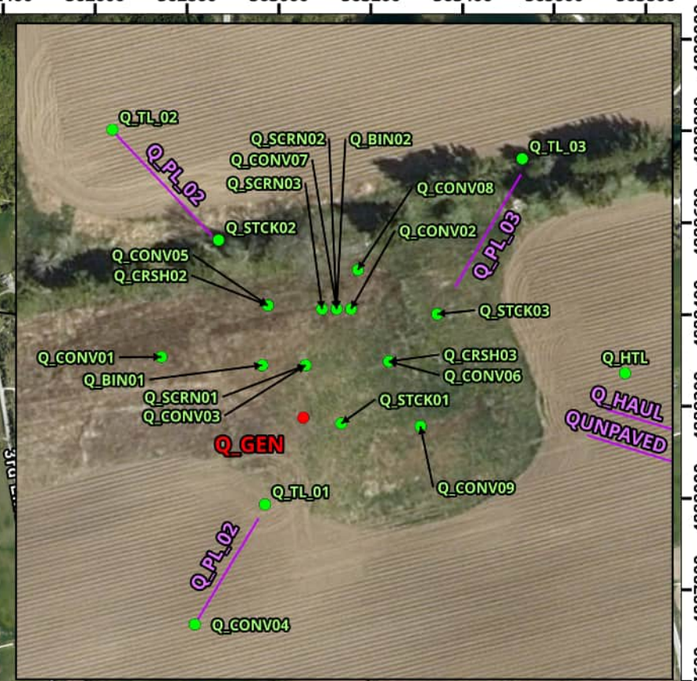
True North

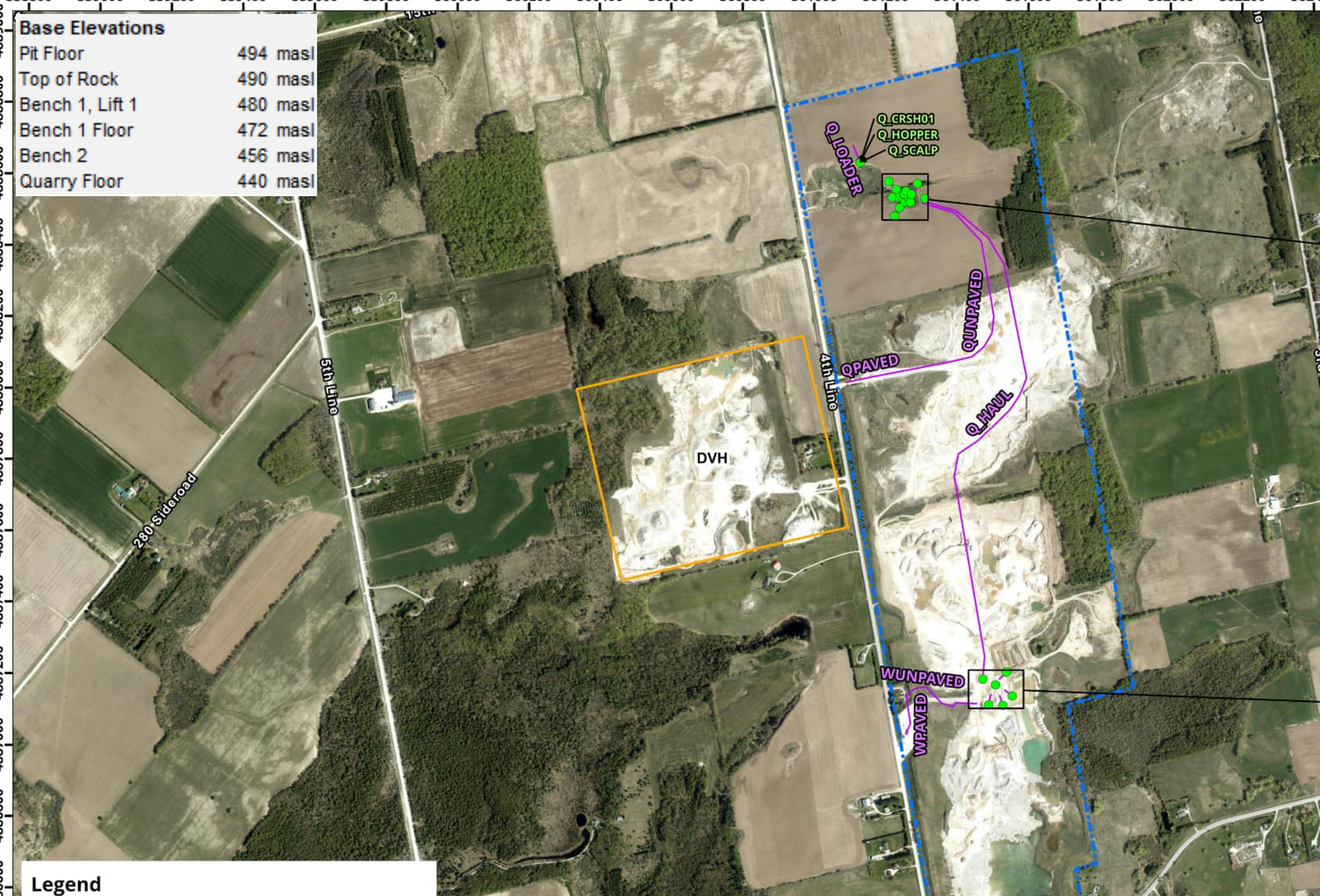
Project #: 2300646

Drawn by: PIP	Figure: 10.4
Approx. Scale:	1:13,000
Date Revised:	Jun 12, 2024

Map Document: C:\Working\Folder\jobs_Americas\P2300646\P2300646_StradaMiningPlan.aprx

Base Elevations	
Pit Floor	494 masl
Top of Rock	490 masl
Bench 1, Lift 1	480 masl
Bench 1 Floor	472 masl
Bench 2	456 masl
Quarry Floor	440 masl





Service Layer Credits: World Imagery: Dufferin, Dufferin County, Grey County, Maxar, Microsoft;World Imagery: Dufferin County, Maxar;Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada 2023

0 250 500 750 m

Legend

- Point Sources
- Volume Sources
- Line Sources
- Area Source
- Property Boundary

Source Locations - Phase 2C

Map Projection: NAD 1983 UTM Zone 17N

Strada Pit / Quarry – Melancthon, Ontario

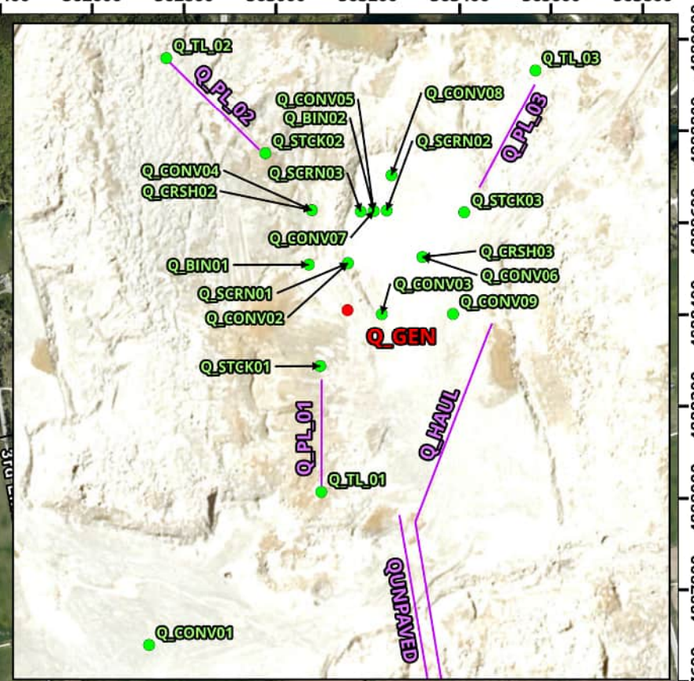
True North

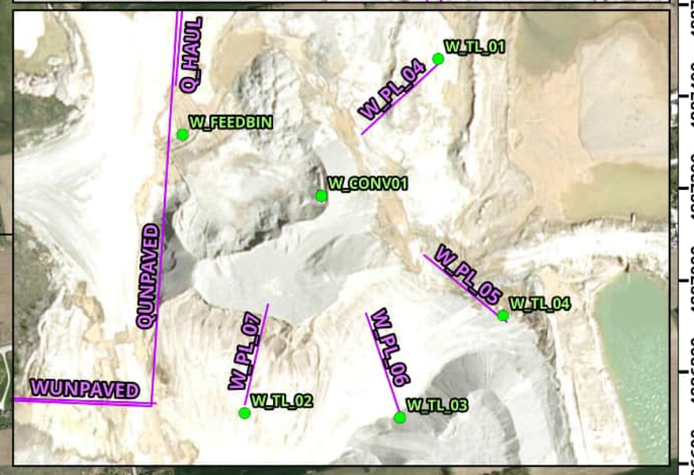
Project #: 2300646

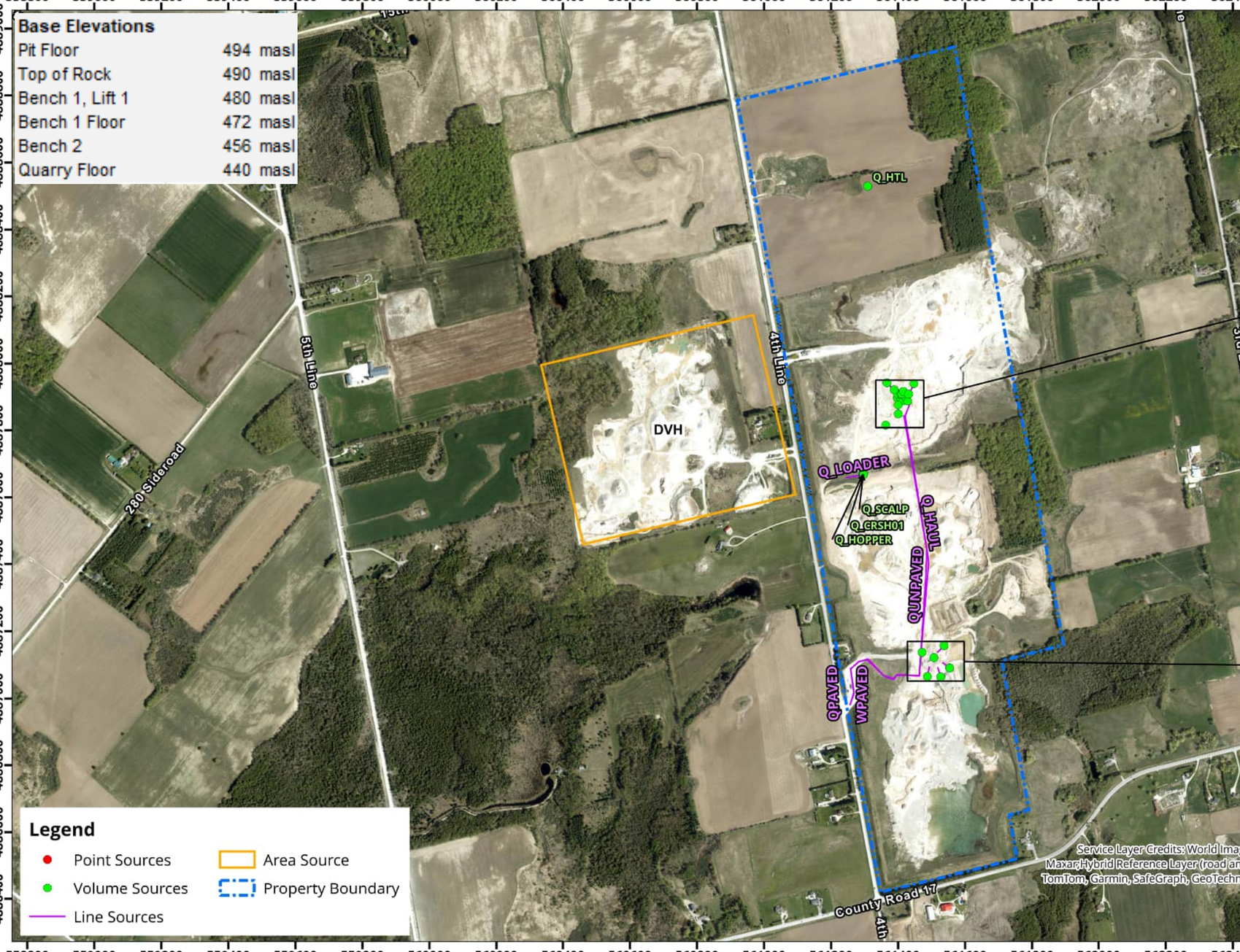
Drawn by: PIP	Figure: 10.5
Approx. Scale:	1:13,000
Date Revised:	Jun 12, 2024

Map Document: C:\Working\Folder\jobs_Americas\P2300646\P2300646_StradaMiningPlan.aprx

Base Elevations	
Pit Floor	494 masl
Top of Rock	490 masl
Bench 1, Lift 1	480 masl
Bench 1 Floor	472 masl
Bench 2	456 masl
Quarry Floor	440 masl







Legend

- Point Sources
- Volume Sources
- Line Sources
- Area Source
- Property Boundary

Service Layer Credits: World Imagery: Dufferin, Dufferin County, Grey County, Maxar, Microsoft;World Imagery: Dufferin County, Maxar;Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada 2023

0 250 500 750 m

Map Document: C:\Working\Folder\jobs_Americas\P2300640\P2300640_StradaMiningPlan.aprx

Source Locations - Phase 4B

Map Projection: NAD 1983 UTM Zone 17N

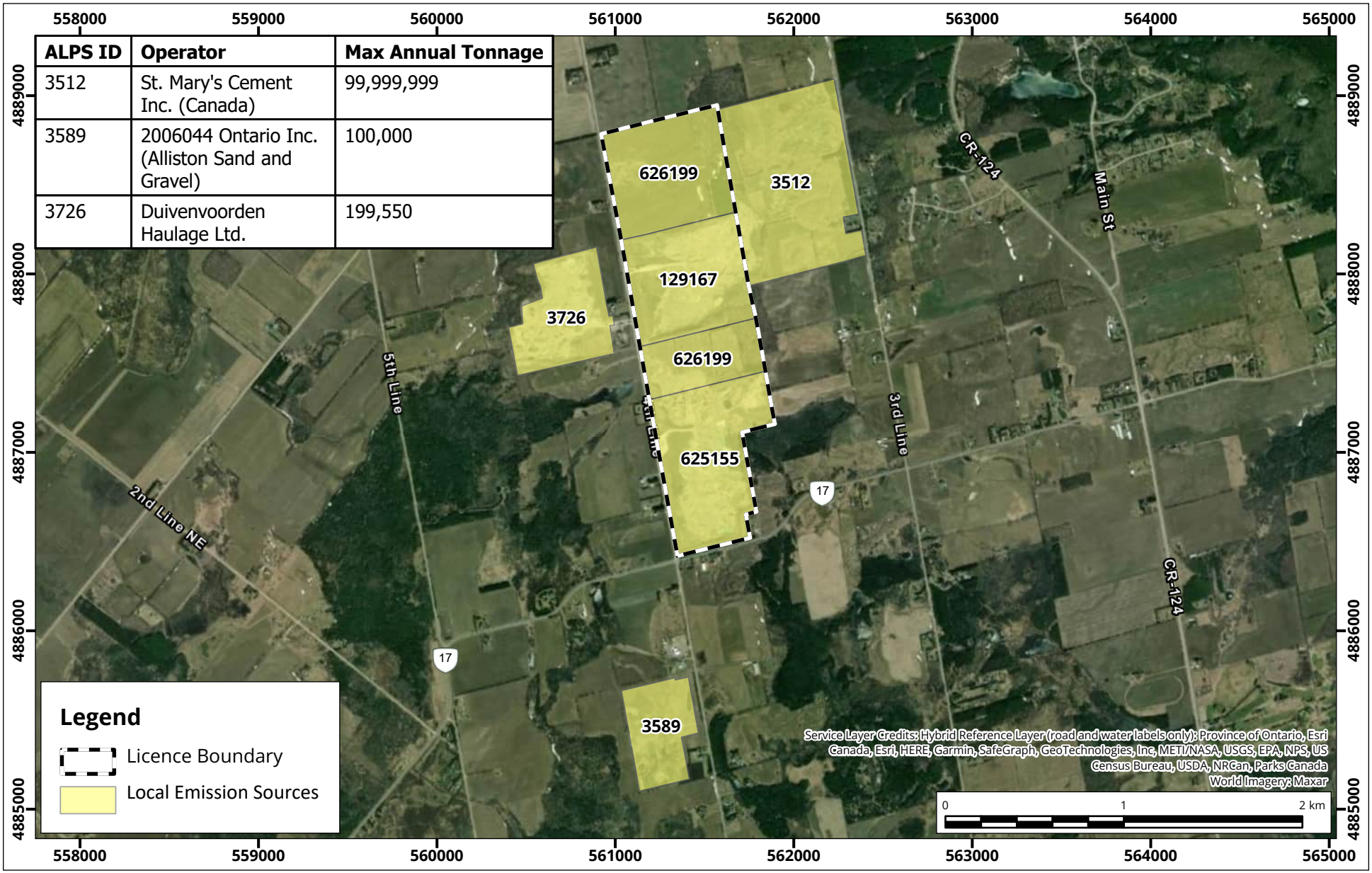
Strada Pit / Quarry – Melancthon, Ontario

True North

Project #: 2300646

Drawn by:	PIP	Figure: 10.6	
Approx. Scale:	1:13,000		
Date Revised:	Jun 12, 2024		

ALPS ID	Operator	Max Annual Tonnage
3512	St. Mary's Cement Inc. (Canada)	99,999,999
3589	2006044 Ontario Inc. (Alliston Sand and Gravel)	100,000
3726	Duivenvoorden Haulage Ltd.	199,550



Local Emission Sources

True North

Drawn by: PIP | Figure: 11

Approx. Scale: 1:30,000

Date Revised: Jun 13, 2024

Map Projection: NAD 1983 UTM Zone 17N

Strada Mining Plan - Melancthon, Ontario

Project #: 2300646

Map Document: C:\WorkingFolder\Jobs_Guelph_\P2300646_StradaMiningPlan\P2300646_StradaMiningPlan.aprx

APPENDIX A

Appendix A: Blasting Operations Emission Spreadsheet

Strada Shelburne Quarry

Project #2300646

WESTERN SURFACE COAL MINING - AP-42 Section 11.9
EXPLOSIVES DETONATION - AP-42 Section 13.3

Blasting operation particulate emissions: $E = 0.00022\ k * A^{1.5}$

E emission factor
k particle size multiplier (1.13, 1.0, 0.52 and 0.03 for TSP, PM_{30}, PM_{10} and $PM_{2.5}$, respectively)
A blast surface area (m^2)

Source ID	Source Description	Total Blast Area (m^2)	Explosive Type	Shot Size (Charge) (Mg)	Number of Blasts			Base AP-42 Emission Factor					Base Emission Rate					Additional Control Efficiency Applied (%)	Final Controlled Emission Rate									
					Hourly	Daily	Annual	TSP (kg/blast)	PM_{10} (kg/blast)	$PM_{2.5}$ (kg/blast)	Silica (kg/blast)	NOx (kg/Mg)	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	Silica (g/s)	NOx (g/s)		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	NOx (g/s)	Data Quality Rating
Q_BLAST	Blasting at working face	1250	ANFO	13	1	1	40	1.10E+01	5.06E+00	2.92E-01	1.04E-01	8.00E+00	3.1E+00	1.4E+00	8.1E-02	2.9E-02	2.9E+01		3.1E+00	C	1.4E+00	C	8.1E-02	C	1.4E+00	C	2.9E+01	D

Sample calculation for uncontrolled TSP emission factor for Source Q_BLAST: Blasting at working face.

