



**Brooks Road
Environmental**



Air Quality and Odour Assessment Report for the Brooks Road Landfill Daily Tonnage Assessment

**Brooks Road Landfill Site
160 Brooks Road
Haldimand County, Ontario**

**MARCH 2021
REF. NO. 018235 (105)**



Table of Contents

1.	Introduction	1
2.	Screening Criteria Checklist.....	3
3.	Existing Conditions	5
	3.1.1 Available Secondary Source Information Collection and Review	5
	3.1.2 Field Investigations.....	5
	3.2 Existing Conditions	5
	3.3 Climate, Air Quality and Odour.....	6
	3.3.1 Hamilton Climate Station.....	6
	3.3.2 Air Quality	8
	3.3.2.1 Vehicle Emissions	9
	3.3.2.2 Indicator Compounds	9
	3.3.2.3 MECP Air Monitoring Data	9
	3.3.3 Odour Quality	11
4.	Potential Effects, Mitigation Measures & Net Effects	11
	4.1 Purpose and Opportunity.....	11
	4.2 Description of Project Components and Activities.....	12
	4.3 Methodology and Investigations	12
	4.3.1 Potential Odour Effects	12
	4.3.2 Potential Air Quality Effects.....	13
	4.4 Air Quality and Odour Net Effects	14
	4.4.1 Potential Effects on Air Quality and Odour Environment	15
	4.4.2 Mitigation Measures	15
	4.4.3 Net Effects.....	15
5.	Monitoring Requirements and Additional Approvals.....	15
6.	Conclusion	15

Figure Index

Figure 1.1	Location of the Proposed Undertaking.....	1
Figure 1.2	Study Area.....	3
Figure 3.1	Wind Rose, Hamilton AP 2010 – 2014	7
Figure 3.2	Wind Class Frequency Distribution	8

Table Index

Table 2.1	Screening Criteria Checklist.....	4
Table 3.1	Comparison of Vertical Expansion Option	6
Table 3.2	Annual Particulate Matter 2.5µm Concentration from the Hamilton West MECP Monitoring Station	11



1. Introduction

The Brooks Road Landfill Site (Site), is located at 160 Brooks Road, near Cayuga, Haldimand County, Ontario and is owned and operated by 2270386 Ontario Limited, herein referred to as Brooks Road Environmental (BRE, Owner, Proponent). The location of the Site is shown in **Figure 1.1**.

