



**Brooks Road
Environmental**



Brooks Road Landfill Site Vertical Capacity Expansion

Environmental Assessment Annual Compliance Report
February 14, 2020 – February 14, 2021

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

**February 2021
REF. NO. 018235 (102)**

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1. Introduction

1.1 Purpose and Background

In accordance with Condition 5 of the Minister of the Environment, Conservation and Parks' (Minister's) Notice of Approval to Proceed with the Undertaking, this report describes the results of the Brooks Road Landfill Site Vertical Capacity Expansion Environmental Assessment (Brooks Road Landfill EA) Compliance Monitoring Program (CMP) for February 14, 2020 to February 14, 2021.

The Minister approved the Brooks Road Landfill EA that proposed to increase the capacity of the landfill on February 14, 2019. The Minister's Notice of Approval (Approval) to proceed with the Undertaking issued under Section 9 of the *Environmental Assessment Act*, dictates the conditions of the Approval of the Undertaking that must be adhered to by Brooks Road Environmental (BRE). In particular, the following conditions relating to compliance monitoring and reporting were specified by the Minister in his approval to proceed:

4. Compliance Monitoring Program

- 4.1 *The Proponent shall prepare and submit to the Director for approval and for the public record, an Environmental Assessment compliance monitoring program.*
- 4.2 *The compliance monitoring program shall be submitted within one year from the Date of Approval, or 60 days before the commencement of Construction, whichever is earlier, or by another date agreed upon by the Director.*
- 4.3 *The compliance monitoring program shall include a description of how the Proponent will:*
 - a. *monitor implementation of the Undertaking in accordance with the Environmental Assessment with respect to mitigation measures, public consultation, and additional studies and work to be carried out;*
 - b. *monitor compliance with the conditions in this Notice of Approval; and,*
 - c. *monitor compliance with all commitments made in the Environmental Assessment and the subsequent review of and approval process for the Environmental Assessment with respect to mitigation measures, public consultation, and additional studies and work to be carried out.*
- 4.4 *The compliance monitoring program must contain an implementation schedule for monitoring activities to be completed.*
- 4.5 *The Director may require the Proponent to amend the compliance monitoring program at any time. Should an amendment be required, the Director will notify the Proponent in writing of the required amendment and the date by which the Proponent must complete and submit the amendment to the Director.*
- 4.6 *The Proponent shall submit the amended compliance monitoring program to the Director within the time period specified by the Director.*

4.7 *The Proponent shall implement the compliance monitoring program and any amendments to it.*

5. Compliance Reporting

5.1 *The Proponent shall prepare an annual compliance report outlining the results of the compliance monitoring program (Condition 4 above) and place the document on the public record.*

5.2 *The first compliance report shall be submitted to the Director for review and for the public record no later than one year following the Date of Approval. Each subsequent annual compliance report shall be submitted on the date that is the anniversary of the Date of Approval thereafter. Each report shall cover the previous year to the date of report submission.*

5.3 *The Proponent shall submit annual compliance reports until all conditions are satisfied.*

5.4 *Once all conditions in this Notice of Approval have been satisfied, the Proponent shall notify the Director in writing that the final annual compliance report is being submitted, and that all conditions in this Notice of Approval have been satisfied. The Ministry will confirm whether all conditions have been satisfied and the Director will state this in writing to the Proponent.*

5.5 *The Proponent shall retain either on the Site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.*

5.6 *The Proponent shall make the compliance reports and associated documentation available to the Director or a designate in a timely manner when requested to do so by the Ministry.*

In accordance with Condition 4, the CMP was approved by the Ministry of the Environment, Conservation and Parks (MECP) on June 22, 2020. The EA CMP outlined the following components to be monitored and managed:

- EA Commitments
- Mitigation and Monitoring Commitments
- *Environmental Assessment Act* (EA Act) Approval Conditions
- Environmental Approvals and Permits

1.2 Overview of the Annual Compliance Report

In accordance with Conditions 5.1 through 5.6 of the Minister's Approval, Brooks Road Environmental is to report on the results of this EA CMP. The Annual Compliance Reports (ACRs) are to cover the activities of the previous year to the date of report submission. In accordance with Condition 5.2, this ACR covers the period of February 14, 2020 to February 14, 2021.

Consistent with the framework presented in the EA CMP, the 2020 ACR is composed of the following sections:

- **Section 2** lists the mitigation and monitoring commitments made by Brooks Road during the EA that were documented in **Section 7** of the Brooks Road EA Report (EA Report), as well as the Minister's EA Act Approval conditions that need to be satisfied.

- **Section 3** lists the additional approvals, authorizations and permits acquired beyond *EA Act* approval as documented in **Section 8** of the EA Report.

Sections 2 and 3 of the ACR include compliance monitoring tables, the following column headings common to all tables have been included for compliance tracking purposes:

- **Evidence of Compliance** – describes how each provision will be monitored for compliance/fulfillment during implementation of the Undertaking.
- **Implementation Schedule** – outlines the estimated project stage when each provision will be fulfilled.
- **Status/Remarks** – allows for an update to be provided on where the fulfillment of the provision stands versus its planned implementation schedule.
- **Compliance Achieved? (Yes or In Progress)** – allows for a “yes” or “in progress” response to be provided so compliance fulfillment can be easily tracked.

The **Evidence of Compliance** and **Implementation Schedule** have been included as they appear in the EA CMP. The **Status/Remarks** and **Compliance Achieved**. Columns contain information specific to this ACR.

2. **EA Mitigation and Monitoring Commitments and EA Act Approval Conditions**

Table 2.1 includes the following:

- Commitments made during the EA that need to be satisfied during implementation of the Undertaking, as documented in Section 7.3 of the EA Report. These commitments include mitigation measures identified in Section 5.0 of the EA Report for addressing potential adverse environmental effects associated with implementing the Undertaking.
- *EA Act* approval conditions that need to be satisfied during implementation of the Undertaking included in the Minister’s Notice of Approval. Where an *EA Act* approval condition relates to an EA commitment, both have been included in the same row for compliance tracking purposes.
- Monitoring programs included in Section 7.1 of the EA Report to ensure that predicted net negative effects are not exceeded, unexpected negative effects are addressed, and predicted benefits are realized.

Table 2.1 indicates the status of fulfilling each provision between February 14, 2020 and February 14, 2021.

Table 2.1 EA Mitigation and Monitoring Commitments and Approval Conditions

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
General	Not Applicable (N.A.)	N.A.	N.A.	N.A.	Condition #2 - General Requirements 2.1. The Proponent shall comply with the provisions in the Environmental Assessment, which are hereby incorporated into this Notice of Approval by reference, except as provided in the conditions of this Notice of Approval and as provided in any other approval or permit that may be issued for this Site. 2.2. The Proponent shall fulfill all commitments made in the Environmental Assessment. 2.3. The conditions of the Notice of Approval do not prevent more restrictive conditions being imposed under other statutes.	Confirm the Conditions of Approval have been fulfilled and commitments made have been undertaken.	Prior to March 27, 2020; and during operation, closure, and post-closure of the Site.	Compliance with some of the provisions of the Environmental Assessment has been achieved.	In Progress
Best Management Practice Plans	5.0 & 7.2	Prepare Best Management Practice (BMP) Plans following approval of the undertaking by the Minister of the Environment and Climate Change and prior to vertical expansion of the Site. The BMP Plans will include a description of proposed mitigation measures, monitoring requirements, and commitments. The BMP Plans will ensure these mitigation measures, monitoring requirements, and commitments are implemented during construction, operation, closure, and post-closure of the Site.	N.A.	N.A.	N.A.	Confirm BMP Plan(s) have been prepared prior to implementation of the Undertaking.	Preparation and implementation of BMP Plans in 2020. Specific time commitments for each BMP Plan are outlined below in the table.	Best Management Practice plans are included within the Brooks Road Landfill Vertical Expansion Design and Operations Report (D&O Report) submitted as part of the Environmental Compliance Approval (ECA), which was approved on March 27, 2020. The Noise BMP Plan (Appendix A) was the final BMP Plan to be complete and submitted to MECP.	Completed
Consultation	6.0	Continue to facilitate the ongoing function of the PLC as per Conditions 86 and 87 of ECA No. A110302 for the existing Brooks Road Landfill Site.	N.A.	N.A.	N.A.	Confirm that the PLC continues during construction and operation of the Undertaking.	Conduct PLC meetings three times a year. They are anticipated to be held at the beginning of March, June, and November each year, however exact dates will be confirmed during	The PLC has continued to operate.	In Progress

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
		Ongoing consultation and engagement, as requested by the public, agencies, County, PLC and First Nations/ Aboriginal communities associated with ECA amendment(s) and other regulatory approvals required at the Site.	N.A.	N.A.	<p>Condition # 7 – Consultation with Indigenous Communities</p> <p>7.1 The Proponent shall prepare, in consultation with Indigenous Communities, an Indigenous consultation plan that sets forth:</p> <ol style="list-style-type: none"> how, during the planning, design, Construction, operation, and closure of the Undertaking, the Proponent will consult with Indigenous Communities and provide them with opportunities to be involved in environmental monitoring activities; how the Proponent will notify Indigenous Communities, using a notification protocol, if archaeological resources or Indigenous remains are encountered during the planning, design, Construction, operation, and closure of the Undertaking; and, how the Proponent will issue notices and updates to Indigenous communities on key steps in the planning, design, Construction, operation, and closure of the Undertaking. <p>2. 90 days before the start of Construction or by such other date as may be agreed to in writing by the Director, the Proponent shall submit the Indigenous consultation plan to the Director for approval, with an outline of how the Proponent consulted on it as per Condition 7.1 above.</p> <p>3. Once the Director is satisfied with the Indigenous consultation plan, the Proponent shall implement the Indigenous consultation plan during the planning, design, Construction, operation, and closure of the Undertaking.</p>	Confirm that consultation is undertaken as per ECA application requirements.	Submit final Indigenous consultation plan to Director by May 31, 2020 and carry out consultation with Indigenous Communities during operation, and closure of the landfill as per the Indigenous consultation plan.	The Indigenous Consultation Plan was submitted to MECP on July 22, 2020 and approved on August 19, 2020.	Completed
Air Quality & Odour	5.0	Fugitive Dust Best Management Plan will be implemented to reduce roadway emission by a minimum of 90 percent. This may include watering and sweeping of roadways and temporary monitoring of particulate matter to confirm that the mitigation measures implemented are effective.	N.A.	N.A.	<p>Condition #8 - Air Quality and Odour</p> <p>8.1 When applying for an Environmental Compliance Approval, the Proponent shall provide, to the satisfaction of the Ministry, the following information as part of its application:</p> <ol style="list-style-type: none"> an emissions summary and dispersion modelling report that includes landfill gas; an odour assessment and modelling report for the expanded landfill Site; a dust management plan for the Site which shall include fugitive dust emissions from all sources at the Site; and an odour management plan detailing the measures for addressing the potential odours that may emanate from the Site. 	Confirm that a Fugitive Dust Best Management Plan is implemented during operation Confirm that a SOP for odour has been prepared. Confirm that an Odour Management Plan has been prepared and includes daily odour monitoring. Confirm that the ECA application is completed to the	Prior to March 27, 2020. Final version of Odour Management Plan to be submitted by June 25, 2020. Implement plans and protocols as specified throughout the life of the Site.	The Odour Management Plan was submitted to the MECP on June 25, 2020. A revised Plan will be submitted as part of the Fill rate amendment to address comments received from the MECP. The Dust Management Plan is included	In Progress

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
					<p>8.2 The Proponent shall prepare and implement a landfill gas mitigation plan that specifies measures for monitoring and reducing landfill gas emissions for the Construction, operation, closure and post-closure phases of the expanded landfill Site. The Proponent shall report on changes in landfill gas production in its annual compliance report (Condition 5 above).</p> <p>Condition # 6 - Complaint Protocol 6.1. The Proponent shall prepare and implement a complaint protocol that sets out provisions for dealing with and responding to inquiries and complaints during all stages of the Undertaking. The complaint protocol shall include a procedure for notifying the Ministry's Hamilton District Office of the complaints received. 6.2. The Proponent shall submit the complaint protocol to the Director for approval and for the public record within one year from the Date of Approval, or 60 days before the start of Construction, whichever is earlier, or by another date agreed upon by the Director. 6.3. The Director may require the Proponent to amend the complaint protocol at any time. Should an amendment be required, the Director shall notify the proponent in writing of the amendment required and when the amendment must be completed. 6.4. The Proponent shall submit the amended complaint protocol to the Director within the time period specified by the Director. 6.5. The Proponent shall implement the complaint protocol and any amendments to it. 6.6. The Proponent shall provide a summary on the complaints received and how they were addressed as part of the annual compliance reporting (Condition 5) and post the summary on the website as part of the public record.</p>	<p>satisfaction of the Ministry. Confirm that a landfill gas mitigation plan has been prepared and implemented. Confirm that a Complaint Protocol is prepared.</p>		<p>in Section 6.9 of the D&O Report, approved by the MECP on March 27, 2020. A Complaint Protocol was submitted on September 30, 2020 and approved by the MECP on October 21, 2020. A summary of annual complaints is provided in Appendix B.</p>	
		Development of standard operating procedure (SOP) for odour 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.	N.A.	N.A.				<p>An Odour Best Management Practices Plan and BRE odour complaint response procedure details the complaint protocols (see Appendix I of the D&O Report). The Odour Management Plan was submitted to the MECP on June 25, 2020. A revised Plan will be submitted as part of the Fill rate amendment to address comments received from the MECP.</p>	In Progress
		Implementation of an Odour Best Management Plan including the continuation and modification of the following odour control measures: <ul style="list-style-type: none"> Daily odour monitoring Minimizing exposed waste through the application of cover material Limit exposed areas of the leachate collection system 	7.1.1	Daily Odour Monitoring Monitoring of odour on Site is conducted and documented daily by Brooks Road Environmental staff. This includes observation of weather conditions; wind speed and direction; site operating conditions; odour type and smell (if present); and documentation of any odour complaints received.				<p>An Odour Best Management Practices Plan and BRE odour complaint response procedure details the complaint protocols (see Appendix I of the D&O Report).</p>	In Progress