EF = 0.00022 x (1.13) x (1250 m)^1.5 = 1.10E+01 kg TSP / blast

Sample calculation for hourly TSP emission rate for Source Q_BLAST: Blasting at working face.

$$\frac{1\ \text{blast}}{1\ \text{h}} \times \frac{1.10\text{E+01}\ \text{kg}_{TSP}}{1\ \text{blast}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{1000\ \text{g}_{TSP}}{1\ \text{kg}_{TSP}} = 3.1\text{E+00}\ \text{g}_{TSP}/\text{s}$$

Sample calculation for NOx emission rate for Source Q_BLAST: Blasting at working face.

$$\frac{13\ \text{Mg}_{explosive}}{1\ \text{blast}} \times \frac{1\ \text{blast}}{1\ \text{h}} \times \frac{8.0\text{E+00}\ \text{kg}_{NOx}}{1\ \text{Mg}_{explosive}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{1000\ \text{g}_{NOx}}{1\ \text{kg}_{NOx}} = 2.9\text{E+01}\ \text{g}_{NOx}/\text{s}$$

Comments

A silica content of: 2.06% was used in the assessment. This reflects the average value of 14 XRF tests on 2 core samples
k-factor for TSP (PM_{44}) scaled up logarithmically to 1.13 from published k-factor of 1.0 which refers to PM_{30}.
Annual number of blasts reflects a predicted maximum estimated based on annual production limit, blast area and average bench depth
Blast area based on 50,000 tonnes per blast, average 15m bench depth, dolostone density of 2670 kg/m^3

APPENDIX B

Appendix B: Bulk Material Handling Emissions Spreadsheet

Strada Shelburne Quarry

Project #2300646

AGGREGATE HANDLING AND STORAGE PILES - AP-42 Section 13.2.4

Average recorded hourly wind speed (m/s):
(used for sample calculations & factor validation) 3.7

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) [2]
U mean wind speed, meters per second (m/s)
M material moisture content (%)

Source ID	Description	Processing Rate		Site Data				Base AP-42 Emission Factor				Base Emission Rate				Additional Control Efficiency Applied	Final Controlled Emission Rate at 3.7 m/s							
		Hourly	Daily	Site Specific Data?	Silt Content	Moisture Content	Source Conditions Valid [1]	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)	(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)	
PHASES 1B(1), 1B(3), 2A AND 2B - GRAVEL PIT OPERATIONS (DURING INITIAL QUARRY OPERATIONS)																								
P_HOPPER	Loader Transfer to Hopper	157	1,884	n	3.9%	3.00%	valid	1.4E-03	6.2E-04	9.4E-05	1.4E-04	6.2E-02	2.7E-02	4.1E-03	5.9E-03		6.2E-02	B	2.7E-02	B	4.1E-03	B	5.9E-03	B
P_STCK01	Stacker - 3/4" or 2" Crushed	51	612	n	3.9%	3.00%	valid	1.4E-03	6.2E-04	9.4E-05	1.4E-04	2.0E-02	8.8E-03	1.3E-03	1.9E-03		2.0E-02	B	8.8E-03	B	1.3E-03	B	1.9E-03	B
P_TL_01	Truck Loading - 3/4" or 2" Crushed	51	612	n	3.9%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.8E-04	4.2E-02	1.9E-02	2.8E-03	4.0E-03		4.2E-02	B	1.9E-02	B	2.8E-03	B	4.0E-03	B
P_STCK02	Stacker - Concrete Stone	38	456	n	3.9%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.8E-04	3.2E-02	1.4E-02	2.1E-03	3.0E-03		3.2E-02	B	1.4E-02	B	2.1E-03	B	3.0E-03	B
P_TL_02	Truck Loading - Concrete Stone	38	456	n	3.9%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.8E-04	3.2E-02	1.4E-02	2.1E-03	3.0E-03		3.2E-02	B	1.4E-02	B	2.1E-03	B	3.0E-03	B
P_STCK03	Stacker - 19mm Clear Stone	68	816	n	3.9%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.8E-04	5.6E-02	2.5E-02	3.7E-03	5.4E-03		5.6E-02	B	2.5E-02	B	3.7E-03	B	5.4E-03	B
P_TL_03	Truck Loading - 19mm Clear Stone	68	816	n	3.9%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.8E-04	5.6E-02	2.5E-02	3.7E-03	5.4E-03		5.6E-02	B	2.5E-02	B	3.7E-03	B	5.4E-03	B
P_HTL	Wash Plant Haul Truck Loading	100	1,200	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	8.3E-02	3.6E-02	5.5E-03	7.5E-04		8.3E-02	B	3.6E-02	B	5.5E-03	B	7.5E-04	B
PHASES 1B(1), 1B(3), 2A AND 2B - GRAVEL PIT OPERATIONS (DURING INITIAL QUARRY OPERATIONS)																								
Q_STCK01	Stacker - 3/4" or 2" Crushed	206	2,472	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.5E-02	1.1E-02	1.5E-03		1.7E-01	B	7.5E-02	B	1.1E-02	B	1.5E-03	B
Q_TL_01	Truck Loading - 3/4" or 2" Crushed	206	2,472	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.5E-02	1.1E-02	1.5E-03		1.7E-01	B	7.5E-02	B	1.1E-02	B	1.5E-03	B
Q_STCK02	Stacker - Concrete Stone	151	1,812	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.3E-01	5.5E-02	8.3E-03	1.1E-03		1.3E-01	B	5.5E-02	B	8.3E-03	B	1.1E-03	B
Q_TL_02	Truck Loading - Concrete Stone	151	1,812	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.3E-01	5.5E-02	8.3E-03	1.1E-03		1.3E-01	B	5.5E-02	B	8.3E-03	B	1.1E-03	B
Q_STCK03	Stacker - 19mm Clear Stone	271	3,252	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.2E-01	9.8E-02	1.5E-02	2.0E-03		2.2E-01	B	9.8E-02	B	1.5E-02	B	2.0E-03	B
Q_TL_03	Truck Loading - 19mm Clear Stone	271	3,252	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.2E-01	9.8E-02	1.5E-02	2.0E-03		2.2E-01	B	9.8E-02	B	1.5E-02	B	2.0E-03	B
Q_HTL	Wash Plant Haul Truck Loading	400	4,800	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	3.3E-01	1.5E-01	2.2E-02	3.0E-03		3.3E-01	B	1.5E-01	B	2.2E-02	B	3.0E-03	B
W_FEEDBIN	Wash Plant Feed Bin	500	6,000	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	4.1E-01	1.8E-01	2.7E-02	3.7E-03		4.1E-01	B	1.8E-01	B	2.7E-02	B	3.7E-03	B
W_STCK01	Wash Plant Stacker - Sand	200	2,400	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.3E-02	1.1E-02	1.5E-03	100%	0.0E+00	B	0.0E+00	B	0.0E+00	B	0.0E+00	B
W_TL_01	Wash Plant Truck Loading - Sand	200	2,400	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.3E-02	1.1E-02	1.5E-03	95%	8.3E-03	B	3.6E-03	B	5.5E-04	B	7.5E-05	B
W_STCK02	Wash Plant Stacker - 1/4" Chip	75	900	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	6.2E-02	2.7E-02	4.1E-03	5.6E-04	100%	0.0E+00	B	0.0E+00	B	0.0E+00	B	0.0E+00	B
W_TL_02	Wash Plant Truck Loading - 1/4" Chip	75	900	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	6.2E-02	2.7E-02	4.1E-03	5.6E-04	95%	3.1E-03	B	1.4E-03	B	2.1E-04	B	2.8E-05	B
W_STCK03	Wash Plant Stacker - HL6	125	1,500	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.0E-01	4.5E-02	6.9E-03	9.3E-04	100%	0.0E+00	B	0.0E+00	B	0.0E+00	B	0.0E+00	B
W_TL_03	Wash Plant Truck Loading - HL6	125	1,500	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.0E-01	4.5E-02	6.9E-03	9.3E-04	95%	5.2E-03	B	2.3E-03	B	3.4E-04	B	4.7E-05	B
W_STCK04	Wash Plant Stacker - 3/4" Clear	50	600	n	1.6%	4.17%	valid	9.0E-04	3.9E-04	6.0E-05	8.1E-06	1.2E-02	5.5E-03	8.3E-04	1.1E-04	100%	0.0E+00	B	0.0E+00	B	0.0E+00	B	0.0E+00	B
W_TL_04	Wash Plant Stacker - 3/4" Clear	50	600	n	1.6%	4.17%	valid	9.0E-04	3.9E-04	6.0E-05	8.1E-06	1.2E-02	5.5E-03	8.3E-04	1.1E-04	95%	6.2E-04	B	2.7E-04	B	4.1E-05	B	5.6E-06	B
SCENARIO 2 - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																								
Q_STCK01	Stacker - 3/4" or 2" Crushed	257	3,084	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.1E-01	9.3E-02	1.4E-02	1.9E-03		2.1E-01	B	9.3E-02	B	1.4E-02	B	1.9E-03	B
Q_TL_01	Truck Loading - 3/4" or 2" Crushed	257	3,084	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.1E-01	9.3E-02	1.4E-02	1.9E-03		2.1E-01	B	9.3E-02	B	1.4E-02	B	1.9E-03	B
Q_STCK02	Stacker - Concrete Stone	188	2,256	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.6E-01	6.8E-02	1.0E-02	1.4E-03		1.6E-01	B	6.8E-02	B	1.0E-02	B	1.4E-03	B
Q_TL_02	Truck Loading - Concrete Stone	188	2,256	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.6E-01	6.8E-02	1.0E-02	1.4E-03		1.6E-01	B	6.8E-02	B	1.0E-02	B	1.4E-03	B
Q_STCK03	Stacker - 19mm Clear Stone	340	4,080	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.8E-01	1.2E-01	1.9E-02	2.5E-03		2.8E-01	B	1.2E-01	B	1.9E-02	B	2.5E-03	B
Q_TL_03	Truck Loading - 19mm Clear Stone	340	4,080	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.8E-01	1.2E-01	1.9E-02	2.5E-03		2.8E-01	B	1.2E-01	B	1.9E-02	B	2.5E-03	B
Q_HTL	Wash Plant Haul Truck Loading	500	6,000	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	4.1E-01	1.8E-01	2.7E-02	3.7E-03		4.1E-01	B	1.8E-01	B	2.7E-02	B	3.7E-03	B
W_FEEDBIN	Wash Plant Feed Bin	500	6,000	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	4.1E-01	1.8E-01	2.7E-02	3.7E-03		4.1E-01	B	1.8E-01	B	2.7E-02	B	3.7E-03	B
W_STCK01	Wash Plant Stacker - Sand	200	2,400	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.3E-02	1.1E-02	1.5E-03	95%	8.3E-03	B	3.6E-03	B	5.5E-04	B	7.5E-05	B
W_TL_01	Wash Plant Truck Loading - Sand	200	2,400	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.7E-01	7.3E-02	1.1E-02	1.5E-03	95%	8.3E-03	B	3.6E-03	B	5.5E-04	B	7.5E-05	B
W_STCK02	Wash Plant Stacker - 1/4" Chip	75	900	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	6.2E-02	2.7E-02	4.1E-03	5.6E-04	95%	3.1E-03	B	1.4E-03	B	2.1E-04	B	2.8E-05	B
W_TL_02	Wash Plant Truck Loading - 1/4" Chip	75	900	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	6.2E-02	2.7E-02	4.1E-03	5.6E-04	95%	3.1E-03	B	1.4E-03	B	2.1E-04	B	2.8E-05	B
W_STCK03	Wash Plant Stacker - HL6	125	1,500	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.0E-01	4.5E-02	6.9E-03	9.3E-04	95%	5.2E-03	B	2.3E-03	B	3.4E-04	B	4.7E-05	B
W_TL_03	Wash Plant Truck Loading - HL6	125	1,500	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	1.0E-01	4.5E-02	6.9E-03	9.3E-04	95%	5.2E-03	B	2.3E-03	B	3.4E-04	B	4.7E-05	B
W_STCK04	Wash Plant Stacker - 3/4" Clear	50	600	n	1.6%	4.17%	valid	9.0E-04	3.9E-04	6.0E-05	8.1E-06	1.2E-02	5.5E-03	8.3E-04	1.1E-04	95%	6.2E-04	B	2.7E-04	B	4.1E-05	B	5.6E-06	B
W_TL_04	Wash Plant Truck Loading - 3/4" Clear	50	600	n	1.6%	4.17%	valid	9.0E-04	3.9E-04	6.0E-05	8.1E-06	1.2E-02	5.5E-03	8.3E-04	1.1E-04	95%	6.2E-04	B	2.7E-04	B	4.1E-05	B	5.6E-06	B
DUIVENVOORDEN HAULAGE EMISSIONS (50% OF TOTAL GRAVEL PIT OPERATION EMISSIONS)																								
DVH	Duivenvoorden Haulage	33	400	n	1.6%	1.77%	valid	3.0E-03	1.3E-03	2.0E-04	2.7E-05	2.7E-02	1.2E-02	1.8E-03	2.5E-04		2.7E-02	B	1.2E-02	B	1.8E-03	B	2.5E-04	B

Appendix B: Bulk Material Handling Emissions Spreadsheet

Project #2300646

Notes:

[1] Relates to AP-42 Section 13.2.4-4

[2] 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 P_HOPPER, at a sample wind speed of 3.7 m/s

EF = 0.0016 x (0.8) x ((3.7 m/s) / 2.2)^1.3 / ((3%) / 2)^1.4 = 1.4E-03 kg TSP / Mg handled

Sample calculation for TSP emission rate for Source P_HOPPER, at a sample wind speed of 5 m/s

$$\frac{157\ Mg_{handled}}{1\ h} \times \frac{1.43E\text{-}03\ kg_{TSP}}{1\ Mg_{handled}} \times \frac{1\ h}{3600\ s} \times \frac{1000\ g_{TSP}}{1\ kg_{TSP}} \times \frac{1\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 6.2E\text{-}02\ g_{TSP}/s$$

Comments		
Pit Operations		
A silica content of:	21.7%	was used in the assessment. This reflects sampling of silt from the pit wash pond.
A silt content of:	3.9%	was used, based on AP-42 s.13.2.4 values for stone quarrying and processing - Various Limestone Products
Raw material moisture content of:	3.0%	was used, due to the high saturation level of the raw extracted material.
Washed product moisture content of	1.77%	was used for crushed stone. Reflects guidance from MECP / Concrete Ontario / OAPC working group.
	4.17%	was used for sand or screenings. Reflects guidance from MECP / Concrete Ontario / OAPC working group.
Quarry Operations		
A silica content of:	2.06%	was used in the assessment. This reflects the average value of 14 XRF tests on 2 core samples
A silt content of:	1.6%	was used, based on AP-42 s.13.2.4 values for stone quarrying and processing - Crushed Limestone.
Raw material moisture content of:	4.8%	was used, due to the high saturation level of the raw extracted material.
Washed product moisture content of	1.77%	was used for crushed stone. Reflects guidance from MECP / Concrete Ontario / OAPC working group.
	4.17%	was used for sand or screenings. Reflects guidance from MECP / Concrete Ontario / OAPC working group.
Operating Hours	12	hours per day

