Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response
				The stormwater pond will also be vegetated and it is common to use a typical seed mix. Above the wetted surface, native species will be considered. A commitment has been added in Section 18.0, Table 18-2..
14.	Draft EA	To limit the spread of invasive species, the Clean Equipment Protocol for Industry should be followed. It is available here: Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf (ontarioinvasiveplants.ca)	--	Acknowledged. Reference to this protocol has been added to Sections 13.4.1.1.2, 13.4.1.2.2 and 13.4.2.1.1
15.	Section 13.4.3.3.2	Consider allowing the unforested portion of the Township of North Dundas property to be used to offset the loss of forest and wetlands resulting from the landfill expansion. Under "Compensation for Potential Impacts to SAR and Wildlife" states that no compensation for the loss of interior forest habitat and wetlands is warranted as the remaining natural areas will continue to function as wildlife habitat. While there is a large area of contiguous forest remaining, please note that a significant amount of this forest is on private	To minimize the loss of significant interior forest wildlife habitat and significant woodlands, it is recommended to re-establish forest cover on the southwest portion of the landfill property that is currently in agricultural production. This area is roughly 4.3 hectares in size and would reduce the overall loss of woodlands from 6.3 ha to 2 ha. If it is not possible to re-forest this area, other properties owned by the Township should be identified for re-planting. Forest cover in the Township was assessed in 2016 and found to be very low at 13.3%. This value was determined using 2014 aerial imagery, and forest cover has likely	As noted in Section 15.2.4 of the EASR cumulative impact assessment, the Township reviewed their records and applications and there are no known new future planned land uses in the Site-vicinity. In addition, as noted on Figure 9-11 of the EASR, the lands to the east of the landfill containing the forest are also noted as predominantly unevaluated wetland. Likewise, a review of the Ministry of Agriculture, Food and Rural Affairs Agricultural Maps show the

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response
		property to the east of the landfill site. The Township does not have a tree cutting by-law or site alteration by-law in place that would prevent the owner from clearing the woodlands on their property. There is a high risk of this occurring as agriculture is the dominant land use in the Township and the soils are considered suitable for agricultural production. Should these 30 hectares of woodlands be removed, the woodlands remaining on the landfill property will become much more important to retain, especially for interior forest significant wildlife habitat.	declined further since 2014. Effort should be made by the Township to increase forest cover, especially on public property.	lands to the east with the forest predominantly within a Muck soil area. Muck soil, as defined in the Soil Survey of Dundas County (Ontario Agricultural College, 1952), is soil having a 0 to 0.45 m thickness of organic layer consisting of semi-decomposed vegetative material, usually neutral to alkaline on the surface. Presently, this soil is generally not suitable for agriculture and has traditionally not been included in an Agricultural designation, as it requires a great deal of work to prepare for crops and the rate of return is low. Given the vast and long term agricultural land use in the area and the nature of the lands to east containing the forest, it is considered reasonable to conclude that if these lands were going to be used for agricultural purposes, they would have already been used in this capacity; however, their wetland and muck status makes them

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response
				unsuitable. As such, the immediate need for forest compensation seems unwarranted and should only be considered in future if these areas are to be developed. No changes to the EASR proposed.

SOUTH NATION CONSERVATION
DE LA NATION SUD

38 rue Victoria Street, Finch, ON K0C 1K0 Tel: 613-984-2948 Fax: 613-984-2872 Toll Free: 1-877-984-2948 www.nation.on.ca

Via E-mail (dfroats@northdundas.com) July 13, 2022

Mr. Doug Froats
Director of Waste Management
Township of North Dundas
636 St. Lawrence Street, P.O. Box 489
Winchester, ON K0C 2K0

Subject: Environmental Assessment Waste Management Plan Review
Boyne Road Landfill Expansion
Township of North Dundas
Lot 8, Concession 6 (Winchester)
Roll Number: 051101600616000

Dear Mr. Froats,

South Nation Conservation (SNC) was asked by the Township of North Dundas to complete a technical review of the Environmental Assessment circulated by the Ministry of the Environment, Conservation and Parks (MECP) for the above-noted landfill expansion. Our review examines the natural heritage survey methods, findings, conclusions and recommendations of the Environmental Assessment as described in the following documents.

i. Volume 1 Environmental Assessment of the Township of North Dundas Waste Management. Prepared by Golder and the Township of North Dundas. Dated May 2022.
ii. Volume 1 Environmental Assessment of the Township of North Dundas Waste Management. Prepared by Golder and the Township of North Dundas. Dated May 2022.

We offer the following comments on the documents for your consideration.

1. Section 9.4.1.3.6 (page 216) - Fish community surveys were only conducted in the summer and fall. Additionally, in 2020 the watershed was in drought conditions which would impact the ability to complete fish surveys. A spring survey should have been completed when water levels were higher to determine use of the watercourses by fish.

2. Section 9.4.2.1 (page 218) - A discussion on Reach 3 is missing.

3. Section 9.4.2 (page 218) - In 2020 the watershed was in drought conditions for the entire summer. A discussion on the implications of this in relation to the aquatic ecosystems findings should be added.

4. Section 9.4.2.2 (page 222) - Quart Municipal Drain would be considered indirect fish habitat as it provides some flow, sediments, nutrients, allochthonous inputs to downstream fish habitat.

5. Section 9.4.4.5.1 (page 227) - The second paragraph states that the boundaries of the unevaluated and evaluated non-significant wetlands were refined in the field. Any refinements to boundaries should be reviewed and accepted by the MNRF.

6. Section 10.1 (page 284) - The piping of the Volks Municipal Drain along the North side of the landfill will require a permit and submission to DFO for review.

7. As part of the work on the Volks Municipal Drain, invasive Phragmites plants should be removed from the drain along Boyne Road. This plant can quickly fill the drain and impede flows, nutrients, fish, and other organisms from moving downstream.

8. Figure 13-9 (page 411) and Figure 11-7 (page 321) don't match Figure 9-11 (page 228) in terms of the significant wildlife habitat - interior forest.

9. Section 13.4.1.2.1 (page 426) - It is very important to note that no alterations to the site can occur prior to receiving approval from the MECP in regard to the Species at Risk identified on or adjacent to the site.

10. Table 13-27 (page 430) -The timing window dates are incorrect. In-water work is allowed from July 1st to March 14th.

11. The new perimeter ditch should follow natural channel design principles and include an appropriate vegetated buffer.

12. The removal of the existing perimeter ditch will require a permit and submission to DFO for review. Especially since it will not be accessible to fish with the installation of the SWM pond.

13. Native seed mixes should be used for all re-vegetation activities.

14. To limit the spread of invasive species, the Clean Equipment Protocol for Industry should be followed. It is available here: Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf (ontarioinvasiveplants.ca)

15. Consider allowing the unforested portion of the Township of North Dundas property to be used to offset the loss of forest and wetlands resulting from the landfill expansion.

Section 13.4.3.3.2 (page 441) under "Compensation for Potential Impacts to SAR and Wildlife" states that no compensation for the loss of interior forest habitat and wetlands is warranted as the remaining natural areas will continue to function as wildlife habitat. While there is a large area of contiguous forest remaining, please note that a significant amount of this forest is on private property to the east of the landfill site. The Township does not have a tree cutting by-law or site alteration by-law in place that would prevent the owner from clearing the woodlands on their property. There is a high risk of this occurring as agriculture is the dominant land use in the Township and the soils are considered suitable for agricultural production. Should these 30 hectares of woodlands be removed, the woodlands remaining on the landfill property will become much more important to retain, especially for interior forest significant wildlife habitat.

To minimize the loss of significant interior forest wildlife habitat and significant woodlands, it is recommended to re-establish forest cover on the southwest portion of the landfill property that is currently in agricultural production. This area is roughly 4.3 hectares in size and would reduce the overall loss of woodlands from 6.3 ha to 2 ha. If it is not possible to re-forest this area, other properties owned by the Township should be identified for re-planting. Forest cover in the Township was assessed in 2016 and found to be very low at 13.3%. This value was determined using 2014 aerial imagery, and forest cover has likely declined further since 2014. Effort should be made by the Township to increase forest cover, especially on public property.

I trust this review is to your satisfaction. If there are any questions, please feel free to contact our office.

Kind regards,

James Holland, MSc RPP
Watershed Planner
South Nation Conservation

c.c. Angela Rutley, CAO Township of North Dundas
Trish Edmond, Golder Associates

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Via E-mail (dfroats@northdundas.com) July 20, 2022 (Revised)

Mr. Doug Froats
Director of Waste Management
Township of North Dundas
636 St. Lawrence Street, P.O. Box 489
Winchester, ON K0C 2K0

Subject: Environmental Assessment Waste Management Plan
Natural Heritage Review
Boyne Road Landfill Expansion
Township of North Dundas
Lot 8, Concession 6 (Winchester)
Roll Number: 051101600616000

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I trust this review is to your satisfaction. If there are any questions, please feel free to contact our office.

Kind regards,

James Holland, MSc RPP
Watershed Planner
South Nation Conservation

c.c. Angela Rutley, CAO Township of North Dundas
Trish Edmond, Golder Associates

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
Environmental Assessment Branch, Jordan Hughes, Project Officer							
1	**Executive Summary**	In accordance with Section 4.3.1 of the Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario 2014 (Code of Practice) and Regulation 334, the Environmental Assessment Study Report (EASR) for the North Dundas Waste Management Plan should contain a brief summary of the environmental assessment generally organized in accordance with the relevant matters set out in subsection 6.1 (2) of the Act (e.g. such as).	As previously indicated to MECP, please ensure that an executive summary is completed for the draft EASR.	An Executive Summary has been prepared and included in the draft EASR, organized by the sections of the EASR to meet the requirements of the Act.	MECP comment has been adequately addressed.	--	--
2	**Glossary of Terms**	Term - EA Study The description of the term uses "as described in this ToR prior to the refinement of the definition of the proposed undertaking". Needs to be updated to the current EASR, not the Terms of Reference (ToR). Term - (the) Site (the) Township of North Dundas is used to describe the term. Needs clarity in whether it means the landfill site or the Township as a whole. Term - (the) Undertaking The description of the term uses "as described in this Tor". Needs to be updated to the current EASR, not the ToR.	Please make corrections accordingly.	Requested corrections to EA Study and Undertaking made in the Glossary of Terms. It is confirmed that the 'Site" refers to the Township of North Dundas for the purpose of the 'Alternatives To' assessment. References to the Boyne Road landfill uses the word 'site' (not capitalized).	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
3	**Description of EA Study** **1.1**	This section includes "the proposed Environmental Assessment (EA) Study is the EA of the Township's waste management plan for a 25-year planning period. The description and rationale will evolve during the preparation of the EA. A description of the undertaking will be defined after a preferred undertaking has been identified during the EA. Therefore, the final description of the proposed undertaking and the rationale for it will be included in the EA once alternatives have been considered and evaluated." This is the EASR document, and the tense of this description needs to be changed and updated.	Please make corrections accordingly.	Corrections made in Section 1.1 as requested.	MECP comment has been adequately addressed.	--	--
4	**Current Waste Management System** **1.3**	The remaining capacity of the Boyne Road Landfill in cubic metres can be provided to give an indication of landfill space remaining relative to the approved capacity. This section does not include any mention or description of the haul route.	Provide the remaining landfill capacity in cubic metres and discuss the operation of the haul route.	Requested information added to Section 1.3.	MECP comment has been adequately addressed.	--	--
5	**Current Waste Management System** **1.3**	Consider reorganizing this section to include "Site History and Background" that will include site history and details followed by "Current Site Waste Management System" that includes the current operations and capacity.	Reorganize information so that the site history and background is separated from current site information.	Section 1.3 has been reorganized into two subsections, 1.3.1 and 1.3.2, to improve clarity. This is an introductory section of the EASR, intended to generally describe the current waste management system as	MECP comment has been adequately addressed.	--	--

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				background for the reader. A greater level of detail is not considered to be appropriate, since the preferred 'Alternative To' has not yet been identified.			
6	**Current Waste Management System 1.3** **Noise 11.2.1.2**	"The parcels are shown on **Error! Reference source not found.**" Reference to source relating to the Townships acquisition of groundwater easements unavailable. "The indicator for Noise is: **Error! Unknown document property name. Error! Unknown document property name."** Reference to source relating to noise indicators not available.	Please make corrections accordingly.	Requested correction made in Section 1.3; we did not see what is referred to in Section 11.2.1.2.	MECP comment has been adequately addressed.	--	--
7	**2.1 Rationale and Purpose of Proposed Undertaking**	It is stated that "the purpose statement will be influenced by diversion studies proposed by the Township and made as a commitment in the ToR. It was proposed that the diversion studies be conducted during the EA, early in the process to provide input into post-diversion residual waste management requirements. Diversion is also an 'Alternative To' in this EA. The Waste Diversion Study is provided in Volume 3 Appendix J to the main EASR". The Diversion study was conducted as part of the current EASR, and as such the influence of the results from the study should be indicated. The	Please revise to reflect the studies undertaken during the EASR.	Reference added in Section 2.1 to a summary of the diversion study results in Sections 6.3.5 and 7.0. Additional information from the findings and conclusions of the diversion study have also been added in Section 7.0.	MECP comment has been adequately addressed.	--	--

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		ministry will have more comments in this regard after the Resource Recovery Branch provides their technical review.					
8	**Organization of the EA Study Report 2.3.2**	In accordance with section 2(1) of Regulation 334, the EASR should contain a list of studies and reports done in connection with the undertaking or matters related to the undertaking. The EASR should also include a list of additional studies and reports related to the undertaking but are not under the control of the proponent. The draft EA does not include a list of additional studies and reports related to the undertaking. The full names of reports in support of the EASR need to be included in the list of "Volume 2 Technical Appendices" for clarity.	Revise the EASR report to include a list of the studies and reports completed, as well as a list of additional studies and reports related to the undertaking but are not under the control of the Township. Add the full titles done in connection with the EASR to the list of Volume 2 Technical Appendices list. Additionally, a table can be provided that lists and describes the technical studies completed.	The organization of this EASR is different when compared to others more recently completed for Individual EAs for waste management projects in that all of the studies/work completed for the EA are contained in the EASR with the exception of the Stage 1 Archaeological Assessment contained in Volume 2, Appendix G-2; and the supporting memo and report on Alternative 3 – New Landfill Site Selection Assessment, Application of Exclusionary Criteria and Mapping to Identify Potential Sites and the Waste Diversion Study, respectively, in Volume 3 . The other Appendices in Volume 2 for various environmental components contain supporting information, calculations, etc. for the studies within the EASR itself. For clarity, some additional annotation of Section 2.3.2 has been provided and, where appropriate, reports noted.	Outstanding. Please include the list of Appendices and titles in the Table of Contents, as well as indicating what contents are included in each of the volumes that comprise the EASR.	Understood. A listing of the other volumes and their contents has been added to the Table of Contents of Volume 1, the EASR.	MECP comment has been adequately addressed.

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				A complete list of reference documents (additional studies and reports) is provided in Section 19.0 of the EASR (as indicated in the listing of the Sections comprising Volume 1 in Section 2.3.2), and those documents are properly referenced wherever used/relied upon throughout the EASR.			
9	**Indigenous Community Involvement** **4.7**	With regards to Indigenous consultation, the ministry notes that to date the Township has not received substantive comments from any interested communities. It will be important for the Township to demonstrate in the final EASR that they have obtained, or at least made meaningful attempts to obtain, input on the draft EASR from the communities that have expressed an interest in the project, at minimum. This should include follow-up with communities, including the final Open House.	Please ensure that meaningful attempts with indigenous communities is made and documented in the final EASR including the final Open House. Furthermore, please provide a copy of the record of consultation for ministry review when it is available.	A complete record of consultation, and attempted consultation with Indigenous Communities is provided in the Volume 4 Consultation Record (which is provided as part of the draft EA package) and summarized in Sections 4.4.2. 4.7 and 4.8.6 of Volume 1.	MECP concern ongoing. Proponent should continue to engage/notify the Indigenous communities at all remaining stages, and document in the final EASR. Any updates to the Record of Consultation should be shared with the ministry.	Acknowledged. The project team continues to reach out to Indigenous communities in multiple ways by phone and email and is documenting these efforts. Since the draft EA submittal, a meeting has been held with the Huron Wendat to review the project, including a high level review of the EA. Documentation of the summary of the meeting, as well as Huron Wendat comments on the summary have been added to Section 4.7.6 of Volume 1 and the Consultation Record.	MECP comment has been adequately addressed.