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
		<ul style="list-style-type: none"> When not in use, ensure blind flanges are placed on leachate collection system cleanouts and sump risers Application of odour control granules and liquid spray Community outreach to identify any impacts at neighbouring residences Maintain the leachate collection system under negative pressure may also be included as an Odour BMP.						The Odour Management Plan was submitted to the MECP on June 25, 2020. A revised Plan will be submitted as part of the Fill rate amendment to address comments received from the MECP.	
		N.A.	7.1.1	Landfill Gas Monitoring The monitoring network currently consists of six gas probes (nested) installed in three on Site locations (two gas probes per nest). An additional pair of gas probes will be installed adjacent to the leachate treatment facility following commissioning. Landfill gas monitoring activities are to be conducted monthly from December 1 to April 30 and on a quarterly basis from May through November.				The monitoring network consists of eight gas probes (nested) installed in four on-Site locations (two gas probes per nest). Monitoring is conducted monthly (see Section 7.4 of the D&O Report).	In Progress
Noise	5.0 & 7.0	Implementation of a Noise Best Management Plan to minimize noise impacts from the Site. BMPs may include barriers and/or berms at the landfill perimeter, as required, administrative controls that limit on-Site landfilling activities, and routine monitoring of landfill equipment to ensure it is performing within acceptable noise limits.	7.1.2	Noise Monitoring Landfill equipment will be routinely monitored to ensure it is performing within acceptable noise limits. As all residential dwellings are below the 55 dBA noise limit, no additional annual monitoring is recommended.	N.A.	Ensure a Noise BMP is prepared and includes a plan for noise monitoring.	Prepare Noise BMP in 2020, and conduct routine noise monitoring in accordance with the final Noise BMP throughout the operation of the Site.	The Noise BMP Plan is included in Appendix A .	Completed
Geology & Hydrogeology	7.0	Continuation of the existing groundwater monitoring program, consisting of both hydraulic monitoring and water quality monitoring at a network of 29 monitoring wells.	7.1.3	Groundwater Monitoring The existing groundwater monitoring program will continue and consists of both hydraulic monitoring and water quality monitoring at a network of 29 monitoring wells (21 on Site and 8 off Site wells). Hydraulic and groundwater quality monitoring are scheduled to take place in May, July, and November. Groundwater levels will continue to be measured at all monitoring locations, when possible, at the time of sample collection.	N.A.	Confirm that existing groundwater program is continued.	Conduct hydraulic and groundwater quality monitoring May, July, and November each year during operation of the Landfill. Continue to conduct groundwater monitoring during the post-closure period.	The updated groundwater monitoring program was approved by the MECP as part of the ECA on March 27, 2020.	Completed
	7.0	Continuation of the existing leachate quality monitoring program.	7.1.3	Leachate Monitoring The existing leachate monitoring program at the Site includes leachate quality monitoring. Leachate quality samples are currently collected directly from the leachate collection system. Leachate hydraulic monitoring will	Condition #9 - Groundwater and Surface Water Protection 9.1 When applying for an Environmental Compliance Approval, the Proponent shall provide, to the satisfaction of the Ministry, the following information as part of its application:	Confirm that existing leachate quality monitoring program is continued. Confirm that the ECA application is	Provide required information during ECA application, continue leachate quality monitoring program as	The ECA was approved by the MECP on March 27, 2020.	Completed

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
				<p>commence upon commissioning of the new leachate treatment facility. As part of Site development and progressive closure, leachate monitoring wells will be installed within the waste mound so that further leachate characterization and hydraulic monitoring can be accomplished.</p> <p>Leachate quality monitoring will be conducted in accordance with the ECA. Leachate samples are currently collected from the leachate collection system on an annual basis in July and are analyzed for inorganic chemistry parameters, metals, PAHs, and VOCs</p>	<p>a. information documenting the performance of the existing leachate management system at the Site;</p> <p>b. a description in the design and operations report on how the Proponent will manage the rate of fill and potential leachate generation; and,</p> <p>c. a leachate management plan for the vertical landfill expansion.</p>	completed to the satisfaction of the Ministry.	specified in the ECA and report annually on program as a part of Annual Compliance Report, which is to be submitted on February 14 each year.		
Surface Water Resources	7.0	Continuation of the existing surface water monitoring program, consisting of water quality monitoring and surface water flow measurements.	7.1.4	<p>Surface water monitoring</p> <p>Surface water monitoring will continue to include both water quality monitoring and surface water flow measurements. The surface water monitoring network currently consists of seven surface water monitoring stations (two on Site and five off Site), as shown in Figure 4.14, and these stations will be maintained.</p> <p>Water quality monitoring and surface water flow measurements at all of the current seven surface water stations will take place on a quarterly basis in March, May, August, and November. The measurements are also correlated with rain fall events. As such, the John C. Munro Hamilton International Airport in Mount Hope, ON (Hamilton Airport), located approximately 24 km to the north, is often used to schedule surface water monitoring events.</p>	N.A.	Confirm that the existing surface water monitoring program is continued.	Continuation of the surface water monitoring program on quarterly basis each year in March, May, August, and November during operation of the Landfill. Continue to conduct surface water monitoring during the post-closure period.	The Surface water Monitoring Program is included in Section 7.2 of the D&O Report, which was approved by the MECP on March 27, 2020.	Completed
	7.0	An eighth monitoring station (SW-2) will be added following the construction of the on-Site stormwater management pond. SW-2 will be located on-Site at the outlet from the on-Site stormwater management pond.	7.1.4	An eighth monitoring station (SW 2) will be added following the construction of the on Site stormwater management pond.		Confirm that SW-2 is added following construction	2019	SW-2 will continue to be monitored as part of the Environmental Monitoring Program.	Completed
Stormwater Management	5.0	Implementation of a stormwater management infrastructure operation, maintenance, and inspection plan, including regular sediment level monitoring (recommended annually under stabilized post closure conditions) to estimate the portion of the permanent pool that is filled by sediment, sediment removal activities (once accumulation reaches approximately 1/3 of the available permanent pool volume), annual inspection of sediment accumulation within the vegetated swales, and maintenance activities if	N.A.	N.A.	N.A.	Confirm that a stormwater management infrastructure operation, maintenance, and inspection plan is implemented.	Implementation of plan prior to March 27, 2020, and inspection of infrastructure in accordance with the plan.	A Stormwater Management Plan for the Site was updated in 2013 and is relevant to the Site still (see Section 4.6.2 of the D&O Report).	Completed

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	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
		conveyance capacities are reduced significantly and/or if bare soil areas are present.							
Terrestrial & Aquatic Environment	5.0	<p>Implementation of a Terrestrial & Aquatic Environment Best Management Plan. BMPs for continued operation of the landfill may include:</p> <ul style="list-style-type: none"> Notify Site operators and delivery contractors of the presence of reptiles and amphibians in the surrounding areas. This includes visual identification tools for species at risk (SAR) common to the area. Any wildlife incidentally encountered during Site operation activities will not be knowingly harmed and will be allowed to move away from the area on its own if at all possible. In the event that an animal encountered during Site operation activities does not move from the area, or is injured, the Site Supervisor will be notified. In the event that the animal is a known or suspected SAR, the Site Supervisor will contact MNRF SAR biologists for advice. Silt fence is recommended to be added to all perimeter Site fencing as an enhanced effort to minimize human-wildlife interactions on Site. <p>Erosion and sediment controls shall be maintained until all disturbed areas of the Site, including the pond and swales, have fully stabilized and vegetated areas have achieved 70 percent of the native background density of growth. The condition of all swales, culverts, vegetation, infiltration basin outlet, and outflow channels leading to the Brooks Road drainage ditch and off Site will be noted at regular intervals.</p>	7.1.6	<p>1) Routine inspections of the integrity of the perimeter silt fence. Inspections should be conducted at a regular frequency (e.g. minimum quarterly monitoring). Inspection reports should be prepared and maintained on-Site. Incidental observations of silt fence disrepair should be reported immediately to the Site Operations Manager and addressed in a timely fashion.</p> <p>2) Routinely evaluate the extent of the heavy-duty silt fence and 5 m north Subject Land vegetated buffer. Extend the silt fence and vegetated buffer east along the north Subject Land boundary when disturbance of the temporarily vegetated portion of the stockpile is scheduled.</p> <p>3) Routine inspections of the integrity and effectiveness of the sites chain link fence for any evidence of wildlife attempting to enter the site. Any disrepair should be reported immediately to the Site Operations Manager and addressed in a timely fashion</p> <p>4) Monitoring and Report any observations of Species At Risk that may enter the site. Photos of Species At Risk in the area of the site will be kept within the office at the site. Photos will be taken of any Species At Risk on site by landfill staff and documented in the annual monitoring report. Follow-up calls to MNRF will be undertaken should Species At Risk be encountered</p> <p>5) Monitoring of the wetland to the north of the site will occur for the duration of receipt of waste at the landfill. Monitoring will review effectiveness of mitigation measures put in place to ensure no effects to wetland, i.e. silt fence is in working order, utilize monitoring data from groundwater wells to demonstrate no offsite impacts beyond the perimeter of the site, etc.</p>	<p>Condition # 12 – Wetland and Species at Risk Protection</p> <p>12.1. The Proponent shall install a permanent silt fence that extends the entire perimeter of the Site property to exclude wildlife from accessing the Site. This exclusion fence shall be routinely monitored and maintained in good working condition throughout the Construction, operation and closure of the landfill.</p> <p>12.2. The Proponent shall train staff in the identification of Blanding's Turtle and other Species at Risk known to be within the general vicinity of the Site. Training shall include Species at Risk awareness and the appropriate steps to take upon encountering a Species at Risk. In the event that a Species at Risk is found on the Site property, all activities that could potentially harm the animal shall cease and a Ministry of Natural Resources and Forestry biologist shall be contacted.</p> <p>12.3. The Proponent shall develop and implement a wetland monitoring program to demonstrate that there are no impairments to water quality, quantity, vegetation, or wildlife in the Cayuga Swamp Wetland Complex located adjacent to the Site as a result of the Undertaking. The Proponent shall prepare wetland monitoring reports outlining the results of the wetland monitoring program. The Proponent shall provide copies of the wetland monitoring reports to the Ministry of Natural Resources and Forestry and submit them to the Ministry as part of its annual compliance report (Condition 5 above).</p>	<p>Confirm a Terrestrial and Aquatic Environment BMP is prepared.</p> <p>Confirm silt fencing is installed.</p> <p>Confirm staff are trained in the identification of Species at Risk.</p>	<p>Confirm BMP is submitted and silt fencing is installed in 2020 and confirm staff are trained in the identification of Species at Risk at the beginning of each year during the life of the Site.</p>	<p>Section 5.1 of the D&O Report, approved by the MECP on March 27, 2020, details the specifications around fencing. The design and installation of the silt fencing is in progress.</p> <p>Section 7.2 of the D&O Report details the additional wetland monitoring location.</p> <p>Staff have been provided a photographic guide and appropriate forms to complete should any wildlife be observed on Site. On-Site SAR Awareness and Identification Training will be conducted in 2021 (pending COVID-19 restrictions).</p> <p>The Terrestrial and Aquatic Environment Best Management Plan submitted to the MECP on September 30, 2020 and approved on October 21, 2020.</p>	In Progress
		7.0	Annual monitoring of wetland for duration of landfill operation				<p>Confirm a wetland monitoring program is prepared and reported on annually.</p>	<p>Submit wetland monitoring program by end of June 2020 and submit wetland monitoring reports annually on</p>	<p>A Wetland Monitoring Program is included in the Terrestrial and Aquatic</p>

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	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
							February 14 as a part of compliance report.	Environment Best Management Plan submitted to the MECP on September 30, 2020 and approved on October 21, 2020. The results of the 2020 wetland monitoring program is included in Appendix C .	
Archaeology & Cultural Heritage	5.0	The <i>Cemeteries Act</i> , R.S.O. 1990 c. C.4 and the <i>Funeral, Burial and Cremation Services Act</i> , 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.	N.A.	N.A.	N.A.	Confirm that if human remains are found that the police or coroner are contacted.	Upon occurrence	No archaeological resources or human remains have been uncovered.	Completed
Land Use	5.0 & 7.0	Monitor land use applications, plans, and/or policies, including Official Plan, Zoning By-Law, Community Development Plans, plans of subdivision, site plans, and OMB decisions, for the following: <ul style="list-style-type: none"> To determine any potential effects on the undertaking; To provide comments to Haldimand County, as necessary, in relation to the above; and To take further action, as required, in relation to the above, including appeals.	7.1.5	Monitor any changes in plans and by-laws on a regular basis to ensure that any related to waste disposal operations are not overlooked.	N.A.	Confirm if any action was taken to respond to land use applications or changes to land use plans and policies.	Immediate action if required.	No relevant changes in plans or by-laws have been identified.	Completed
	5.0	Nuisance related effects to off-Site recreational resources within 500 m of landfill footprint and the two residential properties within 500 m of the landfill footprint will be mitigated through the implementation of Site Design and Operation BMPs included in the Amended Site D&O Report for the Amended ECA	N.A.	N.A.	N.A.	Confirm inclusion of Site Design and Operation BMPs in the Amended Site D&O Report in the Amended ECA.	Prior to March 27, 2020	The sites BMPs, with the exception of the Odour Management Plan and the Noise BMP, are provided in the D&O Report, approved by the MECP on March 27, 2020. The Odour Management Plan was submitted to the MECP on June 25, 2020. A revised Plan will be submitted as part of the Fill	Completed

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	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
								rate amendment to address comments received from the MECP. The Noise BMP is included as Appendix A.	
Agriculture, Soils, & Mining	5.0	Nuisance related effects to surrounding agricultural operations will be mitigated through the implementation of Site Design and Operation BMPs included in the Amended Site D&O Report for the Amended ECA (see Site Design & Operations , below).	N.A.	N.A.	N.A.	Confirm inclusion of Site Design and Operation BMPs in the Amended Site D&O Report in the Amended ECA.	Prior to March 27, 2020	The sites BMPs, with the exception of the Odour Management Plan and the Noise BMP, are provided in the D&O Report, approved by the MECP on March 27, 2020. The Odour Management Plan was submitted to the MECP on June 25, 2020. A revised Plan will be submitted as part of the Fill rate amendment to address comments received from the MECP. The Noise BMP is included as Appendix A.	Completed
Site Design & Operations	5.0	The Amended Site D&O Report for the Amended ECA will include BMPs to be implemented by Brooks Road Environmental to maximize operational flexibility and may include the following: <ul style="list-style-type: none"> Tarping vehicles transporting waste to and around the Site, as required, to prevent litter from blowing out of the vehicle. Applying daily cover to exposed waste to confine light weight material. Ensuring that cover material is readily available to allow the working face to be fully covered at the end of each operating day. Minimizing the area of exposed waste at the working face. 	N.A.	N.A.	N.A.	Confirm the elements are included in the Amended Site D&O Report.	Prior to March 27, 2020	The site D&O Report was approved by the MECP on March 27, 2020.	Completed

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
		<ul style="list-style-type: none"> Adjusting the location of the working face, as required, to provide shelter from prevailing winds, if possible. Using portable litter fences around the working face to capture litter. Collecting litter on an as-needed basis, both from the Site and, if required, from the adjacent lands and roadway. Operating on-Site equipment in a manner such that noise impacts are minimized, wherever possible. Ensuring that all landfill construction equipment associated with the development, operation, or closure of the Site comply with the noise levels outlined in applicable MOECC guidelines and technical standards. Vegetating the berm on the western Site boundary and/or on-Site plantings, as required, to attenuate visual and noise impacts. Compacting waste immediately after placement and spreading. Vector and vermin are controlled, as required. Maintaining the comprehensive monitoring and maintenance program to address all aspects of landfill operation, including waste inspection and monitoring of landfill odour. Site haul roads are constructed to minimize mud trackout and dust mitigation measures are employed on an as-needed basis. 							
Socio-Economic	5.0	Views of the Site from the west and southwest will be minimized by planting trees or shrubs on top of the berm along the western property boundary and/or introducing additional on-Site plantings, as required.	N.A.	N.A.	N.A.	Confirm that plantings and/or berms are implemented, as necessary.	Annually during the spring and fall (as required).	Section 4.2.2 of the D&O Report detail the measures which will be taken to limit visual impacts of the site. Implementation of berms is in progress.	In Progress
	5.0	Nuisance related effects to the 11 residences within the Local Study Area will be mitigated through the implementation of Site Design and Operation BMPs included in the Amended Site D&O Report for the Amended ECA (see Site Design & Operations , above).	N.A.	N.A.	N.A.	Confirm inclusion of Site Design and Operation BMPs in the Amended Site D&O Report in the Amended ECA.	Prior to March 27, 2020	The D&O Report was approved by the MECP on March 27, 2020.	Completed
Contingency Plans	7.4	Prepare Contingency Plans following approval of the undertaking by the Minister of the Environment and Climate Change and prior to vertical expansion of the Site. The Contingency Plans will include a description of proposed contingency	N.A.	N.A.	N.A.	Confirm that Contingency Plans are prepared, as necessary.	Prior to March 27, 2020	Contingency plans have been prepared as part of the Design and Operations	Completed