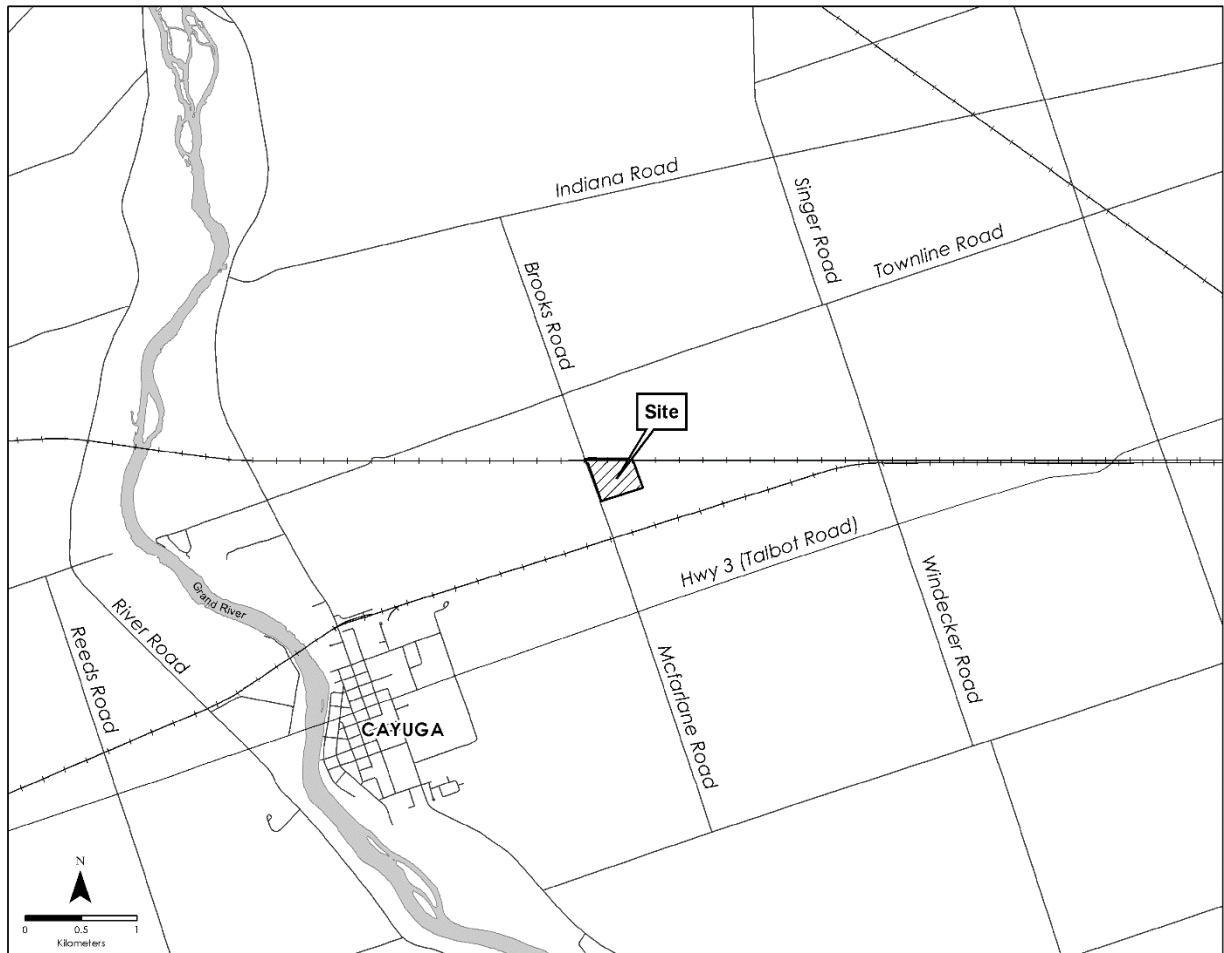


Figure 1.1 Location of the Proposed Undertaking

The Site, which operates under Environmental Compliance Approval (ECA) No. A110302, has an approved annual fill rate of 151,000 tonnes per year and a total capacity of 1,045,065 cubic metres (m³) (including waste and daily/final cover). The Site has accepted waste (in one form or another) since 1959 and received a Certificate of Approval (CofA) in 1980, with amendments approved by the Ministry of the Environment¹ in 1980, 2002, 2004, 2005, 2007, 2011, 2012, 2013, 2014, 2017 and 2018. Under the current ECA, the Site is licenced to receive post-diversion solid non-hazardous Industrial, Commercial & Institutional (IC&I) waste from across Ontario. The 14.3 hectare (ha) Site contains an approved fill area of 6 ha.

¹ Now known as the Ministry of Environment, Conservation and Parks



In 2018, BRE completed an Individual Environmental Assessment (EA) to increase the total approved capacity at the site to allow for the continued receipt of post-diversion IC&I waste over a five to seven year planning period and an amendment to the Site's rate of fill to provide for a maximum of 151,000 tonnes per year (known as the Brooks Road Landfill Vertical Capacity Expansion EA). Previously, the Site was approved to accept up to 500 tonnes per day. The approved Brooks Road Landfill Vertical Capacity Expansion EA assessed the effects to the environment based on a maximum daily fill rate of 1,000 tonnes per day to demonstrate that the Site could manage this daily quantity, while maintaining the same annual limits (151,000 tonnes per year). Therefore, the 1,000 tonnes per day was used in the EA as a benchmark for the environmental effects analysis.

The proposed Project would amend the approved ECA to allow for receipt of this maximum daily quantity (1,000 tonnes per day) throughout the year, increasing the annual fill rate from 151,000 tonnes per year to 250,000 tonnes per year. There is no change to the currently approved total landfill volume, size of landfill footprint, or final site contours. There is no change to the daily, interim, or final cover design, or the landfill base design. This change to the annual fill rate will allow for BRE to respond to the growing demands from waste generators/ customers who need a safe and reliable waste management facility for their residual material. This includes the ability to accommodate BRE's customers facing seasonal volume increases at certain times of the year (i.e. increased construction generated wastes) which the Site might not be able to be accommodate with the current annual fill rate. If this project is approved and the maximum tonnage proposed as part of this Screening were received annually at the Site starting in 2021, the approved capacity of the site may be reached earlier.

This ECA amendment is subject to the Environmental Screening Process in accordance with Section 15 of the Waste Management Projects Regulation, (O. Reg. 101/07) of the EA Act. Ontario Regulation 101/07 – Waste Management Projects Act exempts this project from Part II of the Environmental Assessment Act and subjects it to the Environmental Screening Process. The Project falls under Section 15 of the Regulation – Change to Landfilling site, increase in rate of fill.

The Screening will be conducted in accordance with the planning and design process outlined in Ontario Ministry of Environment, Conservation and Parks (MECP) "*Guide to Environmental Assessment Requirements for Waste Management Projects*". The Screening process includes identifying and applying screening criteria to determine and describe potential environmental effects, public/external agency consultation, and the development of measures to mitigate identified environmental effects. The results of the Study will be documented in an Environmental Screening Report, which will be released for review to Stakeholders including Indigenous communities, the public, and government agencies. Upon completion of the Environmental Screening Process an application will be made to amend the existing ECA No. A110302.

GHD has prepared an Air Quality and Odour assessment on behalf of BRE for the proposed undertaking. This report documents the following as it relates to the Air Quality and Odour environment:

- Baseline/existing conditions (i.e., what exists in absence of the proposed project)
- Potential effects on the environment, mitigation measures and net effects
- Future monitoring requirements to be implemented



The Study Areas reviewed for the Air Quality and Odour assessment was as follows (see **Figure 1.2**):

- **On-Site** – the 9.04 ha Site containing the Town’s existing 2.95 ha WDS
- **Site-Vicinity** – the lands in the vicinity of the Site extending approximately 1000m in all directions

