REPORT

Air Quality Assessment

Proposed Residential Development - Niagara Village, 6000 Marineland Parkway, Niagara Falls, Ontario

Submitted to:

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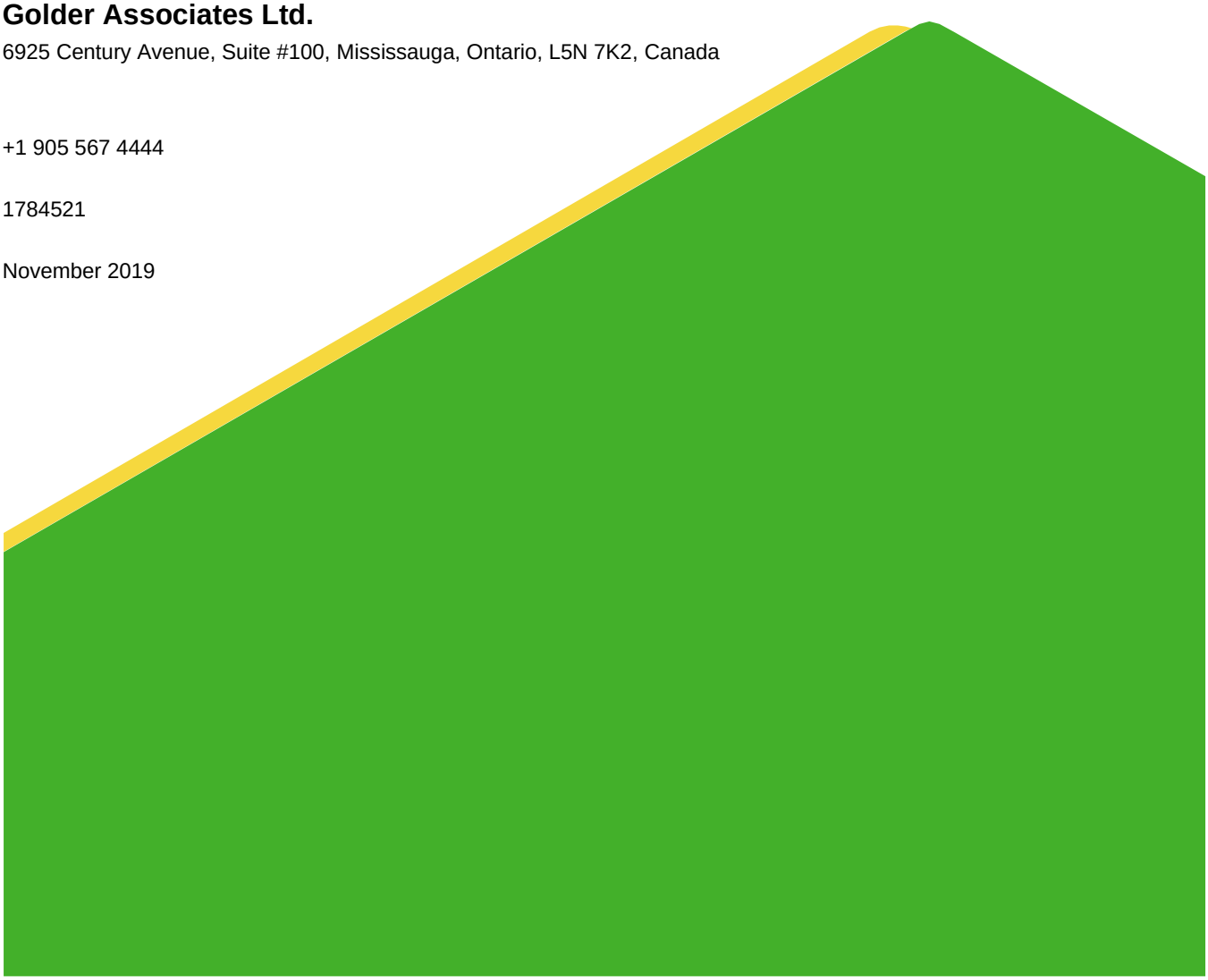
November 2019



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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Prenix Associates International Limited (Prenix) on behalf of Invest Group (the Client) to carry out an air quality assessment (the Study) of a proposed residential development named Niagara Village (the Project), located at the existing Thundering Waters Golf Course at 6000 Marineland Parkway, Niagara Falls, Ontario (the Site). The purpose of the Study is to review the feasibility of the Project with respect to air quality. The Study is to support the Project's official plan amendment application to allow for the redevelopment of the Site with residential and mixed land uses.

The Site is located near the intersection of Marineland Parkway and Stanley Avenue. It is currently an active golf course that was developed in 2005 and covers approximately 150 hectares. A road network encircles the Site and the Canadian Pacific (CP) Montrose Subdivision, a tertiary branch rail line, runs through the centre of the Site and services the industrial facilities in the area. As part of the Project, we have assumed that the Site may be re-developed into a residential subdivision, containing villas, townhouses, residential apartments, and a retirement home, with municipal roads and open recreation spaces. It is anticipated that the majority of residential units will be 2-3 storeys in height, however, there may also be residential apartments and a retirement home which may extend up to 6 storeys in height (approximately 25 m above grade including mechanical penthouse).