APPENDIX C

Appendix C: Processing Emissions Spreadsheet

Strada Shelburne Quarry

Project #2300646

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	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)	(kg/Mg)	(kg/Mg)	(kg/Mg)	(kg/Mg)	(g/s)	(g/s)	(g/s)	(g/s)	(%)	(g/s)		(g/s)		(g/s)		(g/s)	
PHASES 1B(1), 1B(3), 2A AND 2B - GRAVEL PIT OPERATIONS (DURING INITIAL QUARRY OPERATIONS)																						
P_SCALP	Scalping Screen	Screening (controlled)	11.19.2-1	157	1884	5.6E-04	3.7E-04	2.5E-05	7.6E-06	2.4E-02	1.6E-02	1.1E-03	3.3E-04		2.4E-02	E	1.6E-02	C	1.1E-03	E	3.3E-04	C
P_CRSH01	Primary Crusher	Primary crushing (controlled)	11.19.2-1	31	372	3.4E-04	2.7E-04	5.0E-05	5.6E-06	2.9E-03	2.3E-03	4.3E-04	4.8E-05		2.9E-03	E	2.3E-03	E	4.3E-04	E	4.8E-05	E
P_CONV01	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	157	1884	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.6E-03	1.0E-03	2.8E-04	2.1E-05		1.6E-03	E	1.0E-03	D	2.8E-04	E	2.1E-05	D
P_BIN01	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	157	1884	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.6E-03	1.0E-03	2.8E-04	2.1E-05		1.6E-03	E	1.0E-03	D	2.8E-04	E	2.1E-05	D
P_CONV02	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	157	1884	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.6E-03	1.0E-03	2.8E-04	2.1E-05		1.6E-03	E	1.0E-03	D	2.8E-04	E	2.1E-05	D
P_SCRN01	Screen Deck	Screening (controlled)	11.19.2-1	157	1884	5.6E-04	3.7E-04	2.5E-05	7.6E-06	2.4E-02	1.6E-02	1.1E-03	3.3E-04		2.4E-02	E	1.6E-02	C	1.1E-03	E	3.3E-04	C
P_CONV03	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	51	612	3.7E-05	2.3E-05	6.5E-06	4.7E-07	5.2E-04	3.3E-04	9.2E-05	6.7E-06		5.2E-04	E	3.3E-04	D	9.2E-05	E	6.7E-06	D
P_CONV04	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	106	1272	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.1E-03	6.8E-04	1.9E-04	1.4E-05		1.1E-03	E	6.8E-04	D	1.9E-04	E	1.4E-05	D
P_CONV05	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	106	1272	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.1E-03	6.8E-04	1.9E-04	1.4E-05		1.1E-03	E	6.8E-04	D	1.9E-04	E	1.4E-05	D
P_BIN02	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	185	2220	3.7E-05	2.3E-05	6.5E-06	4.7E-07	1.9E-03	1.2E-03	3.3E-04	2.4E-05		1.9E-03	E	1.2E-03	D	3.3E-04	E	2.4E-05	D
P_SCRN02	Screen Deck	Screening (controlled)	11.19.2-1	185	2220	5.6E-04	3.7E-04	2.5E-05	7.6E-06	2.9E-02	1.9E-02	1.3E-03	3.9E-04		2.9E-02	E	1.9E-02	C	1.3E-03	E	3.9E-04	C
P_CONV06	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	79	948	3.7E-05	2.3E-05	6.5E-06	4.7E-07	8.1E-04	5.0E-04	1.4E-04	1.0E-05		8.1E-04	E	5.0E-04	D	1.4E-04	E	1.0E-05	D
P_CRSH02	Cone Crusher	Secondary crushing (controlled)	11.19.2-1	79	948	3.4E-04	2.7E-04	5.0E-05	5.6E-06	7.5E-03	5.9E-03	1.1E-03	1.2E-04		7.5E-03	E	5.9E-03	E	1.1E-03	E	1.2E-04	E
P_CONV07	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	79	948	3.7E-05	2.3E-05	6.5E-06	4.7E-07	8.1E-04	5.0E-04	1.4E-04	1.0E-05		8.1E-04	E	5.0E-04	D	1.4E-04	E	1.0E-05	D
P_CONV08	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	38	456	3.7E-05	2.3E-05	6.5E-06	4.7E-07	3.9E-04	2.4E-04	6.9E-05	5.0E-06		3.9E-04	E	2.4E-04	D	6.9E-05	E	5.0E-06	D
P_CONV09	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	68	816	3.7E-05	2.3E-05	6.5E-06	4.7E-07	7.0E-04	4.3E-04	1.2E-04	8.9E-06		7.0E-04	E	4.3E-04	D	1.2E-04	E	8.9E-06	D
PHASES 1B(1), 1B(3), 2A AND 2B - GRAVEL PIT OPERATIONS (DURING INITIAL QUARRY OPERATIONS)																						
Q_DRILL	Drilling at working face	Wet drilling: unfragmented stone	11.19.2-1	2	24	5.7E-05	4.0E-05	6.0E-06	8.2E-07	3.2E-05	2.2E-05	3.3E-06	4.6E-07		3.2E-05	E	2.2E-05	E	3.3E-06	E	4.6E-07	E
Q_HOPPER	Transfer of Fragmented Rock into Hopper	Truck unloading - fragmented stone	11.19.2-1	628	7536	1.1E-05	8.0E-06	1.2E-06	1.6E-07	1.9E-03	1.4E-03	2.1E-04	2.9E-05		1.9E-03	E	1.4E-03	E	2.1E-04	E	2.9E-05	E
Q_SCALP	Screen Deck	Screening (controlled)	11.19.2-1	628	7536	5.6E-04	3.7E-04	2.5E-05	8.0E-05	9.8E-02	6.5E-02	4.4E-03	1.4E-02		9.8E-02	E	6.5E-02	C	4.4E-03	E	1.4E-02	C
Q_CRSH01	Jaw Crusher	Primary crushing (controlled)	11.19.2-1	228	2736	3.4E-04	2.7E-04	5.0E-05	5.9E-05	2.2E-02	1.7E-02	3.2E-03	3.7E-03		2.2E-02	E	1.7E-02	E	3.2E-03	E	3.7E-03	E
Q_CONV01	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	628	7536	3.7E-05	2.3E-05	6.5E-06	5.0E-06	6.5E-03	4.0E-03	1.1E-03	8.7E-04		6.5E-03	E	4.0E-03	D	1.1E-03	E	8.7E-04	D
Q_BIN01	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	628	7536	3.7E-05	2.3E-05	6.5E-06	5.0E-06	6.5E-03	4.0E-03	1.1E-03	8.7E-04		6.5E-03	E	4.0E-03	D	1.1E-03	E	8.7E-04	D
Q_CONV02	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	628	7536	3.7E-05	2.3E-05	6.5E-06	5.0E-06	6.5E-03	4.0E-03	1.1E-03	8.7E-04		6.5E-03	E	4.0E-03	D	1.1E-03	E	8.7E-04	D
Q_SCRN01	Screen Deck	Screening (controlled)	11.19.2-1	628	7536	5.6E-04	3.7E-04	2.5E-05	8.0E-05	9.8E-02	6.5E-02	4.4E-03	1.4E-02		9.8E-02	E	6.5E-02	C	4.4E-03	E	1.4E-02	C
Q_CONV03	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	206	2472	3.7E-05	2.3E-05	6.5E-06	5.0E-06	2.1E-03	1.3E-03	3.7E-04	2.9E-04		2.1E-03	E	1.3E-03	D	3.7E-04	E	2.9E-04	D
Q_CONV04	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	422	5064	3.7E-05	2.3E-05	6.5E-06	5.0E-06	4.3E-03	2.7E-03	7.6E-04	5.9E-04		4.3E-03	E	2.7E-03	D	7.6E-04	E	5.9E-04	D
Q_CRSH02	Cone Crusher	Secondary crushing (controlled)	11.19.2-1	422	5064	3.4E-04	2.7E-04	5.0E-05	5.9E-05	4.0E-02	3.2E-02	5.9E-03	6.9E-03		4.0E-02	E	3.2E-02	E	5.9E-03	E	6.9E-03	E
Q_CONV05	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	422	5064	3.7E-05	2.3E-05	6.5E-06	5.0E-06	4.3E-03	2.7E-03	7.6E-04	5.9E-04		4.3E-03	E	2.7E-03	D	7.6E-04	E	5.9E-04	D
Q_BIN02	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	740	8880	3.7E-05	2.3E-05	6.5E-06	5.0E-06	7.6E-03	4.7E-03	1.3E-03	1.0E-03		7.6E-03	E	4.7E-03	D	1.3E-03	E	1.0E-03	D
Q_SCRN02	Screen Deck	Screening (controlled)	11.19.2-1	370	4440	5.6E-04	3.7E-04	2.5E-05	8.0E-05	5.8E-02	3.8E-02	2.6E-03	8.3E-03		5.8E-02	E	3.8E-02	C	2.6E-03	E	8.3E-03	C
Q_SCRN03	Screen Deck	Screening (controlled)	11.19.2-1	370	4440	5.6E-04	3.7E-04	2.5E-05	8.0E-05	5.8E-02	3.8E-02	2.6E-03	8.3E-03		5.8E-02	E	3.8E-02	C	2.6E-03	E	8.3E-03	C
Q_CONV06	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	318	3816	3.7E-05	2.3E-05	6.5E-06	5.0E-06	3.3E-03	2.0E-03	5.7E-04	4.4E-04		3.3E-03	E	2.0E-03	D	5.7E-04	E	4.4E-04	D
Q_CRSH03	Cone Crusher	Secondary crushing (controlled)	11.19.2-1	318	3816	3.4E-04	2.7E-04	5.0E-05	5.9E-05	3.0E-02	2.4E-02	4.4E-03	5.2E-03		3.0E-02	E	2.4E-02	E	4.4E-03	E	5.2E-03	E
Q_CONV07	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	318	3816	3.7E-05	2.3E-05	6.5E-06	5.0E-06	3.3E-03	2.0E-03	5.7E-04	4.4E-04		3.3E-03	E	2.0E-03	D	5.7E-04	E	4.4E-04	D
Q_CONV08	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	151	1812	3.7E-05	2.3E-05	6.5E-06	5.0E-06	1.6E-03	9.6E-04	2.7E-04	2.1E-04		1.6E-03	E	9.6E-04	D	2.7E-04	E	2.1E-04	D
Q_CONV09	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	271	3252	3.7E-05	2.3E-05	6.5E-06	5.0E-06	2.8E-03	1.7E-03	4.9E-04	3.8E-04		2.8E-03	E	1.7E-03	D	4.9E-04	E	3.8E-04	D
W_CONV01	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	500	6000	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-03	3.2E-03	9.0E-04	6.9E-04		5.1E-03	E	3.2E-03	D	9.0E-04	E	6.9E-04	D
W_SCRN01	Wash Plant Wash Screen	Conveyor transfer point (controlled)	11.19.2-1	500	6000	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-03	3.2E-03	9.0E-04	6.9E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV02	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	200	2400	3.7E-05	2.3E-05	6.5E-06	5.0E-06	2.1E-03	1.3E-03	3.6E-04	2.8E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV03	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	75	900	3.7E-05	2.3E-05	6.5E-06	5.0E-06	7.7E-04	4.8E-04	1.4E-04	1.0E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV04	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	125	1500	3.7E-05	2.3E-05	6.5E-06	5.0E-06	1.3E-03	8.0E-04	2.3E-04	1.7E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV05	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	50	600	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-04	3.2E-04	9.0E-05	6.9E-05	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
SCENARIO 2 - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																						
Q_DRILL	Drilling at working face	Wet drilling: unfragmented stone	11.19.2-1	2	24	5.7E-05	4.0E-05	6.0E-06	8.2E-07	3.2E-05	2.2E-05	3.3E-06	4.6E-07		3.2E-05	E	2.2E-05	E	3.3E-06	E	4.6E-07	E
Q_HOPPER	Transfer of Fragmented Rock into Hopper	Truck unloading - fragmented stone	11.19.2-1	785	9420	1.1E-05	8.0E-06	1.2E-06	1.7E-06	2.4E-03	1.7E-03	2.6E-04	3.8E-04		2.4E-03	E	1.7E-03	E	2.6E-04	E	3.8E-04	E
Q_SCALP	Screen Deck	Screening (controlled)	11.19.2-1	785	9420	5.6E-04	3.7E-04	2.5E-05	8.0E-05	1.2E-01	8.1E-02	5.5E-03	1.8E-02		1.2E-01	E	8.1E-02	C	5.5E-03	E	1.8E-02	C
Q_CRSH01	Jaw Crusher	Primary crushing (controlled)	11.19.2-1	285	3420	3.4E-04	2.7E-04	5.0E-05	5.9E-05	2.7E-02	2.1E-02	4.0E-03	4.6E-03		2.7E-02	E	2.1E-02	E	4.0E-03	E	4.6E-03	E
Q_CONV01	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	785	9420	3.7E-05	2.3E-05	6.5E-06	5.0E-06	8.1E-03	5.0E-03	1.4E-03	1.1E-03		8.1E-03	E	5.0E-03	D	1.4E-03	E	1.1E-03	D
Q_BIN01	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	785	9420	3.7E-05	2.3E-05	6.5E-06	5.0E-06	8.1E-03	5.0E-03	1.4E-03	1.1E-03		8.1E-03	E	5.0E-03	D	1.4E-03	E	1.1E-03	D
Q_CONV02	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	785	9420	3.7E-05	2.3E-05	6.5E-06	5.0E-06	8.1E-03	5.0E-03	1.4E-03	1.1E-03		8.1E-03	E	5.0E-03	D	1.4E-03	E	1.1E-03	D
Q_SCRN01	Screen Deck	Screening (controlled)	11.19.2-1	785	9420	5.6E-04	3.7E-04	2.5E-05	8.0E-05	1.2E-01	8.1E-02	5.5E-03	1.8E-02		1.2E-01	E	8.1E-02	C	5.5E-03	E	1.8E-02	C

Appendix C: Processing Emissions Spreadsheet

Project #2300646

Strada Shelburne Quarry

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	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)	(kg/Mg)	(kg/Mg)	(kg/Mg)	(kg/Mg)	(g/s)	(g/s)	(g/s)	(g/s)	(%)	(g/s)		(g/s)		(g/s)		(g/s)	
Q_CONV03	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	257	3084	3.7E-05	2.3E-05	6.5E-06	5.0E-06	2.6E-03	1.6E-03	4.6E-04	3.6E-04		2.6E-03	E	1.6E-03	D	4.6E-04	E	3.6E-04	D
Q_CONV04	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	528	6336	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.4E-03	3.4E-03	9.5E-04	7.3E-04		5.4E-03	E	3.4E-03	D	9.5E-04	E	7.3E-04	D
Q_CRSH02	Cone Crusher	Secondary crushing (controlled)	11.19.2-1	528	6336	3.4E-04	2.7E-04	5.0E-05	5.9E-05	5.0E-02	4.0E-02	7.3E-03	8.6E-03		5.0E-02	E	4.0E-02	E	7.3E-03	E	8.6E-03	E
Q_CONV05	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	528	6336	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.4E-03	3.4E-03	9.5E-04	7.3E-04		5.4E-03	E	3.4E-03	D	9.5E-04	E	7.3E-04	D
Q_BIN02	Conveyor Drop into Bin	Conveyor transfer point (controlled)	11.19.2-1	925	11100	3.7E-05	2.3E-05	6.5E-06	5.0E-06	9.5E-03	5.9E-03	1.7E-03	1.3E-03		9.5E-03	E	5.9E-03	D	1.7E-03	E	1.3E-03	D
Q_SCRN02	Screen Deck	Screening (controlled)	11.19.2-1	463	5556	5.6E-04	3.7E-04	2.5E-05	8.0E-05	7.2E-02	4.8E-02	3.2E-03	1.0E-02		7.2E-02	E	4.8E-02	C	3.2E-03	E	1.0E-02	C
Q_SCRN03	Screen Deck	Screening (controlled)	11.19.2-1	463	5556	5.6E-04	3.7E-04	2.5E-05	8.0E-05	7.2E-02	4.8E-02	3.2E-03	1.0E-02		7.2E-02	E	4.8E-02	C	3.2E-03	E	1.0E-02	C
Q_CONV06	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	397	4764	3.7E-05	2.3E-05	6.5E-06	5.0E-06	4.1E-03	2.5E-03	7.2E-04	5.5E-04		4.1E-03	E	2.5E-03	D	7.2E-04	E	5.5E-04	D
Q_CRSH03	Cone Crusher	Secondary crushing (controlled)	11.19.2-1	397	4764	3.4E-04	2.7E-04	5.0E-05	5.9E-05	3.7E-02	3.0E-02	5.5E-03	6.5E-03		3.7E-02	E	3.0E-02	E	5.5E-03	E	6.5E-03	E
Q_CONV07	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	397	4764	3.7E-05	2.3E-05	6.5E-06	5.0E-06	4.1E-03	2.5E-03	7.2E-04	5.5E-04		4.1E-03	E	2.5E-03	D	7.2E-04	E	5.5E-04	D
Q_CONV08	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	188	2256	3.7E-05	2.3E-05	6.5E-06	5.0E-06	1.9E-03	1.2E-03	3.4E-04	2.6E-04		1.9E-03	E	1.2E-03	D	3.4E-04	E	2.6E-04	D
Q_CONV09	Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	340	4080	3.7E-05	2.3E-05	6.5E-06	5.0E-06	3.5E-03	2.2E-03	6.1E-04	4.7E-04		3.5E-03	E	2.2E-03	D	6.1E-04	E	4.7E-04	D
W_CONV01	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	500	6000	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-03	3.2E-03	9.0E-04	6.9E-04		5.1E-03	E	3.2E-03	D	9.0E-04	E	6.9E-04	D
W_SCRN01	Wash Plant Wash Screen	Conveyor transfer point (controlled)	11.19.2-1	500	6000	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-03	3.2E-03	9.0E-04	6.9E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV02	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	200	2400	3.7E-05	2.3E-05	6.5E-06	5.0E-06	2.1E-03	1.3E-03	3.6E-04	2.8E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV03	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	75	900	3.7E-05	2.3E-05	6.5E-06	5.0E-06	7.7E-04	4.8E-04	1.4E-04	1.0E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV04	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	125	1500	3.7E-05	2.3E-05	6.5E-06	5.0E-06	1.3E-03	8.0E-04	2.3E-04	1.7E-04	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
W_CONV05	Wash Plant Conveyor Transfer Point	Conveyor transfer point (controlled)	11.19.2-1	50	600	3.7E-05	2.3E-05	6.5E-06	5.0E-06	5.1E-04	3.2E-04	9.0E-05	6.9E-05	100%	0.0E+00	E	0.0E+00	D	0.0E+00	E	0.0E+00	D
DUIVENVOORDEN HAULAGE EMISSIONS (50% OF TOTAL GRAVEL PIT OPERATION EMISSIONS)																						
DVH	Duivenvoorden Haulage		--	--	--	--	--	--	--	--	--	--	--		5.0E-02	--	3.4E-02	--	3.6E-03	--	6.9E-04	--