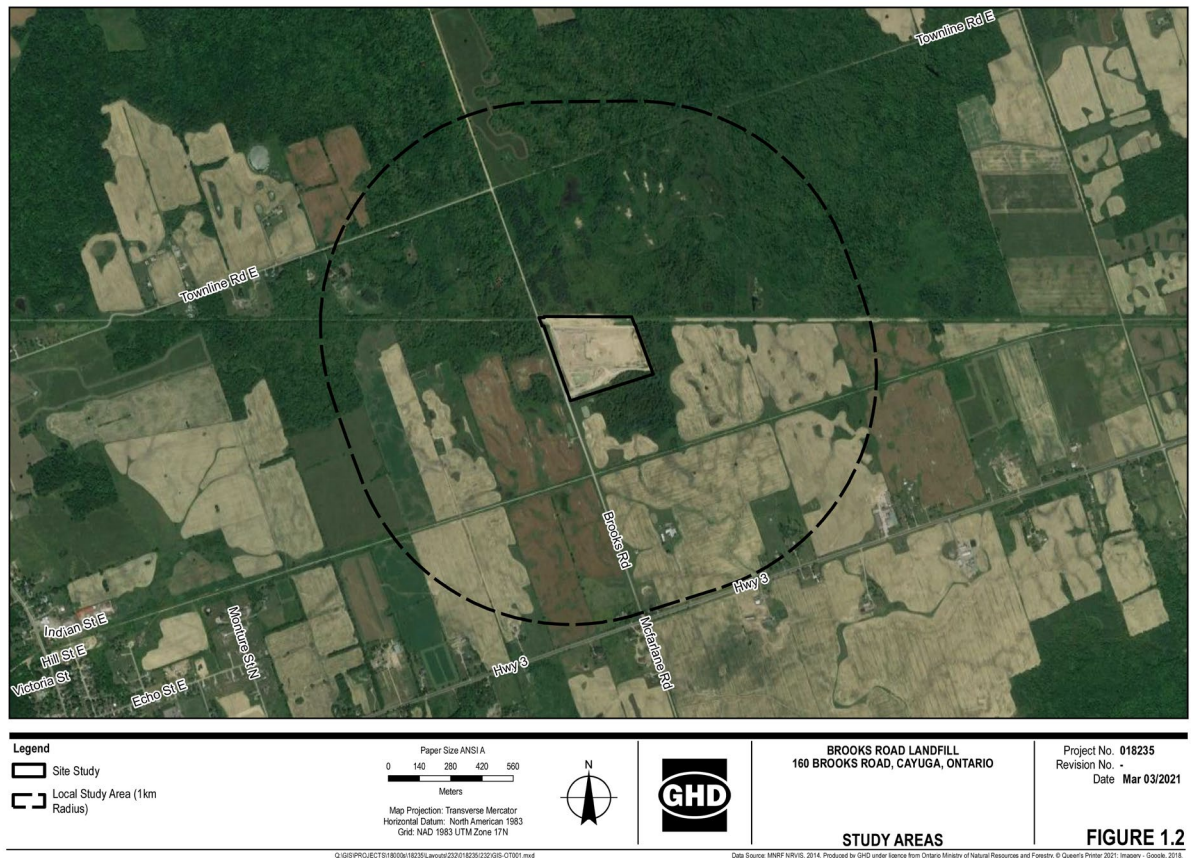


Figure 1.2 Study Area

2. Screening Criteria Checklist

At the beginning of the Environmental Screening, the Screening Criteria Checklist (provided as Schedule I, pp 62 – 64, to the “Guide to Environmental Assessment Requirements for Waste Management Projects”) is to be completed based on the information provided in the Project Description. The Screening Criteria reflect the broad definition of “environment” contained in the *Ontario Environmental Assessment Act*.

As noted in the Guide:

“The Screening Criteria are presented in the form of a checklist with the option of a “Yes” or “No” response. Mitigation measures **are not** to be considered in concluding whether there is “No” potential environmental effect. That is, the proponent is required to answer “Yes” even if the



proponent believes that a potential environmental effect could likely be mitigated. The reason for requiring a “Yes” is to ensure that mitigation measures are open to discussion and review. Another reason for this approach is that further discussion and review of a potential effect may reveal that there is no actual effect, in which case no mitigation is required. Where a “yes” has been identified, the proponent is to provide additional information in the Environmental Screening Report, explaining the potential effect(s), methods to mitigate or address the effect(s), any net effects that are anticipated and if so, their significance. Even where the proponent indicates that no environmental effects are anticipated, it is recommended that additional information is provided in the Environmental Screening Report in order to support the “no effects” conclusion”. Each criterion is based on a question which is prefaced with the phrase, “Might the Project...”.

The table below was completed as the first step of the Environmental Screening Process and is a summary of the criteria for the Air Quality and Odour discipline:

Table 2.1 Screening Criteria Checklist

	Criterion	YES	NO	Additional Information
	Might the project...			
1. Air and Noise				
3.1	Cause negative effects on air quality due to emissions (for parameters such as temperature, thermal treatment exhaust flue gas volume, nitrogen dioxide, sulphur dioxide, residual oxygen, opacity, hydrogen chloride, suspended particulates, or other contaminants)?		X	The proposed Environmental Compliance Approval amendment will not change the existing landfill footprint or on-site operations and will not cause negative effects on air quality due to emissions.
3.2	Cause negative effects from the emission of greenhouse gases (e.g., carbon dioxide, carbon monoxide, methane)?	X		The proposed Environmental Compliance Approval amendment will result in a potential increase in emissions associated with additional truck movements to/from the Site.
3.3	Cause negative effects from the emission of dust or odour?	X		The proposed Environmental Compliance Approval amendment will result in a potential increase in dust and odour emissions associated with additional truck movements to/from the Site.
3.4	Cause negative effects from the emission of noise?	X		The proposed Environmental Compliance Approval amendment will result in a potential increase in noise emissions associated with additional truck movements to/from the Site.
3.5	Cause light pollution from trucks or other operational activities at the site?		X	The proposed Environmental Compliance Approval amendment will not change the existing landfill footprint or on-site operations and will not cause negative effects from light pollution.



3. Existing Conditions

The following subsections describe the existing conditions that are found within the on-Site and Site Vicinity Study Areas of the proposed project.