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
		measures, monitoring requirements, and commitments. The Contingency Plans will ensure these contingency measures, monitoring requirements, and commitments are implemented, if required, during construction, operation, closure, and post-closure of the Site.						Report- Vertical Expansion, see Section 8.	
Public Record	N.A.	N.A.	N.A.	N.A.	<p>Condition # 3 – Public Record</p> <p>3. Public Record 3.1. Where a document is required for the public record, the Proponent shall post the document on the Proponent website and provide one hardcopy and one electronic copy of the document to the Director.</p> <p>3.2. The EA Reference Number 13004 and EA File Number 03-08-02 shall be quoted on all documents submitted to the Ministry pursuant to this Notice of Approval.</p> <p>3.3. For every document submitted to the Ministry, the Proponent shall clearly identify which condition of approval the document is meant to fulfill.</p>	Confirm that documents have been placed on the public record, as required.	Upon submission of documents for the public record	The required number of copies is provided to the Director for each document required for the public record.	In Progress
Compliance Monitoring	N.A.	N.A.	N.A.	N.A.	<p>Condition # 4 – Compliance Monitoring Program</p> <p>4.1. The Proponent shall prepare and submit to the Director for approval and for the public record, an Environmental Assessment compliance monitoring program.</p> <p>4.2. The compliance monitoring program shall be submitted within one year from the Date of Approval, or 60 days before the commencement of Construction, whichever is earlier, or by another date agreed upon by the Director.</p> <p>4.3. The compliance monitoring program shall include a description of how the Proponent will:</p> <ul style="list-style-type: none"> a. monitor implementation of the Undertaking in accordance with the Environmental Assessment with respect to mitigation measures, public consultation, and additional studies and work to be carried out; b. monitor compliance with the conditions in this Notice of Approval; and, c. monitor compliance with all commitments made in the Environmental Assessment and the subsequent review of and approval process for the Environmental Assessment with respect to mitigation measures, public consultation, and additional studies and work to be carried out. <p>4.4. The compliance monitoring program must contain an implementation schedule for monitoring activities to be completed.</p> <p>4.5. The Director may require the Proponent to amend the compliance monitoring program at any time. Should an amendment be required, the Director will notify the Proponent in writing of the</p>	Confirm Compliance Monitoring Program have been prepared and submitted to the Director.	Submission of revised Compliance Monitoring Program by May 31, 2020.	The Compliance Monitoring Program was submitted on February 6, 2020 and approved by the MECPC on June 22, 2020.	Completed

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
					<p>required amendment and the date by which the Proponent must complete and submit the amendment to the Director.</p> <p>4.6. The Proponent shall submit the amended compliance monitoring program to the Director within the time period specified by the Director.</p> <p>4.7. The Proponent shall implement the compliance monitoring program and any amendments to it.</p>				
	N.A.	N.A.	N.A.	N.A.	<p>Condition # 5 – Compliance Reporting</p> <p>5.1. The Proponent shall prepare an annual compliance report outlining the results of the compliance monitoring program (Condition 4 above) and place the document on the public record.</p> <p>5.2. The first compliance report shall be submitted to the Director for review and for the public record no later than one year following the Date of Approval. Each subsequent annual compliance report shall be submitted on the date that is the anniversary of the Date of Approval thereafter. Each report shall cover the previous year to the date of report submission.</p> <p>5.3. The Proponent shall submit annual compliance reports until all conditions are satisfied.</p> <p>5.4. Once all conditions in this Notice of Approval have been satisfied, the Proponent shall notify the Director in writing that the final annual compliance report is being submitted, and that all conditions in this Notice of Approval have been satisfied. The Ministry will confirm whether all conditions have been satisfied and the Director will state this in writing to the Proponent.</p> <p>5.5. The Proponent shall retain either on the Site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.</p> <p>5.6. The Proponent shall make the compliance reports and associated documentation available to the Director or a designate in a timely manner when requested to do so by the Ministry.</p>	Confirm Annual Compliance Reports are submitted annually until all conditions are satisfied.	Annually each year on February 14 until all conditions are satisfied.	The first Annual Compliance Report was submitted to the Director on February 14, 2020. The second Annual Compliance Report was submitted to the Director on February 14, 2021.	In Progress
Extreme Weather Events	N.A.	N.A.	N.A.	N.A.	<p>Condition # 10 – Extreme Weather Events</p> <p>10.1. When applying for an Environmental Compliance Approval, the Proponent shall provide to the satisfaction of the Ministry as part of its application, an assessment of landfill vulnerability to side slope failure due to extreme weather events. The Proponent shall complete a slope stability modelling exercise to determine the appropriate safety factor to be applied to the design of the vertically expanded landfill and</p>	Confirm that the Environmental Compliance Approval is application is completed to the satisfaction of the Ministry.	April 29, 2019	A technical memorandum was prepared which address extreme weather events in relation to the extension of the facility (see Attachment B of the D&O Report).	Completed

Category	EA Commitments		Proposed Monitoring		EA Act Approval Conditions	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Compliance Reporting	
	EA Report Section	EA Commitment	EA Report Section	Monitoring				Status/Remarks (as of February 14, 2021)	Compliance Achieved? (Yes/In Progress)
					identify appropriate mitigation and contingency measures to prevent side slope failure.				
Waste Diversion	N.A.	N.A.	N.A.	N.A.	Condition # 11 – Waste Diversion 11.1. The Proponent shall develop and implement a waste diversion protocol which shall contain information on awareness programs for waste generators and haulers, and on-site waste segregation protocols to maximize the diversion of industrial, commercial and institutional waste, including organics. The Proponent shall submit the waste diversion protocol to the Ministry in its application for an Environmental Compliance Approval and report industrial, commercial and institutional waste diversion amounts in its annual compliance report (Condition 5 above).	Confirm a waste diversion protocol is prepared.	Prior to March 27, 2020	Section 5.5 of the D&O Report discusses waste diversion A Waste Diversion Protocol was submitted in a letter to MECP Approvals dated September 10, 2019. The updated version is attached as Appendix C of the 2019 EAC Report.	Completed
Duration of Approval	N.A.	N.A.	N.A.	N.A.	Condition # 13 – Duration of Approval 13.1. If Construction has not commenced within 2 years of the Date of Approval, the Proponent shall conduct a review of the Environmental Assessment and submit that review to the Director. The review shall look at the potential environmental effects and mitigation measures, and identify any changes to these components. If Construction has not commenced within 5 years of the Date of Approval, this Notice of Approval shall expire.	Confirm construction (expansion of the Landfill) has commenced within two years of the Date of Approval.	January 15, 2021	Expansion of Landfill commenced on March 27, 2020.	Completed

3. Additional Environmental Approvals and Permits

In addition to EA approval, further environmental approvals will be required in support of the proposed undertaking. This section outlines the other approvals that will be required for the proposed undertaking and indicates the status of obtaining each approval/permit between February 14, 2020 and February 14, 2021.

Table 3.1 Approvals and Permits Compliance Monitoring

Applicable Approval/Permit	Evidence of Compliance	Implementation Schedule (Estimate Timelines and Dates)	Status/Remarks (as of date of Annual Compliance Report)	Compliance Achieved? (Yes/In Progress)
Environmental Compliance Approval - Ministry of the Environment, Conservation and Parks				
An application to amend the existing ECA for the Site will need to be submitted to the MECP for approval. Changes to the design and operations of the landfill required as a result of the Preferred Alternative will be documented in an update to the existing Design and Operations (D&O) Report for the Site.	Confirm the ECA is approved by MECP.	March 27, 2020	The application to amend the existing ECA for the Site was approved by the MECP on March 27, 2020.	Completed
Noise				
The updated D&O and amended ECA will include any additional mobile noise sources such as crushing equipment for C&D processing. Other landfill operations equipment and potential on Site noise sources, including intermittent, will be addressed under the ECA for the Site overall.	Confirm the updated D&O includes any additional mobile noise sources, as necessary	April 29 2019	No additional mobile noise sources are anticipated	Completed
Surface Water Resources				
The updated D&O and amended ECA will include details of any changes required to the approved on-Site stormwater management system.	Confirm the updated D&O includes changes to the approved on-site stormwater management system, as appropriate.	April 29 2019	The updated D&O Report was approved by the MECP on March 27, 2020.	Completed

Appendices

Appendix A

Noise Best Management Plan



**Brooks Road
Environmental**



Noise Best Management Practice Plan for Brooks Road Landfill

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

**JANUARY 2021
REF. NO. 018235 (101)**

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Section 1.0 Purpose

Brooks Road Environmental (BRE) has completed a noise Best Management Practices Plan (BMPP) in conjunction with GHD Limited (GHD). The BMPP will minimize the potential for off-site sound level effects for the proposed landfill operations at the Brooks Road Landfill Site (Landfill/Site).

The objectives of this BMPP is summarized below:

- Identify activities that have the potential to affect sensitive receptors near the Landfill site.
- Provide appropriate practices and controls to measure and reduce acoustic emissions.
- Identify reporting programs and handling of noise complaints.
- Establish annual monitoring of landfill equipment to ensure they are performing within acceptable noise limits.

This BMPP is to be amended if there is an alternative solution or modification to the practices and controls provided herein. The following sections outline the procedure that BRE will implement to control the potential for acoustic emissions from the site.

Section 2.0 Responsibilities

BRE is responsible for ensuring the requirements of this BMPP are appropriately implemented. To accomplish this, employees will be trained on this BMPP. This includes: the deployment, maintenance and inspections of equipment, and operations. The employee's responsibilities will be designated with regard to these activities. As a minimum, BRE have the following responsibilities:

- Communicate the best management practices to the responsible supervisors, who shall ensure personnel are following operating procedures as defined in this BMPP.
- Ensure the BMPP is reviewed annually for changes in operations.
- Maintain adequate separation distance between site boundary and surrounding receptors. Must be vigilant to ensure no new sensitive uses encroach close to the site boundary. Any sensitive uses not within the site boundary may be considered a point of reception in the future and as such, any proposed zoning changes or residential infill should be reviewed prior to municipal approval.
- Active participation in land-use planning and policy proposals within the Site Study Area, but more importantly the Local Study Area (Figure 1) would ensure awareness of the potential changes that may impact landfill operations leading to the appropriate actions.
- Existing height of the landfill is approximately 210 meters (m) above grade (AG). BRE will stay within the maximum approved elevations of 221.5 m for the landfill as this may impact off-site noise emissions.



BRE will ensure the Site Managers have the following responsibilities:

- Ensure that this BMPP is followed and formal training is provided to the appropriate staff.
- Knowledge and understanding of the practices and control measures as outlined in this BMPP in order to provide guidance where required.
- Maintaining this plan along with complaints and maintenance logs.
- Monitor and maintain haul route roadways to minimize movement over rough ground and potholes, which can generate higher sound levels from the site.
- Scheduling should be such that activities are spaced out throughout the day where practical to prevent high periods of noise over short durations.
- Annual monitoring of site activities onsite to ensure equipment meets predicted sound level limits as stipulated in Section 6.1 and is in compliance with MECP guidelines.
- BRE will retain all records on equipment onsite and environmental complaints for a minimum of 2 years from the date of their creation and make these records available for review by staff of the Ministry upon request.

Section 3.0 General Information

The current existing Landfill operates under Environmental Compliance Approval (ECA) (Air & Noise) No. 8922-9ZHR29 issued on October 8, 2015, Amended Waste ECA No. A110302 issued on March 27 2020, and EA Notice of Approval dated February 14, 2019. The Landfill operates 6am to 6pm from Monday to Friday, and 6 am to 2 pm on Saturday for other work. Acoustic emissions from construction and landfilling operations have the potential to affect sensitive receptors surrounding the landfill depending on the type and location of activities. A number of factors will influence the sound levels at off-site receptors. Factors affecting acoustic emissions include the following:

- Activity occurrences (acoustic emissions generated by the frequency and scheduling of activities, and hours of operation).
- Travelled surfaces (acoustic emissions generated by vehicles travelling on paved and unpaved haul routes and vehicle movement). Traffic volume and speed also contribute to the overall affect off-site.
- Material handling (acoustic emissions generated by activities associated with construction, landfilling, pest control, ancillary facilities). Condition and proper use of equipment are also critical factors.
- Proper implementation of control measures such as equipment setback distances and maximum sound levels for equipment.
- Meteorological effects on sound propagation (wind speed, wind direction, relative humidity, and temperature).
- Road traffic from Highway 3.



3.1 Statutory Requirements

This BMPP focuses on reducing the potential for sound level effects at sensitive receptors in the Local Study Area and ensuring compliance with the following applicable statutory requirements:

- Ministry of the Environment, Conservation and Parks (MECP) "Landfill standards: A guideline on the regulatory and approval requirements for new or expanding landfilling sites".
- MECP Publication NPC-300 guideline for "Stationary and Transportation Sources".
- MECP Publication NPC-115 guidance for construction equipment.

The acoustic character of the Study Area was defined as a mixture of Class 2 and Class 3 based on setback distances to major roadways or industrial/commercial areas in accordance with the MECP guidelines NPC-300 "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning," October 2013.

As stated in the guideline:

"Class 2 Area" means an area where the background sound level during the day is dominated by the activities of people (07:00 to 19:00) and by natural sounds during the night (19:00 to 07:00 hours)

"Class 3 Area" means an area where the background sound level during the day and night is dominated by natural sounds

The urban sound level limits are 5 dBA greater in comparison to the rural limits to account for the elevated background sound level or the urban hum due to road traffic or adjacent industrial/commercial activities.

The Corporation of Haldimand County Noise By-law Number 1098/10 permits construction activities during the daytime hours only and prohibits construction from 7:00 p.m. to 7:00 a.m. Monday to Friday and extends the restriction from 7:00 p.m. to 9:00 a.m. on the weekend (Saturdays, Sundays and holidays) in Residential Areas.



Construction noise monitoring is not required for by-law compliance but NPC-115 Construction Equipment requirements are detailed by the MECP as follows:

NPC-115 Construction Equipment Requirements

	Excavation Equipment, Dozers, Loaders, Backhoes	Pneumatic Pavement Breakers*	Compressors*	Tracked Drills*
Power Rating < 75 kW	83 dBA	85 dBA	76 dBA/70dBA	100 dBA
Power Rating > 75 kW	85 dBA			

Notes: dBA: decibels (A weighted); * = Residential/Quiet Zone

The equipment requirement is based on a January 1, 1981, date of manufacturer or later. A power rating is not applicable for pavement breakers, compressors, or tracked drills.

Measurements are conducted at a 15 m reference distance and at the rated maximum RPM in accordance with SAE J88a procedures as referenced in NPC-103. Stationary or pass-by tests are appropriate following the procedure below:

3.3.6-For stationary tests, record the sound level obtained at a distance of 15 m (50 ft.) normal to the centers of the four major surfaces of the equipment at the microphone height. Generally, four major surfaces refer to front, rear, and sides of an imaginary box that would just fit over the machine but does not include attachment items such as buckets, dozers, and booms. In the case of a crane or an excavator, the upper (revolving superstructure) fore-and-aft centerline should be in line with the lower fore-and-aft centerline.

3.3.7-For moving tests, take measurements at a distance of 15 m (50 ft.) measured in a direction normal to a major side surface, which is parallel to the machine path.

3.3.8-The final reported sound level per this SAE Recommended Practice shall be the highest of the reported values obtained in paragraphs 3.3.6 and 3.3.7; the test report shall include the test mode, the machine operating conditions during the reported test mode, the stabilized maximum governed engine speed, the location of the microphone in relation to the construction machine, the surface description over which the machine operated, and the sound level measurements were made.

The major concerns of this report are human annoyances due to excessive noise and vibration levels, therefore, the applicable legislative documents that were followed relate to residential impacts and not



to impacts on construction workers, which is the responsibility of contractors performing the construction operations.

This BMPP focuses on reducing the potential for sound level effects at sensitive receptors shown in Figure 2.