Sample calculation for TSP emissions from Source P_SCALP: Scalping Screen

$$\frac{157\ Mg_{process}}{1\ h} \left| \frac{5.6E\text{-}04\ kg_{TSP}}{1\ Mg_{process}} \right| \frac{1\ h}{3600\ s} \left| \frac{1000\ g_{TSP}}{1\ kg_{TSP}} \right| \frac{1.0E+00\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 2.4E\text{-}02\ g_{TSP}/s$$

Notes:

Comments

AP-42 Emission Factor for TSP is based on PM100. The values have been corrected to reflect PM44.
Process Emissions are calculated based on controlled emission factors due to the high moisture content of the virgin aggregate.
Wash plant operations are assumed to have no emissions due to the aggregate being saturated with water.
Drilling reflects hole 4 1/2" diameter, with average depth of 11m, assumed density of 2670kg/m³, 5 holes / hour
Pit Operations
A silica content of: 21.7% was used in the assessment. This reflects sampling of silt from the puit wash pond.
A silt content of: 3.9% was used, based on the AP-42 CH 13.2.4 values for Stone quarrying and processing - Various Limestone Products
Quarry Operations
A silica content of: 2.06% was used in the assessment. This reflects the average value of 14 XRF tests on 2 core samples
A silt content of: 1.6% was used, based on the AP-42 CH 13.2.4 values for Stone quarrying and processing - Crushed Limestone.

APPENDIX D

Appendix D: On-Site Mobile Equipment Emissions Spreadsheet - Fugitive Dust

Strada Shelburne Quarry

Project #2300646

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

Route ID [1]	Route Description	Traffic Passes [2] Hourly (#/h)	Traffic Passes [2] Daily (#/d)	Segment Length [2] (m)	Road Surface [3]	Roadway Type [4]	Mean Vehicle Speed (km/h)	Mean Vehicle Speed (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)	Base AP-42 Emission Factor PM_{10} (g/VKT)	Base AP-42 Emission Factor $PM_{2.5}$ (g/VKT)	Base AP-42 Emission Factor Silica (g/VKT)	Base Emission Rate TSP (g/s)	Base Emission Rate PM_{10} (g/s)	Base Emission Rate $PM_{2.5}$ (g/s)	Base Emission Rate Silica (g/s)	Additional Control Efficiency Applied (%)	Final Controlled Emission Rate TSP (g/s)	TSP Data Quality Rating	Final Controlled Emission Rate PM_{10} (g/s)	PM_{10} Data Quality Rating	Final Controlled Emission Rate $PM_{2.5}$ (g/s)	$PM_{2.5}$ Data Quality Rating	Final Controlled Emission Rate Silica (g/s)	Silica Data Quality Rating
PHASE 1B(1) - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																													
P_LOADER	Loader Traffic at Working Face	22	264	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.5E+02	2.9E+00	5.3E-01	5.3E-02	1.1E-01	75%	7.2E-01	C	1.3E-01	B	1.3E-02	C	2.9E-02	B
P_PL_01	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	3.5E-01	6.5E-02	6.5E-03	1.4E-02	50%	1.8E-01	C	3.2E-02	B	3.2E-03	C	7.0E-03	B
P_PL_02	Loader Traffic at Plant	8	96	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	2.8E-01	5.2E-02	5.2E-03	1.1E-02	50%	1.4E-01	C	2.6E-02	B	2.6E-03	C	5.6E-03	B
P_PL_03	Loader Traffic at Plant	14	168	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	4.9E-01	9.1E-02	9.1E-03	2.0E-02	50%	2.5E-01	C	4.5E-02	B	4.5E-03	C	9.8E-03	B
P_HAUL	Haul Truck Traffic to Wash Plant	4	48	1510	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	1.1E+01	2.0E+00	2.0E-01	4.4E-01	95%	5.5E-01	C	1.0E-01	B	1.0E-02	C	2.2E-02	B
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	4	48	535	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.9E+02	2.9E+00	5.2E-01	5.2E-02	1.1E-01	95%	1.4E-01	C	2.6E-02	B	2.6E-03	C	5.7E-03	B
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	4	48	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.4E+00	1.6E-02	2.1E-03	5.1E-04	4.5E-04		1.6E-02	C	2.1E-03	B	5.1E-04	C	4.5E-04	B
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	90	1080	50	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	7.8E+00	1.4E+00	1.4E-01	3.0E-02	95%	3.9E-01	C	7.2E-02	B	7.2E-03	C	1.5E-03	B
Q_PL_01	Loader Traffic at Plant	41	492	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.7E-01	2.7E-02	5.5E-03	95%	7.2E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
Q_PL_02	Loader Traffic at Plant	30	360	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.1E+00	1.9E-01	1.9E-02	4.0E-03	95%	5.3E-02	C	9.7E-03	B	9.7E-04	C	2.0E-04	B
Q_PL_03	Loader Traffic at Plant	54	648	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.9E+00	3.5E-01	3.5E-02	7.2E-03	95%	9.5E-02	C	1.7E-02	B	1.7E-03	C	3.6E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	18	216	1200	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	3.9E+01	7.2E+00	7.2E-01	1.6E+00	95%	2.0E+00	C	3.6E-01	B	3.6E-02	C	7.9E-02	B
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	14	168	350	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	6.5E+00	1.2E+00	1.2E-01	2.5E-02	95%	3.3E-01	C	6.0E-02	B	6.0E-03	C	1.2E-03	B
QPAVED	Quarry Shipping - Paved Internal Roads	14	168	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	5.7E-02	7.3E-03	1.8E-03	1.5E-04		5.7E-02	C	7.3E-03	B	1.8E-03	C	1.5E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
PHASE 1B(3) - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																													
P_LOADER	Loader Traffic at Working Face	22	264	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.5E+02	2.9E+00	5.3E-01	5.3E-02	1.1E-01	75%	7.2E-01	C	1.3E-01	B	1.3E-02	C	2.9E-02	B
P_PL_01	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	3.5E-01	6.5E-02	6.5E-03	1.4E-02	50%	1.8E-01	C	3.2E-02	B	3.2E-03	C	7.0E-03	B
P_PL_02	Loader Traffic at Plant	8	96	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	2.8E-01	5.2E-02	5.2E-03	1.1E-02	50%	1.4E-01	C	2.6E-02	B	2.6E-03	C	5.6E-03	B
P_PL_03	Loader Traffic at Plant	14	168	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	4.9E-01	9.1E-02	9.1E-03	2.0E-02	50%	2.5E-01	C	4.5E-02	B	4.5E-03	C	9.8E-03	B
P_HAUL	Haul Truck Traffic to Wash Plant	4	48	1730	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	1.3E+01	2.3E+00	2.3E-01	5.0E-01	95%	6.3E-01	C	1.2E-01	B	1.2E-02	C	2.5E-02	B
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	4	48	610	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.9E+02	3.3E+00	6.0E-01	6.0E-02	1.3E-01	95%	1.6E-01	C	3.0E-02	B	3.0E-03	C	6.5E-03	B
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	4	48	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.4E+00	1.6E-02	2.1E-03	5.1E-04	4.5E-04		1.6E-02	C	2.1E-03	B	5.1E-04	C	4.5E-04	B
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	90	1080	50	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	7.8E+00	1.4E+00	1.4E-01	3.0E-02	95%	3.9E-01	C	7.2E-02	B	7.2E-03	C	1.5E-03	B
Q_PL_01	Loader Traffic at Plant	41	492	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.7E-01	2.7E-02	5.5E-03	95%	7.2E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
Q_PL_02	Loader Traffic at Plant	30	360	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.1E+00	1.9E-01	1.9E-02	4.0E-03	95%	5.3E-02	C	9.7E-03	B	9.7E-04	C	2.0E-04	B
Q_PL_03	Loader Traffic at Plant	54	648	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.9E+00	3.5E-01	3.5E-02	7.2E-03	95%	9.5E-02	C	1.7E-02	B	1.7E-03	C	3.6E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	18	216	880	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	2.9E+01	5.3E+00	5.3E-01	1.2E+00	95%	1.4E+00	C	2.7E-01	B	2.7E-02	C	5.8E-02	B
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	14	168	320	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	6.0E+00	1.1E+00	1.1E-01	2.3E-02	95%	3.0E-01	C	5.5E-02	B	5.5E-03	C	1.1E-03	B
QPAVED	Quarry Shipping - Paved Internal Roads	14	168	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	5.7E-02	7.3E-03	1.8E-03	1.5E-04		5.7E-02	C	7.3E-03	B	1.8E-03	C	1.5E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
PHASE 2A - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																													
P_LOADER	Loader Traffic at Working Face	22	264	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.5E+02	2.9E+00	5.3E-01	5.3E-02	1.1E-01	75%	7.2E-01	C	1.3E-01	B	1.3E-02	C	2.9E-02	B
P_PL_01	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	3.5E-01	6.5E-02	6.5E-03	1.4E-02	50%	1.8E-01	C	3.2E-02	B	3.2E-03	C	7.0E-03	B

P_PL_02	Loader Traffic at Plant	8	96	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	2.8E-01	5.2E-02	5.2E-03	1.1E-02	50%	1.4E-01	C	2.6E-02	B	2.6E-03	C	5.6E-03	B
P_PL_03	Loader Traffic at Plant	14	168	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	4.9E-01	9.1E-02	9.1E-03	2.0E-02	50%	2.5E-01	C	4.5E-02	B	4.5E-03	C	9.8E-03	B
P_HAUL	Haul Truck Traffic to Wash Plant	4	48	1600	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	1.2E+01	2.1E+00	2.1E-01	4.7E-01	95%	5.8E-01	C	1.1E-01	B	1.1E-02	C	2.3E-02	B
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	4	48	620	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.9E+02	3.3E+00	6.1E-01	6.1E-02	1.3E-01	95%	1.7E-01	C	3.0E-02	B	3.0E-03	C	6.6E-03	B
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	4	48	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.4E+00	1.6E-02	2.1E-03	5.1E-04	4.5E-04		1.6E-02	C	2.1E-03	B	5.1E-04	C	4.5E-04	B
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	90	1080	50	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	7.8E+00	1.4E+00	1.4E-01	3.0E-02	95%	3.9E-01	C	7.2E-02	B	7.2E-03	C	1.5E-03	B
Q_PL_01	Loader Traffic at Plant	41	492	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.7E-01	2.7E-02	5.5E-03	95%	7.2E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
Q_PL_02	Loader Traffic at Plant	30	360	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.1E+00	1.9E-01	1.9E-02	4.0E-03	95%	5.3E-02	C	9.7E-03	B	9.7E-04	C	2.0E-04	B
Q_PL_03	Loader Traffic at Plant	54	648	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.9E+00	3.5E-01	3.5E-02	7.2E-03	95%	9.5E-02	C	1.7E-02	B	1.7E-03	C	3.6E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	18	216	1150	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	3.8E+01	6.9E+00	6.9E-01	1.5E+00	95%	1.9E+00	C	3.5E-01	B	3.5E-02	C	7.5E-02	B
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	14	168	435	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	8.1E+00	1.5E+00	1.5E-01	3.1E-02	95%	4.1E-01	C	7.4E-02	B	7.4E-03	C	1.5E-03	B
QPAVED	Quarry Shipping - Paved Internal Roads	14	168	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	5.7E-02	7.3E-03	1.8E-03	1.5E-04		5.7E-02	C	7.3E-03	B	1.8E-03	C	1.5E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
PHASE 2B - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																												
P_LOADER	Loader Traffic at Working Face	22	264	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.5E+02	2.9E+00	5.3E-01	5.3E-02	1.1E-01	75%	7.2E-01	C	1.3E-01	B	1.3E-02	C	2.9E-02	B
P_PL_01	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	3.5E-01	6.5E-02	6.5E-03	1.4E-02	50%	1.8E-01	C	3.2E-02	B	3.2E-03	C	7.0E-03	B
P_PL_02	Loader Traffic at Plant	8	96	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	2.8E-01	5.2E-02	5.2E-03	1.1E-02	50%	1.4E-01	C	2.6E-02	B	2.6E-03	C	5.6E-03	B
P_PL_03	Loader Traffic at Plant	14	168	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	2.0E+02	4.9E-01	9.1E-02	9.1E-03	2.0E-02	50%	2.5E-01	C	4.5E-02	B	4.5E-03	C	9.8E-03	B
P_HAUL	Haul Truck Traffic to Wash Plant	4	48	1780	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	1.3E+01	2.4E+00	2.4E-01	5.2E-01	95%	6.5E-01	C	1.2E-01	B	1.2E-02	C	2.6E-02	B
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	4	48	660	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.9E+02	3.5E+00	6.5E-01	6.5E-02	1.4E-01	95%	1.8E-01	C	3.2E-02	B	3.2E-03	C	7.0E-03	B
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	4	48	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.4E+00	1.6E-02	2.1E-03	5.1E-04	4.5E-04		1.6E-02	C	2.1E-03	B	5.1E-04	C	4.5E-04	B
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	90	1080	50	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	7.8E+00	1.4E+00	1.4E-01	3.0E-02	95%	3.9E-01	C	7.2E-02	B	7.2E-03	C	1.5E-03	B
Q_PL_01	Loader Traffic at Plant	41	492	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.7E-01	2.7E-02	5.5E-03	95%	7.2E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
Q_PL_02	Loader Traffic at Plant	30	360	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.1E+00	1.9E-01	1.9E-02	4.0E-03	95%	5.3E-02	C	9.7E-03	B	9.7E-04	C	2.0E-04	B
Q_PL_03	Loader Traffic at Plant	54	648	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.9E+00	3.5E-01	3.5E-02	7.2E-03	95%	9.5E-02	C	1.7E-02	B	1.7E-03	C	3.6E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	18	216	1400	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	4.6E+01	8.4E+00	8.4E-01	1.8E+00	95%	2.3E+00	C	4.2E-01	B	4.2E-02	C	9.2E-02	B
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	14	168	260	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	4.9E+00	8.9E-01	8.9E-02	1.8E-02	95%	2.4E-01	C	4.5E-02	B	4.5E-03	C	9.2E-04	B
QPAVED	Quarry Shipping - Paved Internal Roads	14	168	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	5.7E-02	7.3E-03	1.8E-03	1.5E-04		5.7E-02	C	7.3E-03	B	1.8E-03	C	1.5E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
PHASE 2C - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																												
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	112	1344	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	1.5E+01	2.7E+00	2.7E-01	5.5E-02	95%	7.3E-01	C	1.3E-01	B	1.3E-02	C	2.8E-03	B
Q_PL_01	Loader Traffic at Plant	51	612	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.8E+00	3.3E-01	3.3E-02	6.8E-03	95%	9.0E-02	C	1.6E-02	B	1.6E-03	C	3.4E-04	B
Q_PL_02	Loader Traffic at Plant	38	456	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.3E+00	2.5E-01	2.5E-02	5.1E-03	95%	6.7E-02	C	1.2E-02	B	1.2E-03	C	2.5E-04	B
Q_PL_03	Loader Traffic at Plant	68	816	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	2.4E+00	4.4E-01	4.4E-02	9.0E-03	95%	1.2E-01	C	2.2E-02	B	2.2E-03	C	4.5E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	22	264	1660	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	6.7E+01	1.2E+01	1.2E+00	2.7E+00	95%	3.3E+00	C	6.1E-01	B	6.1E-02	C	1.3E-01	B
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	18	216	840	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	2.0E+01	3.7E+00	3.7E-01	7.6E-02	95%	1.0E+00	C	1.8E-01	B	1.8E-02	C	3.8E-03	B
QPAVED	Quarry Shipping - Paved Internal Roads	18	216	75	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	7.3E-02	9.4E-03	2.3E-03	1.9E-04		7.3E-02	C	9.4E-03	B	2.3E-03	C	1.9E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
PHASE 4B - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																												
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	112	1344	75	Unpaved	Industrial	25	16	58.1		8.3%		6.3E+03	1.2E+03	1.2E+02	2.4E+01	1.5E+01	2.7E+00	2.7E-01	5.5E-02	95%	7.3E-01	C	1.3E-01	B	1.3E-02	C	2.8E-03	B
Q_PL_01	Loader Traffic at Plant	51	612	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.8E+00	3.3E-01	3.3E-02	6.8E-03	95%	9.0E-02	C	1.6E-02	B	1.6E-03	C	3.4E-04	B
Q_PL_02	Loader Traffic at Plant	38	456	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.3E+00	2.5E-01	2.5E-02	5.1E-03	95%	6.7E-02	C	1.2E-02	B	1.2E-03	C	2.5E-04	B
Q_PL_03	Loader Traffic at Plant	68	816	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	2.4E+00	4.4E-01	4.4E-02	9.0E-03	95%	1.2E-01	C	2.2E-02	B	2.2E-03	C	4.5E-04	B
Q_HAUL	Haul Truck Traffic to Wash Plant	22	264	880	Unpaved	Industrial	25	16	64.4		8.3%		6.6E+03	1.2E+03	1.2E+02	2.6E+02	3.5E+01	6.5E+00	6.5E-01	1.4E+00	95%	1.8E+00	C	3.2E-01	B	3.2E-02	C	7.0E-02	B