3.1.1 Available Secondary Source Information Collection and Review

Available secondary sources of information were collected and reviewed by the Air Quality and Odour team to determine existing air quality and odour conditions within the study areas. The following sources of secondary information were collected and reviewed:

- Environment Canada Climate data (2010 to 2014)
- Ambient air quality data obtained from the Ministry of Environment, Conservation and Parks (MECP) (2009 to 2014). Note that the PM_{2.5} data available from the closest monitoring station, the MECP Station #29118 at West Hamilton was used in the net effects assessment for a cumulative particulate evaluation
- Existing Facility Emission Summary and Dispersion Modelling Report, prepared for Brooks Road Environmental by Conestoga-Rovers & Associates (September 14, 2015 and updated June 2020)
- Odour Monitoring Program, prepared for Brooks Road Environmental by Conestoga-Rovers & Associates (July 28, 2014)
- Odour Monitoring Program, prepared for Brooks Road Environmental by Conestoga-Rovers & Associates (November 3, 2014)
- Odour Monitoring Program, prepared for Brooks Road Environmental by GHD (2016, 2017, and 2019)

3.1.2 Field Investigations

On-site and off-site odour investigations were completed by GHD in 2014, 2016, 2017 and 2019. These studies indicated that there was no measurable odour off-site. GHD completed odour measurements during daytime and nighttime periods to try and observe odours in the surrounding community. During all the odour monitoring events, no odours that could be attributed to the Site were detected off-site.

The GHD Team completed a walk-through of the Site, with focused observations at the location of the proposed vertical expansion and the leachate system. GHD did not identify any fugitive emissions during the walkthrough other than minor particulate emissions generated by small vehicles moving throughout the landfill. The GHD Team also observed the area surrounding the Site to confirm the locations of the nearest sensitive receptors to the Facility.

3.2 Existing Conditions

The following conditions are currently present at the Site. During the previous assessment three alternatives were presented. The decision was made to proceed with Alternative 1. The existing conditions are described in **Table 3.1**.



Table 3.1 Comparison of Vertical Expansion Option

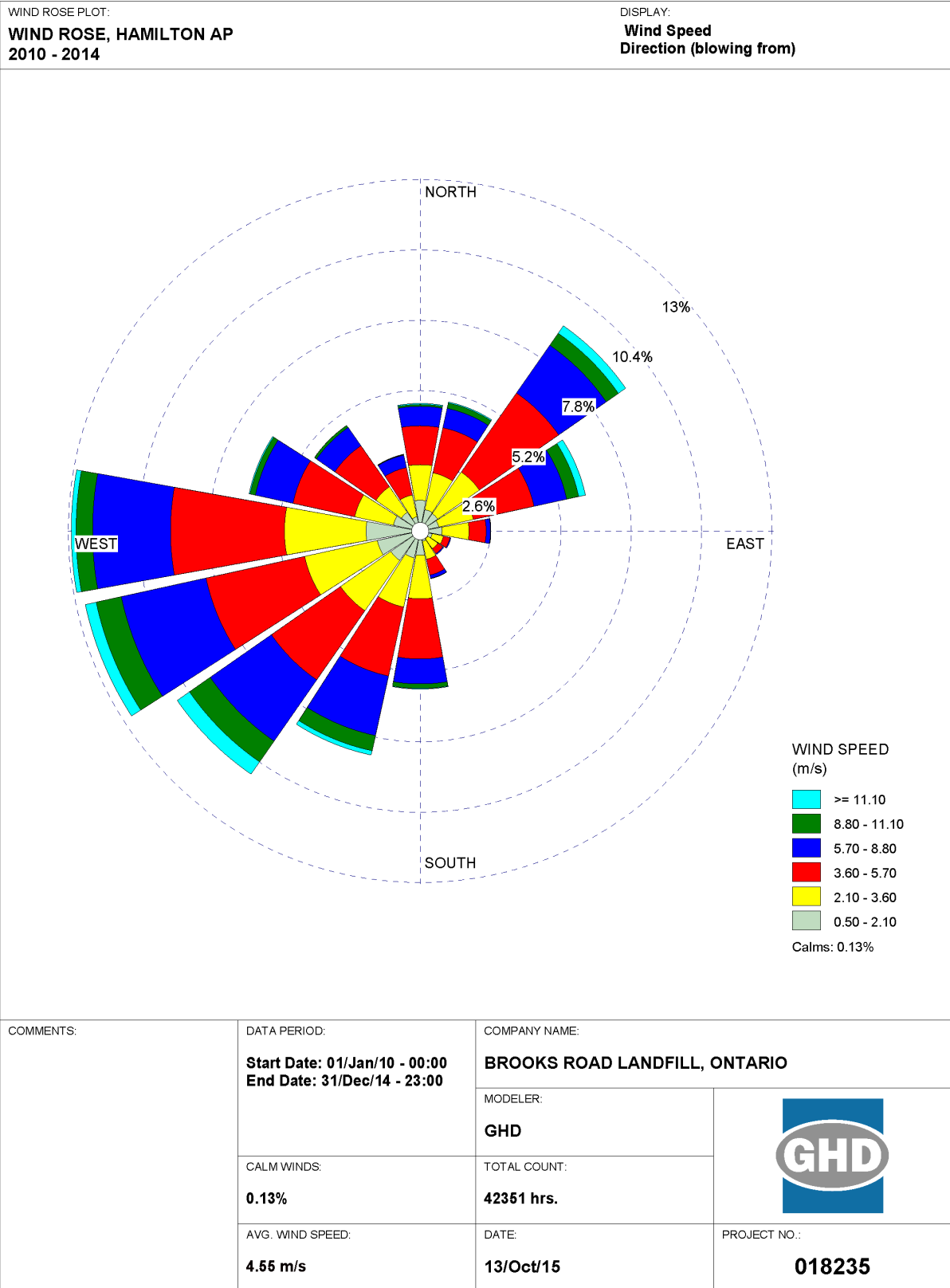
Attribute	Alternative 1
General Description	Expansion capacity with 3H to 1V (33%) side slopes to a crest height of 218.075 m
Approximate Elevation of Top of Landfill (including final cover)	219.65 m
Approximate Height of Landfill Above Existing Grade of 198.96	20.69 m
Post-Closure Leachate Generation Rate	36 m ³ /day
Number of Vehicles Per Day Associated with Waste and Construction Materials	25 to 50