The limits for sound levels due to the landfilling site operation at a Point of Reception are 45 dBA in any hour of the night, 7:00 p.m. - 7:00 a.m., and 55 dBA in any hour of the day, 7:00 a.m. - 7:00 p.m. These levels are expressed in terms of the One Hour Equivalent Sound Level (Leq).

The Facility is located in a mixed Acoustical Class 2 and Class 3 area, depending on the proximity of the sensitive receiver to the Highway 3 corridor. Acoustical Class 2 areas are defined by NPC-300 as an acoustic environment with elevated daytime noise levels. Acoustical Class 3 areas are defined by NPC-300 as rural areas with an acoustical environment that is dominated by natural sounds having little or no road traffic.

The 9 residential dwellings (POR6-14) located along Highway 3 are considered to be Class 2 receivers and the 5 residential dwellings (POR1-5) situated away from the corridor are considered to be Class 3 receivers. However, Landfill Standard is the applicable regulatory Guideline for compliance assessment purposes for this Facility.

3.2 Site Noise Generating Equipment and Activities

The significant environmental noise sources at the Landfill include:

- 1 x Leachate Treatment System (pumps and aerator equipment located inside heavy gauge sheet steel structure).
- 1 x stationary odour control mister (OMI Industries A1101HABA00 located inside an insulated enclosure)
- 2 x trailer mounted odour misters (NOTE – these are not typically operated)
- 2 x Caterpillar D5 Bulldozer.
- 1 x Caterpillar D6 Bulldozer.
- 1 x Caterpillar D7 Bulldozer.
- 1 x Caterpillar 826G Compactor.
- 1 x John Deer 225 Rock Truck.
- 1 x Caterpillar 330 Excavator.
- 1 x Hyundai 210 Excavator.
- 2 x John Deere 270 Skid Steer.
- 1 x HAMM 64 inch sheepsfoot packer.
- 1 x Primary Haul Route.



- 1 x Primary Scale Route.

These noise sources generate continuous steady state mechanical noise that may be audible off-site.

3.3 Predicted Noise Impacts

The noise impacts predicted at the fourteen residential dwellings are expected to be below the daytime 55 dBA noise limit defined in Landfill Guideline as per Noise Assessment Report dated July 2016. The noise source location plan is provided on Figure 3.

Section 4.0 Training

All applicable workers are to receive training so they are competent in the best management practices regarding acoustic controls appropriate for the work they would be undertaking.

The Site Manager shall provide formal training on new and existing operating procedures to relevant new and existing site personnel and contractors at least once every 3 years, and in the event of changes to this BMPP.

The Site Manager will also be responsible for identifying a list of personnel who are trained in acoustic control measures. Records of the training and attendees will be maintained on-site.

The list of individuals identified will be listed in the training log. An example of the training log is provided in Appendix A. The form will be updated every 5 years or upon employee turnover.

Section 5.0 Inspection and Maintenance Procedures

The Site Manager or trained individuals will be responsible for the inspection and maintenance of on-site equipment. All inspections and maintenance will be included in the inspection log. An example of the inspection log is provided in Appendix B. The form will be updated every 5 years.

As a minimum, the following activities or events shall be inspected and recorded in the inspection logs:

- Monthly inspection of haul routes and roadways will be carried out and maintenance will be performed within 1 month or as soon as conditions would allow.
- Unpaved roads and regularly travelled portions of the site will be re-graded as required.
- All on-site BRE and contractor heavy mobile equipment is to be inspected before first use and annually afterwards to comply with NPC-115 equipment guidelines.
- All heavy mobile equipment shall be kept in good working order and fitted with working mufflers if required. Effective acoustic control depends on machinery being in good condition and fitted with working mufflers.



5.1 Noise Equipment Inspection Procedure

A noise inspection will be done on new heavy equipment and annually after. When applicable, prior to purchase, manufacturer specifications with noise levels of new equipment will be reviewed for consistency with the assumptions in the Noise Assessment Report. These noise levels will act as the baseline noise level for the equipment for future annual inspections/monitoring. If noise levels onsite are greater than stipulated in the noise assessment, then new equipment shall not be used until solution is put in place. Annual inspections of heavy equipment will be done as follows:

1. Set annual inspection date for long-term heavy equipment operating on site.
2. Speak with regular operators of equipment about any changes in the operating of the equipment. Including: engine, muffler, and general operational noise changes.
3. Inspect for any wear and tear or rusting on the equipment compared to the previous year.
4. Document any changes through notes and pictures of the equipment.
5. Consult equipment manuals for proper maintenance schedules.
6. Take a measurement of the sound pressure level at 10 meters from the operating equipment using a Type 1 sound level meter. Record the value.
7. Compare the sound pressure measurements with the allowed heavy equipment limits defined below:

Heavy Equipment	Sound Power Level (dBA)	Sound Pressure Level @ 10 m (dBA)
Bulldozer/Compactor	106	75
Excavator	102	71
On Site Haul Route	110	79

A qualified individual must take sound level measurements. The sound level measurements will be taken using a type 1 sound level meter (SLM). The measurements will be completed 10 m away from the source of noise. The sound level will be recorded in A-weighted decibels (dBA) over a 15-second average in triplicate.

A noise inspection should be completed if a complaint occurs or when a new piece of equipment is used. An example noise inspection checklist has been provided in Appendix C. BRE equipment operators must report and record any changes in operations of the equipment that affect the noise emissions.

Section 6.0 Best Practices and Control Measures

To ensure that the off-site noise impact at all off-site residential dwellings is below the 55 dBA daytime and 45 dBA nighttime noise limits, the implementation of this BMP’s administrative controls will serve to minimize noise impacts from the Site. However, additional BMPs may include barriers and/or berms at



the landfill perimeter, as required. Routine annual noise monitoring of the landfill equipment is recommended to ensure the Site is performing within acceptable noise limits.

Environmental noise from Landfill activities has the potential to affect sensitive receptors depending on the type and location of activities. Continued compliance with the statutory requirements with implementation of best practices and controls are outlined in this Section.

6.1 Heavy Mobile Equipment

Landfill operators, machine operators and contractors are recommended to review and follow the practices and controls as outlined below:

1. All heavy mobile equipment activities will be limited to daytime hours (07:00 to 19:00 hours).
2. All heavy mobile equipment shall be kept in good working order as deterioration may increase equipment sound levels.
3. All heavy mobile equipment should meet the sound emission standards as set out in MECP Publication NPC-115 or as specified in the EA.
4. All heavy mobile equipment equipped with mufflers will be kept in good working order.
5. Vehicle movements are recommended to stay within movements depicted in Figure 3 and reduce the use of back-up alarms, where practical. This should coincide with safety considerations.
6. If alternate hauling route is proposed by BRE, a qualified individual should be consulted and approve the change.
7. Administrative controls are required to eliminate uncontrolled tailgate banging and the use of experienced equipment operators.
8. Where equipment back-up alarms will be used near areas that are potentially environmentally sensitive, alternative alarms should be used to reduce sound levels and annoyance. Ambient adjustable, strobe light or broadband alarms are options to consider.

As per Section 5.1 equipment will be inspected on an annual basis or if a complaint occurs.

6.2 Steady-State Landfilling Activities

All recommendations in Section 6.1 are recommended for landfilling activities along with the following controls:

- Landfilling activities should be limited to daytime hours (07:00 to 19:00 hours).
- All landfilling and processing equipment shall be kept in good working order as deterioration may increase equipment sound levels.
- All Landfill equipment should meet the sound emission standards as set out in MECP Publication NPC-115 or as specified in the ECA.



- Administrative controls are required to eliminate uncontrolled tailgate banging and the use of experienced equipment operators.

6.3 Construction Activities

Construction activities should be limited to daytime hours, and equipment should meet the sound emission standards as set out in MECP Publication NPC-115 or as specified in the ECA. All recommendations in Sections 6.1 and 6.2 are to be followed during Construction activities.

Section 7.0 Recordkeeping

Records shall be kept of when and how acoustic control measures are implemented and when complaints, if any, are received. Example of a complaint form is provided in Appendix D. The form will be updated every 5 years or upon employee turnover. As a minimum, the following activities will take place if a complaint is received:

- Complaints or concerns expressed directly to contractors or site personnel should be communicated immediately to the Site Manager so the formal complaint process can be initiated and followed up.
- The complaint form will provide the description of the complaint, environmental conditions, operations at time of incident, and description of all responses and follow up actions.
- Reporting will be conducted with the intent to manage any potential acoustic issues through operational changes to construction and landfilling.
- If the complaint is valid or persistent (i.e., not an upset condition), investigation through sound level measurements will be conducted and reported.
- On an annual basis, the complaint records will be reviewed and any unfavourable trends will be examined further to identify corrective actions and included in the annual report.

Section 8.0 EA/ECA Commitments and Conditions

The Landfill noise document is the applicable regulatory Guideline for compliance assessment purposes for the Landfill and requires that the BRE Facility achieve a noise limit of 55 dBA at all off-site residential dwellings of concern during daytime hours (7 am – 7 pm) and 45 dBA during nighttime hours (7 pm - 7 am). The Landfill operates 6 am to 6 pm from Monday to Friday, and 6 am to 2 pm on Saturday for other work.

There is no specific noise mitigation required for the Facility, however the EA commits to the implementation of a Noise Best Management Plan with annual monitoring of landfill equipment to minimize noise impacts from the Site. Noise mitigation methods may include barriers and/or berms at the landfill perimeter, as required, administrative controls that limit on-Site landfilling activities, and routine monitoring of landfill equipment to ensure the facility is performing within acceptable noise limits.



As per Environmental Compliance Approval (ECA) No. 8922- 9ZHR29, BRE will ensure that, the noise emissions from the Facility comply with the limits stated above. The ECA also commits BRE to the following:

ECA Section	Commitments
Operation and Maintenance	BRE will maintain a manual outlining the operating procedures and maintenance program for the equipment including: <ul style="list-style-type: none">• Routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the equipment suppliers.• Emergency procedures.• Procedures for any record keeping activities relating to the operating and maintenance of the equipment.• All appropriate measures to minimize noise emissions from all potential sources.• Procedures for recording and responding to environmental complaints relating to the operations of the equipment.• And implement recommendations of the equipment manual.



ECA Section	Commitments
Record Retention	<p>BRE shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by the ECA, and make the records available for review by staff of the Ministry upon request.</p> <p>BRE shall retain:</p> <ol style="list-style-type: none">1. all records on the maintenance, repair and inspection of the Equipment.2. all records of any upset conditions associated with the operation of the Equipment.3. all records on the environmental complaints, including:<ol style="list-style-type: none">a. a description, time, date and location of each incident;b. operating conditions (e.g., upset conditions, etc.) at the time of the incident;c. wind direction and other weather conditions at the time of the incident;d. the name(s) of Company personnel responsible for handling the incident;e. the cause of the incident;f. the Company's response to the incident; andg. a description of the measures taken to address the cause of the incident and to prevent a similar occurrence in the future, and the outcome of the measures taken.



ECA Section	Commitments
Notification Requirements	<p>BRE shall notify the District Manager, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:</p> <ol style="list-style-type: none">1. a description of the nature of the complaint;2. a description, time, date and location of each incident;3. operating conditions (e.g. upset conditions, etc.) at the time of the incident;4. wind direction and other weather conditions at the time of the incident;5. the name(s) of Company personnel responsible for handling the incident;6. the cause of the incident;7. the Company response to the incident; and8. a description of the measures taken to address the cause of the incident and to prevent a similar occurrence in the future, and the outcome of the measures taken.

Section 9.0 References

Ontario Ministry of the Environment, 2016: Landfill standards: A guideline on the regulatory and approval requirements for new or expanding landfilling sites, November 2016.

Ontario Ministry of the Environment, 2013: Publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", August 2013.

Ontario Ministry of the Environment (MOE), 1977b: Model Municipal Noise Control By-law, which includes Publication NPC-115 – Construction Equipment.



Source: MNRF NRVIS, 2014. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2016;
 Aerial: 2006 Grand River Conservation Authority
 Coordinate System: NAD 1983 UTM Zone 17N

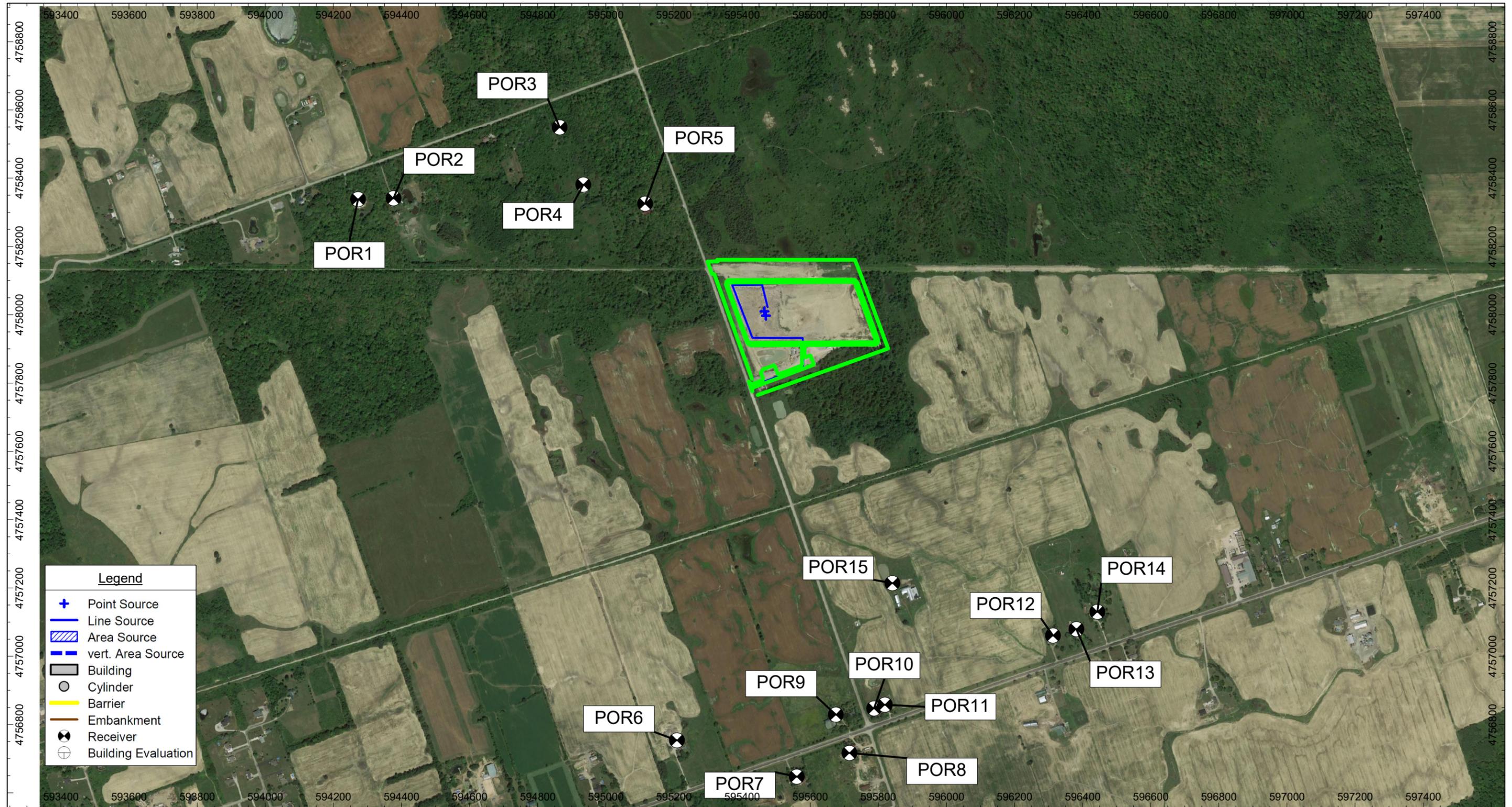
figure 1

LOCAL STUDY AREA
 NOISE BEST MANAGEMENT PRACTICE PLAN
 BROOKS ROAD LANDFILL
 160 Brooks Road, Cayuga, Ontario