As part of the land use planning process, an understanding of whether or not proposed land uses, changes to land uses and/or amendments to land uses will introduce a potential for issues related to land use compatibility is required. The City of Niagara Falls (the City) official plan (Official Plan for the City of Niagara Falls, 2017) includes policies of council that require the following related to this report:

- An air quality study to address impacts of neighboring properties and their uses, roads, rail lines, air traffic etc. on development proposals involving residential uses and other similar sensitive uses.

This scope of work has been prepared to fulfil the requirements of an air quality study for a land use compatibility assessment required as per the policies of the City.

2.0 METHODOLOGY

It is understood that the redevelopment will not include any industrial land use and Golder understands that there will be no significant sources of emission to air from the proposed new land uses. As such, this assessment focuses on the suitability of introducing sensitive land use to the area.

The air quality assessment includes three main tasks:

- Identification of existing air emission sources;
- Land use compatibility assessment; and
- Air quality assessment, if required.

Each of these tasks is described in more detail in the following sections.

3.0 IDENTIFICATION OF EXISTING AIR EMISSION SOURCES

The first step of this assessment is to identify the main sources of air emissions in the area surrounding the Site. The Site is surrounded primarily by industrial land use to the east and south, residential land use to the north, and forested land to the west and south-west. A 1 km radius around the Site was used to define the Study Area, based on the maximum potential influence areas for industrial land use identified in the MECP D series guidelines (Section 4). This study area was used to identify the main sources of air emissions from both industrial and transportation sources, as indicated in Figure 1. The Study Area is marked orange, the Site boundary marked red, and neighbouring industrial facilities in green, purple and blue. Tables 2 and 3 provide the IDs and descriptions of the existing industrial facilities that were identified.

Figure 1: 1 km radius from the Site

Identified industrial and transportation sources are discussed in the following two sections.

3.1 Industrial Land Use Emission Sources

A desktop analysis was carried out to identify nearby industrial land use air quality emission sources. The following further describes the relevant sources of information investigated.

3.1.1 National Pollutant Release Inventory (NPRI) Search

Under Section 46 of Canadian Environmental Protection Act, organizations that meet certain reporting thresholds are required to submit an annual NPRI report to Environment and Climate Change Canada (ECCC). The report must quantify releases to air, water, land, and material recovery of over 300 listed substances that have been determined to have the potential to cause significant environmental impact.

Two industrial facilities were found within 1 km of the Site that reported to the National Pollutant Release Inventory (NPRI) for emissions released to air in 2017. NPRI data for the facilities is provided in Table 1 and their locations are indicated in purple circles on Figure 1.

Reporting to the NPRI is only required for facilities that have annual emissions above relevant thresholds set by ECCC. As a result, there may be additional industrial facilities in the vicinity of the Site that do not trigger NPRI reporting but have air quality emission sources with the potential to impact sensitive receptors introduced by the Site.

Table 1: NPRI Emission Totals for Industry within 1 km of the Site

ID	Company Name	NPRI ID	Distance from Site	Contaminants (Tonnes)								
				1,2,4-Trimethylbenzene	Ethylbenzene	Methanol	Phenol (and its salts)	Toluene	Xylene (all isomers)	Chromium (and compounds)	PM 10	PM 2.5
1	Mancuso Chemicals Limited	728	460 m	0.001	0.019	0.031	0.003	0.085	0.014	-	-	-
2	Washington Mills	2704	290 m	-	-	-	-	-	-	0.016	5.7	1.1
Study Area Total Emissions (tonnes)				0.001	0.019	0.031	0.003	0.085	0.014	0.016	5.7	1.1

3.1.2 Existing Section 9 Air Approvals

In Ontario, the Environmental Protection Act, R.S.O 1990 Chapter E.19 (EPA) regulates the discharge of contaminants into the natural environment and is administered by the Ontario Ministry of Environment, Conservation and Parks (MECP). Section 20.2 of Part II.1 of the EPA, for activities that fall under Section 9 of the EPA, requires that an approval must be obtained before installation or modification of all atmospheric emission sources (i.e., air, odour, noise and vibration). Depending on the facility activities, approval for the atmospheric emission sources is granted through the Environmental Activity and Sector Registry (EASR) or by obtaining an Environmental Compliance Approval (ECA) for the equipment by submitting an application to the MECP in accordance with EPA Section 9.

Golder conducted a review of existing Section 9 air approvals for facilities located within the Study Area using the MECP Access Environment or Environmental Registry websites. The purpose of reviewing existing approvals is to help identify the main sources of emission to air within the surrounding area based on the descriptions of facilities that have already been permitted by the MECP.

Copies of existing approvals are publicly available on the MECP website. Golder has obtained copies of the approvals for the seventeen facilities identified within the Study Area and completed a preliminary review of the sources of air emissions.

Table 2 summarises the approvals identified and the sources of interest. The potential impact of each of these industrial sources on the Site are further discussed in Sections 4.0 and 5.0. Each industry is indicated in a green circle of Figure 1.