Appendix D: On-Site Mobile Equipment Emissions Spreadsheet - Fugitive Dust

Project #2300646

Strada Shelburne Quarry

QUNPAVED	Quarry Shipping - Unpaved Internal Roads	18	216	1060	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	2.5E+01	4.7E+00	4.7E-01	9.6E-02	95%	1.3E+00	C	2.3E-01	B	2.3E-02	C	4.8E-03	B
QPAVED	Quarry Shipping - Paved Internal Roads	18	216	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.1E-01	1.4E-02	3.3E-03	2.8E-04		1.1E-01	C	1.4E-02	B	3.3E-03	C	2.8E-04	B
W_PL_04	Loader Traffic at Plant	40	480	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	1.4E+00	2.6E-01	2.6E-02	5.3E-03	95%	7.1E-02	C	1.3E-02	B	1.3E-03	C	2.7E-04	B
W_PL_05	Loader Traffic at Plant	15	180	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	5.3E-01	9.7E-02	9.7E-03	2.0E-03	95%	2.6E-02	C	4.9E-03	B	4.9E-04	C	1.0E-04	B
W_PL_06	Loader Traffic at Plant	25	300	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	8.8E-01	1.6E-01	1.6E-02	3.3E-03	95%	4.4E-02	C	8.1E-03	B	8.1E-04	C	1.7E-04	B
W_PL_07	Loader Traffic at Plant	10	120	25	Unpaved	Industrial	25	16	36.3		8.3%		5.1E+03	9.3E+02	9.3E+01	1.9E+01	3.5E-01	6.5E-02	6.5E-03	1.3E-03	95%	1.8E-02	C	3.2E-03	B	3.2E-04	C	6.6E-05	B
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	28	336	330	Unpaved	Industrial	25	16	32.0		8.3%		4.8E+03	8.8E+02	8.8E+01	1.8E+01	1.2E+01	2.3E+00	2.3E-01	4.6E-02	95%	6.2E-01	C	1.1E-01	B	1.1E-02	C	2.3E-03	B
WPAVED	Wash Plant Shipping - Paved Internal Roads	28	336	110	Paved	Industrial	25	16	32.0			1.2	1.9E+02	2.5E+01	6.1E+00	5.2E-01	1.7E-01	2.1E-02	5.2E-03	4.4E-04		1.7E-01	C	2.1E-02	B	5.2E-03	C	4.4E-04	B
DUIVENVOORDEN HAULAGE EMISSIONS (50% OF TOTAL GRAVEL PIT OPERATION EMISSIONS)																												
DVH	Duivenvoorden Haulage	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0E+00	C	1.8E-01	B	1.8E-02	C	4.0E-02	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

Sample calculation for uncontrolled TSP emission factor for Source P_LOADER: Loader Traffic at Working Face

EF = 281.9 x (4.9) x [(8.3% / 12)]^(0.7) x [(58.062 tons) / 3]^(0.4 = 6275 g TSP / vkt

Sample calculation for TSP emission rate for Source P_LOADER: Loader Traffic at Working Face

$$\frac{22 \text{ vehicles}}{1 \text{ h}} \times \frac{75 \text{ m}}{} \times \frac{1 \text{ km}}{1000 \text{ m}} \times \frac{6275 \text{ } g_{TSP}}{1 \text{ vehicle}} \times \frac{1 \text{ h}}{3600 \text{ s}} \times \frac{25\% \text{ } g_{TSP\ uncontrolled}}{1 \text{ } g_{TSP}} = 7.2E\text{-}01 \text{ } g_{TSP} / s$$

Comments

Pit Operations
- A silica content of: 21.7% was used in the assessment. This reflects sampling of silt from the put wash pond.
- A silt content of: 3.9% was used, based on the AP-42 CH 13.2.4 values for Stone quarrying and processing - Various Limestone Products

Quarry Operations
- A silica content of: 2.06% was used in the assessment. This reflects the average value of 14 XRF tests on 2 core samples
- A silt content of: 1.6% was used, based on the AP-42 CH 13.2.4 values for Stone quarrying and processing - Crushed Limestone.

A surface silt content of: 8.3% was used in the assessment for unpaved roads, based on the AP-42 CH 13.2.2, Table 13.2.2-1 values for Stone quarrying and processing - Haul road to/from pit.

A surface silt loading of: 1.2 g/m^2 was used in the assessment for paved roads.

Constants for TSP (PM44) extrapolated from published factors for PM30, PM10 and PM2.5. Data quality downgraded by one step.

Control efficiencies were assumed based on watering activities, and reflect the required level of control at peak production and shipping, under worst-case meteorology and dry conditions.

Paved roads were assumed to have a control efficiency of 75% and unpaved roads were assumed to have a control efficiency of 95%.

Traffic to Wash Plant for Scenario 1 based on ratio of pit to quarry production volume.
- 100 tonnes per hour from Pit Processing Plant to Wash Plant
- 400 tonnes per hour from Quarry Processing Plant to Wash Plant

Volumes for shipping directly from pit or quarry processing plants reflects production not hauled to wash plant

As a conservative simplification, shipping mobile emissions from Duivenvoorden Haulage assumed to the the same as the sum of mobile emissions from Pit Operations, scaled down by 50%

Equipment Mix

Operation	Equipment	Typical / Make Model	Payload (tonnes)	Tare Weight (tonnes)	Average Weight (tonnes)	Gross Power (kW)	Height (m)	Width (m)
Pit	Pit Loader	CAT988	14	51.1	58.1	432.0	4.13	3.58
	Rock Truck	Volvo A45 Equivalent	45	41.9	64.4	357.0	3.60	3.40
	Plant Loader	Volvo 220 Equivalent	10	31.3	36.3	280.0	3.73	3.15
	Highway Fleet - Aggregates	25% tri-axle, 75% trailer	32	16	32.0	n/a	4.15	3.50
Quarry	Quarry Loader	CAT988	14	51.1	58.1	432.0	4.13	3.58
	Rock Truck	Volvo A45 Equivalent	45	41.9	64.4	357.0	3.60	3.40
	Plant Loader	Volvo 220 Equivalent	10	31.3	36.3	274.0	3.73	3.15
	Highway Fleet - Aggregates	25% tri-axle, 75% trailer	32	16	32.0	n/a	4.15	3.50

Notes:

[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.

APPENDIX E

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

Strada Shelburne Quarry

Project #2300646

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)	Tailpipe Emission Rate PM10 (g/s)	Tailpipe Emission Rate PM2.5 (g/s)	Tailpipe Emission Rate NOx (g/s)	Tailpipe + Fugitive Emission Rate [6] TSP (g/s)	Tailpipe + Fugitive Emission Rate [6] PM10 (g/s)	Tailpipe + Fugitive Emission Rate [6] PM2.5 (g/s)	Tailpipe + Fugitive Emission Rate [6] NOx (g/s)
PHASE 1B(1) - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																								
P_LOADER	Loader Traffic at Working Face	432	1	22	264	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.5E-01	1.6E-01	4.4E-02	5.6E-01
P_PL_01	Loader Traffic at Plant	280	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.0E-01	5.3E-02	2.3E-02	3.5E-01
P_PL_02	Loader Traffic at Plant	280	1	8	96	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.6E-01	4.6E-02	2.3E-02	3.5E-01
P_PL_03	Loader Traffic at Plant	280	1	14	168	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.7E-01	6.5E-02	2.5E-02	3.5E-01
P_HAUL	Haul Truck Traffic to Wash Plant	357	1	4	48	1510	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	5.8E-01	1.3E-01	3.6E-02	4.6E-01
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	n/a	1	4	48	535	25	48%	0.95	--	0.95	--	0.75	--	11.4	--	5.6E-04	5.6E-04	4.5E-04	6.8E-03	1.4E-01	2.7E-02	3.1E-03	1.2E-02
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	n/a	1	4	48	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	7.9E-05	7.9E-05	6.3E-05	9.5E-04	1.6E-02	2.2E-03	5.7E-04	1.4E-03
P_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	90	1080	50	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	4.2E-01	1.0E-01	3.8E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	41	492	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.2E-02	3.3E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	30	360	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	7.3E-02	2.9E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	54	648	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.7E-02	2.1E-02	3.4E-01
Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	18	216	1200	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	2.0E+00	3.9E-01	6.2E-02	5.2E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	n/a	1	14	168	350	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	1.3E-03	1.3E-03	1.0E-03	1.6E-02	3.3E-01	6.1E-02	7.0E-03	1.7E-02
QPAVED	Quarry Shipping - Paved Internal Roads	n/a	1	14	168	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.8E-04	2.8E-04	2.2E-04	3.3E-03	5.7E-02	7.6E-03	2.0E-03	3.5E-03
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	274	1	25	300	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	6.4E-02	2.8E-02	2.1E-02	3.4E-01
W_PL_07	Loader Traffic at Plant	274	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	3.7E-02	2.3E-02	2.0E-02	3.4E-01
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
PHASE 1B(3) - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																								
P_LOADER	Loader Traffic at Working Face	432	1	22	264	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.5E-01	1.6E-01	4.4E-02	5.6E-01
P_PL_01	Loader Traffic at Plant	280	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.0E-01	5.3E-02	2.3E-02	3.5E-01
P_PL_02	Loader Traffic at Plant	280	1	8	96	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.6E-01	4.6E-02	2.3E-02	3.5E-01
P_PL_03	Loader Traffic at Plant	280	1	14	168	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.7E-01	6.5E-02	2.5E-02	3.5E-01
P_HAUL	Haul Truck Traffic to Wash Plant	357	1	4	48	1730	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	6.6E-01	1.4E-01	3.7E-02	4.6E-01
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	n/a	1	4	48	610	25	48%	0.95	--	0.95	--	0.75	--	11.4	--	6.4E-04	6.4E-04	5.1E-04	7.7E-03	1.6E-01	3.0E-02	3.5E-03	1.4E-02
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	n/a	1	4	48	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	7.9E-05	7.9E-05	6.3E-05	9.5E-04	1.6E-02	2.2E-03	5.7E-04	1.4E-03
P_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	90	1080	50	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	4.2E-01	1.0E-01	3.8E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	41	492	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.2E-02	3.3E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	30	360	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	7.3E-02	2.9E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	54	648	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.7E-02	2.1E-02	3.4E-01
Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	18	216	880	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	1.5E+00	2.9E-01	5.2E-02	5.0E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	n/a	1	14	168	320	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	1.2E-03	1.2E-03	9.3E-04	1.4E-02	3.0E-01	5.6E-02	6.4E-03	1.5E-02
QPAVED	Quarry Shipping - Paved Internal Roads	n/a	1	14	168	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.8E-04	2.8E-04	2.2E-04	3.3E-03	5.7E-02	7.6E-03	2.0E-03	3.5E-03
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	274	1	25	300	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	6.4E-02	2.8E-02	2.1E-02	3.4E-01
W_PL_07	Loader Traffic at Plant	274	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	3.7E-02	2.3E-02	2.0E-02	3.4E-01
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
PHASE 2A - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																								
P_LOADER	Loader Traffic at Working Face	432	1	22	264	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.5E-01	1.6E-01	4.4E-02	5.6E-01
P_PL_01	Loader Traffic at Plant	280	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.0E-01	5.3E-02	2.3E-02	3.5E-01
P_PL_02	Loader Traffic at Plant	280	1	8	96	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.6E-01	4.6E-02	2.3E-02	3.5E-01
P_PL_03	Loader Traffic at Plant	280	1	14	168	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.7E-01	6.5E-02	2.5E-02	3.5E-01
P_HAUL	Haul Truck Traffic to Wash Plant	357	1	4	48	1600	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	6.1E-01	1.3E-01	3.6E-02	4.6E-01
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	n/a	1	4	48	620	25	48%	0.95	--	0.95	--	0.75	--	11.4	--	6.5E-04	6.5E-04	5.2E-04	7.9E-03	1.7E-01	3.1E-02	3.5E-03	1.4E-02
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	n/a	1	4	48	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	7.9E-05	7.9E-05	6.3E-05	9.5E-04	1.6E-02	2.2E-03	5.7E-04	1.4E-03

P_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	90	1080	50	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	4.2E-01	1.0E-01	3.8E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	41	492	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.2E-02	3.3E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	30	360	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	7.3E-02	2.9E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	54	648	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.7E-02	2.1E-02	3.4E-01
Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	18	216	1150	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	1.9E+00	3.7E-01	6.0E-02	5.1E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	n/a	1	14	168	435	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	1.6E-03	1.6E-03	1.3E-03	1.9E-02	4.1E-01	7.6E-02	8.7E-03	2.1E-02
QPAVED	Quarry Shipping - Paved Internal Roads	n/a	1	14	168	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.8E-04	2.8E-04	2.2E-04	3.3E-03	5.7E-02	7.6E-03	2.0E-03	3.5E-03
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	274	1	25	300	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	6.4E-02	2.8E-02	2.1E-02	3.4E-01
W_PL_07	Loader Traffic at Plant	274	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	3.7E-02	2.3E-02	2.0E-02	3.4E-01
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
PHASE 2B - GRAVEL PIT OPERATIONS CONCURRENT WITH QUARRY OPERATIONS																								
P_LOADER	Loader Traffic at Working Face	432	1	22	264	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.5E-01	1.6E-01	4.4E-02	5.6E-01
P_PL_01	Loader Traffic at Plant	280	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.0E-01	5.3E-02	2.3E-02	3.5E-01
P_PL_02	Loader Traffic at Plant	280	1	8	96	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.6E-01	4.6E-02	2.3E-02	3.5E-01
P_PL_03	Loader Traffic at Plant	280	1	14	168	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	2.7E-01	6.5E-02	2.5E-02	3.5E-01
P_HAUL	Haul Truck Traffic to Wash Plant	357	1	4	48	1780	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	6.8E-01	1.5E-01	3.8E-02	4.6E-01
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	n/a	1	4	48	660	25	48%	0.95	--	0.95	--	0.75	--	11.4	--	7.0E-04	7.0E-04	5.5E-04	8.4E-03	1.8E-01	3.3E-02	3.8E-03	1.5E-02
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	n/a	1	4	48	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	7.9E-05	7.9E-05	6.3E-05	9.5E-04	1.6E-02	2.2E-03	5.7E-04	1.4E-03
P_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	90	1080	50	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	4.2E-01	1.0E-01	3.8E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	41	492	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.2E-02	3.3E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	30	360	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	7.3E-02	2.9E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	54	648	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.7E-02	2.1E-02	3.4E-01
Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	18	216	1400	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	2.3E+00	4.5E-01	6.8E-02	5.3E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	n/a	1	14	168	260	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	9.6E-04	9.6E-04	7.6E-04	1.2E-02	2.4E-01	4.5E-02	5.2E-03	1.2E-02
QPAVED	Quarry Shipping - Paved Internal Roads	n/a	1	14	168	75	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.8E-04	2.8E-04	2.2E-04	3.3E-03	5.7E-02	7.6E-03	2.0E-03	3.5E-03
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	274	1	25	300	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	6.4E-02	2.8E-02	2.1E-02	3.4E-01
W_PL_07	Loader Traffic at Plant	274	1	10	120	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	3.7E-02	2.3E-02	2.0E-02	3.4E-01
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
PHASE 2C - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																								
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	112	1344	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.6E-01	1.7E-01	4.5E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	51	612	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.6E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	38	456	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	8.7E-02	3.2E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	68	816	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.4E-01	4.2E-02	2.2E-02	3.4E-01
Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	22	264	1660	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	3.4E+00	6.4E-01	8.7E-02	5.7E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	274	1	18	216	840	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.0E+00	2.0E-01	3.8E-02	3.4E-01
QPAVED	Quarry Shipping - Paved Internal Roads	274	1	18	216	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.2E-02	2.9E-02	2.2E-02	3.4E-01
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	n/a	1	25	300	25	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	1.6E-04	1.6E-04	1.3E-04	2.0E-03	4.4E-02	8.3E-03	9.4E-04	2.1E-03
W_PL_07	Loader Traffic at Plant	n/a	1	10	120	25	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	6.6E-05	6.6E-05	5.2E-05	7.9E-04	1.8E-02	3.3E-03	3.8E-04	8.6E-04
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
PHASE 4B - QUARRY OPERATIONS ONLY (PIT OPERATIONS CEASED)																								
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	432	1	112	1344	75	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	3.1E-02	3.1E-02	3.1E-02	5.3E-01	7.6E-01	1.7E-01	4.5E-02	5.3E-01
Q_PL_01	Loader Traffic at Plant	274	1	51	612	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.1E-01	3.6E-02	2.1E-02	3.4E-01
Q_PL_02	Loader Traffic at Plant	274	1	38	456	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	8.7E-02	3.2E-02	2.1E-02	3.4E-01
Q_PL_03	Loader Traffic at Plant	274	1	68	816	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.4E-01	4.2E-02	2.2E-02	3.4E-01