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						This summary will be shared with the MECP separately via email.	
10	**Noise 5.2.2** **6.3.2 Alternative 2 – Landfill Site Expansion** **Identification of the Preferred 'Alternative To' 6.5** **Archaeological Resources 9.7.1** **Landfill Gas (LFG) Management 12.4** **Emissions Estimate 13.1.1.1**	Sufficient Level of Detail: The EA is the main document and as a result should be sufficiently detailed, so that it can stand on its own and provide a complete picture of the planning process and its conclusions. It should, in detail, provide sufficient information and understanding of the potential undertaking, the existing environment, and evaluation of the alternatives, environmental effects and impact management, as well as consultation undertaken throughout the EA process. Appendices serve to provide additional technical information for the interested reviewer or reader. The EA, including supporting appendices, must be logically organized to ensure that information is accessible. Throughout the draft EA, there are references to various reports in the appendices (more details below), where the reader is directed to as opposed to being provided a sufficient level of detail in the draft EA. Appendices serve to provide additional technical information and data for the interested reviewer or	Please ensure that the draft EA is revised to provide sufficient, detailed information that will enable readers to understand the proposed undertaking, the planning process followed by the Township and the conclusions reached.	This EASR has been prepared by providing the entire environmental component report content directly within the appropriate sections of the main EASR, such that there are no separate component reports within the Volume 2 Technical Appendices B through H. In this way, the main EASR contains all information and detail related to the studies completed for each component. The exception is Appendix G-2 for Cultural Heritage Resources, where a complete Stage 1 Archaeology Assessment Report was prepared for the proposed landfill expansion since the provincial requirements are they have to be submitted in that form to the MHSTCI for review and approval. The only information contained in the Technical Appendices is technical details that were not considered necessary to be within the main EASR in regard to the proposed landfill expansion,	MECP comment has been adequately addressed.	--	--

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		reader and should be referenced in the main body of the EA where they contain critical information to support the understanding of the undertaking and its potential effects on the environment. For example:		i.e., source input parameters, modelling output sheets, traffic analysis summary sheets.			
		Noise 5.2.2: This section needs to be expanded with more detail. Provide a summary of existing source of noise at the landfill site and along the haul route. Summarize the key findings from the noise report/study undertaken and conclusions with further detailed technical information referenced to the Appendix report.		Section 5.0 provides a high level description of the existing conditions for the 'Alternatives To' Study Area, which is the whole of the Township, for each of the environmental components used to compare the 'Alternatives To'. As such, it is not specific to the existing landfill site. It is considered that Section 5.2.2 provides an appropriate high level description of noise in the Township. Section 9.0 of the EASR provides a detailed description of the existing conditions for the Study Areas associated with the Boyne Road Landfill site for each of the components, including noise.	MECP comment has been adequately addressed. Noise review completed and satisfied.	--	--
		6.3.2 Alternative 2 – Landfill Site Expansion: This section refers to the alternative already being assessed in detail as part of the 2015 Waste Management Alternatives Evaluation. Provide a		Section 2.1 of the EASR refers to the 2015 evaluation, lists the four alternatives assessed, and the conclusion that expansion of the exiting landfill was preferred. Also, it states that "this previous assessment of	MECP comment has been adequately addressed.	--	--

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		summary of what was assessed and its conclusions from the 2015 Waste Management Alternatives Evaluation.		waste management alternatives was summarized in Section 4.0 of the approved ToR (Volume 2, Appendix A)". Section 6.0 is the updated evaluation of 'Alternatives To'; in our opinion, the description of Alternative 2 in Section 6.3.2 is not the appropriate place within Volume to 1 provide additional information on what was assessed and the conclusions of the 2015 study, since it was decided by MECP at the ToR stage that the results of the previous evaluation was not suitable for use in the EA (which is also described in Section 2.1). Instead, additional information on the 2015 evaluation has been added in Section 2.1, with a reference back to Section 2.1 added in Section 6.3.2.			
		6.5 Identification of the Preferred 'Alternative To': The landfill site screening assessment "Volume 3 Appendix I" is referenced as the basis for deeming Alternative 3 (Existing Landfill Site Closure and Establish a New Landfill Site) unreasonable. Include a summary of the screening		A summary of the Screening Assessment to establish a new landfill site in the Township is provided in Section 6.3.3; as per the comment, additional information on this assessment has been added to Section 6.3.3. A summary of the waste diversion study is provided in	MECP comment has been adequately addressed.	--	--

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		assessment, and the results of the screening assessment that determined conclusions. The Waste Diversion Study "Volume 3 Appendix J" supports Alternative 5 (Enhanced Waste Diversion). Provide more details on the content provided in Volume 3 Appendix J as well as the final results for the reader.		Section 6.3.5. Therefore, it is not considered necessary or appropriate to repeat this information in Section 6.5, the purpose of which is to state what was identified by the comparative assessment provided in Section 6.4 as the preferred 'Alternative To'. A reference back to Sections 6.3.3 and 6.3.5 has been added in Section 6.5.			
		Archaeological Resources 9.7.1: The Stage 1 Archeological Assessment is referenced to "Volume 2 Appendix G-2". Expand on what was undertaken for the Stage 1 AA as well as the results. Was further work recommended in the Stage 1 AA?		Section 9.1.7 is intended to only describe the existing archeological conditions in the area of the Boyne Road Landfill site. The impact assessment is provided in Section 13.7.1, which states the results including that no further archaeological assessment is recommended. Additional information was added to Section 9.7.1 to describe the purpose of and what was undertaken for the Stage 1 assessment.	MECP comment has been adequately addressed.	--	--
		12.4 Landfill Gas (LFG) Management: Expand on the results of the air quality impact assessment and provide the Appendix/Volume reference in the EASR. What are the results of the detailed air quality		The purpose of Section 12.4 within the Description of the Preferred Undertaking is only to describe what is proposed in terms of landfill gas (LFG) management/control in advance of completing the	Outstanding: for clarity, include a statement that the Air quality assessment in Section 13.1.1 indicated that a collection system was not required.	Understood. Section 12.4 has been updated with a statement that the air quality assessment in Section 13.1.1 indicated that a LFG	MECP comment has been adequately addressed.

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
		impact assessment, did it recommend a landfill gas collection system?		impact assessment. The reference to the air quality assessment in Section 13.1.1 is only to indicate that depending on the results of that assessment it may be necessary to implement LFG controls, i.e., an additional mitigation measure, different than what is described in Section 12.4. Section 13.1.1 is considered to be the appropriate location for the air quality assessment, not Section 12.4. There are no additional impact results in a separate Appendix or Volume.		management system is not required.	
		13.1.1.1 Emissions Estimate: "Volume 2 Appendix B-2" is referenced for details of the specific emissions calculation methods and resulting emissions by source. Provide a summary of the process and results. "Volume 2 Appendix B-3" is referenced for dispersion modelling inputs and source characterization. Please expand and provide some details of what is included in the Appendix.		The process for calculating air emissions, which is a very technical process, is considered to be appropriately summarized in Section 13.1.1.1. The results are provided in Sections 13.1.1.2 and 13.1.1.3. The results of the air emissions modelling are provided in Section 13.1.1.4. These section numbers where the results are provided have been added to the bullets in Section 13.1.1 where reference is made to Appendices B-2 and B-3.	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
11	**6.5 Identification of the Preferred 'Alternative To'**	Section 4.2.4 of the Code of Practice states that the proponent will have to determine and clearly articulate the rationale for choosing the preferred alternative, taking into account the relative advantages and disadvantages. This section needs to be expanded with more detail how the preferred alternative was selected. The draft EASR states "based on the results presented in Table 6-12, and also with consideration of the advantages and disadvantages presented in Table 6-11 and the key factors that are most important to the Township, the preferred 'Alternative To' from the assessment is Alternative 2 – Landfill Site Expansion". The assessment of the 'Alternatives To' should include sufficient detail to determine the benefits and disadvantages of each of alternative, based on effects. Explain the results from Table 6-12 that lead to the preferred alternative as well as specific points from the advantages and disadvantages Table 6-11. This will more clearly present the decision-making process of the preferred alternative from the advantages and disadvantages evaluation. Furthermore, provide a summary or explanation of how the preferred	Please ensure that the draft EA is revised to provide sufficient, detailed information that will enable readers to understand how the evaluative components lead to selecting the preferred alternative.	Section 6.5 has been revised to provide additional rationale and explanation of the reasons for identification of Alternative 2 as the overall preferred 'Alternative To'.	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
		alternative meets the 'factors that are most important to the Township'.					
12	**8.1 Study Areas**	The draft EASR states that "Data for the assessment of the 'Alternative Methods' will be collected and analyzed for generic study areas that will be confirmed and refined during the EA". This needs to be revised to reflect that it has been collected and refined as it is the EA document.	Please make corrections accordingly.	Requested corrections made.	MECP comment has been adequately addressed.	--	--
13	**10.1 Design of Expansion Alternatives**	The draft EASR states "the capacity being pursued for the landfill expansion of 417,700 m3 to accommodate landfilling operations until the end of the planning period in 2048" and then "subsections below describe each of the landfill expansion alternatives, and each provides the required 450,000 m3 of airspace for waste and daily cover". There needs to be consistency in the volumetric capacity expansion (either 417,700 m3 or 450,000 m3) throughout the EASR. Furthermore, there needs to be consistency with the volumetric capacity expansion metric used with regards to whether it includes the cover or not. The proposed volumetric capacity increase with and without cover should be disclosed.	Please ensure that the volumetric capacity expansion is consistent throughout the EASR.	The EASR describes that the 417,700 m^3 beyond 2023 is for waste and daily cover. Because the ToR described the estimated additional airspace with reference to 'beyond 2020', it is necessary to initially refer to the required airspace confirmed in the EA in this regard. However, when referring to the expansion alternatives, all airspace numbers have been changed to only refer to 417,700 m^3 beyond 2023. A value for the additional airspace including the final cover has been added to Section 12.1 for the proposed expansion.	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
14	**Alternative 2 – Combined Horizontal and Vertical Expansion with Larger South Buffer 10.2.2** **Alternative 3 – Primarily Horizontal Expansion 10.2.3**	The qualitative descriptions for Alternative Methods 2 and 3 need to be expanded with more details, similarly to what was provided in Alternative 1 for accuracy and consistency. This will avoid assumptions being made by the reader. Will the current disposal area be raised like in Alternative 1 for Alternatives 2 and 3? Will the slope angles meet the requirements of O.Reg. 232/98 for Alternatives 2 and 3? What is the height above typical ground level? • "The height of all 'Alternative Methods' is about 15 m above typical ground level on the southern part of the property" – This is defined in Alternative 1. This should either be disclosed prior to the Alternative summaries under 10.2 or disclosed for each of the Alternatives for consistency. Will the design include the construction of imported permeable fill material for Alternatives 2 and 3? • Alternative 1 indicates that "south of the existing disposal area is at ground surface/high	Please ensure that the draft EASR is revised to include more details for Alternative Methods 2 and 3.	Section 10.0 was prepared by first describing the factors that would be considered in the design of any 'Alternative Method' of landfill expansion in Sections 10.0 and 10.1, i.e., meet the geometrical requirements of O.Reg.232/98, natural attenuation design, fill pad, stormwater management system. Sections 10.2.1, 10.2.2 and 10.2.3 were then intended to provide a brief overview of the main differences between 'Alternative Methods', illustrated by the plan and section views and summarized in Table 10-1 in Section 10.2.4. As requested, additional information has been added to Alternatives 2 and 3 such that all three now have a similar level of information provided and cover the comments/questions provided.	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
		groundwater table requiring separation". Is this the same for Alternatives 2 and 3?					
15	**Summary of Alternative Methods** **10.2.4**	The summary and comparison table of the alternative methods in the EASR uses mainly a quantitative depiction. Provide simplified visuals of the alternative methods for easier comparison for the reader.	Use the graphics included in the Technical Bulletin #3 for the same comparative table for visual understanding for the reader.	The graphics from Technical Bulletin #3 have been added to Section 10.2.4, Table 10-1 for added reader understanding.	MECP comment has been adequately addressed.	--	--
16	**Comparison and Evaluation of Landfill Expansion Alternatives** **11.0**	Do Nothing: Section 4.2.2 of the EA Codes of Practice states that the do nothing alternative should always be considered as it represents what is expected to happen if none of the alternatives being considered are carried out. It is always included for comparison and therefore cannot be screened out. The do nothing alternative has to be carried throughout the EA as a benchmark for the comparison of the advantages and disadvantages of the preferred undertaking and to determine the extent to which other alternatives address the problem or opportunity. The do nothing alternative is considered in the 'alternatives to' comparative assessments. However, the EASR must assess the advantages and disadvantages of each 'alternative method' using the do	The EASR needs to be revised to consider the do nothing alternative as a benchmark for the comparison of the advantages and disadvantages of the alternative methods. The revised draft EA also needs to include a description of the do nothing alternative for each alternative method.	The EASR has been revised to consider the Do-Nothing alternative as a benchmark for the comparison of the advantages and disadvantages of the 'Alternative Methods'. An introduction of the Do-Nothing alternative has been added to Section 10.2.4 and then it has been used for comparison throughout Section 11. It is noted that the proposed expansion of the Boyne Road Landfill is a relatively small expansion as compared to other similar projects in the province. Additionally, there are constraints related to the possible design/layout of landfill expansion 'Alternative Methods' for this undertaking. As a result, the potential effects from the 'Alternative Methods' of landfill expansion	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
		nothing alternative as the reference benchmark or baseline. Sufficient Level of Detail: The assessment of the 'Alternative Methods' should include sufficient detail to determine the benefits and disadvantages of each alternative, based on effects. The EASR would benefit with more details provided in the advantages and disadvantages sections for each indicator/component as well as comparing to the 'do nothing' scenario. Some advantages and disadvantages sections provide only a table, and no summary explanation following it (example Table 11-7). Some components do not have an advantages and disadvantages comparison and require further explanation beyond that the results yielded similar results for all alternative methods. The ESAR needs to explain why each alternative method yielded similar results to affirm that an advantages and disadvantages comparison is not required.		are considered to be similar by many of the environmental components, resulting in an inability of these components to describe unique advantages or disadvantages when compared to each other. Relevant sections of Section 11 have been updated to explain this. As such it is unreasonable to expect that each description of advantages and disadvantages to be similar in length and/or content for each environmental component/sub-component.			
17	**Potential Indirect Impacts** **13.4.1.2.2**	The draft EASR states that "these indirect impacts are not considered significant and are mitigatable with standard construction best management practices". Where mitigation measures are mentioned,	Please include what the best management practices are with regards to mitigation in the final EASR.	Construction best management practices added to Section 13.4.1.2.2 as requested.	MECP comment has been adequately addressed.	--	--

#	Reference to North Dundas Waste Management Plan draft EASR	Preliminary Draft Review Comments & Rationale	Preliminary Draft Review Proposed Action/Solution	Preliminary Draft Response How Addressed in the EA	Draft Review Ministry Response	Draft Response How Addressed in the EA	Ministry response to outstanding comments
		the measures should be identified. Although potential indirect impacts of the construction phase are considered not significant and mitigatable, the potential mitigation measures related to 'best management practices' should be disclosed for each construction related impact listed.					
18	**Comparison to Do-Nothing** **13.11**	The purpose of comparing the preferred undertaking/project to the do nothing alternative is to highlight the advantages and disadvantages of proceeding with the project, rather than to confirm a preferred alternative. Table 13-32: Comparison of Do-Nothing to the Preferred Undertaking, does not clearly identify the advantages/disadvantages (trade-offs) for carrying out the proposed expansion.	Identify the advantages and disadvantages of expanding the Boyne Road Landfill by comparing the preferred undertaking to the do-nothing scenario which would be to closure of landfill when it reaches its approved capacity	Table 13-32 provided in Section 13.11 has been updated with additional details. It is noted that the comparison provided in Section 13.11 does not "confirm" the preferred alternative, it merely highlights the advantages and disadvantages of proceeding with the project.	MECP comment has been adequately addressed.	--	--

Ministry of the Environment, Conservation and Parks

Resource Recovery Policy Branch

8th Floor, 40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel.: (437) 236-6479

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des politiques de récupération des ressources

8e étage , 40 Avenue St. Clair Ouest
Toronto ON M4V 1M2
Tel.: (437) 236-6479

Date: June 10, 2022

MEMORANDUM

TO: Jordan Hughes, Project Officer,
Environmental Assessment Branch, Environmental Assessment and Permissions Divisions

FROM: Dale Gable
Manager – Technology Projects
Resource Recovery Policy Branch

RE: **Environmental Assessment of the Township of North Dundas Waste Management Plan**

I have reviewed the draft document entitled "Draft - May 2022 – Environmental Assessment of the Township of North Dundas Waste Management Plan" (Volumes 1 through 4) prepared for the Township of North Dundas (Township) by Golder Associates (Golder). The draft report is dated May 2022. The following comments are provided in response to your request to the Resource Recovery Policy Branch (RRPB) to provide comments as part of the Government Review Team for this draft report. In general, the focus of the review from RRPB will be from a waste diversion and resource recovery perspective.