Table 2: Summary of Facilities with Section 9 Approvals within the Study Area

Figure 1 ID	Distance from Site	Facility/ Company Name	Address	Approval (Date Issued)	Sources of Interest as presented in the Approval	Comments
1	450 m	Mancuso Chemicals Limited	5725 Progress St.	7196-AK9Q6Q (May 11, 2017)	Furan resin, acid catalyst and alkyd resin manufacturing facility	Production limit of 30,000,000 kg of products per year
2	290 m	Washington Mills	7780 Stanley Avenue	2240-A3WMAC (January 6, 2016)	Abrasive grain and specialty electro-fused minerals manufacturing facility	-
3	10 m	Chemtrade Logistics Inc.	6300 Oldfield Rd.	3355-9TZLBT (May 25, 2015)	Chemical transfer and storage facility	-
4	340 m	Fencast Industries	6272 Kister Rd.	6951-7Y5LKZ (November 29, 2009)	Produces fence fittings. Uses natural gas fired ovens, HVAC, and furnaces	-
5	510 m	Can Mar Manufacturing Inc.	5869 Progress St.	4568-65HLCW (October 8, 2004)	Metal stamping. Natural gas fired ovens, HVAC, hot water heaters, and industrial processes	5 stacks, tallest being 6.4m above grade
6	510 m	Barbisan Allmetal Designs	5835 Progress St.	9633-53MQ9L (October 26, 2001)	Paint spray booth	Stack reaching 1.98m above grade
7	570 m	Niagara Industrial Finishes Inc.	5635 Progress St.	4894-86QRVE (June 25, 2010)	Contains two paint spray booths and HVAC	Two stacks, 8.82m and 10m above grade
8	560 m	Pumpcrete Corperation	6000 Progress St.	5298-5VLS9Z	Concrete pumping company. Site contains spray booth and exhaust system. Welding occurs on site	Two stacks, 9.75m and 5.49m above grade

Figure 1 ID	Distance from Site	Facility/ Company Name	Address	Approval (Date Issued)	Sources of Interest as presented in the Approval	Comments
9	620 m	HOCO Limited	5720 Progress St.	9580-5H4MA8 (January 6, 2003)	Paint spray booth for the application of a solvent	Stack 6.55m above grade
10	785 m	St. Lawrence Cement	5980 Don Murie St.	6063-6TMLK6 (September 27, 2006)	Dry concrete mixing facility	Limited to 100 cubic metres of concrete per hour
11	790 m	Laurcoat Inc. (Earl)	8591 Earl Thomas Ave.	9345-9ZYMES (September 15, 2015)	Powder coating and industrial sandblasting facility. Ovens, paint booths, and exhaust systems	Two stacks 5.5m and 7.9m above grade
12	775 m	Brunner Manufacturing & Sales Ltd.	5720 Don Murie St. 5770 Don Murie Street	5882-8PHSZE (January 25, 2012) 0387-6BCRBV (April 12, 2005)	Motor Vehicle Brake Part Manufacturing Facility. Site equipment includes exhaust systems, electrical induction units, saws and cooling towers Manufactures products for commercial vehicles. Site equipment includes exhaust systems, welding operations, and a cooling tower	Five stacks ranging in height from 6 m to 7.9 m above grade Five stacks ranging in height from 5 m to 8.7 m above grade
13	470 m	H. & L. Tool and Die Ltd.	5955 Don Murie St.	2764-8ATP7D (November 6, 2010)	Produces metal and rubber components for automotive. Coating operations and assembly	Limit of 2,200 stabilizer bars and 4,400 metal inserts per day
14	470 m	Niagara Pattern Ltd.	6135 Don Murie St.	5857-8AFRRE (October 21, 2010)	Paint spray booth	Stack 6.3m above grade

Figure 1 ID	Distance from Site	Facility/ Company Name	Address	Approval (Date Issued)	Sources of Interest as presented in the Approval	Comments
15	685 m	Laurcoat Inc. (Dorchester)	8100 Dorchester Rd.	5650-8S6LVJ (April 17, 2012)	Drying oven	Stack 8.8m above grade
16	645 m	CYRO Canada Inc.	8100 Dorchester Rd.	4622-4LRL63 (June 29, 2000)	Sawing of plastics and resins	One stack, 7.2m above grade
17	760 m	Corporation of the City of Niagara Falls	6815 Stanley Ave.	7958-86RLGY (June 25, 2010)	Standby generator for convention centre	Emergency generator, 400kW

3.1.3 Additional Industrial Facilities Identified

In addition to industrial facilities identified using approvals and NPRI data, three additional facilities that are located within the Study Area were identified as part of the noise study. Further information on each of these facilities is provided in Table 3. Each of these facilities is identified on Figure 1 with a blue circle.

Table 3: Additional industrial facilities within the Study Area

Figure 1 ID	Distance from Site	Facility/ Company Name	Address	Comments
18	295 m	Lafarge Quality Ready Mix	6224 Progress Street	Ready mix plant
19	10 m	Salit Steel	7771 Stanley Avenue	The plant stores solid, inert finished products only, low potential for fugitive emissions
20	745 m	Palfinger	7942 Dorchester Road	Manufacturer and distributor of cranes

3.2 Transportation Sources

In addition to neighbouring industrial facilities, neighbouring transportation sources were also identified. There are several major transportation sources within the Study Area. However, it should be noted there is a setback of 15 m from the rail corridor upon which development is not permitted, as a result, the distance from the transportation sources to the closest point on the Site boundary is significantly smaller than the distance to closest location on the Site that could be developed. The identified transportation sources include:

- Marineland Parkway located adjacent to the Site boundary but approximately 450 m Northeast from the closest location that could be developed;
- McLeod Road located adjacent to the Site boundary but approximately 500 m North from the closest location that could be developed; and
- CP Rail Corridor which runs through the centre of the Site.