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

Project #2300646

Strada Shelburne Quarry

Q_HAUL	Haul Truck Traffic to Wash Plant	357	1	22	264	880	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.6E-02	2.6E-02	2.6E-02	4.4E-01	1.8E+00	3.5E-01	5.8E-02	5.1E-01
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	274	1	18	216	1060	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.3E+00	2.5E-01	4.3E-02	3.4E-01
QPAVED	Quarry Shipping - Paved Internal Roads	274	1	18	216	110	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	1.3E-01	3.4E-02	2.3E-02	3.4E-01
W_PL_04	Loader Traffic at Plant	274	1	40	480	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	9.0E-02	3.3E-02	2.1E-02	3.4E-01
W_PL_05	Loader Traffic at Plant	274	1	15	180	25	25	48%	--	0.54	--	0.54	--	0.54	--	9.2	2.0E-02	2.0E-02	2.0E-02	3.4E-01	4.6E-02	2.5E-02	2.0E-02	3.4E-01
W_PL_06	Loader Traffic at Plant	n/a	1	25	300	25	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	1.6E-04	1.6E-04	1.3E-04	2.0E-03	4.4E-02	8.3E-03	9.4E-04	2.1E-03
W_PL_07	Loader Traffic at Plant	n/a	1	10	120	25	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	6.6E-05	6.6E-05	5.2E-05	7.9E-04	1.8E-02	3.3E-03	3.8E-04	8.6E-04
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	n/a	1	28	336	330	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	2.4E-03	2.4E-03	1.9E-03	2.9E-02	6.2E-01	1.2E-01	1.3E-02	3.2E-02
WPAVED	Wash Plant Shipping - Paved Internal Roads	n/a	1	28	336	110	25	n/a	0.95	--	0.95	--	0.75	--	11.4	--	8.1E-04	8.1E-04	6.4E-04	9.8E-03	1.7E-01	2.2E-02	5.8E-03	1.0E-02
Q_GEN	Generator for Portable Plant	800	1	n/a	n/a	n/a	n/a	100%	--	0.2	--	0.2	--	0.2	--	6.4	4.4E-02	4.4E-02	4.4E-02	1.4E+00	4.4E-02	4.4E-02	4.4E-02	1.4E+00
DUIVENVOORDEN HAULAGE EMISSIONS (50% OF TOTAL GRAVEL PIT OPERATION EMISSIONS)																								
DVH	Duivenvoorden Haulage	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1E+00	2.6E-01	1.0E-01	1.8E+00

Notes:

[1] ID should reflect Source ID or Route ID, as appropriate.

[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, PM_{10} and $PM_{2.5}$ emissions from mobile equipment. Emissions rates for NOx and stationary sources do not change.

Comments

Emission factor from highway trucks based on U.S. EPA MOVES model at relevant speed for roadway segment.
Factors reflect highest of early morning, mid-day, and late-afternoon emission estimates provided by MOVES.
TSP (and $PM_{2.5}$ emissions for loaders and generator sets) assumed to be equal to PM_{10} emissions.
Generator emissions were updated to reflect Tier 2 standards.

Generator exhaust data:	892.4°F	=	478 °C	=	751 K
	4,626.23 cfm	=	2.18 m³/s		
	Assume stack exit diameter of 12"	=	0.3 m		
	Calculated velocity	=	30.80 m/s		

Sample Calculations

P_LOADER TSP Emissions:

$$\frac{432\ \text{kW}}{1}\times\frac{0.54\ \text{g}}{1\ \text{kW h}}\times\frac{48\%\ \text{Load}}{}\times\frac{1\ \text{h}}{3600\ \text{s}} = 3.1\text{E-}02\ g_{TSP}/\text{s}$$

PPAVED TSP Emissions:

$$\frac{4\ \text{Vehicles}}{1\ \text{h}}\times\frac{75\ \text{m}}{}\times\frac{0.95\ \text{g}}{1\ \text{Veh. Km}}\times\frac{1\ \text{km}}{1000\ \text{m}}\times\frac{1\ \text{h}}{3600\ \text{s}} = 7.9\text{E-}05\ g_{TSP}/\text{s}$$

APPENDIX F

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Mr. Mario Pietrolungo

January 15, 2024

Strada Aggregates Ltd.
30 Floral Parkway
Concord, Ontario
L4K 4R1

Project No.: 23-1004-01
Phase: Shelburne 2023

Subject: Pit Wash Pond Geochemical (XRD) Results, Shelburne Pit

As requested, the Pit Wash Pond material (Lab # 10828) sampled from Shelburne Pit on November 27, 2023 and delivered to our laboratory on November 30, 2023, underwent Geochemical (XRD) testing. The testing was completed on the portion of material passing the 0.075mm sieve. The purpose of Geochemical (XRD) analysis is to determine if there are elements of deleterious materials present in the fine aggregate.

Minerals detected are calcite, dolomite, quartz, plagioclase, K-feldspar, amphibole, mica & chlorite. Gypsum, ettringite and/or thaumasite and hydrocalumite were not detected. The quantitative amounts of these minerals are shown in the table below.

PNJ Lab #	Calcite (wt %)	Dolomite (wt %)	Quartz (wt %)	Plagioclase (wt %)
10828 Pit Wash Pond Material (Portion passing 0.075mm sieve)	24.9	37.2	21.7	8.0
	K- feldspar (wt %)	**Amphibole** (wt %)	**Mica** (wt %)	**Chlorite** (wt %)
	3.8	1.3	1.5	1.7
	Hydrocalumite (wt %)	**Ettringite and/or Thaumasite** (wt %)	**Gypsum** (wt %)	
	n.d.	n.d.	n.d.	

Note: Testing was carried out at Activation Laboratories Ltd.; n.d. = not detected

Should you require any further information, please do not hesitate to contact the undersigned.

Yours truly
PNJ Engineering Inc.

Nick Sibilia
Project Manager,
Manager Quality Assurance

Air Quality Study Strada proposed quarry – Melancthon

Brian Sulley of RWDI has asked if we have silica analysis using semi-quantitative x-ray diffraction techniques?

We have conducted full chemical analysis of two drill cores (1 and 3) from the site. A third core (core 2) is held in reserve as a stratigraphic reference core. This core is similar to cores 1 and 2. Chemical analysis results are shown below in Tables 1 and 2.

The technique used was energy dispersive X-Ray fluorescence or XRF. This is typically used for analysis of rocks. This technique looks at a sample prepared from a much larger sample. Provided the sampling and sample size reduction is done correctly, the results are highly representative of the bulk material. In this case the sample size reduction was done following steps outlined in CSA A23.2-26A a technique for sampling and analysis of quarried carbonate rocks for use in concrete such as found at the Strada site.

The results show that the rock is a high purity dolomite (dolostone). The silica in all sections that will be exploited is less than 6% and is normally less than 1.50% except in a middle zone where values of 5.65% and 3.27% were found. This zone corresponds to a section where chert (silica) nodules are found in small amounts. The silica found in the analysis is probably mainly present as quartz. Using X-ray diffraction techniques the quartz will hardly be detectable when less than about 1-2% silica is present in the samples.

At present, data on silica /quartz content is not available from overlying sands and gravels. The silica in these materials will be substantially higher due to the presence of quartz sand grains.

Table 1: Chemical Properties by XRF (Energy dispersive X-Ray fluorescence) for Diamond Drill Hole No. 1, drilled Feb 2020. Logged Jan 2022 by CR, revised February 2023.

Core depth ft	Core depth m	CaO %	MgO %	Al2O3 %	SiO2 %	Fe2O3 %	LOI %	Acid sol Cl %
13’ 0” – 39’ 2”	4.0-12.0	30.2	21.0	0.48	0.66	0.21	46.5	0.040
39’2” – 65’7”	12.0-20.0	30.0	20.9	0.40	1.22	0.24	46.4	0.041
65’7”-90’7”	20.0-27.6	28.8	19.6	0.81	5.65	0.38	43.8	0.074
90’7”-114’0”	27.6-34.7	30.6	20.7	0.52	1.37	0.03	46.2	0.124
114’0”-141’10”	34.7-43.2	30.8	20.8	0.43	0.34	0.35	46.9	0.112
*141’10”-165’1”	43.2-50.3	23.3	16.1	4.45	13.6	2.21	36.1	0.089

Testing by AME, Caledon, Sept 2022 following CSA A23.2-26A. LOI = Loss on ignition, Acid sol Cl = Acid soluble chloride. Chloride following MTO LS 417.
Note: Chloride values > 0.05% are likely to give concrete chloride values that exceed CSA values for reinforced concrete. High chloride is characteristic of the Goat Island and Gasport found in the quarries of the Niagara Escarpment but is accepted based on satisfactory long term field performance and because water soluble chloride is significantly lower.

- This sample from the base of the section will not be extracted due to poor rock quality because of the presence of deleterious clay minerals. The abnormally high silica is present due to presence of clays and detrital quartz grains.

Table 2: Chemical Properties by XRF (Energy dispersive X-Ray fluorescence) for Diamond Drill Hole No. 3, drilled July 2022. Logged August 2022.

Core depth ft	Core depth m	CaO %	MgO %	Al2O3 %	SiO2 %	Fe2O3 %	LOI %	Acid sol Cl %
67' – 81'	20.4-24.7	31.9	20.8	0.26	0.13	0.17	47.1	0.085
81' – 105'	24.7-32.0	31.2	21.3	0.25	0.28	0.16	47.3	0.062
105' – 122'	32.0-37.2	30.9	20.9	0.37	1.23	0.25	46.2	0.052
122' – 140'	37.2-42.7	29.8	20.2	0.51	3.27	0.23	45.7	0.089
140' – 155'	42.7-47.2	30.9	20.8	0.41	0.60	0.20	47.0	0.137
155' – 175'	47.2-53.3	31.9	20.6	0.28	0.26	0.19	47.3	0.168
175' – 195'	53.3-59.4	31.4	21.5	0.13	0.09	0.25	47.5	0.168
195' – 219'	59.4-66.8	31.1	21.3	0.10	0.08	0.28	47.6	0.186

Testing by AME, Caledon, Sept 2022 following CSA A23.2-26A. LOI = Loss on ignition, Acid sol Cl = Acid soluble chloride. Chloride following MTO LS 417.
Note: Chloride values > 0.05% are likely to give concrete chloride values that exceed CSA values for reinforced concrete. High chloride is characteristic of the Goat Island and Gasport found in the quarries of the Niagara Escarpment but is accepted based on satisfactory long term field performance and because water soluble chloride is significantly lower.

APPENDIX G

Suggested Volume and Line Source Model Parameters

ID	Description	Modelled As	Base Elevation	Structure Width	Elevated or Surface Based	On or Adjacent to Building?	Building Height or Drop Distance	Volume Source Parameters			Comments
								Release Height	Initial Lateral Dimension	Initial Vertical Dimension	
PIT OPERATIONS											
P_HOPPER	Loader Transfer to Hopper	Loader Transfer to Hopper	490	4	surface	no	6	1	0.93	2.79	Drop distance to grizzly = 1m, width of truck bed = 4m, height of raised truck bed = 6m
P_SCALP	Scalping Screen	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_CRSH01	Primary Crusher	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_CONV01	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_BIN01	Conveyor Drop into Bin	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_CONV02	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_SCRN01	Screen Deck	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_STCK01	Stacker - 3/4" or 2" Crushed	Elevated Volume Source	490	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
P_TL_01	Truck Loading - 3/4" or 2" Crushed	Truck Loading with Loader	490	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
P_CONV03	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_CONV04	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_CONV05	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_BIN02	Conveyor Drop into Bin	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_SCRN02	Screen Deck	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_CONV06	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_CRSH02	Cone Crusher	Structure	490	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
P_CONV07	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_CONV08	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_STCK02	Stacker - Concrete Stone	Elevated Volume Source	490	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
P_TL_02	Truck Loading - Concrete Stone	Truck Loading with Loader	490	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
P_CONV09	Conveyor Transfer Point	Elevated Volume Source	490	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
P_STCK03	Stacker - 19mm Clear Stone	Elevated Volume Source	490	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
P_TL_03	Truck Loading - 19mm Clear Stone	Truck Loading with Loader	490	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
QUARRY OPERATIONS (BASE ELEVATIONS VARY BY PHASE)											
Q_BLAST	Blasting at working face	Blasting	varies	10	surface	no	15	1	2.33	6.98	Release height 5m above quarry floor, 10m blast width, 15m bench wall height
Q_HOPPER	Transfer of Fragmented Rock into Hopper	Loader Transfer into Hopper	varies	4	surface	no	6	1	0.93	2.79	Drop distance to grizzly = 1m, width of truck bed = 4m, height of raised truck bed = 6m
Q_SCALP	Screen Deck	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_CRSH01	Jaw Crusher	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_CONV01	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_BIN01	Conveyor Drop into Bin	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_CONV02	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_SCRN01	Screen Deck	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_CONV03	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_STCK01	Stacker - 3/4" or 2" Crushed	Elevated Volume Source	varies	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
Q_TL_01	Truck Loading - 3/4" or 2" Crushed	Truck Loading with Loader	varies	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
Q_CONV04	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_CRSH02	Cone Crusher	Structure	varies	4	elevated	yes	5.5	2.75	0.93	2.56	Centre of volume = 2.75m, physical width = 4m, physical height = 5.5m
Q_CONV05	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_BIN02	Conveyor Drop into Bin	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_SCRN02	Screen Deck	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_SCRN03	Screen Deck	Structure	varies	4	elevated	yes	4	2	0.93	1.86	Centre of volume = 2m, physical width = 4m, physical height = 4m
Q_CONV06	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_CRSH03	Cone Crusher	Structure	varies	4	elevated	yes	5.5	2.75	0.93	2.56	Centre of volume = 2.75m, physical width = 4m, physical height = 5.5m
Q_CONV07	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_CONV08	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_STCK02	Stacker - Concrete Stone	Elevated Volume Source	varies	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
Q_TL_02	Truck Loading - Concrete Stone	Truck Loading with Loader	varies	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
Q_CONV09	Conveyor Transfer Point	Elevated Volume Source	varies	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
Q_STCK03	Stacker - 19mm Clear Stone	Elevated Volume Source	varies	2	elevated	no	2	8	0.47	0.47	Centre of volume = 8m, physical width = 2m, drop height = 2m
Q_TL_03	Truck Loading - 19mm Clear Stone	Truck Loading with Loader	varies	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
W_FEEDBIN	Wash Plant Feed Bin	Truck Dumping into Hopper	varies	4	surface	no	6	1	0.93	2.79	Drop distance to grizzly = 1m, width of truck bed = 4m, height of raised truck bed = 6m
W_CONV01	Wash Plant Conveyor Transfer Point	Elevated Volume Source	494	2	elevated	no	2	2	0.47	0.47	Centre of volume = 2m, physical width = 2m, drop height = 2m
W_SCRN01	Wash Plant Wash Screen	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_CONV02	Wash Plant Conveyor Transfer Point	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_STCK01	Wash Plant Stacker - Sand	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_TL_01	Wash Plant Truck Loading - Sand	Truck Loading with Loader	494	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
W_CONV03	Wash Plant Conveyor Transfer Point	Not modelled	--	--	--	--	--	--	--	--	Not modelled

W_STCK02	Wash Plant Stacker - 1/4" Chip	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_TL_02	Wash Plant Truck Loading - 1/4" Chip	Truck Loading with Loader	494	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
W_CONV04	Wash Plant Conveyor Transfer Point	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_STCK03	Wash Plant Stacker - HL6	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_TL_03	Wash Plant Truck Loading - HL6	Truck Loading with Loader	494	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m
W_CONV05	Wash Plant Conveyor Transfer Point	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_STCK04	Wash Plant Stacker - 3/4" Clear	Not modelled	--	--	--	--	--	--	--	--	Not modelled
W_TL_04	Wash Plant Stacker - 3/4" Clear	Truck Loading with Loader	494	3	elevated	no	4	3	0.7	0.93	Height above ground of midpoint of drop distance to truck bed = 3m, bucket width = 3m, height of drop above truck bed = 4m

Suggested Volume and Line Source Model Parameters

ID	Description	Modelled As	Base Elevation	Vehicle Height VH (m)	Plume Height PH (m)	Vehicle Width / Road Width (m)	Plume Width (m)	Volume Source Parameters			Comments
								Release Height	Initial Lateral Dimension	Initial Vertical Dimension	
PIT OPERATIONS											
P_LOADER	Loader Traffic at Working Face	2-lane roadway	494	4.13	7.018	7.50	13.5	3.51	6.28	1.92	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
P_PL_01	Loader Traffic at Plant	2-lane roadway	494	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
P_PL_02	Loader Traffic at Plant	2-lane roadway	494	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
P_PL_03	Loader Traffic at Plant	2-lane roadway	494	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
P_HAUL	Haul Truck Traffic to Wash Plant	2-lane roadway	494	3.60	6.118	7.50	13.5	3.06	6.28	1.67	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
PUNPAVED	Pit Shipping Traffic on Unpaved Internal Roads	2-lane roadway	494	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
PPAVED	Pit Shipping Traffic on Paved Site Entrance Road	2-lane roadway	494	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
QUARRY OPERATIONS (BASE ELEVATIONS VARY BY PHASE)											
Q_LOADER	Loader Traffic from Muck Pile to Grizzly	2-lane roadway	Varies	4.13	7.018	7.50	13.5	3.51	6.28	1.92	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
Q_PL_01	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
Q_PL_02	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
Q_PL_03	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
Q_HAUL	Haul Truck Traffic to Wash Plant	2-lane roadway	Varies	3.60	6.118	7.50	13.5	3.06	6.28	1.67	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
QUNPAVED	Quarry Shipping - Unpaved Internal Roads	2-lane roadway	Varies	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
QPAVED	Quarry Shipping - Paved Internal Roads	2-lane roadway	Varies	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
W_PL_04	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
W_PL_05	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
W_PL_06	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
W_PL_07	Loader Traffic at Plant	2-lane roadway	Varies	3.73	6.341	7.50	13.5	3.17	6.28	1.73	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
WUNPAVED	Wash Plant Shipping - Unpaved Internal Roads	2-lane roadway	Varies	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6
WPAVED	Wash Plant Shipping - Paved Internal Roads	2-lane roadway	Varies	4.15	7.055	7.50	13.5	3.53	6.28	1.93	PH=1.7xVH, RH=0.5xPH, Sz=PH/2.15. 1-Lane PW=VW+6, Sy=PW/2.15, 2-Lane PW=RW+6

APPENDIX H

REPORT

STRADA AGGREGATES
STRADA PIT/QUARRY

MELANCTHON, ONTARIO

BEST MANAGEMENT PRACTICES PLAN FOR DUST

RWDI # 2300646

June 13, 2024

SUBMITTED TO

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LIST OF ATTACHMENTS

VERSION HISTORY

Index	Date	Pages	Author
1	June 13, 2024	All	Brian G. Sulley

REPORT SIGNATURES

Brian G. Sulley, B.A.Sc., P.Eng.