3.3 Climate, Air Quality and Odour

3.3.1 Hamilton Climate Station

The Hamilton Climate Station is a weather station located at Hamilton's John C. Munro International Airport (43.1N, 79.5W, elevation 237.7 m). The station has been operating since January 15, 1970 under World Meteorological Organization (WMO) ID 71263. The Hamilton Climate Station was selected as it is the closest representative station to the Facility that has hourly documented climate data since 2010. Data from this station is published online at Environment Canada's National Climate Data and Information Archive. Hourly data from the station was analyzed to determine prevalent atmospheric conditions that are considered representative of the Site.

Figure 3.1 presents a five-year wind rose for the Hamilton Climate Station for the period between 2010 and 2014 and **Figure 3.2** presents the wind class frequency distribution. The dominant wind directions, as shown on **Figure 3.1**, are from the southwest, and west.



WRPLOT View - Lakes Environmental Software

Figure 3.1 Wind Rose, Hamilton AP 2010 2014

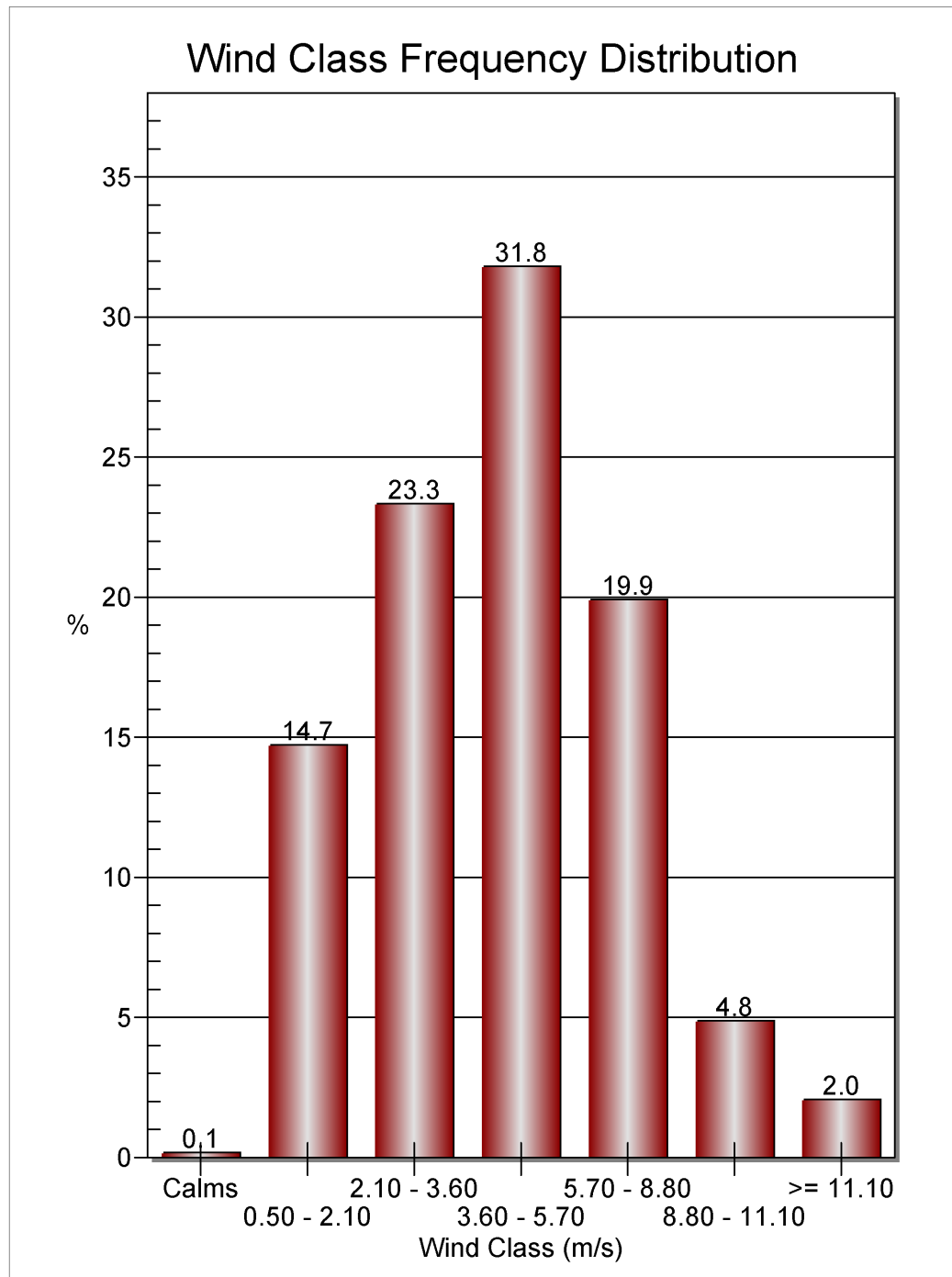


Figure 3.2 Wind Class Frequency Distribution

3.3.2 Air Quality

The Facility is located approximately 2.8 km northeast of Cayuga and 25 km south of Hamilton and is surrounded by agricultural land. The closest residential building is approximately 232 m from the Site and there are no major industrial sources within the Study Area. The Facility has a berm that



runs along the west side of the site and a clay stockpile located along the north side that would reduce the line of sight and fugitive particulate matter emissions when the landfill is in operation.