Studies by the US EPA have found that roadways generally influence air quality within a few hundred metres downwind from a heavily travelled road. The actual distance varies by location, time of day, year and prevailing meteorology, topography and traffic patterns (US EPA, 2014). Concentrations will dissipate rapidly from the road source. Each of these roads has annual average daily traffic of less than 40,000 vehicles and there are already residential developments in much closer proximity to each of these roads (i.e. less than 50 m). Therefore, given the distance of the two roads from potential development on the Site, neither of the two roads identified above were considered further in this assessment.

A rail corridor runs through the Site however it is considered a tertiary branch line and consists of freight train activity to support the local industries only. No development is permitted within 15 m of the Site. Given the infrequency of rail traffic along this line and the mandatory setback distance of residential development, emissions from the rail corridor were not considered further in this assessment.

4.0 LAND USE COMPATIBILITY ASSESSMENT

4.1 D-Series Guidelines

During the land use planning process for proposed future land uses, the MECP has recommendations described in a set of D-Series Guidelines developed in July 1995. The D-Series Guidelines are intended to assist in minimizing potential problems due to encroachment of sensitive land uses and industrial land uses on one another.

4.1.1 Guideline D-1 Land Use Compatibility

The MECP's Guideline D-1 Land Use Compatibility (Guideline D-1) provides recommendations and other control measures for land use planning proposals, which have the potential to involve encroachment of incompatible land uses. These recommendations seek to prevent or minimize potential adverse effects for an existing or proposed facility and apply only under circumstances of changes in land use proposals (i.e., future proposals).

Adverse effects considered under Guideline D-1 may include:

- noise and vibration;
- visual impact;
- odour and other air emissions;
- litter, dust and other particulates; and
- other contaminants.

Guideline D-6 Compatibility between Industrial Facilities and Sensitive Land Uses (Guideline D-6) discusses the applicability of Guideline D-1 for industrial facilities.

4.1.2 Guideline D-6 Compatibility between Industrial Facilities and Sensitive Land Uses

The purpose of Guideline D-6 is to prevent or minimize land use incompatibility between sensitive and industrial land uses through encroachment and the possibility of potential adverse effects due to normal operations of industrial facilities. This purpose is achieved by the suggestion of separation distances; however, Guideline D-6 also notes that detailed studies could be conducted to determine site-specific separation distances.

Guideline D-6 applies to proposed, committed and/or existing industrial land uses that have the potential to generate point and/or fugitive atmospheric emissions (noise, vibration, odour, dust and others) through normal operations, procedures, maintenance or storage activities, and/or from associated traffic/transportation. Guideline D-6 does not apply to non-stationary industrial facilities (e.g., mobile asphalt plant), roadways and railways (except ancillary facilities), agricultural operations, airports, or pits and quarries.

Guideline D-6 provides **potential influence areas** for three different classes of industrial land uses if an actual influence area is not available. The three different classes of industrial land uses are:

- Class I – Small scale business that is a self-contained plant or building which produces/stores a product contained to a package and has a low probability of fugitive emissions. Infrequent movement of products and/or heavy trucks. No outside storage. The facility only operates during the daytime period.

- Class II – Medium scale processing and manufacturing with occasional outputs of either point of fugitive emissions. Frequent movement of products and/or heavy trucks during the daytime hours. Outside storage of wastes or materials exists. The facility is permitted to have shift operations.
- Class III – Large scale processing or manufacturing. Frequent outputs of major annoyance with a high probability of fugitive emissions. Continuous movement of products. Outside storage of raw and finished product exists. The facility is permitted to have shift operations.

Actual influence areas refer to overall ranges within which a potential adverse effect would occur or is experienced. These areas are site-specific for facilities. They may be defined within or beyond the potential area of influence before or after buffers have been implemented as the approach to prevent or minimize potential adverse effects. Category classifications can be lowered if mitigative measures are applied at the source of emissions, which would reduce the recommended minimum separation distance.

Guideline D-6 recommends that there should not be incompatible land uses within the range of the minimum separation distance. The **minimum separation distance** is the distance between the designation, zoning or Site lines of closest proposed or existing sensitive and industrial land uses. It is used as an initial screening distance for land use separation to identify whether a more detailed assessment may be required.

Table 4 below summarizes the potential influence area and recommended minimum separation distances according to Guideline D-6 for each of the industrial facility classes.

Table 4: Summary of MECP Potential Influence Area and Recommended Minimum Separation Distances

Designation	Potential Influence Areas Separation Distance (m)	Minimum Separation Distance (m)
Class I (Light Industrial)	70	20
Class II (Medium Industrial)	300	70
Class III (Heavy Industrial)	1000	300

According to Guideline D-6, when a change in land use is proposed within an actual or potential influence area of one of the three classes of an industrial land use, a sensitive land use should not be permitted unless evidence can prove absence of compatibility issues due to possibility of adverse effects. In cases where a sensitive land use is proposed beyond an industrial facility's influence area (potential or actual), there should be no objection to a change in land use.