Legend

 Local Study Area (1km Radius)

 Site Location



Source: Google Satellite

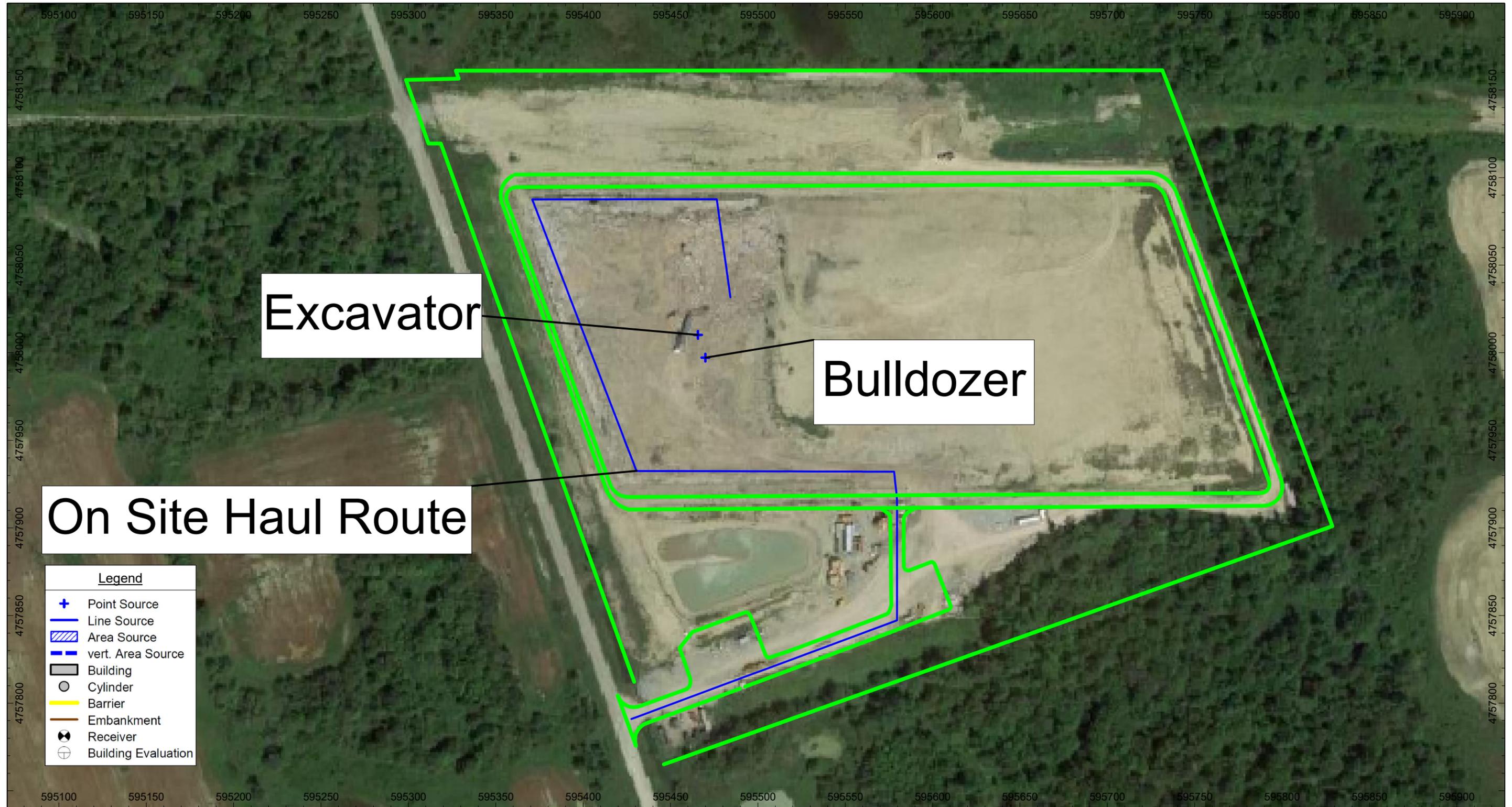


NOISE BEST MANAGEMENT PRACTICE PLAN
 BROOKS ROAD ENVIRONMENTAL
 160 BROOKS ROAD HALDIMAND COUNTY, ONTARIO

SITE AND POINT OF RECEPTION LOCATION PLAN

018235
 29.09.2020

FIGURE 2



Source: Google Satellite



NOISE BEST MANAGEMENT PRACTICE PLAN
 BROOKS ROAD ENVIRONMENTAL
 160 BROOKS ROAD HALDIMAND COUNTY, ONTARIO
 NOISE SOURCE LOCATION PLAN

018235
 20.08.2020

FIGURE 3

Appendices

Appendix A

Example Training Log

Appendix B

Example Noise Inspection Log

Appendix C

Noise Inspection Check List

Noise Inspection Check List
Brooks Road Landfill – Haldimand, Ontario

Form Last Updated
August 18, 2020

Inspector Name:	Inspection Date:
Inspector Position:	Reason for Inspection:
Current Weather Conditions:	Wind Speed:

Equipment (Make/Model/Serial#)	Operator Name	Operator Notes	Condition of Equipment	Maintenance Needed? (Y/N)	Sound Pressure Level at 10m (dBA)			Pass/Fail (Circle)
					Height of Source (m)	Measurement Sound Level	Expected Sound Level	
CAT D7 Bulldozer	Joe Smith	Bulldozer operating as normal little bit of rusting on muffler	Overall good	N	2	74	75	<u>Pass</u> /Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail
								Pass/Fail

Note: This form is reviewed and updated annually. For expected sound levels, see page 7 of Noise Best Management Practice Plan for Brooks Landfill.

Appendix D

Example Noise Complaint Form

1. Complaint information		Date & Time:	
Name:		Phone	
Address:			
Complaint Method (In-Person / Phone / Email / Other _____)			
2A. Complaint Description		Noise Source Visible? (Yes / No)	
Description of Noise:			
2B. Location		Location of Annoyance: (Inside / Outside)	
Description of Location: <i>What location are you hearing the noise from? When did you hear the noise?</i>			
Other Comments			
3A. Employee Receiving Complaint		Date & Time:	
Name:		Title:	
Phone:			
4. Environmental Conditions			
Weather Description			
Precipitation (Rain, Hail, Snow, None, Other: _____)			
Wind Direction			
Other Comments			
5. Complaint Investigations and Corrective Actions			
Activities at Time if Incident:			
Unusual Occurrence (Yes/No):			
If yes, describe:			
Need to Monitor? (Yes / No)			
Corrective Actions:			

Note: This form is reviewed and updated annually

Other Comments:

Appendix B

2020 Complaint Summary

Date of Complaint	Time	Received	By	Mitigation Action
1/3/2020	7:48 PM	1/3/2020 @ 7:48pm	BRE	mister running, proactive granule placement
1/3/2020	7:43 PM	1/7/2020	MECP	mister running, proactive granule placement
1/3/2020	10:03 PM	1/7/2020	MECP	mister running, proactive granule placement
1/15/2020	7:29 PM	1/15/2020 @ 7:29pm	BRE	mister running, proactive granule placement
2/10/2020	8:22 PM	2/12/2020 @ 8:04am	MECP	mister running, proactive granule placement
2/24/2020	7:36 PM	2/26/2020 @ 8:41AM	MECP	mister running, proactive granule placement
2/24/2020	10:07 PM	2/26/2020 @ 8:41 AM	MECP	mister running, proactive granule placement
3/3/2020	2:14 PM	3/3/2020 @ 2:14 PM	BRE	mister running, additional cover applied, granules applied after rain
3/11/2020	10:30 PM	3/11/2020 @ 10:30 PM	BRE	Extra Granules appied, Mister Running
3/12/2020	8:54 AM	3/12/2020 @ 8:54 AM	BRE	Mister Running
3/25/2020	5:46 PM	3/25/2020 @ 5:46 PM	BRE	mister running, proactive granule placement due to changing winds
4/12/2020	4:20 PM	4/12/2020 @ 4:20 PM	BRE	mister running
4/17/2020	8:30 PM	4/17/2020 @ 8:30 PM	BRE	Mister Running
7/4/2020	12:30 AM	7/4/2020 @ 12:30 AM	BRE	Mister Running
7/11/2020	7:05 AM	7/11/2020 @ 7:05 AM	BRE	Mister Running
9/15/2020	8:57 AM	9/15/2020 @ 8:57 AM	BRE	Mister Running
9/19/2020	8:29 AM	9/19/2020 @ 8:29 AM	BRE	Mister Running
9/19/2020	7:00 AM	9/23/2020 @10:44	MECP	Mister Running
10/29/2020	7:00 AM	10/29/2020 @ 8:15 AM	MECP	Mister Running
10/31/2020	8:40 AM	10/31/2020 @ 8:40 AM	BRE	Mister Running
11/9/2020	8:15 AM	11/9/2020 @ 8:15 AM	BRE	Mister Running
12/17/2020	3:43 PM	12/17/2020 @ 3:43 PM	BRE	Mister Running

Appendix C

Wetland Monitoring Report



Memorandum

February 12, 2021

To: Tim Danyliw

Ref. No.: 018235

From: Amy Douglas and Laura Lawlor/jd/115

**Subject: 2020 Annual Wetland Monitoring, Approval Condition 12
Brooks Road Landfill
Cayuga, Ontario
March to December 2020**

1. Introduction

The following document details the 2020 Annual Wetland Monitoring results at Brooks Road Landfill (Site) in Haldimand County, Ontario, from March to December 2020. The Site is owned and operated by Brooks Road Environmental (BRE) as a solid waste landfill. Monitoring was conducted in accordance with the Terrestrial and Aquatic Environment Best Management Plan (BMP) (GHD 2020) to comply with Condition 12 of the facility's Notice of Approval EA File number 03-08-02 (Approval), issued in 2019 under the *Environmental Assessment Act*. The BMP outlining BRE's approach to Condition 12 of the Approval was finalized in September 2020, following the Ministry of the Environment, Conservation and Parks' (MECP) review and acknowledgment.

2. Silt Fence Inspection

A baseline inspection of the perimeter silt fencing was completed on May 22, 2020, by walking the perimeter of the property. It was at that time observed that the silt fencing was in poor working order and not installed along most of the perimeter fence (**Photos 1 and 2 – Attachment A**). To be compliant with Condition 12.1 of the Approval, the silt fence around the Site is to be installed prior to amphibians and reptiles emerging from hibernation (before February thaw-off and after October) as per the recommendations provided in the BMP. As of February 1, 2021, BRE is consulting with a contractor to install the silt fencing in 2021. Once installed, the fence will be maintained by BRE and monitored at a minimum of each quarter by GHD staff in 2021 and 2022. Copies of the inspection reports are to be maintained on Site for two years, as per the BMP.

3. Species at Risk Training

GHD prepared a site-specific SAR identification guide for BRE Site staff and visitor use to address Condition 12.2 of the Approval. This guide provides a visual and descriptive representation of SAR species



potentially occurring within the area. The guide is accessible on Site in the trailer. Any SAR observations reported are communicated by BRE to the MECP directly.

4. Wetland Monitoring

A multi-faceted wetland monitoring program was implemented for the Site, to address Condition 12.3 of the Approval. The 2020 results of the program outlined in the BMP (GHD 2020) are summarized in the following sections. A summary of the surface water and groundwater monitoring relevant to the wetland monitoring is provided herein; the complete Site surface water and groundwater monitoring results for 2020 are provided in the 2020 Operations and Maintenance annual report (GHD 2021).

4.1 Surface Water Monitoring

The Site currently implements a surface water monitoring program that includes water quality monitoring and surface flow measurements. This program consists of a network of nine monitoring stations (two on Site and seven off Site); indicated on **Figure 1**. Surface water monitoring location SW9 was established immediately to the north of the Site in May 2020 (**Photo 3 – Attachment A**). This location was established as part of the submission of the Wetland Monitoring Program to satisfy Condition 12.3 of the Approval.

Water quality monitoring and surface water flow measurements at all surface water stations occur on a quarterly basis (generally March, May, August, November/December). Surface water monitoring was conducted on March 20, May 22, August 31, and November 24, 2020. All nine surface water locations were noted as dry during the August monitoring event. Surface water sample collection is ideally only completed when flowing conditions are observed at each monitoring station; however, some samples have been identified as being collected from stagnant (non-flowing) conditions. The analytical data for the 2020 surface water monitoring is presented in **Attachment B**.

For comparison purposes, surface water quality is compared to the Provincial Water Quality Objectives (MOEE 1994, reprinted 1999).

The surface water monitoring locations include two background locations (SW1 and SW8) to document the background water quality in the local ditches and ponds. A comparison of the background surface water quality of the ditch network (SW1) to the quality reported immediately downstream of the Site (SW3) as well as 1 km downstream of the Site (SW4) indicates that surface water quality at SW3 and SW4 was generally similar to that observed upstream. Several metals parameters were comparatively elevated in the sample collected from SW4 in May 2020 however the TSS results from this even suggests that the elevated metals were the result of sediment entrained in the sample container. Leachate indicator parameter concentrations at SW4 were within the ranges observed at SW1 during the monitoring period.

Background monitoring location SW8 was dry during all monitoring events except March 2020. A comparison of the surface water quality of background ponded water (SW8) to the quality of the water reported on Site (SW5) and immediately off Site (SW6) indicates minor exceedances of metals concentrations detected above the PWQO values at all three locations. The water quality results for SW5 and SW6 are similar to or



better than those reported at SW8 during the monitoring period. On the basis of these results there is no evidence of significant landfill-related water quality impacts at SW5 or SW6.

SW2 (installed in 2019) is located on Site and indicated minor exceedances of metals and polycyclic aromatic hydrocarbons (PAHs) during the May monitoring event. Concentration ranges for the majority of parameters are similar at SW2 and background location SW1. The slightly elevated metals concentrations reported in the May 2020 sample are suspected to be partially attributable to sediment entrained within the sample container, based on the reported TSS concentration during this event. The low-level detections of PAHs reported at SW2 in March are similar to sporadic historical results at SW3, located, off Site immediately downstream of SW2. The low level PAH concentrations are interpreted to be the result of historical stockpiling of railway ballast and use of this material in road base in the southern portion of the site. The November 2020 sample from SW2 did not contain detectable concentrations of PAH parameters.

Based on the limited dataset collected to date, there is no evidence that the landfill is significantly impacting water quality at SW2.

Newly installed SW9 located immediately north of the Site indicated some minor exceedances of metals concentrations detected above the PWQO values during the May monitoring event only. Based on the pattern of elevated metals (e.g. elevated aluminum concentration) it is suspected that sediment entrained within the sample container was an important factor contributing to the elevated concentrations. It is noted that the TSS concentration in the May 2020 sample was 274 mg/L, as compared to the November 2020 TSS result of 19.1 mg/L. Further monitoring is required to understand the relationship between water quality at SW9 and the Site.

4.2 Groundwater Monitoring

The Site currently implements a groundwater monitoring program that includes twice annual hydraulic monitoring and water quality monitoring. This program consists of a network of 35 monitoring wells (27 on Site and eight off Site wells). The results of this program are reported annually in the Operations and Monitoring Report as required by the Site's amended Environmental Compliance Approval No. A110302. The results of groundwater monitoring have demonstrated that natural background groundwater quality within the shallow overburden is generally characterized by elevated levels of alkalinity, hardness, DOC, TDS, sulphate, and iron. On Site groundwater quality monitoring generally demonstrates that significant landfill-related impact to the shallow groundwater monitoring regime is not apparent. A more fulsome discussion of the results of the 2020 groundwater monitoring program is provided in the 2020 Operations and Monitoring Report.