1 INTRODUCTION

1.1 Overview

This Best Management Practice Plan ("BMPP") for dust was prepared for Strada Aggregates (the "Company") for implementation at the Strada Pit / Quarry and the existing Shelburne Pit (the "Site") in the Township of Melancthon. 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.

A BMPP is meant to be a living document, reflecting operational experience at the site, and shall be reviewed periodically to ensure that mitigation measures are effective. Furthermore, if the site is operating at levels below maximum capacity, the mitigation measures may be adjusted accordingly.

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 Sites

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, estimated at less than 20%.

1.4 Overview of the Best Management Practices Plan

This document provides a separate section for fugitive dust sources at the Site, 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 DEFINITIONS

2.1 Dry Conditions

Where the BMPP refers to ”dry conditions”, this is defined as a period before which there have been more than 2 consecutive days without total rainfall over 1 mm.

2.2 Precipitation

Where the BMPP refers to ”sufficient precipitation”, this is defined as:

- Greater than 1 hour of rain;
- Greater than 2 hours of drizzle;

This does not include:

- Periods of rain or drizzle less than 1 hour per day;
- Periods of fog.

2.3 Fugitive Dust

Where the BMPP refers to observations of “fugitive dust”, it refers to the MECP definition of fugitive dust:

> “‘Fugitive dust’ means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.”

3 SITE PREPARATION & REHABILITATION

3.1 Activities Included

- Overburden removal using excavators, loaders and haul trucks.
- Berm construction using loaders, haul trucks and bulldozers.
- Rehabilitation using loaders, haul trucks, bulldozers and other equipment as required.

3.2 Controls

- Avoid overburden removal, berm construction and rehabilitation operations, if possible, during drier months, such as July, August, and September and during peak periods of extraction and processing of aggregates. Should these activities occur during this period, the measures identified below for dry conditions will be implemented, regardless of location and wind direction.
- During stripping, berm construction and rehabilitation, personnel shall monitor operations to ensure that visible fugitive dust does not leave the property when the following criteria are met:
  - Dry conditions are anticipated;
  - Excavation and loading activities are within 150 m of a residence; and
  - Winds are anticipated to be blowing towards the nearby residences.
- If visible fugitive dust is observed under these conditions, these operations shall be reduced, or additional mitigation measures shall be undertaken, such that visible fugitive dust is prevented from leaving the site. These additional mitigation measures could include, but are not limited to:
  - Application of water using a spray cannon mounted on the water truck.
  - If operations allow it, shifting operations to another area of the Site to reduce the potential for dust to migrate to the nearby residences.

4 AGGREGATE EXTRACTION

4.1 Activities Included

- Drilling;
- Blasting;
- Excavation of shot rock at the quarry muck pile;
- Excavation of sand and gravel at the pit face; and,
- Transfer of shot rock or sand and gravel to haul trucks by front-end loader.

4.2 Controls

- Personnel shall monitor blasting, extraction, and loading haul trucks to ensure that visible fugitive dust does not leave the property when the following criteria are met:
  - Blasting, extraction or loading haul trucks is occurring within 150 meters of a residence;
  - Winds are blowing from the operations towards nearby residences; and,
  - Dry conditions are anticipated (operations can proceed at full production under rainy conditions);
- If visible fugitive dust is observed blowing towards nearby residences, the following measures shall be implemented:
  - Water should be applied to the working face using a spray cannon mounted on the water truck, as quickly as possible.
  - Activities may need to be reduced or stopped completely if the dust cannot be mitigated.
  - If operations allow it, shifting operations to another area of the Site to reduce the potential for dust to migrate to the nearby residences.

5 AGGREGATE PROCESSING

5.1 Activities Included

- Aggregate crushing, screening, washing and stockpiling at the processing plants.
- Aggregate stockpile area and loading of trucks around the stockpiles.

5.2 Controls

- The portable processing plants shall be equipped with a water spray system.
- The total processing rate for the site shall not exceed 9,420 tonnes/day.
- The watering rate shall be set as needed to suppress visible dust.
- If the natural moisture content of the virgin aggregate is sufficiently high, watering may not be required.
- If sufficient precipitation is occurring, watering may not be required.
- For screenings and other high-fine 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.

6 UNPAVED HAUL ROUTES

6.1 Activities Included

- Traffic on unpaved haul routes for loader traffic from working face to the processing plants.
- Traffic on unpaved haul routes for haul truck traffic from the processing plants to the wash plant.
- Traffic on unpaved haul routes for shipping traffic from the stockpiles to paved portion of haul route.

6.2 Controls

- A speed limit of 15 km/h shall be posted near the site entrance. Heavy equipment and truck operators will be directed to observe the speed limit.
- Unpaved roads are watered using a water truck. The application of water to the unpaved roads will be dependent on weather conditions and the amount of traffic.
- Water shall not be applied to the roads when temperatures are below, or predicted to fall below, 4°C.
- The watering system shall be designed 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.
- Site staff will conduct visual inspections of the unpaved roads for dust emissions and the opacity of the dust emissions on a daily basis. If there is a significant amount of dust being emitted and/or the dust being emitted is of a high opacity, the water truck will be implemented.

7 PAVED HAUL ROUTES

7.1 Activities Included

- Paved haul routes for shipping traffic near the site entrances.

7.2 Controls

- A speed limit of 15 km/h shall be posted near the site entrance. Heavy equipment and truck operators will be directed to observe the speed limit.
- The facility shall have the capability to sweep or flush the on-site paved surface, as well as the portion of 4th Line near the site entrance where visible track-out of material from the Site is observed.
- Sweeping or flushing shall occur if silt is visible on the final 100 metres of the paved road surface at the site entrances.
- In dry conditions, the paved entrance area and the portion of 4th Line near the site entrance shall be inspected at the end of each day's shift and be swept or flushed, if necessary, to provide a clean entrance for the start of the next day's operations.
- The frequency of sweeping shall vary, depending on surface moisture conditions and traffic levels, and shall be triggered, as soon as practical, whenever routine inspections indicate that there is visible track-out on the pavement (may need to be swept once or twice per day, during peak operating periods).
- Water shall not be applied to the roads when temperatures are below, or predicted to fall below, 4^{o}C.

8 WIND EROSION

8.1 Activities Included

- Wind erosion may occur at disturbed areas, or at stockpiles that have relatively high silt contents, such as screenings or granular aggregate.
- Disturbed areas include the working face, areas that have been stripped but not yet extracted, and areas that have been extracted but not yet rehabilitated.
- 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).

8.2 Controls

- The amount of disturbed area will be kept to the minimum necessary for extraction to proceed in an efficient manner. Progressive rehabilitation will be used to reduce erosion from previously extracted areas, in accordance with recommendations in **Section 3**.
- Stockpiles of finer-grained material will be located on the eastern side of the plant area so as to be sheltered from prevailing winds by other piles.
- If visible fugitive dust associated with wind erosion of stockpiles or exposed areas is observed blowing towards nearby residences, water should be applied to the stockpiles and / or working face using a spray cannon mounted on the water truck, as quickly as possible.

9 EQUIPMENT SPECIFICATIONS

9.1 Activities Included

- These controls pertain to all diesel-fired off-road and stationary equipment at the site, including:
  - Front-end loaders used for extraction and loading.
  - Haul trucks used for moving aggregate to and from the active face to the processing plant.
  - Excavators, loaders, and haul trucks used for site preparation and rehabilitation.

9.2 Controls

- At a minimum, all equipment shall meet the Tier 2 or 3 emission limits, as applicable to each size of engine, as established under the Canadian Off-Road Compression-Ignition Engine Emission Regulations.
- Should Tier 4-compliant equipment be used at the site in the future, this will only serve to further reduce potential impacts.

10 OPERATIONAL WATERING FORECASTING

10.1 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.

10.2 Conditions Under Which Watering is Required

- The site operator should monitor local weather conditions using local weather forecasts.
- The following table provides guidance on optimal frequency at which water should be applied:

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 shall be implemented immediately if dust is observed to be blowing toward nearby residences.
- 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.

11 ADMINISTRATION

11.1 Implementation Schedule

- All control measures should be in a state of readiness before operation of the Site commences.

11.2 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 Assessment, and to ensure operations will not have a negative environmental impact on the surrounding area.
- The BMPP shall be kept on file at the onsite scale house (or with other health and safety information and procedures on site).

12 INSPECTION & MONITORING

12.1 Inspection and Maintenance

- Any dust suppressing or collection systems, such as spray bars, water trucks, or other such equipment should be inspected weekly;
- The paved and unpaved haul routes shall be inspected weekly, and maintenance shall be performed as soon as practicable.

12.2 Monitoring

- Weather forecasts shall be checked daily, to plan for current and next-day watering needs according to the Operation Weather Forecasting procedure described in **Section 10**.
- Throughout the operating day, on-site personnel shall report to the Site Manager any observations of visible fugitive dust blowing towards nearby residences.
- 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 dust management measures.

12.3 Record Keeping

- Records shall be kept of when and how dust control measures are implemented and when complaints are received, if any.
- In addition, records shall also be kept of the results of all Inspection, Maintenance and Monitoring activities.

13 COMPLAINT RESOLUTION

Strada has an External Communication procedure implemented as part of the Health & Safety Program, which includes an External Communication Log. All complaints received by Strada are handled according to the External Communication procedure, and all relevant information is tracked in the External Communication Log. A copy of the current procedure and accompanying log are attached to this BMPP.

ATTACHMENT 1

EXTERNAL COMMUNICATION

1.0 PURPOSE

The purpose of this procedure is to describe the process by which external environmental complaints are managed at the site.

2.0 SCOPE

This Standard Working Procedure applies to external communications from any interested parties (including the public) with the site.

3.0 RESPONSIBILITY

3.1 It is the responsibility of Senior Management to manage, address and record all external communications regarding the site.

3.2 It is the responsibility of all employees to report any external communications regarding the site to Senior Management.

3.3 It is the responsibility of all third party contractors to report any external communications regarding the site to Senior Management.

4.0 PROCEDURE

EXTERNAL COMMUNICATION PROCEDURE

- An External Communication Log will be maintained on an ongoing basis.
- When an inquiry (complaint) is received the information contained in the following log will be recorded.
- Upon receipt of an inquiry (complaint) the appropriate Senior Management personnel will notify appropriate plant personnel and take corrective action to implement the necessary solution.
- Upon receipt of an inquiry (complaint) the appropriate Senior Management personnel will record pertinent process operating conditions coinciding with the time of the incident (e.g. processing rates, equipment running, normal or upset conditions, etc.)
- The External Communications Log will be maintained as part of the site's Operation and Maintenance Documents.

5.0 REFERENCES

5.1 External Communication Log

External Communication Log

Date: _____ Time: _____ Type of Contact: Meeting: _____ E-mail/Letter:_____ Phone:_____ Other:_____	Contact Name(s): _____ _____ Person completing form: _____ Wind Direction: _____

Inquiry/Concern:

_____

_____

_____

_____

_____

_____

Actions to be taken:

_____

_____

_____

_____

_____

Type of follow-up-required: Organizational routing:

_____

_____

Comments:

APPENDIX H

BRIAN SULLEY, B.A.SC., P.ENG.

TECHNICAL DIRECTOR - AIR QUALITY | PRINCIPAL

T: 519.823.1311 X 2373 | Brian.Sulley@rwdi.com

Brian is a Technical Director and Principal whose area of expertise includes air quality emissions and dispersion modelling, odour assessments, dust assessments, hazard modelling and chemical process quantitative risk analysis.

Brian has also served as an expert witness before the Ontario Land Tribunal (formerly the Ontario Municipal Board and Local Planning Appeal Tribunal) multiple times, as well as the Ontario Superior Court of Justice, the Toronto Local Appeal Body, and for a Hearing of Necessity under the Expropriations Act. Brian has been qualified to provide expert testimony in each of his areas of expertise.

Brian's experience includes heavy industry such as the mining, aggregates, hot mix asphalt, cement, pulp and paper, petrochemical, and automotive industries, through to institutional facilities such as hospitals and universities, as well as transportation infrastructure, including highways, rail systems and airports.

Brian's experience in chemical process quantitative risk analysis spans his work with his previous employer in the chemical process industry and with RWDI. His work in chemical process engineering provides a strong foundation for his current role.

Brian sits involved in several industry associations, providing guidance and training to members on best practices and regulatory compliance requirements.

Brian also acts as a technical lead for our air quality modelling group, coaching and mentoring scientists and engineers across Canada at work on a range of emissions inventory, monitoring and modelling projects.

Employment History

2001 – Present
Technical Director – Air Quality, Principal, RWDI

2016 – Present
Instructor: Air and Water Quality Analysis, Environmental Building Science Program, Conestoga College

2003 – Present
Instructor: Introduction to Air Quality, Environmental Engineering Applications Program, Conestoga College

2011 – 2018
Instructor: Air Pollution Control, Environmental Control Program, Sheridan College

1999 – 2001
Process Engineering Associate, Huntsman Corporation Canada Inc.

Engineering Licences

Licenced Professional Engineer (P.Eng.) with:

- **Professional Engineers of Ontario, 2005**
- **Association of Professional Engineers and Geoscientists of Saskatchewan, 2019**
- **Association of Professional Engineers of Nova Scotia, 2020**
- **Association of Professional Engineers and Geoscientists of Alberta, 2021**
- **Engineers and Geoscientists British Columbia, 2021**

Affiliations

A&WMA - Air & Waste Management Association

OSSGA – Ontario Stone Sand and Gravel Association

Ontario Air Practitioners Group.

Education

Bachelor of Applied Science (Environmental [Chemical] Engineering), University of Waterloo, 2000

Courses Taught

Controlling Dust from Process Equipment. Ontario Agri Business Association

Evolution of the Ontario Approvals Process. Ontario Association of Physical Plant Administrators

Emission Sources, From Boilers to Bulldozers. A&WMA Ontario Section

Emission Estimation & Data Quality, Good Emissions Data Makes for Good Decisions. A&WMA Ontario Section

Controlling Fugitive Dust. OSSGA Environmental Management Workshop

Environmental Engineering for Non-Environmental Engineers, EPIC Educational Program Innovations Center

BRIAN SULLEY, B.A.SC., P.ENG.