It also should be noted that even where facilities meet the recommended separation distances specified in Guideline D-6, an air, odour, noise and/or vibration assessment may still be required to ensure that the facility meets the applicable guidelines and regulations. Therefore, it is possible for the MECP to recommend separation distances greater that those outlined in this guideline. When industrial activities cannot be mitigated (reduction or minimization of potential adverse effects), the development of a new industrial facility or sensitive land use should not be permitted.

4.2 Application of D-Series Guidelines

Industrial facilities located within the Study Area were identified through the use of NPRI reporting data and Section 9 air approvals as well as finding of the noise study as described in Section 3. As detailed information on site-specific emission inventories and mitigation measures are not available, the 20 facilities were classified based on their typical operating hours (where available) and sources identified in their approvals. Table 5 provides a summary of the application of Guideline D-6 for the 17 facilities with respect to the Site. The Site is within the potential area of influence of five facilities and within the recommended minimum separation distance of three of these five facilities. As a result, further assessment is required to demonstrate compatibility. This is provided in Section 5.

Table 5: Application of Guideline D-6 to Neighbouring Industrial Facilities

Figure ID (in Figure 1)	Facility/Company and Address	Designation	Potential Influence Areas Separation Distance (m)	Minimum Separation Distance (m)	Facility's Separation Distance from Site[1] (m)	Further Assessment Required?
1	Mancuso Chemicals Limited	Class III	1000	300	450	Yes
2	Washington Mills	Class III	1000	300	290	Yes
3	Chemtrade Logistics Inc.	Class II	300	70	10	Yes
4	Fencast Industries	Class II	300	70	340	No
5	Can Mar Manufacturing Inc.	Class II	300	70	510	No
6	Barbisan Allmetal Designs	Class I	70	20	510	No
7	Niagara Industrial Finishes Inc.	Class II	300	70	570	No
8	Pumpcrete Corporation	Class II	300	70	560	No
9	HOCO Limited	Class I	70	20	620	No
10	St. Lawrence Cement	Class II	300	70	785	No
11	Laurcoat Inc. (Earl)	Class II	300	70	790	No
12	Brunner Manufacturing & Sales Ltd.	Class II	300	70	775	No

Figure ID (in Figure 1)	Facility/Company and Address	Designation	Potential Influence Areas Separation Distance (m)	Minimum Separation Distance (m)	Facility's Separation Distance from Site[1] (m)	Further Assessment Required?
13	H. & L. Tool and Die Ltd.	Class I	70	20	470	No
14	Niagara Pattern Ltd.	Class I	70	20	470	No
15	Laurcoat Inc. (Dorchester)	Class II	300	70	685	No
16	CYRO Canada Inc.	Class II	300	70	645	No
17	Corporation of the City of Niagara Falls	Class I	70	20	760	No
18	Quality Ready Mix	Class II	300	70	295	Yes
19	Salit Steel	Class II	300	70	10	Yes
20	Palfinger	Class II	300	70	745	No

Note: [1] Distances measured from Facility property boundary to Site property boundary

5.0 AIR QUALITY ASSESSMENT

The results of the D-6 Assessment indicated that an air quality assessment is required to demonstrate land use compatibility between five existing industrial facilities and proposed residential land use at the Site. A qualitative assessment was completed for facilities that are operating with a Section 9 approval that are within the potential influence area of the Site but meet the minimum separation distance. A more detailed assessment which includes dispersion modelling was completed for the facilities that are not operating with a Section 9 approval and have significant sources of emissions or that are within the potential influence area of the Site and/or did not meet the recommended minimum separation distance to the Site.

Of the five industrial facilities identified within the Study Area that require further assessment, three are approved to operate under an ECA. To be granted EPA section 9 approval, facilities are required to demonstrate that predicted concentrations of significant air quality contaminants released are below the relevant air quality standards listed in Ontario Regulation 419/05 (MECP Air Quality Standards) at ground level beyond their property boundary and at any elevated sensitive receptors such as condominium balconies or windows. The proposed land use for the Site is for low and mid-rise residential use. As a result, the land use introduces new receptors to the area that are not already required to be considered. The proposed buildings at the Site extend up to 25 m in height and therefore introduce potential sensitive receptors up to 25 m above grade. This is primarily a concern for facilities with stacks that are located very close to the Site. Short stacks typically result in less dispersion of emissions, as a result, maximum concentrations are typically highest relatively close to the point of emission. As a result, the concentrations of emissions from short stacks are not expected to significantly contribute to elevated concentrations at the Site. An assessment of each of the five facilities identified to be located within the potential influence area of the Site is provided below.