4.3 Calling Amphibian Monitoring

Due to uncertainty during the early COVID-19 pandemic response, only two of the recommended three amphibian calling surveys were conducted in 2020: on May 28 and June 29. April monitoring will be included in subsequent years.

Amphibian calling surveys were conducted according to the Marsh Monitoring Protocol (BSC 2009) and were carried out at two stations in the wetlands on Site (**Figure 1**). All surveys commenced a half hour after sunset and consisted of listening at each station for three minutes after two minutes of silence. During the



survey, the ecologists documented any frogs or toads heard calling and a measure of 1, 2 or 3 for the abundance of each species within 50 metres (m) of the survey point, 50 – 100 m of the survey point, or greater than 100 m of the survey point.

The initial survey was conducted on May 28, 2020. The weather conditions were 19°C, with 10% cloud cover, and no precipitation. A slight breeze was observed during the Station 1 survey, which reduced to calm conditions for the Station 2 survey. The second survey was conducted on June 29, 2020; weather conditions were 20.4 – 21.1°C, and clear skies with no precipitation or wind. The results of the surveys are provided in **Table 4.1**.

Table 4.1 Amphibian Calling Survey Results

Species	Call Level Code ¹			
	Station 1		Station 2	
	28-May-2020	29-Jun-2020	28-May-2020	29-Jun-2020
American bullfrog (<i>Lithobates catesbeianus</i>)	-	C-1 (2)	-	C-2 (3)
Gray treefrog (<i>Hyla versicolor</i>)	B-1 (1) B-2 (5)	-	A-3 (FC)	-
Green frog (<i>Lithobates clamitans</i>)	-	A-1 (2) B-1 (1) B-1 (1) C-3 (FC)	-	C-2 (5)

Notes:

1. - Species not detected
 - A: Within 50 m of the survey point
 - B: 50 - 100 m of the survey point
 - C: Greater than 100 m of the survey point
- Call Level 1: Calls not simultaneous, number of individuals can be accurately counted
- Call Level 2: Some calls simultaneous, number of individuals can be reliably estimated
- Call Level 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated
- Numbers in parentheses indicate estimated abundance of species (full chorus cannot be estimated, indicated as FC)
- No stations observed significant calling activity (MNRF, 2015)

In addition to the species listed, American toad (*Anaxyrus americanus*) was heard prior to the Station 1 survey in May, near the northwest extent of the Site. No species listed under the provincial *Endangered Species Act* (ESA; 2007) or the national *Species at Risk Act* (SARA; 2002) were recorded during the amphibian monitoring.

Each of the species recorded during the 2020 surveys have been previously documented in the vicinity as part of the EA records.

4.4 Wildlife Observations

All incidental wildlife observed during GHD Site surveys were recorded. Species observed on or near Site during 2020 are presented in **Table 4.2**. No species listed under the ESA or the SARA were observed on or near Site.



Table 4.2 Incidental Wildlife Observed On or Near Site

Species Observed		S-Rank	SARO	SARA
Common Name	Scientific Name			
Birds				
American robin	<i>Turdus migratorius</i>	S5B	N/A	N/A
American woodcock	<i>Scolopax minor</i>	S4B	N/A	N/A
Common grackle	<i>Quiscalus quiscula</i>	S5B	N/A	N/A
Common yellowthroat	<i>Geothlypis trichas</i>	S5B	N/A	N/A
Gray catbird	<i>Dumetella carolinensis</i>	S4B	N/A	N/A
Killdeer	<i>Charadrius vociferus</i>	S5B, S5N	N/A	N/A
Northern cardinal	<i>Cardinalis</i>	S5	N/A	N/A
Red-winged blackbird	<i>Agelaius phoeniceus</i>	S4	N/A	N/A
Song sparrow	<i>Melospiza melodia</i>	S5B	N/A	N/A
Turkey vulture	<i>Cathartes aura</i>	S5B	N/A	N/A
Yellow warbler	<i>Setophaga petechia</i>	S5B	N/A	N/A
Amphibians				
American bullfrog	<i>Lithobates catesbeianus</i>	S4	N/A	N/A
American toad	<i>Anaxyrus americanus</i>	S5	N/A	N/A
Gray treefrog	<i>Hyla versicolor</i>	S5	N/A	N/A
Green frog	<i>Lithobates calamitans</i>	S5	N/A	N/A
Mammals				
Big brown bat	<i>Eptesicus fuscus</i>	S5	N/A	N/A
Eastern cottontail	<i>Sylvilagus floridanus</i>	S5	N/A	N/A
Northern raccoon	<i>Procyon lotor</i>	S5	N/A	N/A
Notes:				
S-Rank: Sub-national Rank				
S4: Common in Ontario: apparently secure, usually more than 100 occurrences				
S5: Very common in Ontario, demonstrably secure				
SZB: No clearly definable occurrences of breeding				
SZN: no clearly definable occurrences of a non-breeding species				
SARO: Species at Risk in Ontario (N/A: Not Applicable)				
SARA: Species at Risk Act (N/A: Not Applicable)				

4.5 Vegetation Plot Monitoring

Ecological Land Classification (ELC) detailed in a prior Environmental Assessment¹ (GHD, 2017) was utilised to establish a baseline vegetation community within the Mixed Mineral Meadow Marsh (MAMM3-1) north of the Site. This mid-age understory vegetation community is characterized by reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*). Narrow leaved cattail (*Typha angustifolia*),

¹ This MAMM3-1 community was originally reported in the Scoped Environmental Impact Study (CRA, 2013) and EA (GHD, 2017), however reed canary grass (*Phalaris arundinacea*) was incorrectly referenced as common reed grass (*Phragmites australis*) in the 2013 narrative describing the community. MAMM3-1 communities are characterized by reed canary grass, as observed on Site.



narrow leaved meadowsweet (*Spiraea alba*), and large-fruited bur-reed (*Sparganium eurycarpum*) are also present within the understory layer, including a MASM1-1 (cattail marsh) inclusion.

Vegetation monitoring plots were established and observed on June 29, 2020 (**Photo 4, 5, and 6 – Attachment A**). They consisted of three 1 x 1 metre plots established at 10 m increments within the MAMM3-1 community north of the Site (**Figure 1**). Observed species and plot coverage (percentage) is presented in **Table 4.3**.

Table 4.3 Vegetation Monitoring Results

Species Observed		Coverage per Location		
Common Name	Scientific Name	Plot 1	Plot 2	Plot 3
Reed canary grass	<i>Phalaris arundinacea</i>	54 %	65 %	2 %
Purple loosestrife	<i>Lythrum salicaria</i>	26 %	20 %	45 %
Branching bur-reed	<i>Sparganium angrocladum</i>	15 %	10 %	5 %
Hybrid cattail	<i>Typha</i> sp.	5 %	1 %	20 %
Soft-stemmed bulrush	<i>Schoenoplectus tabernaemontani</i>	-	-	5 %
Water-plantain	<i>Alisma</i> sp.	-	-	2 %
Great duckweed	<i>Spirodela polyrhiza</i>	-	<1 %	1 %
Small duckweed	<i>Lemna minor</i>	-	<1 %	1 %
Total vegetation cover		100 %	96 %	81 %
Water Depth		Dry	10-30 mm	0-15 mm

Incidental plants observed within the MAMM3-1 community, but not within a plot, included sensitive fern (*Onoclea sensibilis*), small forget-me-not (*Myosotis laxa*), curled dock (*Rumex crispus*), narrow leaved meadowsweet, and hop sedge (*Carex lupulina*).

The MAMM3-1 vegetation community observed during the 2020 monitoring is comparable to that of the baseline community documented in 2013 and 2017 reports.

5. Summary and Recommendations

GHD completed monitoring of and reporting activities associated with the Site in 2020 on behalf of BRE to satisfy the first monitoring year of Condition 12 of the Approval. As the BMP was not finalized until September 2020, the results are representative of Site conditions, but are not all complete in accordance with what were identified in the BMP.

The results of the 2020 activities indicate that, where baseline data exists, the wetland characteristics are consistent with pre-Approval conditions. No SAR were observed as part of GHD's incidental or targeted wildlife surveys.

GHD recommends the following actions for completion in 2021:

- To be compliant with Condition 12.1 of the Approval, silt fencing is to be installed around the Site prior to emergence from hibernation (before February thaw-off and after October) as per recommendations



provided in the BMP. Once installed, the silt fence will be maintained by BRE and monitored quarterly by GHD.

- Continue with wetland monitoring in 2021 as outline in the BMP and in compliance with Approval Condition 12.3.
- Subsequent years of calling amphibian monitoring, i.e. 2021 and every third year following, are to have three surveys (April, May, June) completed.
- Vegetation Monitoring will be conducted in the MAMM3-1 community north of the Site in June 2021, and every third year following as per BMP recommendations.

6. References

Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

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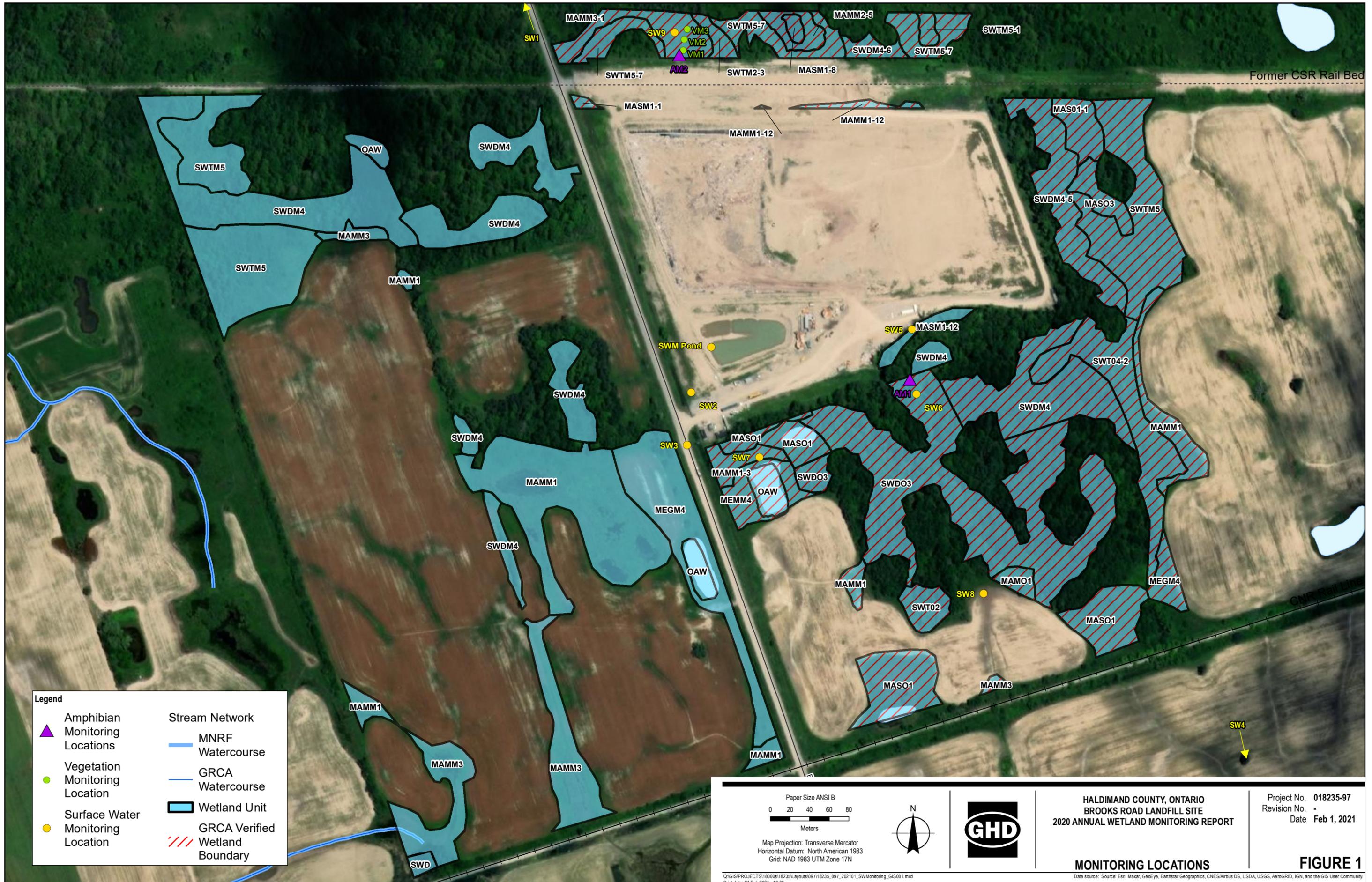
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Ontario. Endangered Species Act, SO 2007, c. 6. URL: <https://www.ontario.ca/laws/statute/07e06>

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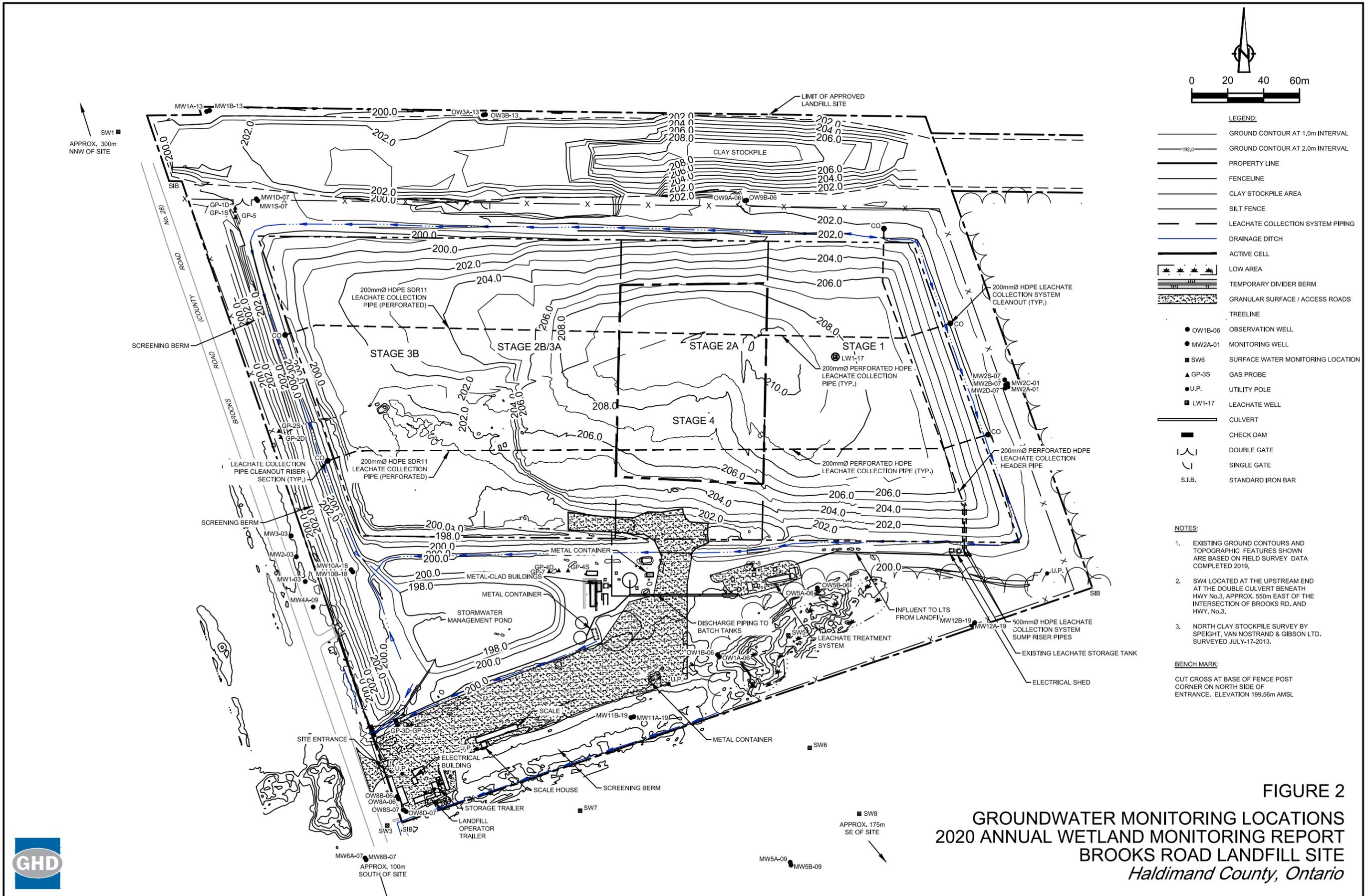
Legend

Amphibian Monitoring Locations	Stream Network
Vegetation Monitoring Location	MNRF Watercourse
Surface Water Monitoring Location	GRCA Watercourse
	Wetland Unit
	GRCA Verified Wetland Boundary

<p>Paper Size ANSI B</p> <p>0 20 40 60 80</p> <p>Meters</p> <p>Map Projection: Transverse Mercator Horizontal Datum: North American 1983 Grid: NAD 1983 UTM Zone 17N</p>			<p>HALDIMAND COUNTY, ONTARIO BROOKS ROAD LANDFILL SITE 2020 ANNUAL WETLAND MONITORING REPORT</p>	<p>Project No. 018235-97 Revision No. - Date Feb 1, 2021</p>
MONITORING LOCATIONS			FIGURE 1	

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Print date: 01 Feb 2021 - 19:05

Data source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Attachment A

Photographic Log



Photo 1 – Damaged silt fencing located along the northwestern perimeter fence (May 22, 2020).