TECHNICAL DIRECTOR - AIR QUALITY | PRINCIPAL

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Selected Project Experience

Hearings

- Albion Hills Automotive, Palgrave, ON, (OMB File PL070637)
- Crestwood Subdivision OMB Appeal, London, ON (OMB File PL080059)
- SASE Aggregates Ltd., Uxbridge, ON (OMB File PL160852)
- Blythe Holsteins Ltd., Municipality of Thames Centre, ON (LPAT File PL161154)
- Atlantic Power Corporation, Williams Lake, BC (EAB file 2016-EMA-G05)
- James Dick Construction Limited, Township of Guelph-Eramosa, ON (LPAT File PL170688)
- Colacem Canada Inc., Township of Champlain, ON (LPAT File PL170756)
- C. H. Demill Holdings Inc., Township of Tyendinaga, ON (LPAT File MM180027)
- Halton Crushed Stone, Town of Erin, ON (LPAT File MM190008)
- Zircon Design and Development Inc., Toronto, ON Hearing of Necessity under the Expropriations Act.
- MJJJ Developments Inc. v. Caledon (Town), Town of Caledon, ON (LPAT File PL190106, PL190107)
- RioTrin Properties (Burnhamthorpe) Inc. v. Mississauga (City), Mississauga, ON (LPAT File PL190221, PL190222)
- Woodstock Biomed Inc. v. Pelham (Town), Town of Pelham, ON (OLT File PL200426)
- Duca v. Vaughan (City), City of Vaughan, ON (OLT-22-002164, Legacy Case PL210333)
- Obico Rail Yard (GP) Inc., City of Toronto, ON Proceeding under s.13 of the Expropriations Act (OLT Case No. LC200010)
- Capital Paving Inc. v. Woolwich (Township), Township of Woolwich, ON (OLT-21-001326)
- 9205187 Canada Ltd o/a Morven Construction v. Hong Jie Xu and Yu Qing Huang, Napanee ON (Ontario Superior Court of Justice Court File No. CV-22-00000019-0000)
- Pearce v. Uxbridge (Township), Township of Uxbridge, ON (OLT-22-002956, Legacy Case PL200240)
- Urros Investments Inc. Appeal of Refusal to Allow a Minor Variance, Toronto, ON (TLAB Case No. 22 217984 S45 05)
- 1602211 Ontario Limited et. al. v. Burlington (City), Burlington, ON (OLT-22-003893)
- PR Bloor Street GP Inc. v. Toronto (City), Toronto, ON (OLT-22-004116)
- 747752 Ontario Ltd. v. North Dumfries, Township of North Dumfries, ON (OLT- 22-004440)
- OMERS Realty Holdings (STC One) Inc. et al v. Toronto (City), Scarborough, ON (OLT-22-004605)
- Rosart Bucci Group v. Brantford (City), Brantford, ON (OLT-23-000785)
- OMERS Realty Holdings (STC One) Inc. et al. v. Toronto (City), Toronto, ON (OLT-22-004605)
- Sanimax LOM Inc. v. Communauté métropolitaine de Montréal and City of Montréal, Montreal, PQ (CSM 500-17-123461-223)
- OBD Developments Inc. v. Georgian Bay (Township), Township of Georgian Bay, ON (OLT-23-000741)
- Camarro Developments Inc. v. Burlington (City), Burlington, ON (OLT-23-000415)

Land-Use Planning Air Quality Assessments

- Bolton Gateway Feasibility Assessment, Bolton ON
- Active Wellness Products, London, ON
- 225 Birmingham Street Redevelopment, Toronto, ON
- 6 Cuddy Boulevard, London, ON
- Dundas & Shorncliffe, Toronto, ON
- 5507-5509 Dundas Street Redevelopment, Toronto, ON
- 328-374 Dupont Street, Toronto, ON
- 176-178 Front Street Redevelopment, Toronto, ON
- 250 Front Street East Redevelopment, Toronto, ON
- 105 Garden Avenue Development, Brantford, ON
- Hansler Rd. Development, Thorold, ON
- iPoly, St. Catharines, ON
- 6 Lloyd Avenue, Toronto, ON
- Niagara Stone Rd. Development, Niagara-on-the-Lake, ON
- Nyon Energy Park Review, Port Colborne, ON
- Portage Rd. Development, Niagara Falls, ON
- Portuguese Cheese, Toronto, ON
- 933-935 Queensway Redevelopment, Toronto, ON
- Riverside Waste Transfer Facility, Centre, Wellington, ON
- 383 Sorauren Avenue Peer Review, Toronto, ON
- Thorold Park Redevelopment, Thorold, ON
- 771 Yonge Street Redevelopment, Toronto, ON
- 393053 County Road 12, Township of Amaranth, ON
- 431 Elmbrook Road, Prince Edward County, ON
- 682768 Dundas Street, Thamesford, ON
- 201 Ontario Road, Welland, ON
- 860 Pharmacy Avenue, Toronto, ON
- 1000 & 1024 Dundas Street East, Mississauga, ON
- 625 Conlin Road, Whitby, ON

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Industrial Facility Air Quality Assessments

- Anchor-Danly, Cambridge, ON
- Anchor-Danly, Windsor, ON
- Arcelor Mittal Hamilton East Works, Hamilton, ON
- Ar-Razi Methanol Plant, Jubail, Kingdom of Saudi Arabia
- Breeze Dried Flooring, Tilsonburg, ON
- Cooper Plating, Newmarket, ON
- Enbridge Gas Storage and Transfer Operations, ON
- Fiat Chrysler, Multiple Sites, ON
- Gateway Pet Memorial, Guelph, ON
- Gateway Pet Memorial, Ottawa, ON
- General Motors of Canada Limited, Multiple Sites, ON
- IMBC Blow Molding, Orangeville, ON
- Kuntz Electroplating, Kitchener, ON
- L.J. Barton, Hamilton, ON
- Mitten Vinyl, Paris, ON
- NOVA Chemicals, Corunna, Sarnia & St. Clair, ON
- Peel Plastics, Brampton, ON
- Pestell Pet Products, New Hamburg, ON
- Resolute Iroquois Falls Mill, Iroquois Falls, ON
- Resolute Thunder Bay Mill, Thunder Bay, ON
- Rochling Engineering Plastics, Orangeville, ON
- Sithe Energy, Mississauga and Brampton, ON
- Stelco, Hamilton & Nanticoke, ON
- TBay Tel Generators, Multiple Sites, ON
- Weston Bakeries, Multiple Sites, ON

Institutional Air Quality Assessments

- Bridgepoint Hospital, Toronto, ON
- Brock University, St Catharines, ON
- Carleton University, Ottawa, ON
- Centre for Addiction and Mental Health, Toronto, ON
- Centre Wellington Sportsplex, Fergus, ON
- Fanshaw College, London, ON
- Joseph Brant Hospital, Burlington, ON
- London Health Sciences Centre, London, ON
- Mackenzie Health Care, Multiple Sites, ON
- Milton District Hospital, Milton, ON
- North Bay Aquatic Centre, North Bay, ON
- North Bay Regional Health Centre, North Bay, ON
- St. Joseph's Health Centre, Hamilton, ON
- St. Michael's Hospital, Toronto, ON
- Stratford General Hospital, ON
- Trillium Health Care, Multiple Sites, ON
- Toronto Western Hospital, Toronto, ON
- University of Guelph, Guelph, ON
- University of Ottawa, Ottawa, ON
- Women's College Hospital, Toronto, ON
- Fanshaw College, London, ON

Transportation / Roadway Air Quality

- Bluewater Bridge, Sarnia, ON
- CN MacMillan Yard, Vaughan, ON
- GO Milton Expansion, ON
- Highway 400 Improvements, Barrie, ON
- Highway 417 Widening, Ottawa, ON
- Highway 69 Widening North of Parry Sound, ON
- Jebel Ali Airport, Dubai, UAE
- Metrolinx Network Expansion, ON
- North Channel Seaway Bridge, Cornwall, ON
- QEW Widening, Oakville, ON
- CN MacMillan Yard Pull Back Track, Vaughan, ON

Agricultural Experience

- DLM Foods Canada Inc., Elmira, ON
- Horst Farm Odour Assessment, Woolwich, ON
- New Life Mills Limited, Inkerman, ON
- New Life Mills Limited, Wyoming, ON
- Masterfeeds, Stratford, ON
- Don J. Pestell Limited, New Hamburg, ON
- Cargill, Multiple Sites, ON

Federal Government

- Cliff Hill Central Heating Plant, Ottawa, ON
- Revision to NPRI Welding Emission Factors, Gatineau, PQ
- Tunney's Pasture Central Heating Plant, Ottawa, ON

Ready-Mix Concrete Facility Air Quality Assessments

- Dufferin Construction, Burlington, ON
- Dufferin Construction, Hamilton, ON
- Dufferin Construction, Bowmanville, ON
- Dufferin Construction, Toronto, ON
- Dufferin Construction, Scarborough, ON
- Ontario Redi-Mix, Pickering, ON
- Ontario Redi-Mix, Toronto, ON

Hot-Mix Asphalt Facility Air Quality Assessments

- AECON, Brampton, ON
- Walker Aggregates, Thorold, ON
- Ingram Asphalt, Toronto, ON
- Walker Aggregates, Vineland, ON
- Dufferin Aggregates, Mosport, ON
- Waterford Group, Port Colborne, ON
- Coco Paving, Windsor, ON

Mining Air Quality Assessments

- Vale, Sudbury, ON
- Kirkland Lake Gold, Kirkland Lake, ON
- Rubicon Minerals Phoenix Gold Mine, Red Lake, ON
- Treasury Metals Goliath Gold, Wabigoon, ON

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Fugitive Dust Studies

- 5W Farms, Victoria Road Quarry, Victoria Road, ON
- AECON Ottawa Quarry, Ottawa, ON
- Blythe Dale Agg. Leitch Gover Pit, Thames Centre, ON
- Brampton Brick Hillsdale Plant, Hillsdale, ON
- Brampton Brick Norval Quarry Review, Brampton, ON
- Bruno's Contracting, Trout Lake Pit, Thunder Bay, ON
- Cambridge Aggregates Edworthy Pit, North Dumfries, ON
- Capital Paving, Aikensville Pit, Puslinch, ON
- Capital Paving, West Montrose Pit, West Montrose, ON
- Capital Paving, Shantz Station Pit, Maryhill, ON
- CBM Sunderland Pit Dust Control, Sunderland, ON
- C.H. Demill Melrose Quarry, Shannonville, ON
- City of Ottawa Trail Road Landfill, Ottawa, ON
- Cressy Quarry Review, Cressy, ON
- D&J Lockhart Martin Pit Expansion, Woolwich, ON
- Dufferin Aggregates Aberfoyle Pit, Puslinch, ON
- Dufferin Aggregates Acton Quarry, Acton, ON
- Dufferin Aggregates Alps Pit, North Dumfries, ON
- Dufferin Aggregates Butler Pit, North Dumfries, ON
- Dufferin Aggregates Carden Quarry, Carden, ON
- Dufferin Aggregates Cayuga Quarry, Cayuga, ON
- Dufferin Aggregates Cedar Creek Pit, North Dumfries, ON
- Dufferin Aggregates Chudyk Pit, North Dumfries, ON
- Dufferin Aggregates Flamboro Quarry, Dundas, ON
- Dufferin Aggregates Maple Yard, Maple, ON
- Dufferin Aggregates Mill Creek Pit, Puslinch, ON
- Dufferin Aggregates Milton Quarry, Milton, ON
- Dufferin Aggregates Mosport Pit, Mosport, ON
- Dufferin Agg. Richmond Hill Yard, Richmond Hill, ON
- Dufferin Aggregates Pickering Yard, Pickering, ON
- Duncor Portable Plant, Barrie, ON
- Duncor Emulsions, Shanty Bay, ON
- E.C. King Transfer Yard, Owen Sound, ON
- Essential Soils Solutions, Ramara, ON
- Farrish Crushing Portable Plant, Listowel, ON
- Federal Marine Terminals, Hamilton, ON
- Halton Crushed Stone, Town of Erin, ON
- Hanson Brick Burlington Review, Burlington, ON
- Highlands Group Melancthon Quarry, Melancthon, ON
- Hillway Equipment Limited, Orillia, ON
- James Dick Rockfort Quarry, Rockfort, ON
- James Dick Erin Pit Extension, Erin, ON
- James Dick Hidden Quarry, Guelph Eramosa, ON
- James Dick Reid Road Reservoir Quarry, Campbellville, ON
- Jennison Construction Clinton Pit, Clinton, ON
- Johnson Brothers McGuigan Pit, Cedar Springs, ON
- Johnson Brothers Erwin South Pit, Putnam, ON
- Kingfisher Aggregates Kingfisher Quarry, Ramara, ON
- Lafarge Cement, Bath, ON
- Lafarge Cement, Exshaw, AB
- Lafarge Goodwood Pit, Goodwood, ON
- Lippa Quarry, Skeleton Lake, ON
- Livingston Excavating & Trucking Inc., Simcoe, ON
- Lower Mattagami River Project, Mattagami, ON
- Lowndes Holdings, Mountsberg Quarry, Mountsberg, ON
- McCann Redi-Mix Durst Pit, Benmiller, ON
- Miller Aggregates, Paris Plains Pit, Brant County, ON
- NJ Excavating Martin Pit, Woolwich, ON
- SASE Aggregates, Uxbridge, ON
- Staples Himsworth Quarry, Himsworth, ON
- Thames Valley Agg., Banner Rd. Pit, Thamesford, ON
- Thames Valley Aggregates, Golding Pit, Putnam, ON
- The Murray Group, Cole Pit, Inverhaugh, ON
- The Murray Group, Devin Pit, Inverhaugh, ON
- Trent Valley Sand & Gravel Norfolk Quary, Norfolk, ON
- Try Aggregates Byron Pit Review, London, ON
- Preston Sand & Gravel Roszell Pit, Puslinch, ON
- Preston Sand & Gravel Henning Pit, North Dumfries, ON
- VicDom Sand and Gravel, Uxbridge, ON
- VicDom Sand and Gravel, Sunderland, ON
- VicDom Sand and Gravel, Utica, ON
- Walker Aggregates Walker Brothers Quarry, Thorold, ON
- Walker Aggregates Severn Pines Quarry, Orillia, ON
- Walker Aggregates Duntroon Quarry, Duntroon, ON
- Walker Aggregates Uppers Lane Quarry, Niagara Falls, ON
- Walker Aggregates Vineland Quarry, Vineland, ON
- Waterford Group Vinemount Quarry, Vinemount, ON
- Waterford Group Law Crushed Stone, Port Colborne, ON
- Wilson Quarry, Monck, ON

Fugitive Dust Monitoring Studies

- Summit Aggregates, Ayr Pit, Ayr, ON
- CBM Sunderland Pit, Sunderland, ON
- CBM Codrington Pit, Codrington, ON
- CBM Westwood Pit, Peterborough, ON
- CBM Thamesford Pit, Thamesford, ON
- CBM St. Mary's Quarry, St. Mary's ON
- CBM Osprey Quarry, Duntoon, ON
- CBM Hillsburgh Pit, Hillsburgh, ON
- CBM David Pit, North Dumfries, ON
- CBM Buckhorn Quarry, Buckhorn, ON
- CBM Bowmanville Quarry, Bowmanville, ON
- CBM Aberfoyle South Pit, Puslinch, ON
- CBM Aberfoyle North Pit, Puslinch, ON
- Waterford Group Dunnville Rock Products, Dunnville, ON
- Waterford Group Law Crushed Stone, Port Colborne, ON
- Waterford Group Norfolk Aggregates, Norfolk, ON
- Waterford Group Vinemount Quarry, Vinemount, ON
- Waterford Group Waterford Pit, Waterford, ON

BRIAN SULLEY, B.A.SC., P.ENG.

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Odour Assessments

- Active Wellness Products, London, ON
- Arnprior Sewage Treatment Plant, Arnprior, ON
- Colonial Sewage Pumping Station, Waterloo, ON
- Creemore Springs Brewery Peer Review, Creemore, ON
- Guelph Composting Facility, Guelph, ON
- Guelph Wet/Dry Facility, Guelph, ON
- Elora Wastewater Treatment Plant, Elora, ON
- IGPC Ethanol, Aylmer, ON
- Kawartha Ethanol, Kawartha Lakes, ON
- Keswick Wastewater Treatment Plant, Keswick, ON
- Lush Cosmetics, Toronto, ON
- Nitta Gelatin, Toronto, ON
- Parry Sound Sewage Treatment Plant, Parry Sound, ON
- Peel Composting Facility Management Plan, Caledon, ON
- Portuguese Cheese, Toronto, ON
- Ravensview Water Pollution Control Plant, Kingston, ON
- Royal Canin Pet Foods, Puslinch, ON
- S.C. Johnson, Brantford, ON
- Symplastics Engineering Plastics, Orangeville, ON
- Trail Road Landfill, Ottawa, ON
- Zircon Design and Development Inc., Toronto, ON
- Redecan Odour Assessment, Fenwick, ON
- River Valley Developments, Guelph, ON
- Gibson Energy Moose Jaw Refinery, Moose Jaw, SK
- Sanimax Odour Assessment, Montreal, PQ

Hazard Modelling / Chemical Process Quantitative Risk Analysis

- Quantitative Hazard Assessment Sulphur Dioxide Storage and Transfer Systems, Huntsman Corporation Canada Inc., Guelph, ON
- Quantitative Hazard Assessment Hydrogen Chloride Storage and Transfer Systems, Huntsman Corporation Canada Inc., Guelph, ON
- Quantitative Hazard Assessment Ethylene Oxide Storage and Transfer Systems, Huntsman Corporation Canada Inc., Guelph, ON
- Peer Review of Cytec Canada Risk Assessment, Niagara Falls, ON
- Edmonton Air Quality Assessment, Edmonton, AB
- Madoc Co-Operative Association, Madoc, ON
- Screening Level Risk Assessment of a Propane Facility, St. George, ON
- RioTrin Grand Park Redevelopment Hazard Consequence Modelling, Mississauga, ON
- CN MacMillan Yard Accidental Release Hazard Modelling, Vaughan, ON
- 1125 Finch Avenue West, Toronto, ON

Chemical Engineering Experience

- Process Design, Optimization and Control Relating to the Chemical Process Industry
- Two years in the process-engineering group of Huntsman Corporation Canada Inc.

Air Pollution Control Technologies

- Flue Gas Desulphurization Technology and Design Review, Moa Nickel, Cuba
- City of Guelph Waste Resource Innovation Centre Biofilter Replacement, Guelph, ON

Air Quality Monitoring Studies

- SaskPower Boundary Dam Power Station, Estevan, SK

Environmental Protection Plans

- Pound-Maker Bioethanol, Lanigan, SK
- North West Bio-Energy Ltd, Unity, SK

Building Air Quality Design Reviews

- 81 Bay Street, Toronto, ON
- 141 Bay Street, Toronto, ON
- 280 King Street East, Toronto, ON
- 17 Prince Arthur Street, Toronto, ON

APPENDIX I (AVAILABLE VIA FTP)