5.1 Mancuso Chemicals

The Mancuso Chemicals facility manufactures furan resin, acid catalyst and alkyd resin and includes both furan batch reactors and alkyd batch reactors. It was classified as a Class III facility, therefore, the Site, at 450 m away, meets the 300 m recommended minimum setback distance but it is located within the 1000 m potential influence area. The Mancuso Chemicals facility operates under an ECA with Limited Operational Flexibility, therefore no details are provided about the facilities stacks. A copy of the Emission Summary and Dispersion Modelling (ESDM) Report that supports the Facility's ECA was not publicly available.

A review of aerial imagery dated 2018 indicates that the Mancuso Chemical facility has a number of short stacks that appear to be less than 2 m above roof height and located greater than 400 m from the Site. There appear to be no tall stacks at the Mancuso Chemicals facility. Short stacks typically result in less dispersion of emissions, as a result, maximum concentrations are typically highest relatively close to the point of emission. As a result, the concentrations of emissions from these sources are not expected to significantly contribute to elevated concentrations at the Site. Additionally, this facility operates under an ECA, which will have included an assessment of ground level concentrations at or beyond the facility property line to demonstrate compliance with MECP air quality standards.

It is understood that the Mancuso Chemical facility has historically been a source of odour complaints (Arcadis, 2016). In Ontario, odour is typically assessed at odour sensitive receptors (which include residences) with predicted concentrations calculated on a 10-minute average to demonstrate compliance with a 1 OU threshold. As described above, the facility only has short stacks and/or tanks with vents, as a result, odour concentrations are expected to be highest close to the facility. There are already existing residences closer to the facility than the Site, including residences that are in the same wind direction but approximately 50 m closer to facility than the Site. As a result, the predicted odour concentrations at the Site are anticipated to be lower than those at the existing odour sensitive receptors and the Site is not adding odour receptors closer than existing locations.

Proposed development of the Site is therefore not anticipated to impact the ability of the Mancuso Chemicals facility to maintain compliance with their ECA.

5.2 Washington Mills

Washington Mills operates a speciality abrasive grain and electrofused minerals processing facility that is located approximately 290 m from the Site. The Site is within the minimum recommended separation distance and potential influence area of Washington Mills facility, therefore a more detailed assessment of air emissions from the Washington Mills facility was undertaken to assess the potential impact of the Site on Washington Mills. The Washington Mills facility operates under an ECA with limited operational flexibility, which allows for the operation of the following sources to produce up to 90,718 tonnes of fused material per year:

- Briquetting operations;
- Furnace operations;
- Pouring and casting;
- Crushing and screening; super sack/paper bag packaging;
- Dust collectors; and
- Natural gas fired comfort heating systems.

A copy of the ESDM Report that supports the facility's ECA was not publicly available. As a result, to provide a conservative screening assessment of the potential impacts of the facility on the Site, a simplified conservative emission estimate and dispersion modelling exercise was conducted. The screening assessment focussed on trivalent chromium and suspended particulate matter emissions as the Washington Mills facility triggered reporting of Chromium (and its compounds) and particulate matter (PM_{10} and $PM_{2.5}$) to the NPRI in 2016 therefore data for these compounds is available. It should be noted that the facility did not report emissions of hexavalent chromium to the NPRI in 2016 and additionally, only chromium in its trivalent form is listed as a potential emission source on the Environmental Registry posting that supported the ECA application (EBR Registry 012 – 4051).

As copies of the facility's emission estimates and modelling files are not available, general estimates of chromium and suspended particulate matter emission rates were calculated using the total NPRI releases reported for 2016 and assuming the facility operates 10 hours per day, 250 days per year. A summary of the calculated emissions is provided in Table 6, below.

Table 6: Washington Mills Emission Summary

Substance	Annual Release Reported to NPRI (tonnes/year)	Estimated Emission Rate for Screening Assessment (g/s)
Suspended Particulate Matter[1]	5.7	0.63
Chromium	0.016	0.002

Notes: [1.] Assumed to be equal to PM_{10}

Historical ECA documents for the facility indicate that there are at least two stacks at the facility that are 15.24 m above grade and 18.9 m above grade. For this screening assessment, it was assumed that these stacks are both located on the western edge of the Washington Mills facility (i.e. closest to the Site) and that all of the chromium and suspended particulate matter emissions are being released from these stacks. It is understood that there may be fugitive sources of emissions of these contaminants but the ECA contains requirements that the facility develop best management plans to control fugitive releases. Additionally, emissions of fugitive sources are typically emitted at ground level and would not be expected to be buoyant, as a result, predicted concentrations would be expected to be maximum close to the facility boundary and decrease with distance.

Each stack was modelled using the MECP-approved dispersion model AERMOD version 16216r and accompanying MECP meteorological dataset for the area. The actual exhaust parameters for the two baghouse dust collectors were obtained from the facility's historical ECA information and are presented in Table 7Aerial imagery dated 2018 indicates the presence of at least two stacks at the Washington Mills Facility.

Table 7: Washington Mills Modelled Source Parameters

Source	Stack Height Above Grade (m)	Stack Exit Diameter (m)	Stack Exhaust Flow Rate (m^3/s)	Exhaust Temperature (K)
Baghouse 1	15.24	0.99 x 0.89	3.12	Ambient
Baghouse 2	18.9	0.6 x 0.45	2.92	Ambient

The exact layout of proposed development at the Site is not finalized, therefore, a series of receptor grids were placed over the entire Site property to represent potential sensitive receptor locations. Each receptor grid has receptors placed at a 25 m spacing with varying elevations starting at 0 m (ground level) and extending up to 24 m above grade in increments of 3 m. Elevated receptors represent potential openable windows and balconies. This is a very conservative assessment as it assumes there are receptors ranging from ground level to 25 m above grade across the entire Site property. In reality, it is understood that only one or two individual buildings on the Site will be 25 m above grade.