Photo 2 – Northern perimeter fence with no silt fence installed (May 22, 2020).





Photo 3 – Surface water monitoring gauge, SW9, installed in MAMM3-1 community north of the Site (May 22, 2020).



Photo 4 – Vegetation monitoring plot 1, installed in MAMM3-1 community north of the Site (June 29, 2020).



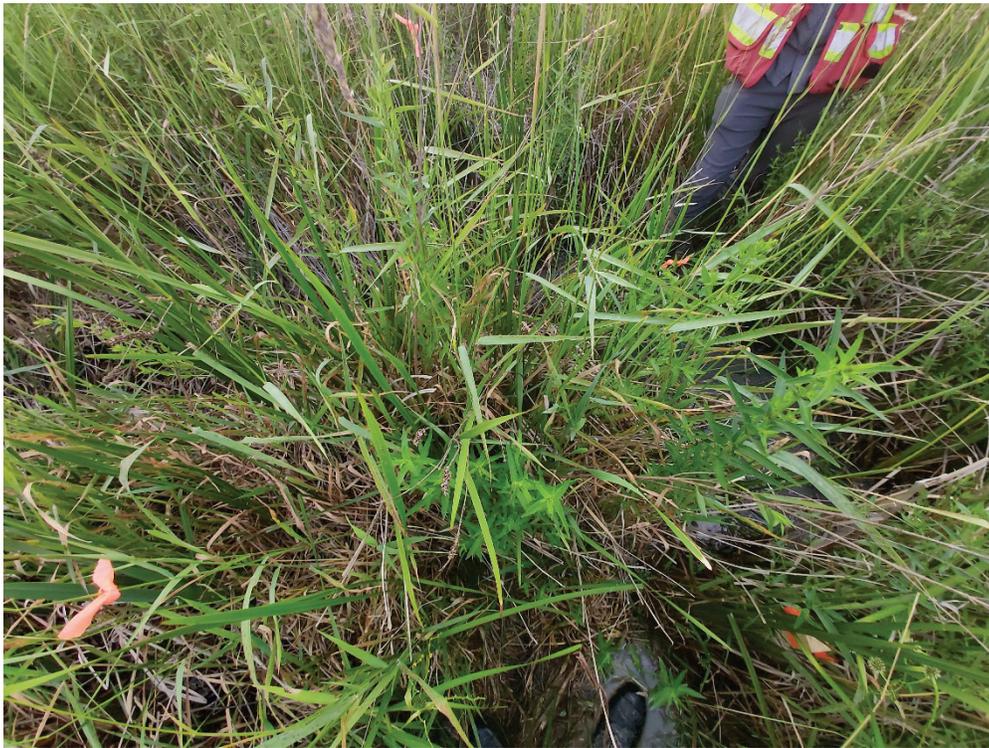


Photo 5 – Vegetation monitoring plot 2, installed in MAMM3-1 community north of the Site (June 29, 2020).



Photo 6 – Vegetation monitoring plot 3, installed in MAMM3-1 community north of the Site (June 29, 2020).

Attachment B
2020 Surface Water Monitoring Analytical Data

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW1	SW1	SW1	SW1	SW1	SW2	SW2	SW2		
Sample ID:	SW-18235-0320- DD-006	SW-18235-0320- DD-007	SW-18235-0520- DD-002	SW-18235-1120- HM-001	SW-18235-1120- HM-002	SW-18235-0320- DD-009	SW-18235-0520- DD-003	SW-18235-1120- HM-008		
Sample Date:	20-Mar-20	20-Mar-20	22-May-20	24-Nov-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20		
Parameters	PWQO ⁽¹⁾ Duplicate		Duplicate							
Units	a									
General Chemistry										
Alkalinity, total (as CaCO3)	mg/L	-	30	30	76	166	181	104	120	169
Ammonia-N	mg/L	-	0.036	<0.010	0.039	0.012	<0.010	0.280	0.077	0.023
Biochemical oxygen demand (BOD)	mg/L	-	<3.0	<3.0	<3.0	<3.0	3.1	3.5	3.1	<3.0
Chemical oxygen demand (COD)	mg/L	-	62	59	54	49	49	59	27	31
Chloride	mg/L	-	22.1	23.3	0.65	151	152	37.7	17.6	38.9
Conductivity	µS/cm	-	136	140	193	955	950	812	618	875
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	-	-	21.7	17.6	19.5	-	9.85	9.78
Hardness	mg/L	-	-	-	96	238	239	-	275	360
Nitrate (as N)	mg/L	-	0.048	0.037	0.029	<0.020	<0.020	1.33	0.097	0.099
Nitrite (as N)	mg/L	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.230	<0.010	<0.010
pH, lab	s.u.	6.5-8.5	6.79	6.71	7.61	7.39	7.52	8.92	8.20	8.01
Phenolics (total)	mg/L	0.001	0.0034	0.0021	<0.0010	0.0016	0.0013	0.0066	0.0016	0.0019
Phosphorus	mg/L	0.01	0.143	0.139	0.0842	0.150	0.148	0.173	0.100	0.0886
Sulfate	mg/L	-	3.01	3.13	18.3	85.9	86.9	243	193	287
Total dissolved solids (TDS)	mg/L	-	183	178	174	610	530	600	437	535
Total kjeldahl nitrogen (TKN)	mg/L	-	1.13	0.87	1.03	0.780	0.800	1.60	0.88	0.950
Total suspended solids (TSS)	mg/L	-	5.6	5.6	7.3	5.1	3.7	71.7	69.7	37.7
Metals (Total)										
Aluminum	mg/L	0.075	-	-	0.718	0.0134	0.0143	-	1.81	<0.0050
Arsenic	mg/L	0.005	-	-	0.00083	0.00054	0.00051	-	0.00215	0.00096
Barium	mg/L	-	-	-	0.0136	0.0549	0.0569	-	0.0335	0.0368
Beryllium	mg/L	0.011	-	-	-	<0.00010	<0.00010	-	-	<0.00010
Boron	mg/L	0.2	-	-	0.018	0.027	0.027	-	0.183	0.345
Cadmium	mg/L	0.0002	-	-	0.0000217	0.0000138	0.0000139	-	0.0000315	0.0000058
Calcium	mg/L	-	-	-	25.8	67.3	67.4	-	47.7	66.7
Chromium	mg/L	0.001	-	-	0.00123	<0.00050	<0.00050	-	0.00577	0.00115
Cobalt	mg/L	0.0009	-	-	0.00029	0.00015	0.00016	-	0.00127	0.00013
Copper	mg/L	0.005	-	-	0.0017	0.0010	0.0014	-	0.0070	0.0018
Iron	mg/L	0.3	0.561	0.410	1.27	0.195	0.188	0.162	2.44	<0.010
Lead	mg/L	0.005	-	-	0.000556	0.000058	0.000053	-	0.00373	<0.000050
Magnesium	mg/L	-	-	-	7.69	17.1	17.1	-	37.9	46.9
Manganese	mg/L	-	-	-	-	0.0808	0.0827	-	-	0.00672
Mercury (dissolved)	mg/L	0.0002	-	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050
Molybdenum	mg/L	0.04	-	-	0.000168	0.00163	0.00170	-	0.00308	0.00393
Nickel	mg/L	0.025	-	-	0.00158	0.00088	0.00121	-	0.00421	0.00203
Potassium	mg/L	-	-	-	1.42	6.10	5.96	-	6.32	7.99
Silver	mg/L	0.0001	-	-	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050
Sodium	mg/L	-	-	-	2.47	101	99.2	-	26.3	46.6
Thallium	mg/L	0.0003	-	-	<0.000010	<0.000010	<0.000010	-	0.000028	<0.000010
Titanium	mg/L	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.006	-	-	0.00147	<0.00050	<0.00050	-	0.00438	0.00068
Zinc	mg/L	0.03	-	-	0.0046	0.0058	0.0062	-	0.0147	<0.0030
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	µg/L	20	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,1,1-Trichloroethane	µg/L	10	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,1,2,2-Tetrachloroethane	µg/L	70	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,1,2-Trichloroethane	µg/L	800	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,1-Dichloroethane	µg/L	200	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,1-Dichloroethene	µg/L	40	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,2-Dibromoethane (Ethylene dibromide)	µg/L	5	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,2-Dichlorobenzene	µg/L	2.5	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,2-Dichloroethane	µg/L	100	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,2-Dichloropropane	µg/L	0.7	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,3-Dichlorobenzene	µg/L	2.5	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
1,4-Dichlorobenzene	µg/L	4	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	400	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0
2-Hexanone	µg/L	-	-	-	<3.0	<3.0	<3.0	-	<3.0	<3.0
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	-	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0
Acetone	µg/L	-	-	-	<3.0	<3.0	<3.0	-	<3.0	<3.0
Benzene	µg/L	100	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Bromodichloromethane	µg/L	200	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0
Bromoform	µg/L	60	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Bromomethane (Methyl bromide)	µg/L	0.9	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Carbon tetrachloride	µg/L	-	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Chlorobenzene	µg/L	15	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Chloroethane	µg/L	-	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Chloroform (Trichloromethane)	µg/L	-	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Chloromethane (Methyl chloride)	µg/L	700	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
cis-1,2-Dichloroethene	µg/L	200	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
cis-1,3-Dichloropropene	µg/L	-	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Dibromochloromethane	µg/L	40	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0
Ethylbenzene	µg/L	8	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
m&p-Xylenes	µg/L	2	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Methyl tert butyl ether (MTBE)	µg/L	200	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0
Methylene chloride	µg/L	100	-	-	<5.0	<5.0	<5.0	-	<5.0	<5.0
o-Xylene	µg/L	40	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Styrene	µg/L	4	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Tetrachloroethene	µg/L	50	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Toluene	µg/L	0.8	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
trans-1,2-Dichloroethene	µg/L	200	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
trans-1,3-Dichloropropene	µg/L	7	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Trichloroethene	µg/L	20	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	<5.0	<5.0	<5.0	-	<5.0	<5.0
Trihalomethanes	µg/L	-	-	-	<3.2	<3.2	<3.2	-	<3.2	<3.2
Vinyl chloride	µg/L	600	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Xylenes (total)	µg/L	-	-	-	<1.1	<1.1	<1.1	-	<1.1	<1.1

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW1	SW1	SW1	SW1	SW1	SW2	SW2	SW2	
Sample ID:	SW-18235-0320- DD-006	SW-18235-0320- DD-007	SW-18235-0520- DD-002	SW-18235-1120- HM-001	SW-18235-1120- HM-002	SW-18235-0320- DD-009	SW-18235-0520- DD-003	SW-18235-1120- HM-008	
Sample Date:	20-Mar-20	20-Mar-20	22-May-20	24-Nov-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	
Parameters	Units	PWQO ⁽¹⁾	Duplicate	Duplicate	Duplicate	Duplicate	Duplicate	Duplicate	
		a							
Semi-volatile Organic Compounds									
1-Methylnaphthalene/2-Methylnaphthalene	µg/L	-	-	<0.028	<0.028	<0.028	-	0.047	<0.028
Acenaphthene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Acenaphthylene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Anthracene	µg/L	0.0008	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Benzo(a)anthracene	µg/L	0.0004	-	<0.020	<0.020	<0.020	-	0.024	<0.020
Benzo(a)pyrene	µg/L	-	-	<0.010	<0.010	<0.010	-	0.017	<0.010
Benzo(b)fluoranthene	µg/L	-	-	<0.020	<0.020	<0.020	-	0.031	<0.020
Benzo(g,h,i)perylene	µg/L	0.00002	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Benzo(k)fluoranthene	µg/L	0.0002	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Chrysene	µg/L	0.0001	-	<0.020	<0.020	<0.020	-	0.026	<0.020
Dibenz(a,h)anthracene	µg/L	0.002	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Fluoranthene	µg/L	0.0008	-	<0.020	<0.020	<0.020	-	0.047	<0.020
Fluorene	µg/L	0.2	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Naphthalene	µg/L	7	-	<0.050	<0.050	<0.050	-	0.143	0.073
Phenanthrene	µg/L	0.03	-	<0.020	<0.020	<0.020	-	0.022	<0.020
Pyrene	µg/L	-	-	<0.020	<0.020	<0.020	-	0.041	<0.020

Notes:

(1) Water Management Policies, Guidelines, Provincial Water Quality Objectives, July 1994 (reprinted February 1999), prepared by MECP.

- No Value/Not Analyzed.

J The result is an estimated value.

R Rejected.

0.054 Does not meet the applicable PWQO criteria.

< 0.10 Method detection limit does not meet PWQO criteria.

< 0.20 Result below method detection limit.