The following is an overview of the key comments/assessment provided below:

1. It is noted that the Township appears to have overestimated their volumetric disposal need by over **100,000 cubic metres**. There are inconsistencies in the assumptions to determine historical annual amount of waste deposited and approach used to determine the anticipated volumetric disposal requirements for the Township. Based on the approach/assumptions made, the volume requirements estimated is significantly more those volumes stated in other sections of the report and available statistics for the average amount of waste generated per person 700 kg/yr) by a person in Ontario. Therefore, further information and discussion is required to justify the overall volume requirements identified in the report.

2. The proponent should consider the potential impacts that the Extended Producer Responsibility Regulations will have on diversion in the Township. There is no discussion on whether the requirements will change the diversion rate within the

Township or how those impacts may impact the anticipated long term disposal needs for the municipality.

3. The proponent should consider elaborating on why they have estimated only a minimal increase in waste diversion throughout the planning period. This approach contributes may lead to an overestimation of the long term waste disposal needs without adequate justification.

4. In summary, the Township should elaborate on some of the key assumptions on the anticipated annual volume of waste and address inconsistency data identified in the report that related to diversion and overall waste management disposal capacity needs. The justification should consider sound operational practices and adequately consider diversion opportunities.

Background

The Township is undertaking an Environmental Assessment (EA) study for their long term waste management plans (25 years). Currently, the primary waste disposal option for the Township is the Boyne Road Landfill Site operating under Environmental Compliance Approval (ECA) No. A482101. The landfill has currently reached it approved capacity and it is operating under an emergency provision in the ECA.

The EA study has identified six (6) alternatives for the long term waste management plan. These alternatives are:

i. Existing landfill site closure and export waste for disposal;
ii. Landfill site expansion;
iii. Existing landfill site closure and establish a new landfill site in the Township;
iv. Existing landfill site closure and alternative waste management technologies;
v. Enhanced waste diversion; and
vi. Do nothing

Based on the evaluation, the township determined that Alternative No. 2 was the preferred choice.

As a result, the Township is proposing expand the existing capacity to create a waste disposal airspace of 417,000 cubic metres. The overall disposal capacity of the site will be 1,060,750 cubic metres. There are no new waste diversion facilities planned as part of the expansion. The Township did describe potential waste diversion activities that may occur in the Township. These activities may occur at another location. If these activities occur at this site, the EA requirements will have to assessed on those activities.

Summary of Key Comments on Diversion

1. In Volume 3, in the report entitled “Waste Diversion Study” prepared by Golder dated May 2020, in Section 3, the Township identifies the various materials that the EPR are intended to address. Batteries should be included in the list of materials.

2. In Volume 3, in the report entitled “Waste Diversion Study” prepared by Golder dated May 2020, the report provides an overview of the current diversion programs in Ontario.

This discussion in Section 4 of the report is mainly based on the older and now phased out programs. Therefore, the section and assessment may be considered outdated. The oversight for delivering these programs is now the responsibility of RPRA. Furthermore, in the discussion of waste diversion as it relates to the estimation of potential waste volumes in Section 8.3 (Option 3 – Enhanced Recycling) in the report and within Volume 1 of the EA report, the potential impacts to waste diversion due to the diversion program changes are not discussed. The Township should provide a discussion on the potential impacts that the regulations under the Resource Recovery Circular Economy may have on the Township's diversion rate, and thus the potential impact on volumetric waste capacity needs.

3. The Township has indicated due to the rural setting, a portion of the organics generated in residential settings are managed through backyard composters or own leaf and yard composting. It was mentioned in Section 3 that with regards to the Food and Organic Policy Statement that where the collection of food and organics is not provided by the municipality that other means such as home composting are to be provided by the municipality. The Township should provide a discussion on the amount of home composters that they have provided to the residents over the years to have an estimate on the amount of organics that may be diverted through the years.

4. The Township provided a discussion on the potential options for increasing diversion. The Township has indicated that the options that can be considered could increase diversion to approximately 56% of the waste generated which is an increase of 33%. In the estimations for waste volumes needed, the Township only increased potential diversion by only 10% by the year 2030 and maintains that diversion throughout the planning period. It is unclear why the diversion rate is maintained through the planning period and not increased. The approach is conservative and may result in overestimated the volumetric requirements. It is recommended that the Township provide an explanation on the approach.

5. Figure 1 in the Waste Diversion Study indicates that 32% of Ontario's waste composition is organics and Figure 2 indicates that organics makes up approximately 35% of the waste composition of the Townships waste. In Section 8.2, the report mentions that organics make up 40% of the waste stream in Canada. For the purposes of the EA, it is assumed that the Township is working with 35% composition number. In Section 8.2 minor comments, it indicated that "assuming 10% of the organic composition is leaf and yard waste….", to confirm that this is meant to read 28.6 % (10/35) of the organic composition is leaf and yard or that 10% of the overall waste composition is leaf and yard with 25 percent as source separated organics.

<u>Summary of Key Comments Waste Volume</u>

1. There is a need to clarify the approach used to estimate the proposed volumetric disposal waste needs for the Township over the twenty-five (25) year planning period.

2. In Section 7-2 of the report (Volume 1), the Township estimated the long term waste disposal needs by reviewing the annual waste surveys and averaging estimated volumes over a short period of time. The estimated baseline for waste needs was estimated to be 16,200 cubic metres. No data was provided on those volumes within the Environmental Assessment Report. (This has resulted in an estimation of 417,000 cubic metre requirements). It is preferred is additional data points were provided to

demonstrate the annual capacity and there has been no historical fluctuation over the years. A data set of 10-15 years would be acceptable.

3. The Township has provided only selected population estimates within Volume 1. It is suggested that the Township provided all yearly population estimates for each year in the planning period ..

4. Within the main report (Volume 1), there was no discussion on the ratio of waste to daily cover in the estimated historical annual waste volumes. Ministry and industry accepted ratios for waste to daily cover for the purposes of estimated airspace is 4 (waste):1 (daily cover).

   However, in Volume 2, in the emissions report, it is indicated that the Average Daily Waste Receipt is 26 Mg/day and the Average Daily Cover Throughput is 16 Mg/day. Based on these operational numbers, the waste to cover ratio is 1.625:1. Furthermore, in the expansion phase that ratio is further reduced to 1.57:1. As mentioned landfill waste to daily ratio typically is 4:1 These ratios are not consider optimum landfill operations conditions. As a result, a significant portion of the surveyed waste volumes appears to be daily cover and not waste. As a result, it clearly appears that the landfill volumetric needs from a waste to daily cover is significantly overestimated. Furthermore, other data provided in the report support the overestimation of waste and the operational ratio of 1.6:1. The Township needs to provide further discussion and rationale for utilizing those waste to daily cover rations and deviating from generally accepted approached. In addition, it should provide a discussion on why it should be considered good operational practice.

5. In Volume 3, in the report entitled “Waste Diversion Study” prepared by Golder dated May 2020, it indicated that in 2018 the Township generated approximately 2715 tonnes of residential waste in which 628 tonnes were diverted. Therefore, approximately 2087 tonnes of residential waste were sent to landfill. The Township indicated that an ICI waste is approximately 20% of the residential volume (so approximately 543 tonnes). (Worst case scenario if the Township is implying that the 20% is on top of the residential volume). Therefore, it is estimated that the site received approximately 2630 tonnes of waste in 2018. Waste density in a compacted landfill is typically around 0.75T/m3. Assuming that a municipal site of this size is only using a dozer, the compacted density can be assumed to be less (approx. 0.6T/m3). Based on this density, it would equate to approximately 4,380 cubic metres. With the addition of daily cover (using 4:1), it is estimated that annual air space need for that year would be 5,475 cubic metres. the annual amount of airspace needed would be significantly below the annual volumes identify in Volume 1 of the EA report. This would result in an volumetric air difference of approximately 268,000 cubic metres. Further justification on the volumetric needs is required.

6. Notwithstanding the comments above, using the Township’s volume and removing the daily cover component at 4:1 ratio, the Townships waste generation rate is considerably above 1 T/person for the Township. The Government of Canada has estimated that the average waste generated rate per person in Canada is 0.704 T/person (residential and non-residential waste volume total). From a provincial perspective per person, Ontario generated below 0.7T/person. This rate does not include diversion.

If we use 0.7T/pp and a population of 12,107 (2021 data), the amount of waste generated would be approximately 8,475 T. Assuming a diversion rate of 33% (conservative), that would be approximately 6525 T for disposal or approximately 9,460 cubic metres of waste. Applying the daily cover ratio, would result in a volumetric need of 11,830 cubic metres per year. This annual difference can result in volumetric airspace difference of over 100,000 cubic metres over the planning period.

As a result, it is recommended that the Township provide further information to justify their volumetric airspace requirements.

7. The difference in data further supports the need for additional information to explain the significant difference in waste generated in the Township compared to the rest of the province and difference in long term waste planning needs.

8. In summary, based on review of the report, available statistics and generally accepted waste management planning approaches, I have questions about the use of inconsistent assumptions and approaches that were used to estimate the volumetric waste disposal need for the Township which appears to result in a significant overestimation of the disposal needs. Therefore, the Township should explain these discrepancies or recalculate the volumes needed.

General Non-Diversion Comments

1. Section 10.2.5 of the EA report (Volume 1) provides a summary of the three (3) alternative footprints/geometry to the proposed landfill expansion. The decision to develop three (3) potential layouts was done at the prerogative of the Township. It does not appear to be a requirement of the MECP. Whereas the height and areas are similar, the Township should undertake a contaminant lifespan (CLS) assessment for each option and add that consideration into their evaluation table. CLS is an estimate of how long the site will produce contaminants at a level that may impact the natural environment. If there is significant difference in the CLS, it may be worthwhile to assess and discuss in the alternative evaluation.

If there are any questions regarding the assessment or references from the report or other statistics mentioned in the memorandum, please reach out to me

Dale Gable
Manager, Technology Projects
Resource Recovery Policy Branch

cc: Charles O'Hara, Director, RRPB
Kathleen O'Neill, Director, EAB
Solange Desautels, Supervisor, EAB

TECHNICAL MEMORANDUM

DATE December 6, 2022 1648253

TO Dale Gable, Manager
Resource Recovery Policy Branch, MECP

CC Jordan Hughes, MECP

FROM Trish Edmond **EMAIL trish.edmond@wsp.com**

UPDATED ESTIMATE OF RESIDUAL WASTE MANAGEMENT REQUIREMENTS FOR THE ENVIRONMENTAL ASSESSMENT OF THE TOWNSHIP OF NORTH DUNDAS WASTE MANAGEMENT PLAN

This memorandum has been prepared to respond to ongoing comments and questions from the Ministry of Environment, Conservation and Parks (MECP), Resource Recovery Policy Branch on the residual waste management requirements for the Environmental Assessment of the Township of North Dundas Waste Management Plan.

As described in the draft EASR, and as a result of the Township being a small rural municipality and without a scale at its existing landfill, the residual waste management requirements were estimated based on known historical annual airspace volumes for disposal of all their residential waste and a small amount of industrial, commercial and institutional (IC&I) waste and daily cover usage, calculated using regular volumetric surveys of the existing Boyne Road Landfill. As requested in the most recent comments from the Resource Recovery Policy Branch received on November 28, 2022, this memo employs a generation rate volumetric methodology, despite there being many assumptions in this method that may not be applicable to waste generation in the Township of North Dundas.

The required input parameters for the generation rate volumetric methodology are waste generation rate (either including or excluding diversion) for both residential and IC&I waste; waste density; population; and waste to cover material ratio, which are each further described below.

Waste Generation Rate

Waste generation rates for the province of Ontario can be obtained from the Government of Canada January 2022 Solid Waste Diversion and Disposal (https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html) accessed November 2, 2022. This report incudes 2018 data on total waste disposed and diverted for the residential and IC&I sectors in Ontario. A summary of the Ontario data is provided in the table below:

Table 1: Ontario StatsCan Waste Generation Rate Data

	Waste Disposed from Residential Sources	Waste Disposed from Non-residential Sources*	Waste Diverted from Residential Sources+	Waste Diverted from Non-residential Sources*+
Kilograms/person/year	278	426	138	78

Notes:

*In this instance Non-residential sources is assumed to be predominantly IC&I waste

+Additional diversion of 17 kilograms/person was identified but could not be clearly attributed to residential or non-residential.

The Resource Recovery Policy Branch has suggested to take the total waste generated of 278 and 426 kilograms per person per year that sums to 704 kilograms per person per year, and then apply a 33% diversion rate to arrive at a waste generation rate of 472 kilograms per person per year.

The project team provides an alternate waste generation rate by assuming in this EASR that the Boyne Road Landfill receives 100% of the Township of North Dundas residential waste and the split of waste received at the Boyne Road Landfill has been very roughly estimated as 80% residential and 20% IC&I waste. Furthermore, looking at the Ontario residential diversion rate from the table above, it is apparent that the residential diversion in Ontario in 2018 was 33%. This is in good agreement with the proposed long term residential diversion for the Boyne Road Landfill as described in the EASR, and hence further assessment will be conducted using the waste disposed rates provided by the Ontario-specific Government of Canada data.

As such the residential waste disposed (residual waste) would be 278 kilograms per person per year, which is estimated as 80% of the total at the Boyne Road Landfill and therefore implies the Boyne Road Landfill receives 348 kilograms per person per year including residential and IC&I waste.

Waste Density

In the absence of any other data and considering the receipt of IC&I waste is likely limited, this is a small rural landfill, and equipment is limited to a dozer, the density of waste placed at the Boyne Road Landfill has been assumed to be 0.6 tonnes/cubic metre.

Population

In the draft EASR the Official Plan population projections were used to project the required disposal airspace, as described in the ToR. The Township was aware that with the onset of COVID-19, and even somewhat before that, the increased demand for housing outside of but near major urban centres was becoming a reality in North Dundas and that there was significant increased interest and applications by residential developers in the Township. Therefore, for the purpose of using generic provincial waste generation and disposal rates per person to estimate the 25 year disposal volume for expansion of the Boyne Road Landfill, as suggested by the Resource Recovery Policy Branch, it is proposed to use the actual residential development between 2012 and 2021, the currently approved new residential development for 2022/2023 and the projected residential development through 2030 as the basis for estimating the required disposal volume for 2023 through 2048 planning period. This actual and proposed residential development growth is notably higher than the 0.6% per year described in the Official Plan projections. This updated population data, is supported by the attached memo. The table below summarizes the updated population data provided by the Township through 2030, and then projected through 2048.

Table 2: North Dundas Population Data

Year	Updated Population Data (2022)
2021	12672
2022	13217
2023	14304
2024	14928
2025	15381
2026	15836
2027	16294
2028	16755
2029	17219
2030	17685
2031	18039
2032	18400
2033	18768
2034	19143
2035	19526
2036	19917
2037	20315
2038	20721
2039	21136
2040	21558
2041	21990
2042	22429
2043	22878
2044	23336
2045	23802
2046	24278
2047	24764
2048	25259

Cover Material Ratio

In the absence of any other data, and to be conservative, a waste to cover volumetric ratio of 4:1 has been assumed, although it is expected that the Township of North Dundas may use slightly more cover material as a result of having a low daily rate of waste deposition in the existing landfill.

Analysis of Residual Waste Disposal Requirements

Utilizing the updated population data and the waste generation rate suggested by the Resource Recovery Policy Branch and all other assumptions within this memo, the estimated 25 year airspace required by the Township of North Dundas is 506,200 cubic metres (which is about 20% higher than proposed in the EASR).

However, using the updated population data and the waste generation rate suggested by the consultant and all other assumptions within this memo, the 25 year airspace required by the Township of North Dundas is 373,100 cubic metres (which is only about 45,000 cubic metres (10%) less than proposed in the EASR.

The two tables used to estimate the residual waste generation are provided at the end of this memo. As can be seen, one scenario requires more capacity than originally requested in the draft EASR and one scenario requires less capacity than originally requested in the draft EASR, highlighting that this methodology for predicting residual waste needs is strongly influenced by the assumptions made to make the estimate. The use of the actual annual airspace consumed as the basis for projecting the expanded landfill volume requirements requires no such assumptions and is considered to represent the most appropriate approach for this landfill site. As such, the Township is not proposing to request an increase or decrease in the airspace, but to stay with the volume requested in the draft EASR.