3.3.2.1 Vehicle Emissions

Particulate emissions related to vehicles operating at the landfill are the primary emissions of concern at the landfill. Particulate may be defined in various particle size categories; including total suspended particulate (TSP), particulate less than 10 microns (PM10) and particulate less than 2.5 microns (PM2.5). All fractions of particulate were previously assessed for the potential landfill emissions. There is no change in the TSP, PM10, or PM2.5 emissions from the previous assessment as the proposed operations were assessed.

3.3.2.2 Indicator Compounds

As identified above, TSP, PM10, and PM2.5 were previously included in the assessment as they are the primary emissions of concern at the landfill. Potential TSP, PM10, and PM2.5 emissions from vehicle exhaust and break and tire wear for the on-site vehicles was concluded to be insignificant based on results from Mobile6.2 and were not included in the assessment.

Other tailpipe/combustion emissions, such as nitrogen oxides (NOx) and carbon monoxide (CO), can also be concluded to be insignificant based on the small volume of daily traffic at the landfill, and the significant distances to sensitive receptors. The potential concentrations of NOx and CO that a person might be expected to be exposed to near a municipal road would far exceed the concentrations of these compounds at the landfill boundary. Therefore, it may be concluded that NOx and CO emissions from the vehicles at the landfill continue to be insignificant contributors to the background concentrations of these compounds as the traffic volumes have remained the same.

Landfill gases, such as hydrogen sulfide (H₂S) and vinyl chloride, can also be concluded to be insignificant based on the operations at the landfill. GHD completed a theoretical landfill gas generation rate for the site. Based on the existing and proposed waste to be disposed at the site, it was determined that the maximum amount of landfill gas that will be generated is less than approximately 80 cubic feet per minute (in 2025). This would be distributed over an area of approximately 14.3 hectares or 143,000 square metres, resulting in a landfill gas exit velocity of only 0.000004 metre per second. This amount of landfill gas generation is anticipated to be insignificant from an overall site profile and therefore landfill gases are not included in any further assessment.

Odours from the operations have not been further assessed. Due to the nature of the material being landfilled and the previous assessment that evaluated the proposed conditions there is no change in the odour profile for the Site.

3.3.2.3 MECP Air Monitoring Data

The MECP has ambient air monitoring stations across Ontario that measure a variety of pollutant concentrations. Typically, the stations monitor criteria air contaminants, such as nitrogen oxides, carbon monoxide, sulphur dioxide, and particulate matter, with the exception of some specialized monitors that measure speciated volatile organic compounds (VOCs) and ammonia. There are no



active monitoring stations within the Study Area, therefore, the monitor located in West Hamilton (29118), Ontario was chosen as the closest monitor to the Site.

The West Hamilton station monitors nitrogen oxides, ground-level ozone, and particulate matter 2.5 μm (PM2.5). The West Hamilton station is located in West Hamilton and is expected to be influenced by the industry within the City of Hamilton. The focus of this assessment is on the various size fractions of particulate matter. Although the West Hamilton Station is not representative of the Brooks Road Landfill Site the data from this location has been included for completeness. The focus of this assessment is on the TSP, PM10, and PM2.5. These fractions of particulate matter are the main containments that will be released at the Brooks Road Landfill Site.

Hourly readings and 24-hour average values are provided as part of the MECP hourly results data set for PM2.5. The West Hamilton monitor is located in a predominantly urban area. Therefore, the PM2.5 concentrations around the Brooks Road Landfill Site are expected to be much lower compared to the monitoring station.

The hourly readings for PM2.5 from the West Hamilton station were averaged to obtain an annual average concentration, which is presented in **Table 3.2** along with the average over the six year period (2009 to 2014). A time frame of six years was chosen as it provides an accurate representation of the PM2.5 levels for West Hamilton that is influenced from the industrial activities in Hamilton but is not representative of the PM2.5 levels at the Brooks Road Landfill Site.

As shown in **Table 3.2**, the concentration for PM2.5 is below its respective Ambient Air Quality Criteria (AAQC) and Canada Ambient Air Quality Standard (CAAQS). The monitoring data indicates PM2.5 levels are slowly increasing over time. However, this is a result of an increase in industry in the vicinity of the West Hamilton monitoring station and is not expected to be the trend for the Brooks Road Landfill Site and its surrounding area. Based on the monitored data, the PM2.5 background concentrations in the vicinity of the Site are well below the respective AAQC and CAAQS. It is expected that the levels at the Brooks Road Landfill site are significantly lower as they are not influenced by the industrial and populated areas of Hamilton.

Based on the information from the West Hamilton meteorological station it is expected that the existing ambient particulate matter concentration at the site is negligible.

As part of the Brooks Road Landfill continuing commitment to ensuring that particulate matter emissions from the site are minimized from amended operations the standard operating procedure (SOP) will be continue to be deployed. The purpose of the SOP is to ensure best management practices are implemented at the site to reduce the potential generation of particulate matter results. This includes, but is not limited to, the watering and sweeping of roads that equipment uses to travel the site.