The maximum predicted concentration of each contaminant assessed was compared to the relevant MECP Air Quality Standard listed in O.Reg. 419/05 and are summarised in Table 8.

Table 8: Washington Mills Screening Assessment Summary and Comparison to MECP Air Quality Standards

Substance	Averaging Period	MECP Air Quality Standard (µg/m^3)	Maximum Predicted Concentration at The Site (µg/m^3)	Percentage of MECP Air Quality Standard [%]
Suspended Particulate Matter	24-hour	120	17.52	15%
Chromium (and compounds)	24-hour	0.5	0.05	10%

This conservative screening assessment indicates that predicted concentrations from the facility, are unlikely to exceed MECP air quality standards at the Site. As a result, proposed development of the Site is not anticipated to impact the ability of the Washington Mills facility to maintain compliance with their ECA.

5.3 Chemtrade

Chemtrade operates a chemical transfer and storage facility that is located within 40 m of the Site boundary, thus within both the potential influence area and recommended minimum separation distance. Chemtrade is approved to operate under an ECA for air and noise emissions and a copy of the Emission Summary and Dispersion Modelling (ESDM) Report which supports the current ECA was provided to Golder by Chemtrade for review.

The main emission sources from the Chemtrade facility listed in the ESDM Report are as follows:

- Sulphuric acid and sulphur dioxide emissions from Sulphuric Acid tank passive vents;
- Hydrogen sulphide and sulphur dioxide from scrubber exhausts;
- Fugitive sulphuric acid and sulphur dioxide from truck and railcar loading
- Combustion products from diesel fired combustion equipment;
- Occasional emissions of chemicals from QAQC laboratory fumehoods.

A total of seven sources were modelled in the ESDM Report with stack heights ranging from 0.6 to 11.5 m above grade. Given the proximity of the Chemtrade facility to the Site, Golder completed modelling of the four most significant contaminants released from the facility: hydrogen sulphide, sulphuric acid, sulphur dioxide and nitrogen oxides using the stack parameters and emission rates included in the ESDM Report. Modelling was completed using the AERMOD dispersion model version 16216r and regional meteorological data for the area.

Gridded receptors were places as described in Section 5.1.2. In reality, only one or two individual buildings on the Site may be 25 m above grade and these are unlikely to be built within 50 m of the Chemtrade property due to the presence of the drainage channel.

For additional conservatism, each source was modelled independently using an emission rate of 1 g/s to calculate a dispersion factor in µg/m³/g/s. The maximum concentration of each contaminant was then calculated by multiplying the relevant emission rate of each contaminant taken from the ESDM Report by the largest dispersion factor. This is very conservative as it assumes that the maximum emission rate of each contaminant is emitted only from the source which results in the highest concentration which may not necessarily be the case. Emission rates for each contaminant assessed are provided in Table 9 and the stack parameters taken from the ESDM Report are provided in Table 10.

Table 9: Chemtrade Emission Summary

Substance	1 hour Emission Rate from ESDM Report [g/s]	24 hour Emission Rate from ESDM Report [g/s]
Nitrogen Oxides	0.19	0.01
Sulphur Dioxide	0.12	0.02
Hydrogen Sulphide	0.0027	0.0002
Sulphuric Acid	0.0012	0.0002

Table 10: Chemtrade Modelled Source Parameters

Source	Stack Height Above Grade (m)	Stack Exit Diameter (m)	Stack Exhaust Flow Rate (m^3/s)	Exhaust Temperature (K)
S1 – 93% sulphuric Acid Vent	11.5	0.2	0.076	Ambient
S2 – 98% Sulphuric Acid Vent	0.6	0.2	0.019	Ambient
S3 – Molten Sulphur Scrubber Exhaust	6.1	0.15	0.19	Ambient
S4 – Sulphur Dioxide Scrubber Tank System	1.0	0.15	0.047	Ambient
S5 – Sulphuric Acid Loading into Trucks	2.9	0.5	0.038	Ambient
S10 – Diesel Fueled Pressure Washer	3.7	0.2	0.20	423.15
S11 – Portable Diesel Fuelled Compressor	1.6	0.076	0.12	423.15

The maximum predicted concentration of each contaminant assessed was compared to the relevant MECP air quality standard listed in O.Reg. 419/05 and are summarised in Table 11.

Table 11: Chemtrade Screening Assessment Summary and Comparison to MECP Air Quality Standards

Substance	Averaging Period	MECP Air Quality Standard (µg/m^3)	Maximum Predicted Concentration at The Site (µg/m^3)	Percentage of MECP Air Quality Standard [%]
Nitrogen oxides	1-hour	400	352.11	88%
	24-hour	200	5.54	3%
Sulphur Dioxide	1-hour	690	220.39	32%
	24-hour	275	14.79	5%
Hydrogen Sulphide	10-minute	13	8.15	63%
	24-hour	7	0.16	2%
Sulphuric Acid	24-hour	5	0.14	3%

This conservative screening assessment indicates that predicted concentrations from the Chemtrade facility are unlikely to exceed MECP air quality standards at the Site. As a result, proposed development of the Site is not anticipated to impact the ability of the Chemtrade facility to maintain compliance with their ECA.