Golder Associates Ltd.

PLE/RM/PAS/sg

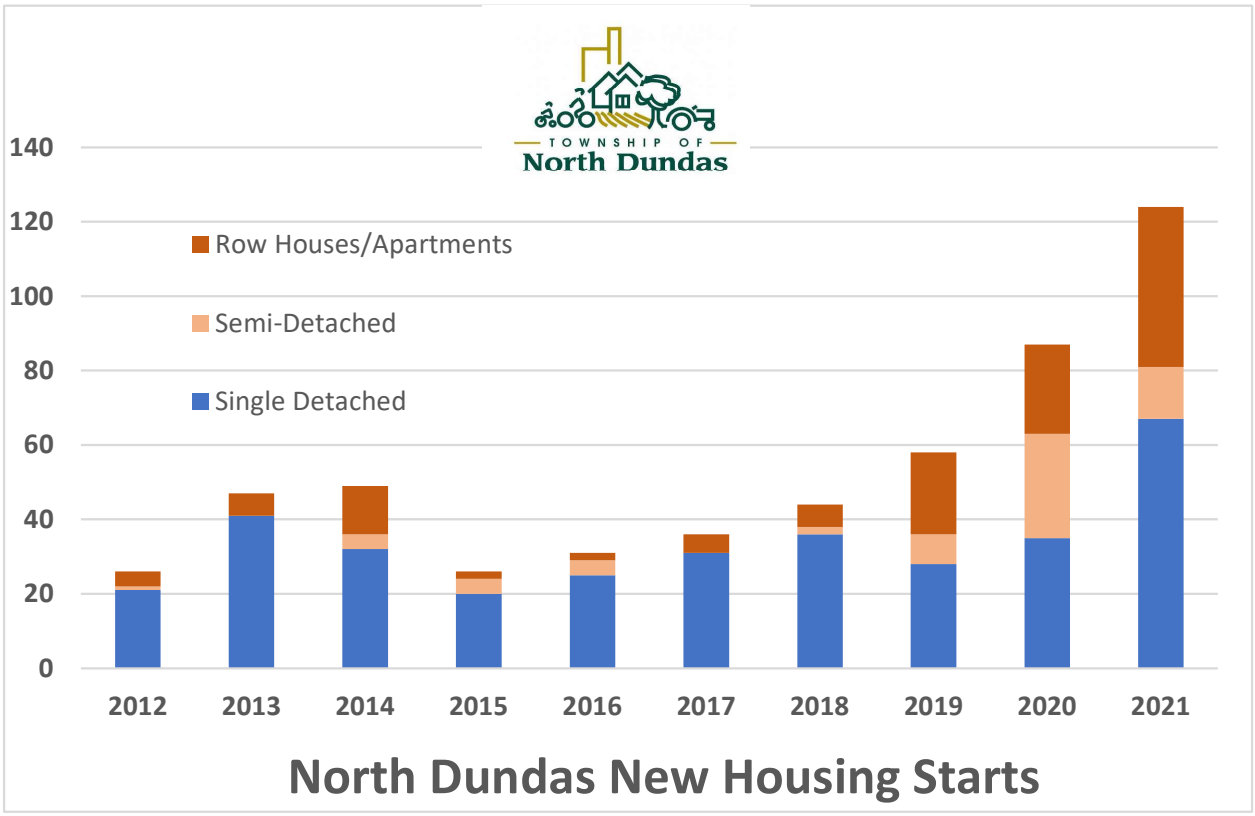
Distribution: Angela Rutley, Township of North Dundas

Attachments: Memo Township of North Dundas Building Stats
Two tables of residual waste estimates

https://golderassociates.sharepoint.com/sites/117046/project files/6 deliverables/volume 1 easr/3 final/comment responses/00_split up response tables (sent to jordan)/north dundas waste volume memo.docx

Township of North Dundas Building Stats

- Year 2021 Building Permits: 276; Total dwelling units 124; Declared Value of construction: $62.8 million.
- 528 new homes built in the past ten years.



Current Approved Projects (2022-2023):

63	units	Wellings of Winchester (Phase 1) Just completing 90% occupied
69	units	Wellings of Winchester (Phase 2) Under construction Fall 2022
80	units	Wellings of Winchester (Phase 3) Under construction Fall 2023
72	units	in existing subdivisions (vacant lots being built on) 2022-2023
10	units	Infill and conversions, intensification
28	units	Wylie Creek Estates Subdivision (2021-2023)
6	units	Industrial Drive Chesterville (Rental Units)
5	units	Country Lane Subdivision (Harmony) (2021-2023)
28	units	Winchester Meadows stacked townhomes (Spring 2023)
361	**Units**	

Approved projects awaiting water capacity or on-going (2023-2024)

104 units Dream Haven Subdivision (Townhouse development)
174 units Woods Subdivision Development (mixed residential use development)
38 units in existing subdivisions (vacant lots being built on) 2023-2024
15 units Dundas Manor (30 additional beds) 2024 occupancy
36 units Falcon Homes (Chesterville – Queen Street) 2023-2024
35 units Silver Creek Estates Subdivision (Hallville) 2023-2024
12 units Infill and conversions, intensification
414 Units

Future Subdivision Projects being proposed (2025-2030)

30 units Ian Drew (2 new) Subdivisions (Single detached units)
10 units Harmony Road (Single detached units)
52 units Ormond North (44-60 single detached units)
13 units Morewood East (Single detached units)
17 units Morewood West (Single Detached Units)
170 units Herkins Subdivision Chesterville (Multiple Towns and Semis)
135 units Winchester Moderna Homes (Multiple Towns and Semis)
150 units Winchester – Rental Apartments
211 units Wellings of Winchester Seniors Oriented Dwelling units
50 units Infill and conversions, intensification
838 Units

Scenario 1

Year	Population	Waste (Tonnes)	Waste (m^3)	Waste with Daily Cover (m^3)	
2021	12,672	4,410	7,350	9,200	
2022	13,217	4,600	7,666	9,600	
2023	14,304	4,978	8,296	10,400	
2024	14,928	5,195	8,658	10,800	
2025	15,381	5,353	8,921	11,200	
2026	15,836	5,511	9,185	11,500	
2027	16,294	5,670	9,451	11,800	
2028	16,755	5,831	9,718	12,100	
2029	17,219	5,992	9,987	12,500	
2030	17,685	6,155	10,258	12,800	
2031	18,039	6,278	10,463	13,100	
2032	18,400	6,403	10,672	13,300	
2033	18,768	6,531	10,885	13,600	
2034	19,143	6,662	11,103	13,900	
2035	19,526	6,795	11,325	14,200	
2036	19,917	6,931	11,552	14,400	
2037	20,315	7,070	11,783	14,700	
2038	20,721	7,211	12,018	15,000	
2039	21,136	7,355	12,259	15,300	
2040	21,558	7,502	12,504	15,600	
2041	21,990	7,652	12,754	15,900	
2042	22,429	7,805	13,009	16,300	
2043	22,878	7,962	13,269	16,600	
2044	23,336	8,121	13,535	16,900	
2045	23,802	8,283	13,805	17,300	
2046	24,278	8,449	14,081	17,600	
2047	24,764	8,618	14,363	18,000	
2048	25,259	8,790	14,650	18,300	
			TOTAL	**391,900**	**Original Estimate**
			TOTAL POST 2023	**373,100**	**417,700**

Scenario 2

Year	Population	Waste (Tonnes)	Waste (m^3)	Waste with Daily Cover (m^3)	
2021	12,672	5,981	9,969	12,500	
2022	13,217	6,239	10,398	13,000	
2023	14,304	6,752	11,253	14,100	
2024	14,928	7,046	11,743	14,700	
2025	15,381	7,260	12,100	15,100	
2026	15,836	7,475	12,458	15,600	
2027	16,294	7,691	12,818	16,000	
2028	16,755	7,909	13,181	16,500	
2029	17,219	8,127	13,546	16,900	
2030	17,685	8,348	13,913	17,400	
2031	18,039	8,514	14,191	17,700	
2032	18,400	8,685	14,475	18,100	
2033	18,768	8,858	14,764	18,500	
2034	19,143	9,036	15,059	18,800	
2035	19,526	9,216	15,361	19,200	
2036	19,917	9,401	15,668	19,600	
2037	20,315	9,589	15,981	20,000	
2038	20,721	9,780	16,301	20,400	
2039	21,136	9,976	16,627	20,800	
2040	21,558	10,176	16,959	21,200	
2041	21,990	10,379	17,299	21,600	
2042	22,429	10,587	17,644	22,100	
2043	22,878	10,798	17,997	22,500	
2044	23,336	11,014	18,357	22,900	
2045	23,802	11,235	18,724	23,400	
2046	24,278	11,459	19,099	23,900	
2047	24,764	11,689	19,481	24,400	
2048	25,259	11,922	19,871	24,800	
			TOTAL	**531,700**	**Original Estimate**
			TOTAL POST 2023	**506,200**	**417,700**