Table 3.2 Annual Particulate Matter 2.5µm Concentration from the Hamilton West MECP Monitoring Station

Year	2009	2010	2011	2012	2013	2014	Average	AAQC	CAAQS
Concentration (µg/m³)⁽¹⁾	7.42	6.74	6.99	7.59	9.55	9.94	8.04	30.00	30.00
Concentration (µg/m³)⁽¹⁾	15.92	23.34	21.17	20.16	23.4	24.92	21.49	30.00	30.00

Notes:
 1. Based on MECP monitoring station located in West Hamilton, average values.
 2. Based on MECP monitoring station located in West Hamilton, 98 percentile values

3.3.3 Odour Quality

Since the previous application the Site has completed the leachate treatment facility to minimize the generation of odours at the Site. The most recent odour monitoring was completed by GHD at the Brooks Road Landfill Site in 2019 and also confirmed that the leachate treatment system has reduced the potential for odour impacts. Faint odours were detected throughout the Site during the most recent odour monitoring however no odour that would be attributed to the Site was detected at any off-Site monitoring locations.

In addition to the on-site and off-site odour monitoring that was completed by Brooks Road Landfill, GHD completed a theoretical landfill gas generation rate for the site. Based on the existing and proposed waste to be disposed at the site, it was determined that the maximum amount of landfill gas that will be generated is less than 80 cubic feet per minute (in 2025). This would be distributed over an area of approximately 14.3 hectares or 143,000 square metres, resulting in a landfill gas exit velocity of only 0.000004 metre per second. This amount of landfill gas generation is anticipated to be insignificant from an overall odour site profile.

As part of Brooks Road Landfill commitment to ensuring that odour complaints are minimized from the existing and proposed operations a standard operating procedure (SOP) was developed. The purpose of the SOP is to include odour mitigation measures that would be implemented to ensure that odour complaints are investigated and the condition that resulted in the odour complaint is mitigated.

4. Potential Effects, Mitigation Measures & Net Effects

4.1 Purpose and Opportunity

The purpose of the project is to increase the annual waste fill rate currently approved at the site. The proposed project would allow for receipt of a maximum daily quantity (1,000 tonnes per day) throughout the year, which would increase the permitted annual fill rate from 151,000 tonnes per year to 250,000 tonnes per year. This annual maximum assumes the site will operate 5 days a week, (closed on holidays) accepting 1,000 tonnes per day². The proposed change to the annual

² 1,000 tonnes per day over 250 days (5 days per week minus 10 public holidays) equals 250,000



fill rate requires no additional landfill infrastructure and there is no change to the currently approved landfill volume, footprint, or final contours.

The proposed undertaking provides an opportunity for BRE to capture additional wastes generated by their customers during busier months of operation and to fill the site rapidly. If this proposed undertaking is approved and the maximum tonnage proposed as part of this Screening were received annually at the Site starting in 2021, the ultimate approved capacity of the site may be reached earlier than contemplated as part of the 2018 EA.

4.2 Description of Project Components and Activities

The proposed project outlined in this report does not involve a change to the final site capacity, contours or footprint. No construction is required to implement the proposal. There will be no change to the existing infrastructure and no new facilities are proposed on Site. The Site will continue to operate within currently approved operating hours and current construction activities and daily operations will continue as usual.

From a traffic perspective there will be no changes to existing haul routes or Site entrance. Increasing the maximum annual fill rate will result in increased truck traffic on the haul route from Highway 3 along Brooks Road only on a total annual basis. It should be noted that as part of the Vertical Capacity Expansion EA completed in 2018, the assessment of impacts to traffic was based on 1,000 tonnes per day to demonstrate that the Site could manage this daily quantity and the potential effects resulting from this volume of traffic could be mitigated to acceptable levels.

GHD will build on the analysis completed in the 2018 Vertical Capacity Expansion EA which reviewed the total daily maximum quantity of waste that the site can accommodate from an operational perspective (1,000 tonnes per day) to evaluate the potential effects and mitigation measures required to maintain this daily volume over the course of a year to reach the annual fill rate of 250,000 tonnes per year.

If this project is approved and the maximum tonnage proposed as part of this Screening were received annually at the Brooks Road Landfill starting in 2021, the approved capacity of the site may be reached earlier than contemplated as part of the 2018 EA.

4.3 Methodology and Investigations

The assessment of effects associated with the proposed undertaking was carried out through a series of steps that is based, in part, on the description of existing conditions as well as the Project Description and Site Plan. The assessment of effects was also undertaken within the context of the previously completed Screening Criteria Checklist, as summarized in **Section 2** of this report.

4.3.1 Potential Odour Effects

Ontario does not have an odour standard. However, a value of one odour unit (OU) is sometimes used by the MECP as a limit for odour impacts at sensitive receptors such as residences. Based on the existing conditions odour studies, it has been shown that odour levels at the nearest sensitive receptors will not exceed one OU.



Odour was not modelled for the alternatives within this EA as odour impacts from the increased annual capacity were assessed under the previous application and the conditions will remain the same at the maximum receipt of 1,000 tonnes per day.

As discussed previously, the estimated landfill gas production for the Site is extremely small and is not expected to result in any off-Site odour impacts.

Additionally, GHD conducted numerous odour analyses in 2014, 2016, 2017, and 2019 and concluded that there were high on-Site odour levels near the leachate tank and the working face in the earlier studies but were lower in the 2019 studies after the installation of the leachate treatment system. Odours at the concentration currently observed at the site typically do not result in complaints at off-Site sensitive receptor locations. This has been investigated through numerous odour monitoring programs that did not identify any on-site odours being observed at off-site locations.

Lastly, the Site currently implements several operational measures in order to reduce and/or mitigate odour impacts from the Site and they will continue to implement these throughout the vertical expansion. These include:

- Continuing with the daily odour monitoring program carried out by the Site Operator.
- If odours are evident on the property boundary, increase the amount of daily cover applied on the waste.
- Minimize the active working face. Apply interim cover at a minimum thickness of 300 mm on areas of the landfill where landfilling has ceased for 6 months or more.
- Continue with the use of odour control granules for odour mitigation. Assess areas of placement and their effect on odour mitigation.