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW3	SW4	SW4	SW4	SW4	SW5	SW5	SW5	SW6	
Sample ID:	SW-18235-0320-DD-010	SW-18235-0320-DD-008	SW-18235-0520-DD-006	SW-18235-0520-DD-007	SW-18235-1120-HM-003	SW-18235-0320-DD-002	SW-18235-0520-DD-004	SW-18235-1120-HM-004	SW-18235-0320-DD-004	
Sample Date:	20-Mar-20	20-Mar-20	22-May-20	22-May-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	
Parameters	Duplicate									
	Units									
General Chemistry										
Alkalinity, total (as CaCO3)	mg/L	290	129	155	154	247	135	273	220	122
Ammonia-N	mg/L	0.083	0.057	0.099	0.097	0.012	0.015	0.020	0.024	0.067
Biochemical oxygen demand (BOD)	mg/L	<3.0	3.6	5.9	6.0	<3.0	<3.0	<3.0	5.9	<3.0
Chemical oxygen demand (COD)	mg/L	80	108	91	85	27	84	50	79	49
Chloride	mg/L	178	15.5	22.3	22.4	246	8.64	25.3	60.2	90.7
Conductivity	µS/cm	1480	323	414	412	1380	403	996	1280	1400
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	-	23.1	23.0	13.2	-	17.8	25.4	-
Hardness	mg/L	-	-	180	180	157	-	486	612	-
Nitrate (as N)	mg/L	17.4	0.842	<0.020	0.021	0.16	<0.020	<0.020	<0.10	3.27
Nitrite (as N)	mg/L	0.144	0.011	<0.010	<0.010	<0.050	<0.010	<0.010	<0.050	0.667
pH, lab	s.u.	7.97	7.93	8.37	8.29	7.94	7.59	8.12	7.32	7.74
Phenolics (total)	mg/L	0.0033	0.0016	0.0017	0.0027	<0.0010	0.0012	0.0014	0.0020	0.0030
Phosphorus	mg/L	0.130	0.730	0.360	0.324	0.0741	0.129	0.0521	0.173	0.0898
Sulfate	mg/L	225	20.9	27.9	27.9	85.4	67.7	269	435	519
Total dissolved solids (TDS)	mg/L	1000	350	294	301	764	305	622	905	1050
Total kjeldahl nitrogen (TKN)	mg/L	2.48	3.46	2.24	2.26	0.620	1.63	0.90	1.30	1.40
Total suspended solids (TSS)	mg/L	99.3	375	95.5	160	8.9	36.8	10.4	71	56.2
Metals (Total)										
Aluminum	mg/L	-	-	8.20	8.71	0.0060	-	0.281	0.0478	-
Arsenic	mg/L	-	-	0.00270	0.00274	0.00045	-	0.00146	0.00110	-
Barium	mg/L	-	-	0.0666	0.0689	0.0285	-	0.0510	0.0593	-
Beryllium	mg/L	-	-	-	-	<0.00010	-	-	<0.00010	-
Boron	mg/L	-	-	0.120	0.120	0.015	-	0.256	0.199	-
Cadmium	mg/L	-	-	0.000173	0.000179	0.0000145	-	0.0000089	0.0000126	-
Calcium	mg/L	-	-	46.6	46.8	50.1	-	131	183	-
Chromium	mg/L	-	-	0.0102	0.0112	<0.00050	-	0.00090	0.00059	-
Cobalt	mg/L	-	-	0.00542	0.00596	0.00011	-	0.00035	0.00141	-
Copper	mg/L	-	-	0.0097	0.0104	0.0048	-	0.0014	0.0034	-
Iron	mg/L	0.12	0.168	10.1	10.9	0.013	0.359	0.529	1.15	0.153
Lead	mg/L	-	-	0.00491	0.00534	0.000079	-	0.000729	0.000237	-
Magnesium	mg/L	-	-	15.4	15.2	7.81	-	38.9	38.1	-
Manganese	mg/L	-	-	-	-	0.0143	-	-	1.20	-
Mercury (dissolved)	mg/L	-	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Molybdenum	mg/L	-	-	0.00130	0.00135	0.00354	-	0.00104	0.000277	-
Nickel	mg/L	-	-	0.0108	0.0117	0.00101	-	0.00249	0.00263	-
Potassium	mg/L	-	-	6.07	6.23	1.82	-	8.68	10.5	-
Silver	mg/L	-	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Sodium	mg/L	-	-	20.2	20.1	237	-	31.5	34.3	-
Thallium	mg/L	-	-	0.000078	0.000085	<0.000010	-	<0.000010	<0.000010	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	0.0160	0.0169	0.00063	-	0.00086	<0.00050	-
Zinc	mg/L	-	-	0.0407	0.0441	0.0064	-	0.0032	0.0068	-
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,1,1-Trichloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,1,2,2-Tetrachloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,1,2-Trichloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,1-Dichloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,1-Dichloroethene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,2-Dibromoethane (Ethylene dibromide)	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,2-Dichlorobenzene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,2-Dichloroethane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,2-Dichloropropane	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,3-Dichlorobenzene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
1,4-Dichlorobenzene	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	-	-	<20	<20	<20	-	<20	<20	-
2-Hexanone	µg/L	-	-	<30	<30	<30	-	<30	<30	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	-	-	<20	<20	<20	-	<20	<20	-
Acetone	µg/L	-	-	<30	<30	<30	-	<30	<30	-
Benzene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Bromodichloromethane	µg/L	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0	-
Bromoform	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
Bromomethane (Methyl bromide)	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Carbon tetrachloride	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Chlorobenzene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Chloroethane	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
Chloroform (Trichloromethane)	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
Chloromethane (Methyl chloride)	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
cis-1,2-Dichloroethene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
cis-1,3-Dichloropropene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Dibromochloromethane	µg/L	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0	-
Ethylbenzene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
m&p-Xylenes	µg/L	-	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	-
Methyl tert butyl ether (MTBE)	µg/L	-	-	<2.0	<2.0	<2.0	-	<2.0	<2.0	-
Methylene chloride	µg/L	-	-	<5.0	<5.0	<5.0	-	<5.0	<5.0	-
o-Xylene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Styrene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Tetrachloroethene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Toluene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
trans-1,2-Dichloroethene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
trans-1,3-Dichloropropene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Trichloroethene	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	<5.0	<5.0	<5.0	-	<5.0	<5.0	-
Trihalomethanes	µg/L	-	-	<3.2	<3.2	<3.2	-	<3.2	<3.2	-
Vinyl chloride	µg/L	-	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	-
Xylenes (total)	µg/L	-	-	<1.1	<1.1	<1.1	-	<1.1	<1.1	-

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW3	SW4	SW4	SW4	SW4	SW5	SW5	SW5	SW6	
Sample ID:	SW-18235-0320- DD-010	SW-18235-0320- DD-008	SW-18235-0520- DD-006	SW-18235-0520- DD-007	SW-18235-1120- HM-003	SW-18235-0320- DD-002	SW-18235-0520- DD-004	SW-18235-1120- HM-004	SW-18235-0320- DD-004	
Sample Date:	20-Mar-20	20-Mar-20	22-May-20	22-May-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	
Parameters	Duplicate									
	Units									
Semi-volatile Organic Compounds										
1-Methylnaphthalene/2-Methylnaphthalene	µg/L	-	-	<0.028	<0.028	<0.028	-	<0.028	<0.028	-
Acenaphthene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Acenaphthylene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Anthracene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Benzo(a)anthracene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Benzo(a)pyrene	µg/L	-	-	<0.010	<0.010	<0.010	-	<0.010	<0.010	-
Benzo(b)fluoranthene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Benzo(g,h,i)perylene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Benzo(k)fluoranthene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Chrysene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Dibenz(a,h)anthracene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Fluoranthene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Fluorene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Indeno(1,2,3-cd)pyrene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Naphthalene	µg/L	-	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	-
Phenanthrene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-
Pyrene	µg/L	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-

Notes:

(1)	Water Mans
	Quality Obje
	prepared by
	No Value/Nt
J	The result is
R	Rejected.
0.054	Does not mt
< 0.10	Method dete
< 0.20	Result below

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW6	SW7	SW7	SW7	SW8	SW9	SW9	Fieldblank	Fieldblank	
Sample ID:	SW-18235-1120- HM-005	SW-18235-0320- DD-001	SW-18235-0520- DD-005	SW-18235-1120- HM-007	SW-18235-0320- DD-005	SW-18235-0520- DD-001	SW-18235-1120- HM-009	SW-18235-0320- DD-003	SW-18235-1120- HM-006	
Sample Date:	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	24-Nov-20	
Parameters	Units									
General Chemistry										
Alkalinity, total (as CaCO3)	mg/L	220	68	115	80	54	105	31	<10	<10
Ammonia-N	mg/L	0.017	0.058	0.035	0.017	0.017	0.030	0.015	<0.010	<0.010
Biochemical oxygen demand (BOD)	mg/L	3.6	4.8	6.0	7.5	<3.0	5.2	<3.0	<3.0	<3.0
Chemical oxygen demand (COD)	mg/L	61	153	72	70	121	101	34	<10	<10
Chloride	mg/L	57.3	9.17	11.6	41.9	5.46	<0.50	7.2	1.01	<0.50
Conductivity	µS/cm	1300	244	449	909	132	256	1340	6.5	<3.0
Dissolved organic carbon (DOC) (dissolved)	mg/L	21.6	-	22.0	21.1	-	20.3	12.1	-	<0.50
Hardness	mg/L	623	-	199	420	-	164	755	-	<1.3
Nitrate (as N)	mg/L	<0.10	0.065	0.021	0.023	0.031	0.022	0.075	<0.020	<0.020
Nitrite (as N)	mg/L	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010
pH, lab	s.u.	7.66	6.76	7.87	6.87	7.02	7.77	7.66	6.61	5.90
Phenolics (total)	mg/L	0.0027	0.0074	0.0024	0.0013	0.0032	0.0010	0.0021	0.0033	<0.0010
Phosphorus	mg/L	0.0998	0.452	0.160	0.436	0.268	0.425	0.138	<0.0030	<0.0030
Sulfate	mg/L	461	48.1	97.5	356	14.5	24.3	630	<0.30	<0.30
Total dissolved solids (TDS)	mg/L	905	248	323	620	217	231	1120	13	<10
Total kjeldahl nitrogen (TKN)	mg/L	1.32	4.40	1.50	2.20	2.56	1.91	0.910	<0.15	<0.050
Total suspended solids (TSS)	mg/L	82	186	6.1	20.9	390	274	19.1	<2.0	<3.0
Metals (Total)										
Aluminum	mg/L	0.0128	-	0.145	0.0286	-	7.97	<0.0050	-	<0.0050
Arsenic	mg/L	0.00099	-	0.00118	0.00052	-	0.00279	0.00069	-	<0.00010
Barium	mg/L	0.0542	-	0.0205	0.0422	-	0.0689	0.0539	-	0.00062
Beryllium	mg/L	<0.00010	-	-	<0.00010	-	-	<0.00010	-	<0.00010
Boron	mg/L	0.314	-	0.112	0.276	-	0.024	0.031	-	0.011
Cadmium	mg/L	0.0000146	-	0.0000101	0.000133	-	0.0000921	0.0000098	-	<0.0000050
Calcium	mg/L	180	-	55.4	120	-	44.8	224	-	<0.50
Chromium	mg/L	0.00053	-	0.00139	<0.00050	-	0.0111	<0.00050	-	<0.00050
Cobalt	mg/L	0.00053	-	0.00031	0.00043	-	0.00498	0.00024	-	<0.00010
Copper	mg/L	0.0055	-	<0.0010	0.0014	-	0.0112	0.0032	-	<0.0010
Iron	mg/L	0.224	0.660	0.364	0.129	0.789	12.6	0.068	<0.010	<0.010
Lead	mg/L	0.000303	-	0.000258	0.000111	-	0.00555	<0.000050	-	<0.000050
Magnesium	mg/L	42.0	-	14.7	29.2	-	12.7	47.3	-	<0.050
Manganese	mg/L	0.278	-	-	0.311	-	-	0.204	-	<0.00050
Mercury (dissolved)	mg/L	<0.0000050	-	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-	<0.0000050
Molybdenum	mg/L	0.00270	-	0.00136	0.00114	-	0.000230	0.00176	-	<0.000050
Nickel	mg/L	0.00254	-	0.00174	0.00225	-	0.0124	0.00094	-	<0.00050
Potassium	mg/L	11.4	-	3.86	17.3	-	3.22	9.54	-	<0.050
Silver	mg/L	<0.000050	-	<0.000050	<0.000050	-	<0.000050	<0.000050	-	<0.000050
Sodium	mg/L	43.4	-	14.7	28.3	-	2.71	17.0	-	0.258
Thallium	mg/L	<0.000010	-	<0.000010	<0.000010	-	0.000092	<0.000010	-	<0.000010
Titanium	mg/L	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.00052	-	0.00080	<0.00050	-	0.0143	<0.00050	-	<0.00050
Zinc	mg/L	0.0053	-	<0.0030	0.0157	-	0.0480	<0.0030	-	<0.0030
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,1,1-Trichloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,1,2,2-Tetrachloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,1,2-Trichloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,1-Dichloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,1-Dichloroethene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,2-Dibromoethane (Ethylene dibromide)	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,2-Dichlorobenzene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,2-Dichloroethane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,2-Dichloropropane	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,3-Dichlorobenzene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
1,4-Dichlorobenzene	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	<20	-	<20	<20	-	<20	<20	-	<20
2-Hexanone	µg/L	<30	-	<30	<30	-	<30	<30	-	<30
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	<20	-	<20	<20	-	<20	<20	-	<20
Acetone	µg/L	<30	-	<30	<30	-	<30	<30	-	<30
Benzene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Bromodichloromethane	µg/L	<2.0	-	<2.0	<2.0	-	<2.0	<2.0	-	<2.0
Bromoform	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
Bromomethane (Methyl bromide)	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Carbon tetrachloride	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Chlorobenzene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Chloroethane	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
Chloroform (Trichloromethane)	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
Chloromethane (Methyl chloride)	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
cis-1,2-Dichloroethene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
cis-1,3-Dichloropropene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Dibromochloromethane	µg/L	<2.0	-	<2.0	<2.0	-	<2.0	<2.0	-	<2.0
Ethylbenzene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
m&p-Xylenes	µg/L	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-	<1.0
Methyl tert butyl ether (MTBE)	µg/L	<2.0	-	<2.0	<2.0	-	<2.0	<2.0	-	<2.0
Methylene chloride	µg/L	<5.0	-	<5.0	<5.0	-	<5.0	<5.0	-	<5.0
o-Xylene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Styrene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Tetrachloroethene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Toluene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
trans-1,2-Dichloroethene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
trans-1,3-Dichloropropene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Trichloroethene	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Trichlorofluoromethane (CFC-11)	µg/L	<5.0	-	<5.0	<5.0	-	<5.0	<5.0	-	<5.0
Trihalomethanes	µg/L	<3.2	-	<3.2	<3.2	-	<3.2	<3.2	-	<3.2
Vinyl chloride	µg/L	<0.50	-	<0.50	<0.50	-	<0.50	<0.50	-	<0.50
Xylenes (total)	µg/L	<1.1	-	<1.1	<1.1	-	<1.1	<1.1	-	<1.1

**Summary of Surface Water Analytical Results
2020 Annual Wetland Monitoring Report
Brooks Road Landfill Site
Haldimand County, Ontario**

Sample Location:	SW6	SW7	SW7	SW7	SW8	SW9	SW9	Fieldblank	Fieldblank	
Sample ID:	SW-18235-1120- HM-005	SW-18235-0320- DD-001	SW-18235-0520- DD-005	SW-18235-1120- HM-007	SW-18235-0320- DD-005	SW-18235-0520- DD-001	SW-18235-1120- HM-009	SW-18235-0320- DD-003	SW-18235-1120- HM-006	
Sample Date:	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	22-May-20	24-Nov-20	20-Mar-20	24-Nov-20	
Parameters	Units									
Semi-volatile Organic Compounds										
1-Methylnaphthalene/2-Methylnaphthalene	µg/L	<0.028	-	<0.028	<0.028	-	<0.028	<0.028	-	<0.028
Acenaphthene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Acenaphthylene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Anthracene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Benzo(a)anthracene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Benzo(a)pyrene	µg/L	<0.010	-	<0.010	<0.010	-	<0.010	<0.010	-	<0.010
Benzo(b)fluoranthene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Benzo(g,h,i)perylene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Benzo(k)fluoranthene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Chrysene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Dibenz(a,h)anthracene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Fluoranthene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Fluorene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Indeno(1,2,3-cd)pyrene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Naphthalene	µg/L	<0.050	-	<0.050	<0.050	-	<0.050	<0.050	-	<0.050
Phenanthrene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020
Pyrene	µg/L	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-	<0.020

Notes:

(1)	Water Mana Quality Obje prepared by No Value/Nt
-	The result is
J	Rejected.
R	
0.054	Does not mt
< 0.10	Method dete
< 0.20	Result below