December 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
Ministry of the Environment, Conservation and Parks Dale Gable, Manager – Technology Projects Resource Recovery Policy Branch						
1.	Volume 3, Appendix J - Waste Diversion Study	In Volume 3, in the report entitled "Waste Diversion Study" prepared by Golder dated May 2020, in Section 3, the Township identifies the various materials that the EPR are intended to address.	Batteries should be included in the list of materials.	Acknowledged. Batteries will be included in the list of materials addressed by EPR and Section 3.0 of Appendix J, Volume 3 has been updated.	Acknowledged	I have reviewed the additional supporting documentation provided by the Township and Golder (dated December 6, 2022) in response to my review comments, the following comments are provided for your consideration. The primary concern raised was the difference between the volumetric capacity needs proposed by the in-place survey approach and the statistical approach using data from waste generated per person. Whereas there was different approaches to determine capacity needs, there was a significant difference that warranted further information to be provided. In response to the comments, Golder reviewed their supporting documentation for waste generation but also reviewed and updated information on population growth. As a comparison to their original estimate, Golder completed an assessment using statistical data, assumed density and daily cover ratios over a 25-year period. Based on this data and the updated population growth estimates during the planning period, Golder estimated that volumetric needs using this method was approximately 380K cubic metres. This is slightly less than the survey method. However, factoring in the severe weather events that the area has experience which has resulted in additional waste (weather events could potentially align with increase
2.	Volume 3, Appendix J - Waste Diversion Study	In Volume 3, in the report entitled "Waste Diversion Study" prepared by Golder dated May 2020, the report provides an overview of the current diversion programs in Ontario. This discussion in Section 4 of the report is mainly based on the older and now phased out programs. Therefore, the section and assessment may be considered outdated. The oversight for delivering these programs is now the responsibility of RPRA. Furthermore, in the discussion of waste diversion as it relates to the estimation of potential waste volumes in Section 8.3 (Option 3 – Enhanced Recycling) in the report and within Volume 1 of the EA report, the potential impacts to waste diversion due to the diversion program changes are not discussed.	The Township should provide a discussion on the potential impacts that the regulations under the Resource Recovery Circular Economy may have on the Township's diversion rate, and thus the potential impact on volumetric waste capacity needs.	As described in the approved ToR, a diversion study was to be carried out early in the EA process to both assess one of the Alternatives To and to determine the quantity of residual waste to be managed during the planning period. The ToR was initiated in 2016 and for various reasons the submission of the proposed ToR could not occur until August 2019. Approval of the ToR was not issued until July 2020. In view of the limited remaining approved landfill capacity, the Township decided to proceed with the diversion study prior to the approval of the ToR, such that the diversion study report is dated May 2020, and forms the basis for the preparation of the draft EASR. The changes in responsibility for the provincial diversion programs was only starting when the diversion study was completed, and the implementation of its various components has been phased in over the past couple years and is ongoing. In view of this timing and the status of this EA, it is not proposed to update the diversion	Acknowledged that some wording has changed to reflect RPRA and new programs. Further comments on understanding needs and volume requirements will be provided below in absence of commentary on impacts to diversion to this section.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
				study based on the current responsibilities for diversion. Generally insufficient time has passed for the municipality to know what changes/improvements in diversion have actually occurred with the exception of a small notable increase in electronics diversion with an increase in one container shipped every 6 months to every 4 months. However, the provincial changes in diversion programs have been added to Section 7.0 of the EASR.		fluctuation in survey volumes provided), the slight differences in approaches could be justified. As a result, I am satisfied that the Township and Golder have addressed my technical comments on the assessment related to waste volumetric needs for the Township. The Township estimate which uses survey data is acceptable. However, this statement is based on the assumption that the additional information used in the comparison assessment on population growth is acceptable.
3.	Volume 3, Appendix J - Waste Diversion Study	The Township has indicated due to the rural setting, a portion of the organics generated in residential settings are managed through backyard composters or own leaf and yard composting. It was mentioned in Section 3 that with regards to the Food and Organic Policy Statement that where the collection of food and organics is not provided by the municipality that other means such as home composting are to be provided by the municipality.	The Township should provide a discussion on the amount of home composters that they have provided to the residents over the years to have an estimate on the amount of organics that may be diverted through the years.	Historically, the Township has not provided backyard composters nor coupons for composters but when they receive requests for such equipment, they direct individuals to one of two stores in the Township to purchase equipment. As such there is no database on how many home composters exist in the Township. In the future if the Township or County subsidize home composters, which is likely, a mechanism to track numbers provided will be contemplated in the program. No changes to the EASR or Volume 3 have been made.	The responses provides an acceptable response. No further comment.	
4.	Volume 3, Appendix J - Waste Diversion Study	The Township provided a discussion on the potential options for increasing diversion. The Township has indicated that the options that can be considered could increase diversion to approximately 56% of the waste generated which is an increase of 33%. In the estimations for waste volumes needed, the Township only increased potential diversion by only 10% by the year 2030 and maintains that diversion throughout the planning period.	It is unclear why the diversion rate is maintained through the planning period and not increased. The approach is conservative and may result in overestimated the volumetric requirements. It is recommended that the Township provide an explanation on the approach.	On review of the Diversion Study report, it was noticed that there were typos in the numbers stated in Section 11.0 at the top of page 26. It should have read (changes shown in bold) "between 10 to **15** percentage points, corresponding to an increased residential diversion rate of 33 to **38**%. For the reasons described in Section 11.0, it was considered	No further comments	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
				appropriate for planning purposes to assume that a 10% increase could be achieved in this largely rural municipality, and that this would take several years (until 2030) to achieve. Because it is currently not known what other diversion activities might be practical to implement or what additional diversion may be achieved, the diversion rate was assumed to remain at 33% for the remaining portion of the planning period. It is considered that this is a responsible approach for a small rural municipality to take in long term residual waste management planning. Updates to Volume 3 Appendix J to correct any typos have been made.		
5.	Volume 3, Appendix J - Waste Diversion Study	Figure 1 in the Waste Diversion Study indicates that 32% of Ontario's waste composition is organics and Figure 2 indicates that organics makes up approximately 35% of the waste composition of the Townships waste. In Section 8.2, the report mentions that organics make up 40% of the waste stream in Canada. For the purposes of the EA, it is assumed that the Township is working with 35% composition number. In Section 8.2 minor comments, it indicated that "assuming 10% of the organic composition is leaf and yard waste….", to confirm that this is meant to read 28.6 % (10/35) of the organic composition is leaf and yard or that 10% of the overall waste composition is leaf and yard with 25 percent as source separated organics.	Confirm that this is meant to read 28.6 % (10/35) of the organic composition is leaf and yard or that 10% of the overall waste composition is leaf and yard with 25 percent as source separated organics.	This is meant to convey that 10% of the overall waste composition is leaf and yard waste and 25% of the overall waste composition is source separated organics in the Township. Section 8.2 of Volume 3, Appendix J has been updated to more accurately reflect the wording presented.	No further comments.	
6.	Volume 1, Section 7.0 – Updated Diversion and	There is a need to clarify the approach used to estimate the proposed volumetric disposal waste needs for the Township	Clarify the approach used to estimate the proposed volumetric disposal waste needs for the	To assist in understanding the volumetric disposal waste needs for the Township Table 7-2 in Volume 1 has been updated to	No further comment	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
	Residual Waste Disposal Requirements	over the twenty-five (25) year planning period.	Township over the twenty-five (25) year planning period.	provide additional details such as total residential waste generated and total ICI waste generated.		
7.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements, page 7-2	In page 7-2 of the report (Volume 1), the Township estimated the long term waste disposal needs by reviewing the annual waste surveys and averaging estimated volumes over a short period of time. The estimated baseline for waste needs was estimated to be 16,200 cubic metres. No data was provided on those volumes within the Environmental Assessment Report. (This has resulted in an estimation of 417,000 cubic metre requirements).	It is preferred if additional data points were provided to demonstrate the annual capacity and there has been no historical fluctuation over the years. A data set of 10-15 years would be acceptable.	Surveys of the landfill that allow the annual airspace consumption to be calculated are only available since 2008. Although the annual values are not provided, they are described in Section 7.0 of the EASR, "surveys of the active portion of the landfill completed since 2008 indicate that the annual fill rate ranges from approximately 10,400 to 18,900 m3 per year (with one higher fill rate in 2017)". This shows that there has been considerable variation between 2008 and 2020. Section 7.0 has been updated to include the actual annual fill rates. In view of these annual variations, to determine an annual average landfilling rate that could be considered representative of overall waste management in the Township over recent years (rather than using a survey from earlier than 2015), an average annual airspace consumption was calculated over the 2015 through 2020 period using the actual surveys in those years; this average was then increased through the planning period based on the projected population increase, which is the approach typically taken in waste planning studies. It is noted that where there are weigh scales, the projected annual residual waste disposal is usually estimated on a tonnage basis and then converted to volume based on annual tonnage disposed and	Based on comments provided and text in the EASR, the proposed responds still does not address the concern. In determining waste needs and estimated the volume of waste generated, it appears that Table 7-3 generally works backwards. Stating the waste volume needs and then calculated the estimated Residential waste needs. In the absence of other data, perhaps this may be an acceptable method. However, there is known data on the average amount of waste a person generates in Ontario that can be used to validate the proposed approach. When comparing the approaches, the difference in volumetric needs are significant. Whereas, different approaches can be used, further data provided within the report indicates an over usage of daily cover material. This over usage was not addressed in the Table or the report adequately. The over usage of daily cover is not considered "good operational" practices and it not addressed in the report. Good operational practices should be considered when assessing potential waste needs for the undertaking. In general, the approach is providing an overestimate on the actual waste disposal needs for the planning period.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
				corresponding airspace consumed based on annual surveys. However, there is no weigh scale at the Boyne Road Landfill site. The approach taken is considered appropriate for planning purposes.		
8.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements, Table 7-1	The Township has provided only selected population estimates within Volume 1.	It is suggested that the Township provide all yearly population estimates for each year in the planning period.	The requested yearly population estimates have been added to Section 7.0 of Volume 1.	No further comments.	
9.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements And Volume 2, Appendix B-2, Emissions Calculations	Within the main report (Volume 1), there was no discussion on the ratio of waste to daily cover in the estimated historical annual waste volumes. Ministry and industry accepted ratios for waste to daily cover for the purposes of estimated airspace is 4 (waste):1 (daily cover). However, in Volume 2, in the emissions report, it is indicated that the Average Daily Waste Receipt is 26 Mg/day and the Average Daily Cover Throughput is 16 Mg/day. Based on these operational numbers, the waste to cover ratio is 1.625:1. Furthermore, in the expansion phase that ratio is further reduced to 1.57:1. As mentioned landfill waste to daily ratio typically is 4:1 These ratios are not consider optimum landfill operations conditions. As a result, a significant portion of the surveyed waste volumes appears to be daily cover and not waste. As a result, it clearly appears that the landfill volumetric needs from a waste to daily cover is significantly overestimated. Furthermore, other data provided in the report support the overestimation of waste and the operational ratio of 1.6:1.	The Township needs to provide further discussion and rationale for utilizing those waste to daily cover ratios and deviating from generally accepted approached. In addition, it should provide a discussion on why it should be considered good operational practice.	It is noted that waste:cover ratios are based on volume and not weight. Because the site does not have a weigh scale, there are not records of the tonnage of waste disposed and the tonnage of cover material used. If there were, then approximate densities of each could be assumed to convert the tonnages to volume and an estimate of the actual waste:cover ratio then made. At the Boyne Road Landfill, the annual surveys allow the annual airspace consumption to be determined, which accounts for the waste, the daily cover materials used and their degree of compaction. The Township recognizes the value of their approved airspace and makes efforts to minimize the amount of cover material used while still satisfying the ECA requirements for daily cover application. It must be recognized that the landfill receives a relatively small amount of waste each day that is required to receive daily cover; as such, the waste:cover	The concerns remain for the comment. Reasonable estimates on daily cover densities can be used to determine the volumetric airspace that will be consumed based on the EASR estimate of the amount (weight) of daily cover used. Using the typical number of days the site is operating, an overall annual volumetric estimate can be achieved and deducted from the annual waste generated estimates. Furthermore, the consultants response of the data provided on daily cover should not be used in estimates does not address the comment on daily cover volumes. The reference section in the original comments and the response are not consistent. The consultant should clearly explain/clarify the inconsistency and/or provide information on the estimate on the amount of daily cover.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
				ratio has the potential to be lower than can be achieved at sites that receive larger daily waste volumes. Because landfill capacity is based on volume, it is the total volume of airspace required over the planning period that is the basis for the design, while recognizing that operationally it is desirable to minimize the consumption of that airspace by daily cover. The estimate of 417,700 cubic metres of expanded landfill airspace is based on the actual airspace consumed at this site (and accounting for increased diversion) and is considered the most accurate way of determining the required airspace given the constraints of the data available. The proposed airspace is not overestimated, and is appropriate for this EA. As related to Volume 2, Appendix B-2, these are weights for waste and daily cover assumed, as best possible, to reflect site operations. These weights should not be used to try to derive waste:cover ratios, since the ratio is based on volume.	As discussed above, there is reasonable concern that due to the method approach, and difference in available data on waste generate rates that a significant amount of waste in the estimate is related to daily cover above a 4:1 ratio. Concerns still remain on the method to estimate the volumetric needs for the undertaking. If the estimated annual waste volume are used, the consultant should provide a rationale on why the Township generated significantly more waste per person than any other Township, municipality in Ontario and why that data on waste per person is not considered in their estimate.	
10.	Volume 3, Appendix J - Waste Diversion Study and Volume 1, Section 7.0 – Updated Diversion and	In Volume 3, in the report entitled "Waste Diversion Study" prepared by Golder dated May 2020, it indicated that in 2018 the Township generated approximately 2715 tonnes of residential waste in which 628 tonnes were diverted. Therefore, approximately 2087 tonnes of residential waste were sent to landfill. The Township indicated that an ICI waste is approximately 20% of the residential	Further justification on the volumetric needs is required.	Section 5.0 of the Volume 3 Appendix J Waste Diversion Study is in regard to waste composition and the tonnage quoted was from the data call and used together with broader provincial information to try and estimate the Township's waste composition. This tonnage was not used to estimate the volume of airspace needed for the	To clarify, collected data exist but did not use it in the estimate in the EASR. Can it be explained why the data was not used in the estimate. The responses to this item and those above do not address the concern.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
	Residual Waste Disposal Requirements	volume (so approximately 543 tonnes). (Worst case scenario if the Township is implying that the 20% is on top of the residential volume). Therefore, it is estimated that the site received approximately 2630 tonnes of waste in 2018. Waste density in a compacted landfill is typically around 0.75T/m3. Assuming that a municipal site of this size is only using a dozer, the compacted density can be assumed to be less (approx. 0.6T/m3). Based on this density, it would equate to approximately 4,380 cubic metres. With the addition of daily cover (using 4:1), it is estimated that annual air space need for that year would be 5,475 cubic metres. The annual amount of airspace needed would be significantly below the annual volumes identify in Volume 1 of the EA report. This would result in an volumetric air difference of approximately 268,000 cubic metres.		landfill expansion, which as described in the EASR Section 7.0 and in the response to comments 7 and 9 above was appropriately based on actual airspace consumption and is not considered to be overestimated.	Furthermore, compaction density is not addressed either. In short, the concerns still around estimated volumes still exist. Available data provided in the report, through national data and through good operations indicated that the estimated volumetric needs are overestimated	
11.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements	Notwithstanding the comments above, using the Township's volume and removing the daily cover component at 4:1 ratio, the Townships waste generation rate is considerably above 1 T/person for the Township. The Government of Canada has estimated that the average waste generated rate per person in Canada is 0.704 T/person (residential and non-residential waste volume total). From a provincial perspective per person, Ontario generated below 0.7T/person. This rate does not include diversion. If we use 0.7T/pp and a population of 12,107 (2021 data), the amount of waste generated would be approximately 8,475 T. Assuming a diversion rate of 33% (conservative), that would be approximately 6525 T for disposal or	As a result, it is recommended that the Township provide further information to justify their volumetric airspace requirements.	The Ministry's comment is acknowledged and there are many approaches that can be taken to try to estimate waste generation and residual waste disposal requirements. In the absence of municipality-specific information based on waste composition studies, waste audits, tonnage information, etc., these approaches have to rely on typical national or provincial information. In the case of North Dundas, where only limited information is available, as described in the EASR Section 7.0 and in the response to Comment 7, 9 and 10 above, the expanded landfill airspace required over the 25 year planning period was appropriately	See comments above.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
		approximately 9,460 cubic metres of waste. Applying the daily cover ratio, would result in a volumetric need of 11,830 cubic metres per year. This annual difference can result in volumetric airspace difference of over 100,000 cubic metres over the planning period.		based on actual airspace consumption at the Boyne Road Landfill and is not considered to be overestimated.		
12.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements	The difference in data further supports the need for additional information to explain the significant difference in waste generated in the Township compared to the rest of the province and difference in long term waste planning needs.	Additional information requested to explain the difference in waste generated in the Township compared to the rest of the province.	Please see previous response to Comments 7, 9 and 10.	See comments above	
13.	Volume 1, Section 7.0 – Updated Diversion and Residual Waste Disposal Requirements	In summary, based on review of the report, available statistics and generally accepted waste management planning approaches, I have questions about the use of inconsistent assumptions and approaches that were used to estimate the volumetric waste disposal need for the Township which appears to result in a significant overestimation of the disposal needs.	Therefore, the Township should explain these discrepancies or recalculate the volumes needed.	Please see previous response to Comments 7, 9 and 10.	See comments above.	
14.	Volume 1, Section 10.2.5 – Summary of Alternative Methods	Section 10.2.5 of the EA report (Volume 1) provides a summary of the three (3) alternative footprints/geometry to the proposed landfill expansion. The decision to develop three (3) potential layouts was done at the prerogative of the Township. It does not appear to be a requirement of the MECP. Whereas the height and areas are similar, the Township should undertake a contaminant lifespan (CLS) assessment for each option and add that consideration into their evaluation table. CLS is an estimate of how long the site will produce contaminants at a level that may impact the natural environment. If there is significant difference in the CLS, it may be worthwhile to assess and discuss in the alternative evaluation.	The Township should undertake a contaminant lifespan (CLS) assessment for each option and add that consideration into their evaluation table. If there is significant difference in the CLS, it may be worthwhile to assess and discuss in the alternative evaluation	The contaminating lifespan (CLS) of the selected Alternative Method (Alternative Method 3) was calculated (see Volume 1, Section 13.2.5 and Volume 2, Appendix D-3). The assessment in Volume 1, Section 11.2.2 considered the differences in groundwater quality at the landfill site boundary based on 1) the position of the landfill footprint, 2) the waste footprint area configuration relative to groundwater flow direction, and 3) the maximum thickness of waste. These three factors were equally preferred across all three Alternative Methods. These three factors would contribute to CLS	No further comments.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	MECP's Response (November 2022)	MECP's Response (December 2022)
				calculations; however, as they are not significantly different, there would be no significant difference in CLS calculations. No changes to the EASR have been made.		

Ministry of the Environment, Conservation and Parks
Eastern Region
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M E M O R A N D U M

June 20, 2022

TO: Erin Legue
Sr. Environmental Officer
Cornwall Area Office
Eastern Region

FROM: Thomas Guo
Hydrogeologist
Technical Support Section
Eastern Region

RE: Environmental Assessment (EA)
The Township of North Dundas Waste Management Plan
United Counties of Stormont, Dundas and Glengarry, ON

I have reviewed the following documents:

- "Environmental Assessment of the Township of North Dundas Waste Management Plan, Notice of Draft Environmental Assessment Study Report", jointly issued by the Township of North Dundas and Golder, and dated May 27, 2022;
- "Volume 1 – Environmental Assessment of the Township of North Dundas Waste Management Plan", prepared by Golder and dated May 2022, which contains EA Study Report;
- "Volume 2 – Appendices, Environmental Assessment of the Township of North Dundas Waste Management Plan", prepared by Golder and dated May 2022, which includes following appendices:
    - Appendix A – Approved Terms of Reference
    - Appendix B – Air Quality and Odour
    - Appendix C – Noise
    - Appendix D – Geology, Hydrogeology, and Geotechnical
    - Appendix E – Surface Water
    - Appendix F – Biology
    - Appendix G – Cultural Heritage
    - Appendix H – Traffic;
- "Volume 3 – Supporting Documents, Environmental Assessment of the Township of North Dundas Waste Management Plan", prepared by Golder and dated May 2022, which contains:
    - Appendix I – New Landfill Site Selection Assessment
    - Appendix J – Waste Diversion Study

- "Volume 4 – Record of Consultation, Environmental Assessment of the Township of North Dundas Waste Management Plan", prepared by Golder and dated May 2022

With reference to the comments on the Terms of Reference provided by Shawn Trimper and dated September 5, 2019, I provide the following comments for your consideration from groundwater perspective.

Background

The Township is seeking to accommodate disposal of waste corresponding to the consumption of approximately 417,700 m^3 of waste landfill disposal from 2023 to 2048, as its existing Boyne Road Landfill is currently at capacity. The EA Study evaluated long-term solid waste management options to achieve this objective and has identified increased diversion and expansion of the existing Boyne Road Landfill as the preferred alternative.

The Boyne Road Waste Disposal Site (WDS) has been in operation since 1965 and is the only operational WDS in the Township of North Dundas. The site receives all residential and some of the industrial, commercial and institutional waste generated in the Township. The site is approved for the operation of an 8.1 hectare fill area within a total site area of approximately 97.13 hectares by Environmental Compliance Approval (ECA) No. A482101 and has an approved volumetric capacity of 395,000 m^3. During 2014, it was recognised that the site was in an overfill situation and at the end of 2014 the volume of waste in place was estimated to be approximately 533,780 m^3, representing an overfill of approximately 139,000 m^3. Since this time annual extensions have been approved through the ECA which are intended to allow the site to continue to operate until a suitable waste management strategy can be determined and implemented.

In addition to the landfill property, the Township has acquired groundwater easements, referred to as Contamination Attenuation Zones (CAZs). The existing landfill site is a natural attenuation landfill, without an engineered bottom liner and leachate collection system.

Approved Terms of Reference (TOR)

The approved TOR provides the framework for the completion of EA, which evaluates the waste management alternatives and determines a preferred option for the management of waste generated within the township over the next 25 years. Those waste management alternatives to be considered are:

- site closure and exportation of waste;
- expansion of the existing site;
- develop a new waste disposal site at an other location;
- alternative waste management technologies (i.e. energy from waste);
- enhanced waste diversion; and,
- do nothing (a required benchmark of the EA process)

Once a preferred waste management alternative is identified alternative methods (i.e. alternative methods and configurations with respect to the selected alternative) are to be identified and assessed. The TOR provides high-level commitments to be completed and provided in the EA Report. The workplans related to the commitments will be provided to relevant agencies and parties throughout the process of planning and completing the commitments.

Site Settings of Boyne Road WDS

The Boyne Road Landfill is located on Lot 8, Concession VI in the former Township of Winchester, along the south side of Boyne Road about 2 km east of the Village of Winchester, which is approximately mid-way between the two main population centres within the Township – the Villages of Winchester and Chesterville.

The surface water Site-vicinity Study Area is located in a rural agricultural area of flat to undulating farmland. Drainage in this area is via a network of constructed municipal drains, primarily the Volks Municipal Drain and the Quart Municipal Drain (historically known as the Irving-Quart Drain or Irving Drain). The area directly east and south of the existing landfill mound is forested with a shallow groundwater level.

Geology

The geology at Boyne Road WDS is determined to be:

- A topsoil/peat unit (between 0 and 2 m in thickness);
- A silt/clay unit at surface or underlying topsoil/peat where present (generally between 0 and 3 m in thickness);
- A silty sand/sandy silt till (between 0.9 and 6.0 m in thickness); and
- Bedrock, consisting of limestone (interbedded with shale), has been encountered at between 1.4 and 11.6 mbgs.