5.4 Quality Ready-Mix

Quality Ready-Mix is a ready mix concrete batching plant that does not appear to be operating with a Section 9 approval. It is located approximately 295 m from the Site boundary, which is greater then the recommended minimum separation distance of 70 m but the Site is within the potential area of influence. The facility is expected to have emissions related to the delivery, storage and transfer of materials. Based on a review of aerial imagery and Golder's experience with ready-mix facilities, the Quality Ready-Mix likely has a baghouse dust collector to control emissions from process operations. Other sources of emission from the facility are anticipated to be fugitive, and therefore not buoyant, with maximum concentrations typically occurring closest to the point of emission.

To provide a conservative screening assessment of the potential impacts of the Quality Ready-Mix facility on the Site, a simplified emission estimate and dispersion modelling assessment was conducted. Modelling was completed based on particulate matter emissions from a 20 m tall baghouse exhaust using the MECP outlet loading concentration of 20 mg/m^3 and typical exhaust flow rate of 10,000 cfm. The calculated emission rate based on these assumptions and the assumed stack parameters are provided in Table 12.

Table 12: Quality Ready-Mix Modelled Source Parameters

Source	Stack Height Above Grade (m)	Stack Exit Diameter (m)	Stack Exhaust Flow Rate (m^3/s)	Exhaust Temperature (K)	SPM Emission Rate [g/s]
Baghouse	20	0.335	5	Ambient	0.63

Gridded receptors were places as described in Section 5.1.2. The maximum predicted concentration of suspended particulate matter was compared to the relevant MECP air quality standard listed in O.Reg. 419/05 and is presented in Table 13.

Table 13: Quality Ready – Mix Screening Model Output Summary and Comparison to MECP Air Quality Standards

Substance	Averaging Period	MECP Air Quality Standard (µg/m^3)	Maximum Predicted Concentration at The Site (µg/m^3)	Percentage of MECP Air Quality Standard [%]
Suspended Particulate Matter	24-hour	120	1.5	1%

This conservative screening assessment indicates that predicted concentrations from the Quality Ready-Mix facility are unlikely to exceed MECP Air Quality Standards at the Site. As a result, proposed development of the Site is not anticipated to impact the ability of the Quality Ready-Mix facility to obtain Section 9 approval.

5.5 Salit Steel

Salit Steel does not currently operate under a Section 9 approval. It is understood that the facility manufactures and supplies steel rebar and structural steel members. The facility primarily stores solid, inert finished products and it is understood that there are no significant sources of air quality emissions (Arcadis, 2016). In aerial imagery for the site dated 2018, there are also no stacks visible and there does not appear to be significant material handling occurring outside, as a result any emissions would be expected to be ground based fugitive sources. To be granted EPA section 9 approval, facilities are required to demonstrate that predicted concentrations of significant air quality contaminants released are below the relevant air quality standards listed in Ontario Regulation 419/05 (MECP Air Quality Standards) at ground level beyond their property boundary. Emissions of fugitive sources, such as the Salit Steel sources, are typically emitted at ground level and would not be expected to be buoyant, as a result, predicted concentrations would be expected to be maximum close to the facility boundary and decrease with distance. As a result, proposed development of the Site is not anticipated to impact the ability of the Salit Steel to obtain Section 9 approval. In addition, the Site is not expected to be impacted by air quality emissions from the Salit Steel facility.

6.0 CONCLUSIONS

Golder was retained by Prenix on behalf of Invest Group to carry out an air quality assessment in support of a proposed residential development named Niagara Village. The proposed redevelopment plans for the Site include mid-rise residential housing in close proximity to industrial and transportation sources of air emissions.

Golder completed an assessment of the existing air emission sources within the Study Area to identify whether there is a potential for elevated air quality concentrations at the Site through the following:

- Identification of existing sources of air quality emissions in the surrounding area, including:
  - Industrial sources
  - Transportation sources
- Assessment of land use compatibility through the application of D-Series Guidelines to identify whether further air quality assessment are required for industrial sources;
- Air quality assessment of potential impacts from industrial sources.

The results of the land use compatibility assessment indicate that there are twenty industrial facilities, one railway line and two arterial roads that are located within the Study Area. Of these sources, five industrial facilities were identified as potentially having an impact to air quality at the Site. An air quality assessment was completed for each facility to assess the potential for elevated concentrations resulting from the industrial facility at the Site. The air quality concentrations at the Site are expected to be below the relevant MECP air quality criteria for each of the facilities that were assessed.

As a result, the Site is not anticipated to introduce additional environmental burden on the existing industrial facilities surrounding the Site and the use of mid-rise residential land use at the Site would be considered compatible with current surrounding land uses. In addition, the proposed new sensitive land use is not anticipated to be significantly impacted by emissions from existing nearby sources.

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