4.3.2 Potential Air Quality Effects

The air contaminant of concern for this Site is particulate matter. Other air contaminants are expected to be insignificant. As previously discussed, potential tailpipe and brake and tire wear emissions from vehicles operating at the landfill are insignificant. Also, the estimated landfill gas production of only 200 cfm confirms that any potential off-site impacts of compounds in the gas, such as methane, would be insignificant.

Particulate is primarily produced by vehicle traffic on the landfill roads. The particulate matter that is of concern is based on the re-suspension of particulate matter from traffic on the roads. The tailpipe and brake and tire wear has been determined to be insignificant sources of particulate matter. The Ontario ambient air quality criterion for TSP is $120 \mu\text{g}/\text{m}^3$ on a 24-hour basis. There are other particulate provincial and federal criteria for particulate less than 10 microns (PM-10) and particulate less than 2.5 microns (PM-2.5). These particulate emissions would also occur from vehicle traffic on the landfill roads.

It is GHD's experience that if one can show compliance with the TSP standard, a site with road traffic being the major source, then the PM10 and PM2.5 concentrations will also be below criteria. However, for completeness, GHD has modeled the TSP, PM10 and PM2.5 emissions in the assessment of the alternatives.



The TSP, PM10 and PM2.5 emissions from the on-site roads were estimated based on truck traffic and emissions factors from the United States Environmental Protection Agency (USEPA). Particulate off-site concentrations were estimated using the AERMOD air dispersion model which is an approved dispersion model under Ontario Regulation 419/05. The AERMOD model incorporates 5 years of meteorological data to determine the worst case air concentration. Therefore, the modeling results can be considered to be conservative.

The on-Site haul roads were previously modelled for 50 trucks per day. This is the same amount of daily trucks proposed in this amendment. The Site has paved the on-Site roadway from the site entrance to the landfill as was identified in the previous study.

TSP, PM10 and PM2.5 from the Site were previously evaluated at the property boundary and all residential dwellings. The predicted worst case particulate impact at the property boundary is as follows:

- TSP – 50 trucks per day - 122.4 $\mu\text{g}/\text{m}^3$
- PM10 – 50 trucks per day – 64.18 $\mu\text{g}/\text{m}^3$
- PM2.5 – 50 trucks per day – 8.8 $\mu\text{g}/\text{m}^3$

The predicted maximum worst case particulate impact at the sensitive receptors is as follows:

- TSP – 50 trucks per day - 5.78 $\mu\text{g}/\text{m}^3$
- PM10 – 50 trucks per day – 4.56 $\mu\text{g}/\text{m}^3$
- PM2.5 – 50 trucks per day – 0.61 $\mu\text{g}/\text{m}^3$

The MECP AAQC for TSP is 120 $\mu\text{g}/\text{m}^3$, 50 $\mu\text{g}/\text{m}^3$ for PM10, and 30 $\mu\text{g}/\text{m}^3$ for PM2.5.

The modelled concentration at the sensitive receptors well below the MECP AAQC for all particulate matter fractions.

The modelled concentration at the property boundary is right at the AAQC for TSP and PM10 and the concentration of PM2.5 remains well below the MECP AAQC. There have been no changes to the modelled impacts from the previous application.

4.4 Air Quality and Odour Net Effects

This Section provides an assessment of the potential negative environmental effects (i.e., those for which a “Yes” answer was given in the Screening Criteria Checklist) for those Air Quality and Odour criteria which might be affected by the project as identified in **Section 2**. The effects assessment describes how existing environmental conditions in the Study Area(s) would change as a result of the construction and operation of the proposed undertaking.

As described in **Section 2**, a “Yes” was applied to the following Air Quality and Odour criteria:

- Cause negative effects from the emission of greenhouse gases (e.g., carbon dioxide, carbon monoxide, methane)?
- Cause negative effects from the emission of dust or odour?



With respect to the above criteria/criterion, a description of the potential negative environmental effects, necessary mitigation measures and the resultant net effects on the environment are discussed. Studies conducted during the screening showed that the anticipated effects will be much less than expected or will not occur at all. In all cases, mitigation measures have been identified that, when applied, will eliminate the potential environmental effects or reduce them to acceptable levels.

4.4.1 Potential Effects on Air Quality and Odour Environment

As previously mentioned, the previous application was completed assuming the proposed parameters and there are no changes to the Air Quality and Odour Environment

4.4.2 Mitigation Measures

The Site has completed numerous mitigation measures since the previous application such as the introduction of SOPs for odour and dust and commissioning a leachate treatment system. The Air Quality and Odour were assessed for the proposed conditions in the previous assessment and the identified mitigation measures were implemented. The Site is committed to continuing the mitigation measures.

4.4.3 Net Effects

The net effects of the proposal are low. The previous assessment was completed based on the proposed conditions and the mitigation measures were implemented.

5. Monitoring Requirements and Additional Approvals

There are no additional monitoring requirements at this time.

6. Conclusion

There has not been a change in the Air Quality or Odour environment since the previous amendment. The previous amendment was assessed based on the proposed conditions in this amendment. The previous assessment showed that the concentrations of TSP, PM10 and PM2.5 were all well below the AAQC at the sensitive receptors and will continue to be so with the proposed amendment. The cumulative effect for PM2.5 was below the PM2.5 AAQC at the sensitive receptors as well. The Site has implemented the control measures that were identified in the previous assessment and will continue with these controls to minimize the Air Quality and Odour impacts from the Site operations.