Hydrogeology

The physical hydrogeology is determined to be:

- Overburden aquifer
    - The glacial till has a higher hydraulic conductivity than the marine clays; it is perhaps only capable of providing adequate well yields for an individual water supply in very localized areas;
    - The groundwater flow direction is expected to be north, toward the East Castor River;
    - The geometric mean of hydraulic conductivity is 3×10^{-4} cm/s;
    - The horizontal hydraulic gradient is typically measured at approximately 0.005 m/m; and
    - The average linear groundwater velocity in the vicinity of the waste mound is estimated to be about 1 m/yr. and has ranged between 0.9 and 45 m/yr. (as measured between 2007 and 2020) but is typically within the range of 1 – 4 m/yr.

- Bedrock aquifer
    - Bedrock aquifers occurs along and through fractures and bedding plane features (secondary porosity). The contact zone between the upper weathered bedrock surface and the overburden materials (basal till) has an enhanced permeability and thus has a higher hydraulic conductivity than the lower, more massive bedrock;
    - The bedrock aquifers are considered mostly to be confined/semi-confined;
    - Groundwater flow directions in the bedrock have been observed to vary historically - to the south in the area immediately south of the landfill site; and to the north, further south of the landfill site;
    - Horizontal gradients in the bedrock have historically been weak and variable in direction; and
    - The hydraulic conductivity in bedrock aquifer ranges from 1 – 3 $x10^{-5}$ cm/s.

Groundwater Quality and Leachate Indicators

Monitoring wells MW13 and BR07-26 in Boyne Road WDS have been established as representative of background water quality in the overburden and the bedrock, respectively. Monitoring well MW06-22 and the replacement well MW06-22R are screened in the silty sand unit immediately below the waste mound and have been used as indicators of leachate strength at the landfill site.

Based on a comparison of background groundwater quality, leachate quality and mobility of the leachate parameters, leachate indicator parameters (LIPs) for the landfill site are alkalinity, aluminum, ammonia, barium, biological oxygen demand (BOD), boron, chloride, cobalt, conductivity, dissolved organic carbon (DOC), hardness, iron, manganese, phenols, potassium, sodium, and total dissolved solids (TDS).

The 2020 Monitoring Results

Sampling of groundwater quality at the Boyne Road Landfill site is conducted twice annually and reported annually and includes the analysis of general chemistry, metals, and volatile organic compounds.

The summary of the 2020 groundwater assessment is as follows:

- To the west of the landfill site, landfill leachate impacts have been delineated, with monitoring well MW07-23 interpreted to be potentially impacted leachate;
- To the south of the landfill site, landfill leachate impacts have been delineated with MW06-20 interpreted to be potentially impacted and BRW15-3 interpreted to be not impacted by landfill leachate;
- To the north of the landfill site, landfill leachate impacts have been delineated. Monitoring wells at the northern extent of the monitoring network have been interpreted to not be impacted by landfill leachate (MW07-24, MW16-1A, MW16-1B, MW16-3A, MW16-3B and MW16-3C);
- Concentrations of leachate indicator parameters at each monitoring location have been generally consistent for the last several years with the exception of increasing trends in the concentrations of several parameters at MW1, MW5, MW16, BRW1-B, and BRW2, all of which are located on the landfill Site Study Area or within the buffer/CAZ in areas relatively close to the waste footprint; and,

- Within locations monitored in the bedrock there is limited leachate impact except at BRW2 and BRW3, which are located within 100 m of the waste footprint and are interpreted to be impacted by landfill leachate.

Golder states that the existing landfill is in compliance with the Reasonable Use Guideline B-7 (RUG) based on current assessment of the groundwater program.

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Sampling Results

As requested by Mr. Trimper, Groundwater samples were collected for the analysis of PFAS compounds in August 2021. Groundwater samples were obtained at five locations: MW06-22R, MW07-23, MW06-20, MW07-25, and MW4. These locations were selected to characterize PFAS quality in the source leachate (MW06-22R), in the vicinity of the snow storage facility (MW4), and to check for the presence of downgradient PFAS in the north, west, and south directions from the waste footprint (MW07-25, MW07-23 and MW06-20, respectively).

Multiple PFAS compounds were detected in leachate quality well MW06-22R. The sum of the select PFAS compound concentrations in this sample is 1423.8 ng/L. No PFAS compounds were detected in the samples collected at MW4 and MW06-20. Trace PFAS compounds were detected at MW07-23 and MW07-25; the groundwater samples from these locations had a summation of select PFAS compound concentrations of 0.45 ng/L and 20.62 ng/L, respectively.

With the exception of the leachate quality well, all locations reported sums of select PFAS compound concentrations below the MECP suggested drinking water value of 70 ng/L. This indicates that, where present, PFAS compounds are in the groundwater in the immediate vicinity of the waste mound and not migrating in downgradient directions on-site or off-site at concentrations of potential concern to off-site groundwater users.

Groundwater Supply and Source Water Protection

The North Dundas Drinking Water System (System) supplies treated water to Winchester and Chesterville. The System derives its water supply from three communal wells completed in bedrock within and to the west of Winchester (Winchester Wells No. 1, 5 and 6), and two well fields completed in overburden sediments, comprised of three communal wells (Winchester Wells No. 7a, 7b, and 7c) and two communal wells (Chesterville Wells No. 5 and 6).

The Boyne Road Landfill exists within the existing WHPA-D of the Chesterville wellfield with a vulnerability score of 4. The current Source Protection Plan (SNC and RRC, 2016a) for the Chesterville wellfield indicates that the provincial policies concerning waste only apply to WHPAs A and B and portions of WHPA-C for which the vulnerability score is 8 or higher.

Golder concludes that the Boyne Road WDS is not interpreted to be having an impact on the Winchester, Chesterville, or nearby residential wells due to its location within the geological setting, the local hydrogeology and its remote location from residents.

Impact Assessment of the Preferred Undertaking – Boyne Road WDS Expansion

In order to assess the impacts to groundwater, Golder chose chloride and boron as the conservative and mobile leachate indicators.

One-dimensional contaminant transport calculations were completed to provide an assessment of contaminant transport based on the available data for the existing landfill.

Based on the calculation, chloride and boron concentrations are expected to meet RUG limits at 700 m downgradient from the fill area (for the northward and southward groundwater flow pathways) for the proposed landfill expansion. As such, to achieve compliance with the RUG limits in future, it will be necessary for the Township in future to obtain control over an additional 400 m of groundwater travel distance towards the south as CAZ through either property acquisition or groundwater easement below this land area.

It is anticipated that chloride concentrations in the leachate beneath the landfill expansion will be below the RUG limits at approximately year of 2070 or 22 years post closure.

Groundwater Monitoring Program

For the proposed landfill expansion, the continued objectives of the groundwater monitoring program are to monitor the quality of leachate and groundwater to determine the extent and degree of leachate effects on groundwater quality and assess site compliance with the RUG.

Golder proposed the following groundwater monitoring:

- Existing monitoring wells MW7, MW12, BRW3, MW15-1 and 15-2 are within or immediately adjacent to the proposed expansion. These monitoring wells will need to be decommissioned.
- Monitoring Locations: MW1, MW4, MW5, MW9, MW13, MW14, MW16, MW17, MW18, MW19, BRW1-A, BRW1-B, BRW1-C, BRW2, MW06-20, MW06-21, MW06-22R, MW07-23, MW07-24, MW07-25, BRW07-26, BRW15-3, BRW16-1A, MW16-1B, MW16-2, BRW16-3A, MW16-3B, MW16-3C, BRW22-A, MW22-B
- Monitoring Frequency: Spring, Late Summer
- Field Measured Parameters: groundwater levels at all accessible monitoring wells, temperature, conductivity, pH
- Analytical Parameters: potassium, boron, iron, manganese, barium, aluminum, cadmium, chromium, cobalt, lead, zinc, TDS, alkalinity, sulphate, sodium, nitrate, chloride, BOD, DOC, ammonia, dissolved reactive phosphorous (DRP), phenols, hardness (calculated from laboratory calcium and magnesium analysis), copper, nickel; VOCs (at MW06-22R, MW1, MW4, MW5, and MW16 only)

Groundwater Contingency Measures

Should the ongoing groundwater monitoring program at any of the Compliance Evaluation Monitoring Wells define the existence of, or potential for, unacceptable impacts on groundwater quality beyond the CAZ boundaries, the Township will prepare and present a mitigation plan for the approval of the MECP Director and/or the District Manager. Contingency actions to be taken by the Township to prevent or remediate the off-property impacts could consist of:

- Delineation of the extent of the leachate impact on groundwater, and acquisition of additional CAZ land to bring the site into compliance with the RUG;
- Gaining control over the contaminated groundwater to bring the site into compliance; and,

- Developing and implementing groundwater control/treatment measures (for example, a groundwater interceptor trench in overburden or purge wells in bedrock) to bring the site into compliance with the RUG.

Conclusions and Recommendations

- The EA was completed as per the approved TOR;
- I have no objections to the Preferred Undertaking – Boyne Road WDS Expansion;
- The impact assessment on Boyne Road WDS Expansion is acceptable;
- The site specific data indicate that leachate is not migrating toward the municipal wells, the risk posed to the municipal wells appears to be low; however, as mentioned by Mr. Trimper, further assessment and appropriate monitoring and contingency plans are required to ensure that municipal water supplies and regionally significant aquifers are not at risk;
- The groundwater monitoring program is acceptable. However, this program may be adjusted based on the annual monitoring results and the requirements to protect regionally significant aquifers. Additional monitoring wells are required if the new CAZ is established;
- As recommended by Mr. Trimper, the RUG assessments of relevant emerging contaminants associated with landfill leachate should be considered as part of the assessment. One such group of compounds is per- and poly-fluoroalkyl substances (PFAS). PFAS are environmentally persistent compounds that are routinely identified in municipal landfill leachates and pose a potential risk to the environment and human health and are also ideal tracers of landfill leachate;
- The groundwater contingency measures are acceptable. However, the corresponding trigger mechanism should be developed in the following annual report; and
- Reasonable Use Guideline B-7 (RUG) applies to Boyne Road WDS. An annual monitoring report should be prepared by a qualified person (P. Eng or P. Geo) to assess the compliance with the RUG. The report should be submitted to MECP for review.

Thomas Guo, M. Eng, P. Geo.
TG/

cc: Beth Gilbert, Surface Water Specialist
Jordan Hughes, Project Officer, Environment Assessment Branch
Jon Orpana, Regional Environmental Planner, Environmental Assessment Branch
File No.: GW ST ND 03 06 C4 (Boyne Road WDS - ECA No. A482101)
TG/ECHO# 1-98117790

ec: Victor Castro, Water Resources Supervisor
Christina Klein, Technical Support Section Manager

November 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
Ministry of the Environment, Conservation and Parks Thomas Guo, Hydrogeologist – Technical Support Section					
1.	Draft EA	The EA was completed as per the approved TOR;	--	Acknowledged.	Comment has been addressed.
2.	Draft EA	I have no objections to the Preferred Undertaking – Boyne Road WDS Expansion;	--	Acknowledged	Comment has been addressed.
3.	Volume 1, Section 13.2, Impact Assessment of the Preferred Undertaking – Geology and Hydrogeology	The impact assessment on Boyne Road WDS Expansion is acceptable;	--	Acknowledged.	Comment has been addressed.
4.	Volume 1, Section 13.2, Impact Assessment of the Preferred Undertaking –	The site specific data indicate that leachate is not migrating toward the municipal wells, the risk posed to the municipal wells appears to be low; however, as mentioned	Further assessment and appropriate monitoring and contingency plans are required to ensure that municipal water supplies and regionally significant aquifers are not at risk.	Mr. Trimper made his comments for further assessment, monitoring and contingency plans in September 2019 while reviewing the Terms of Reference. It is noted that additional assessment was provided in Section 9.2.2.3 of	Comment has been addressed.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
	Geology and Hydrogeology	by Mr. Trimper, further assessment and appropriate monitoring and contingency plans are required to ensure that municipal water supplies and regionally significant aquifers are not at risk;		Volume 1 for the existing site and Section 13.2.4 of Volume 1 for the preferred landfill expansion alternative. The monitoring and contingency programs outlined in Sections 16.1.1 and 16.2.1 of Volume 1, respectively, although meant primarily to be protective of reasonable groundwater usage adjacent to the landfill, are also therefore monitoring and would trigger contingency that would also be protective of the distant municipal water supply wells. As noted in Section 16.1 of Volume 1, the existing groundwater trigger mechanism will be reviewed and modified as appropriate during the ECA amendment application for the landfill expansion. No changes to the EASR proposed.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
5.	Volume 1, Section 16.1.1, Monitoring and Contingency – Monitoring – Groundwater Monitoring	The groundwater monitoring program is acceptable. However, this program may be adjusted based on the annual monitoring results and the requirements to protect regionally significant aquifers. Additional monitoring wells are required if the new CAZ is established;	--	Acknowledged and agreed that the monitoring program may be adjusted based on the annual monitoring results. It is also acknowledged that additional monitoring wells may be required in the future when the new CAZ is established, noting that the need for installation of those additional monitoring wells will be determined through monitoring and will be triggered at a time when the trigger mechanism is exceeded along the existing south boundary of the landfill site property. As noted in Section 16.1 of Volume 1, the proposed groundwater monitoring program will be finalized and confirmed during the ECA amendment application for the landfill expansion. No changes to the EASR proposed.	Comment has been addressed.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
6.	Draft EA And Volume 1, Section 16.1.1, Monitoring and Contingency – Monitoring – Groundwater Monitoring	As recommended by Mr. Trimper, the RUG assessments of relevant emerging contaminants associated with landfill leachate should be considered as part of the assessment. One such group of compounds is per- and poly-fluoroalkyl substances (PFAS). PFAS are environmentally persistent compounds that are routinely identified in municipal landfill leachates and pose a potential risk to the environment and human health and are also ideal tracers of landfill leachate;	RUG assessments of relevant emerging contaminants (PFAS) associated with landfill leachate should be considered as part of the assessment.	A PFAS assessment was completed for groundwater at the existing landfill as described in Section 9.2.2.2.6 of Volume 1. With the exception of the leachate quality well, all locations evaluated reported sums of select PFAS compound concentrations below the MECP suggested drinking water value of 70 ng/L. This indicates that, where present, PFAS compounds are in the groundwater in the immediate vicinity of the waste mound and not migrating in downgradient directions on the site or off-site at concentrations of potential concern to off-site groundwater users. With this new information, it was determined that monitoring PFAS in groundwater at this landfill did not provide additional clarity or assistance in evaluating site compliance and hence PFAS were not included in the proposed monitoring program identified in Section 16.1.1 of Volume 1. No changes to the EASR proposed.	Having discussed with Shawn Trimper, I concur with the proposal that PFAS would not be included in the proposed monitoring program. However, I will add a condition in the upcoming ECA saying: • Should increasing trends or RUG (Reasonable Use Guideline B-7) limit exceedances occur in the future and the source of such trends/exceedances are uncertain or in dispute, additional PFAS sampling should be used as a tool to differentiate landfill from non-landfill related impacts.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
7.	Volume 1, Section 16.2.1, Monitoring and Contingency – Contingency Measures – Groundwater	The groundwater contingency measures are acceptable. However, the corresponding trigger mechanism should be developed in the following annual report;	The corresponding trigger mechanism should be developed in the following annual report.	There is an existing groundwater trigger mechanism that is described and for which an assessment of triggering is carried out in the annual monitoring report . As noted, the trigger mechanism will be reviewed and updated if required during the ECA application process for the landfill expansion. No changes to the EASR proposed.	Comment has been addressed.
8.	Draft EA And Volume 1, Section 16.2.1, Monitoring and Contingency – Contingency Measures – Groundwater	Reasonable Use Guideline B-7 (RUG) applies to Boyne Road WDS.	An annual monitoring report should be prepared by a qualified person (P. Eng or P. Geo) to assess the compliance with the RUG. The report should be submitted to MECP for review.	Acknowledged. Annual monitoring reports are prepared for the Boyne Road landfill including an assessment of the RUG and are provided to the MECP. These annual reports will continue with landfill expansion if approved. No changes to the EASR proposed.	Comment has been addressed.

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Ontario

M E M O R A N D U M

July 4, 2022

TO: E. Legue, Senior Environmental Officer, Cornwall Area Office

FROM: B. Gilbert, Surface Water Specialist, Technical Support Section, Eastern Region

RE: Draft Environmental Assessment Township of North Dundas Waste Management Plan
Township of North Dundas, United Counties of Stormont, Dundas and Glengarry

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As requested, I have reviewed the surface water aspects of the Draft Environmental Assessment of the Township of North Dundas Waste Management Plan, dated May 2022 prepared by Golder Associates Limited and The Township of North Dundas. The Draft Environmental Assessment consists of several Volumes and Appendices outlined below:

- "Volume 1 - Environmental Assessment of the Township of North Dundas Waste Management Plan, Draft May 2022" prepared by Golder Associates Limited and The Township of North Dundas.
- "Volume 2 – Appendices - Environmental Assessment of the Township of North Dundas Waste Management Plan, Draft May 2022" prepared by Golder Associates Limited and The Township of North Dundas, containing:
    - Appendix A – Approved Terms of Reference [containing: Volume 1 (Proposed Terms of Reference), Volume 2 (Supporting Documents, "Waste Management Alternatives Evaluation"), Volume 3 (Record of Consultation and associated Appendices A through G)]
    - Appendix B – Air Quality and Odour
    - Appendix C – Noise
    - Appendix D – Geology, Hydrogeology, and Geotechnical
    - Appendix E – Surface Water
    - Appendix F – Biology

    - Appendix G – Cultural Heritage
    - Appendix H – Traffic
- "Volume 3 – Supporting Documents – Environmental Assessment of the Township of North Dundas Waste Management Plan, Draft May 2022" prepared by Golder Associates Limited and The Township of North Dundas, containing:
    - Appendix I – New Landfill Site Selection Assessment (note: Draft dated June 2020, not signed by Golder's QPs)
    - Appendix J – Waste Diversion Study
- "Volume 4 – Environmental Assessment of the Township of North Dundas Waste Management Plan, Draft May 2022" prepared by Golder Associates Limited and the Township of North Dundas, containing:
    - Appendix A – Draft Engagement Plan
    - Appendix B – Government Review Team
    - Appendix C – Indigenous Community Consultation
    - Appendix D – Environmental Assessment Notice of Commencement
    - Appendix E – Technical Bulletin #1 – Diversion Study results
    - Appendix F – Technical Bulletin #2 – 'Alternative To' Assessment
    - Appendix G – Technical Work Plans
    - Appendix H – Technical Bulletin #3 – 'Alternative Method' Assessment
    - Appendix I – Open House #3 (In-person and Virtual)
    - Appendix J – Comments Received on the Draft EA

Background

The Boyne Road Waste Disposal Site (WDS) has been in operation since 1965 and is the only operational WDS in the Township of North Dundas. The site receives all residential and some of the industrial, commercial, and institutional waste generated in the Township. The site is approved for the operation of an 8.1 hectare fill area within a total site area of approximately 97.13 hectares by Environmental Compliance Approval (ECA) No. A482101 and has an approved volumetric capacity of 395,000 m^3. The existing landfill site is a natural attenuation landfill, without an engineered bottom liner and leachate collection system.

During 2014, it was recognised that the site was in an overfill situation and at the end of 2014 the volume of waste in place was estimated to be approximately 533,780 m^3, representing an overfill of approximately 139,000 m^3. Since this time annual extensions have been approved through the ECA which are intended to allow the site to continue to operate until a suitable waste management strategy can be determined and implemented.

The Township is seeking to accommodate disposal of waste corresponding to the consumption of approximately 417,700 m^3 of waste landfill disposal from 2023 to 2048 corresponding to a 25-year planning period.

Terms of Reference

The Terms of Reference (ToR) were approved in 2019 and provided the framework for completion of an Environmental Assessment (EA) to evaluate waste management alternatives. Within the Proposed ToR, there was a sample design for a possible expansion of the existing Boyne Road Landfill.

Although the ToR outlined the process for selection of an appropriate remedial strategy, it is understood that a preliminary assessment of waste management options was conducted in 2015 (provided with the ToR as Volume 2) and identified the expansion of the existing naturally attenuating Boyne Road WDS as the preferred waste management alternative. In the 2015 assessment, continued operation of the Boyne Road WDS as a naturally attenuating site was deemed to be the only financially viable alternative for expansion. As such, technical feasibility studies, including surface water studies, only considered proceeding with a landfill expansion on the basis of a continued natural attenuation landfill design approach. The preliminary landfill design was for expansion to the south of the existing disposal area, contiguous to the existing mound.

It is understood that additional alternative assessment would be conducted through the EA process to confirm the preferred option.

Alternatives Considered

The waste management alternatives considered were: site closure and exportation of waste; expansion of the existing Boyne Road Landfill site; develop a new waste disposal site at another location; alternative waste management technologies (i.e. energy from waste); enhanced waste diversion; and, do nothing (a required benchmark of the EA process).

Preferred Option

The draft EA identified increased diversion and expansion of the existing Boyne Road Landfill as the preferred alternative.

Alternative Methods of Landfill Expansion

The draft EA evaluated three landfill expansion methods and selected one of these based on identified/anticipated impacts to known environmental receptors/components. The landfill expansion methods evaluated included: Alternative 1 – Combined horizontal

and vertical expansion with larger east and west buffers; Alternative 2 – Combined horizontal and vertical expansion with larger south buffer; Alternative 3 – Primarily horizontal expansion.

The draft EA identified a preferred method of primarily horizontal expansion after evaluating the anticipated impacts of each method of landfill expansion on various environmental receptors/components.

The draft EA presented a site plan (Figure ES-1) of the preferred expansion design, including the proposed limit of waste, proposed limit of landfill property boundary, controls to be in place such as the relocated perimeter ditch, the proposed location of the stormwater pond, and the portion of Volks Municipal Drain which would have to be isolated from groundwater (via a culvert or a liner). Being that the Volks Municipal Drain is reportedly classified as fish habitat, input (and possibly a permit) from the Department of Fisheries and Oceans has been identified in order to place a culvert or line a portion of the municipal drain. The draft EA also presented a proposed surface water monitoring program, contingency plan, and trigger mechanism.

Proposed Landfill Expansion Design

It is understood that expansion of the existing waste mound would require the purchase of additional land to the southeast and east of the site and deposition of imported permeable fill to provide minimum separation distance between the groundwater table and the waste.

The proposed stormwater design involves directing effluent from the existing and proposed perimeter drains to a newly constructed wetland type stormwater management pond (SWMP) within an existing wet/pooled water area in the northeast corner of the site, without excavation below existing grades.

The existing perimeter ditch is proposed to be moved and it is proposed to raise it above ground surface to avoid impacted groundwater discharging into it. Discharge from the site's stormwater perimeter drains and SWMP would continue to be via the existing culvert to the roadside ditch on the north side of Boyne Road where it would continue to discharge to Volks Municipal Drain and eventually Black Creek.

The SWMP is described as being designed in accordance with the MECP Stormwater Management Planning and Design Manual (2003), providing water quality and quantity control to provide enhanced level treatment (80% total suspended solids removal) and pre- and post-development water quantity control.

Surface Water Regime

The drainage area in question is primarily made up of agricultural drains. Surface water within the existing landfill area drains into a perimeter drain, located along the west, south and east boundaries of the fill area. The perimeter ditch outlets through a culvert at the northeast corner of the site (between SW2 and SW3) to a roadside ditch (Volks Municipal Drain) which runs along the north side of Boyne Road. This roadside ditch flows eastward, then north to the Black Creek municipal drain (2.3 km downstream). Black Creek flows to the East Castor River approximately 12 km downstream from the site, which eventually outlets to the South Nation River.

Groundwater Flow Directions

In section 12.2 (Leachate Management and Groundwater Protection), the seasonally high groundwater table has been described as essentially at ground surface. Section 9.2.2.2.1 (Groundwater Elevations and Groundwater Flow Directions) indicates that groundwater flow direction is both to the north and south of the site and it can be variable with flow occurring to the northeast and to the southwest or southeast. It is also understood that mounding has caused groundwater to flow radially away from the mound in the immediate vicinity of the mound.

Impact Assessment of the Preferred Undertaking – Boyne Road WDS Expansion

Surface water monitoring data collected as part of the Boyne Road WDS surface water monitoring program indicates intermittent landfill leachate effects to the roadside ditch (Volks Municipal Drain). In their 2015 assessment, Golder indicated that implementation of approved contingency measures to mitigate leachate impacts to the roadside ditch would likely be required as a condition of any proposed expansion of the Boyne Road WDS (i.e. installation of a culvert with seepage collars to convey surface water past the site).

Reviewer's Comments:

With reference to the comments on the Terms of Reference provided by Shawn Trimper dated September 5, 2019, and Lauren Forrester dated September 5, 2019, I provide the following comments on the draft EA for your consideration from a surface water impact perspective. Comments pertaining to specific sections of the draft EA are provided for clarity where possible. Comments on the draft EA pertaining to hydrogeological aspects are provided by the Regional Hydrogeologist.

1. The draft EA did not specify what changes occurred to the preliminary design for possible expansion to address/consider previous comments from Regional Hydrogeologist Shawn Trimper dated September 5, 2019 on the ToR The comment was: "A permeable fill layer has been proposed to ensure adequate separation between the groundwater table and the waste. I am concerned that

the proposed permeable layer will result in the seepage of leachate to ground surface and the proposed perimeter ditch. An appropriate design should prevent the seepage/discharge of leachate to surface/surface water".

Comment: Please provide details on how this design concern has been considered and addressed.

2. Prior comments dated September 5, 2019 from Surface Water Specialist Lauren Forrester on the ToR for the North Dundas Waste Management Plan included: "Expansion of the existing waste mound as described above will require the purchase of additional land to the southeast and east of the site and deposition of imported permeable fill to provide minimum separation between the groundwater table and waste. Measures to prevent leachate impacted groundwater from discharging to surface water (including to the roadside ditch along Boyne Road and stormwater works) are also likely necessary and should be evaluated through the EA process. Specific conceptual site design considerations must be in accordance with O. Reg. 232/98 under the Environmental Protection Act."

   Comment: It is recognized that the draft EA presents proposed measures to prevent leachate impacted groundwater from interacting with the surface water in Volks Municipal Drain. Please describe what measures were evaluated through the EA process to prevent leachate impacted groundwater from discharging to other site-specific surface water features, particularly the proposed perimeter ditches and stormwater water management pond.

3. Prior comments from surface water specialist Lauren Forrester (dated September 5, 2019) on the ToR indicate that "If landfill expansion is selected as the preferred alternative, the EA must demonstrate that landfill leachate will be adequately controlled relative to current and potential impacts to surface water (including to any proposed stormwater works)".

   Comment: Please describe how these concerns were addressed and identify how leachate will be adequately controlled relative to impacts to surface water receptors and to the proposed stormwater works.

4. Section 9 (Description of the Environment Potentially Affected for Landfill Expansion).

   General Comment: Please consider describing in more detail the surface water quality management goals for the downstream receiver, Volks Municipal Drain. For example, consider specifying which surface water quality parameters are Policy 1 and which parameters are Policy 2 at the background location through examination of the entire dataset. Based on independent review of the historical

data set of SW1, total phosphorus, nitrate, and iron have 75th percentile values that exceed Provincial Water Quality Objectives (PWQO) or Canadian Water Quality Guidelines (in the case of nitrate) so would be considered Policy 2 parameters. Phenols has a 75th percentile equal to the PWQO so could be considered either Policy 1 or Policy 2. Please consider also stating/describing the overall surface water quality management goal(s) of the Province of Ontario which is "to ensure that the surface waters of the province of Ontario are of a quality which is satisfactory for aquatic life and recreation". In addition to identifying Policy 2 parameters, please consider identifying Policy 1 parameters also since Policy 1 requires surface water quality to be maintained at or above the objective during the undertaking.

Comment: In Section 9.3.3 (Surface Water Quality) the results of the 2020 monitoring sessions are described in relation to downstream concentrations in excess of the UTL (Upper Tolerance Limit). The annual reports also make comparisons relative to the 75th percentiles at the background location. Please consider including both evaluations in the EA.

5. In Section 9.3.2 (Surface Water Quantity) of the draft EA, it is reported that the area directly south of the mound, which is the location of the proposed expansion, is part of a deciduous swamp where water is close to surface for the majority of the year. It is reported that due to flat low-lying topography and lack of detailed topographic survey information in the area south of the existing landfill, it is difficult to determine the surface flow direction in this area and how much of the area directly drains to the perimeter ditch around the landfill and/or how much flows in other directions. Section 9.4.2.1 (Surface Water Features) describes a small piece of degraded swamp along the western edge of landfill site (SWD 3-2, Silver Maple Mineral Deciduous Swamp). This area is described as an area of moist soils and it is indicated that this area may have undergone flooding historically; however, anthropogenic drainage features in the area appear to have diverted spring runoff, at least in part. Section 9.4.2.1.2 (Reach 2) indicates that south of the proposed expansion area there is an agricultural field owned by the Township that is tile drained and which discharges to an intermittent channelized stream/ditch that flows north towards the existing landfill through a culvert under an access road and into the existing perimeter drain of the landfill. Section 13.3.4 (Surface Water Conveyance) indicates that existing tile drainage piping will be removed as required for the expansion and drainage will be directed to the existing natural wetland area.

   Comment: Topographic survey information south of the proposed expansion area could help determine the drainage directions in this area and how much of the area directly drains to the perimeter ditch around the landfill and/or how much

flows in other directions. Ultimately, the EA should provide commitment and confirmation that off site flows which flow onto the proposed expansion area will be directed around (not towards or through) the proposed expansion area/waste mound.

6. The draft EA commits to providing separation distance between the waste and the high groundwater table by importing fill to form the base of the expansion area.

   Comment: It appears as though anthropogenic drainage features in the vicinity of the proposed expansion area had the effect of preventing flooding ('in part') historically. It remains unclear in reading the draft EA a) which area of land contributed to the possible historical flooding and b) if removal of the tile drains from the field to the south of the proposed expansion area would affect determination of the high groundwater table and/or depth of surface water in the natural wetland area where the expansion is proposed. Could additional information be provided on how these uncertainties can be addressed.

7. Section 13.4.1.1.2 (Potential Indirect Impacts, Impact Assessment of the Preferred Undertaking) Page 13-50 indicates potential indirect impacts to aquatic ecosystems during the construction phase of the undertaking including "changes in water quality including a change in: contaminant concentrations, water temperature, nutrient concentrations, dissolved oxygen concentrations, change in baseflow, and change in sediment concentration.

   Comment: Consider describing in more detail the impacts that the preferred undertaking will have on the chemistry of surface water receptors as it relates to the existing Policy Status for that parameter (e.g. is the preferred undertaking expected to meet surface water quality management goals following expansion).

8. Section 13.3.1 (Stormwater Management System Design) indicates that surface drainage from potentially contaminated areas, i.e., originating from active landfilling areas, will be contained locally within berms and will discharge into the waste. Surface drainage from non-contaminated areas such as road areas and areas with interim or final landfill cover will be conveyed to the SWM pond via the internal drainage ditches.

   Comment: Further detail is needed on how the surface drainage from potentially contaminated areas could be contained locally within the berms and discharge into the waste given the concerns raised by Mr. Trimper regarding the proposed permeable layer resulting in the seepage/discharge of leachate to surface/surface water and the proposed perimeter ditch.

9. Volume 1, page E10 states: “Due to high capital and operating costs associated with an engineered leachate collection and treatment system; constraints on the available capacity of Winchester and Chesterville communal sewage treatment systems in the Township; and in the absence of a receiving watercourse for treated effluent from an on-site leachate treatment facility that has year round flow, the only economically viable approach for the Township is to continue operating an expanded Boyne Road Landfill as a natural attenuation site.”

   Comment: This statement implies that a year-round watercourse is needed for an on-site leachate treatment facility. If contingencies are required in the future because of adverse impact, a leachate collection and treatment system may be required, and it is possible to discharge treated landfill leachate effluent from an on-site treatment facility to a receiving watercourse that does not have year-round flow. Dry ditch discharge criteria are conservative and can be considered in consultation with Regional Technical Support staff in scenarios where there is no permanently flowing water course for wastewater assimilation.

10. Section 17.0 (Other Approvals): The snow storage facility is located on lands to the north of the existing landfill footprint. There is little information provided regarding the snow storage facility, it’s drainage patterns to surface water receivers, and interaction with off-site flows from the existing landfill to the Volks Municipal Drain.

    Comment: To the best of my knowledge, the MECP issues Section 53 Ontario Water Resources Act Approval for stormwater associated with snow dumps.

11. Section 16.1.2 (Surface Water Monitoring):

    Section 16.1.2.1: Page 16-1 notes that the proposed surface water monitoring programs for the landfill expansion are summarized in the draft EA and will be finalized and confirmed during the ECA amendment application for the expansion. The EA also notes that the surface water trigger mechanisms will also be reviewed and modified as appropriate at that time. The proposed surface water monitoring program is to maintain the existing stations (SW1, SW4, SW3) and parameters and frequency, but remove SW2 (adjacent to the site) and is proposing to add a sampling location at the outfall of the SWMP. The SMWP outfall is proposed to be sampled four times per year (once in spring and fall and two other times per year after significant rainfall events) and analyzed for the same set of parameters as other surface water monitoring locations. Although the pre-submission consultation for the ECA will focus on detailed review of the surface water monitoring programs and trigger mechanism, at this time the following preliminary concerns are noted:

Comment: When a contingency measure is implemented (e.g., installing a culvert or lined open ditch to ensure surface water drainage along Boyne Road does not interact with leachate impacted groundwater), monitoring programs are adjusted accordingly to monitor the success and effectiveness of the implemented measure. While the surface water monitoring location adjacent to the site (SW2) may need to be adjusted to accommodate the contingency measure, there will be a need to monitor the effectiveness of this contingency action to ensure it works as intended to prevent leachate impacted groundwater from interacting with surface water drainage along Boyne Road.

Comment: Currently, any runoff drainage pathways from the snow storage facility in relation to the existing landfill surface water monitoring stations in Volks Municipal Drain are unknown. This information is needed to undertake a review of the surface water monitoring program locations associated with the existing landfill.

Comment: Since at least 2017, the annual reports have been comparing the trigger concentrations based on both a 75th percentile and an Upper Tolerance Limit statistic. The Upper Tolerance Limit trigger concentration appears to be less conservative in comparison to a 75th percentile approach.

Comment: In Section 9.3.3 (Surface Water Quality) it is indicated that an UTL calculation using background surface water quality data at SW1 is used to evaluate if Policy 2 conditions exist. This should also indicate that annual monitoring reports also use a 75th percentile statistic to characterize background surface water quality data and evaluate impacts. It would be useful at the ECA pre-submission consultation stage to identify whether the two statistical methods result in differing Policy Status and/or increased risk to the environment.

Comment: The parameter list for surface water impact assessment requires some additional laboratory parameters (arsenic, conductivity, mercury and pH) to meet the full list of Schedule 5, Column 3 parameters in Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites, 2012.

Comment: The draft EA acknowledged that the use of chloride as a leachate indicator is complicated by road salting activities and the snow dump on the north side of Boyne Road adjacent to the site. Monitoring of perfluoroalkyl and polyfluoroalkyl substances (PFAS) in surface water may be useful for distinguishing leachate impacts from that of other sources considering the concentration of PFAS detected in the leachate well.

12. Section 16.2.2 identifies proposed contingency measures to address potential surface water impacts. The draft EA indicates contingency measures will be finalized and confirmed during the ECA amendment application for the expansion. The proposed contingency plan for surface water impacts is described as follows: In the event of a trigger concentration being exceeded at the outfall of the stormwater management pond, the result would be confirmed through re-sampling. If the second result is confirmed the pond would be operated in batch discharge mode with the gate valve closed. During batch discharge mode, surface water sampling would occur prior to discharge. Discharge would occur when the concentration for each trigger parameter is less than the corresponding trigger concentration. If impounded water does not meet the trigger concentration it could be slowly infiltrated back into the landfill or possibly pumped into a tanker and hauled to the municipality's sewage lagoons.

    Comment: Re-circulating leachate impacted stormwater back through the waste mound is not an acceptable contingency practice to the best of my knowledge.

    Comment: A contingency measure which is not provided is early site closure and is one that is usually presented in a contingency plan.

Thank you for the opportunity to comment on the draft EA. Should there be any questions or clarification you require regarding these comments, please do not hesitate to contact me.

"*Original Signed by*"

Beth Gilbert, M.Sc.

BG/bg

ec: C. Klein, Technical Support Section Manager
V. Castro, Water Resources Unit Supervisor, Acting
R. Orwin, Air, Pesticides, Environmental Planning Supervisor
J. Hughes, Project Officer, Environmental Assessment Branch

c: T. Guo, Regional Hydrogeologist
File SW ST ND 03 06 C4 (Boyne Road WDS)
File SW 13 06 07 02 BL (Black Creek, South Nation River Basin)
BG ECHO# 1-98063716

November 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
Ministry of the Environment, Conservation and Parks Beth Gilbert, Surface Water Specialist – Technical Support Section					
1.	Draft EA	The draft EA did not specify what changes occurred to the preliminary design for possible expansion to address/consider previous comments from Regional Hydrogeologist Shawn Trimper dated September 5, 2019 on the ToR The comment was: "A permeable fill layer has been proposed to ensure adequate separation between the groundwater table and the waste. I am concerned that the proposed permeable layer will result in the seepage of leachate to ground surface and the proposed perimeter ditch. An appropriate design should prevent the	Please provide details on how this design concern has been considered and addressed.	As outlined in Section 12.2 of Volume 1, the current design continues to use a permeable fill material above the existing ground surface to allow leachate to infiltrate into the groundwater system while minimizing the potential for both the development of a leachate mound within the waste and lateral seeps at the perimeter of the expanded disposal area footprint. As noted in Section 12.5 of Volume 1, the perimeter ditch is proposed to be reconfigured and extended around the perimeter of the expansion footprint. The proposed location of this ditch is near the toe area	General: Many of the comments I provided on the draft EA were technical in nature and the subsequent responses would be appropriate for further technical and engineering review during the ECA application stage.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		seepage/discharge of leachate to surface/surface water".		of the landfill sideslope but elevated in relation to adjacent grades around the expansion such that collected runoff is from the landfill cover only and does not intercept adjacent stormwater or potentially leachate-impacted groundwater. As such, this design concern has been considered and incorporated into the proposed expansion design. No changes to the EASR proposed.	
2.	Draft EA	Prior comments dated September 5, 2019 from Surface Water Specialist Lauren Forrester on the ToR for the North Dundas Waste Management Plan included: "Expansion of the existing waste mound as described above will require the purchase of additional land to the southeast and east of the site and deposition of imported permeable fill to provide minimum	It is recognized that the draft EA presents proposed measures to prevent leachate impacted groundwater from interacting with the surface water in Volks Municipal Drain. Please describe what measures were evaluated through the EA process to prevent leachate impacted groundwater from discharging to other site-specific	See Comment 1 above for how leachate-impacted groundwater will be prevented from discharging to the proposed perimeter ditch. As noted in Section 13.3.4 of Volume 1, stormwater runoff from the landfill cover will be directed to a stormwater management wetland located within an existing partially filled, partially low area adjacent to the	The EA contains the main surface water components that would be expected to comprise aspects of an ECA including a surface water monitoring program, contingency plan, and trigger mechanism. I note that a groundwater monitoring program is also in place. Details of the surface water monitoring program (parameters, locations, monitoring frequency),

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		separation between the groundwater table and waste. Measures to prevent leachate impacted groundwater from discharging to surface water (including to the roadside ditch along Boyne Road and stormwater works) are also likely necessary and should be evaluated through the EA process. Specific conceptual site design considerations must be in accordance with O. Reg. 232/98 under the Environmental Protection Act."	surface water features, particularly the proposed perimeter ditches and stormwater water management pond.	landfill. The depth of excavation will be limited to the existing grades of the existing ditch in the area, to limit the possibility of interception of groundwater potentially impacted by leachate. No changes proposed to the EASR.	contingency plan, and trigger mechanism will be reviewed in detail at the ECA stage and will require support and concurrence from the Regional Surface Water Specialist. The reviewer does not support the contingency plan to re-circulate stormwater through the waste mound on a temporary basis. There is a high groundwater table in the area requiring imported fill to achieve minimum separation between the expansion area and the groundwater table. The site is a naturally attenuating unlined site with no leachate treatment or collection system. Re-circulating stormwater into the mound would be expected to produce additional leachate and subsequently additional impact on surface water quality. Additionally, the waste mound is not to be regarded as a treatment zone.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
3.	Draft EA	Prior comments from surface water specialist Lauren Forrester (dated September 5, 2019) on the ToR indicate that "If landfill expansion is selected as the preferred alternative, the EA must demonstrate that landfill leachate will be adequately controlled relative to current and potential impacts to surface water (including to any proposed stormwater works)".	Please describe how these concerns were addressed and identify how leachate will be adequately controlled relative to impacts to surface water receptors and to the proposed stormwater works.	See responses to Comments 1 and 2 above. Control of potential discharge of leachate-impacted groundwater to surface water in Volks Municipal Drain is also described in Section 12.5 of Volume 1 and further elaborated in 13.4.1.1.1 with two options provided. No changes proposed to the EASR.	Comment has been satisfied. Refer to item 1 response.
4.	Volume 1, Section 9.3, Description of the Environment Potentially Affected for Landfill Expansion – Surface Water	Please consider describing in more detail the surface water quality management goals for the downstream receiver, Volks Municipal Drain. For example, consider specifying which surface water quality parameters are Policy 1 and which parameters are Policy 2 at the background location through examination of the entire dataset. Based on independent review of the historical data set of SW1, total phosphorus, nitrate,	Please consider describing in more detail the surface water quality management goals for the downstream receiver, Volks Municipal Drain. In addition to identifying Policy 2 parameters, please consider identifying Policy 1 parameters also since Policy 1 requires surface water quality to be maintained at or above the objective during the undertaking	Section 9.3 of Volume 1 provides a clear description of the surface water quality management goals of the Province of Ontario and stated which parameters in 2020 were considered Policy 2 parameters. Text has been added to this section to highlight those parameters for the entire dataset at sampling location SW1 that are typically Policy 2, and that the remaining parameters are Policy 1.	Comment has been satisfied. Refer to item 1 response.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		and iron have 75th percentile values that exceed Provincial Water Quality Objectives (PWQO) or Canadian Water Quality Guidelines (in the case of nitrate) so would be considered Policy 2 parameters. Phenols has a 75th percentile equal to the PWQO so could be considered either Policy 1 or Policy 2. Please consider also stating/describing the overall surface water quality management goal(s) of the Province of Ontario which is "to ensure that the surface waters of the province of Ontario are of a quality which is satisfactory for aquatic life and recreation". In addition to identifying Policy 2 parameters, please consider identifying Policy 1 parameters also since Policy 1 requires surface water quality to be			

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		maintained at or above the objective during the undertaking.			
5.	Volume 1, Section 9.3.3, Description of the Environment Potentially Affected for Landfill Expansion – Surface Water – Surface Water Quality	In Section 9.3.3 (Surface Water Quality) the results of the 2020 monitoring sessions are described in relation to downstream concentrations in excess of the UTL (Upper Tolerance Limit). The annual reports also make comparisons relative to the 75th percentiles at the background location.	Please consider including both evaluations in the EA.	Section 9.3.3 has been updated to include the requested information.	Comment has been satisfied. Refer to item 1 response.
6.	Volume 1, Section 9.3.2, Description of the Environment Potentially Affected for Landfill Expansion – Surface Water – Surface Water Quantity	In Section 9.3.2 (Surface Water Quantity) of the draft EA, it is reported that the area directly south of the mound, which is the location of the proposed expansion, is part of a deciduous swamp where water is close to surface for the majority of the year. It is reported that due to flat low-lying topography and lack of detailed topographic survey information in the area south of the existing landfill, it is difficult to	Topographic survey information south of the proposed expansion area could help determine the drainage directions in this area and how much of the area directly drains to the perimeter ditch around the landfill and/or how much flows in other directions. Ultimately, the EA should provide commitment and confirmation that off site flows which flow onto	Given the overarching flat nature of the area, any off-site flows that drain towards the proposed expansion area are expected to be limited to negligible. Presently the perimeter ditch can collect these flows and yet these ditches are regularly dry or have limited water. As such, no specific mechanism was presented to manage these flows, but instead the situation can be monitored and	The response addressed the concern about routing stormwater runoff from off-site sources that flow onto the property around (not through) the waste mound by providing a commitment in Section 18 of the EA while noting this will be further assessed in the ECA-level and final design steps.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		determine the surface flow direction in this area and how much of the area directly drains to the perimeter ditch around the landfill and/or how much flows in other directions. Section 9.4.2.1 (Surface Water Features) describes a small piece of degraded swamp along the western edge of landfill site (SWD 3-2, Silver Maple Mineral Deciduous Swamp). This area is described as an area of moist soils and it is indicated that this area may have undergone flooding historically; however, anthropogenic drainage features in the area appear to have diverted spring runoff, at least in part. Section 9.4.2.1.2 (Reach 2) indicates that south of the proposed expansion area there is an agricultural field owned by the Township that is tile drained and which discharges to an intermittent channelized	the proposed expansion area will be directed around (not towards or through) the proposed expansion area/waste mound.	construction of conveyance features can occur if necessary to direct these expected minor flows away from the expansion area. This will be further assessed in the ECA-level and final design steps. A commitment has been added in Section 18.0, Table 18-2 of Volume 1.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		stream/ditch that flows north towards the existing landfill through a culvert under an access road and into the existing perimeter drain of the landfill. Section 13.3.4 (Surface Water Conveyance) indicates that existing tile drainage piping will be removed as required for the expansion and drainage will be directed to the existing natural wetland area.			
7.	Volume 1, Section 10.1, Description of and Rationale for the 'Alternative Methods' of Landfill Expansion – Design of Expansion Alternatives	The draft EA commits to providing separation distance between the waste and the high groundwater table by importing fill to form the base of the expansion area.	It appears as though anthropogenic drainage features in the vicinity of the proposed expansion area had the effect of preventing flooding ('in part') historically. It remains unclear in reading the draft EA a) which area of land contributed to the possible historical flooding and b) if removal of the tile drains from the field to the south of the proposed expansion area would	As described above in the response to Comment 6, the requirements for control of drainage in the area adjacent to the proposed landfill expansion will be further assessed in the ECA-level and final design steps.	Comment has been satisfied. Refer to item 1 response.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
			affect determination of the high groundwater table and/or depth of surface water in the natural wetland area where the expansion is proposed. Could additional information be provided on how these uncertainties can be addressed.		
8.	Volume 1, Section 13.4.1.1.2, Impact Assessment of the Preferred Undertaking – Biology – Construction Stage – Aquatic Ecosystems - Potential Indirect Impacts	Section 13.4.1.1.2 (Potential Indirect Impacts, Impact Assessment of the Preferred Undertaking) Page 13-50 indicates potential indirect impacts to aquatic ecosystems during the construction phase of the undertaking including "changes in water quality including a change in: contaminant concentrations, water temperature, nutrient concentrations, dissolved oxygen concentrations, change in baseflow, and change in sediment concentration.	Consider describing in more detail the impacts that the preferred undertaking will have on the chemistry of surface water receptors as it relates to the existing Policy Status for that parameter (e.g., is the preferred undertaking expected to meet surface water quality management goals following expansion).	Section 13.4.1.1.2 and Page 13-50 of Volume 1 include potential indirect impacts; all relate to potential for change during the construction stage. During the construction stage, any potential changes in water quality (contaminant concentrations, water temperature, nutrient concentrations and dissolved oxygen concentrations) are directly related to sediment concentrations, if they happen at all. Within Section 13.4.1.1.2 is a detailed description	Comment has been satisfied. Refer to item 1 response.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
				of all necessary mitigation measures to control sediment concentrations and hence. if properly controlled, there should be no associated changes in surface water quality. This section has nothing to do with surface water quality management goals following expansion. Section 13.3.2 of Volume 1 has been updated to describe how leachate-impacted groundwater discharge to surface water and / or direct runoff from waste management areas to surface water have been removed during the design process and, therefore, no adverse changes to surface water quality associated with landfill leachate are anticipated.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
9.	Volume 1, Section 13.3.1, Impact Assessment of the Preferred Undertaking – Surface Water – Stormwater Management System Design	Section 13.3.1 (Stormwater Management System Design) indicates that surface drainage from potentially contaminated areas, i.e., originating from active landfilling areas, will be contained locally within berms and will discharge into the waste. Surface drainage from non-contaminated areas such as road areas and areas with interim or final landfill cover will be conveyed to the SWM pond via the internal drainage ditches.	Further detail is needed on how the surface drainage from potentially contaminated areas could be contained locally within the berms and discharge into the waste given the concerns raised by Mr. Trimper regarding the proposed permeable layer resulting in the seepage/discharge of leachate to surface/surface water and the proposed perimeter ditch.	See response to Comment 1.	Comment has been satisfied. Refer to item 1 response.
10.	Volume 1, Executive Summary, Page E10. And Volume 1, Section 10.1, Description of and Rationale for the 'Alternative Methods' of Landfill Expansion –	Volume 1, page E10 states: "Due to high capital and operating costs associated with an engineered leachate collection and treatment system; constraints on the available capacity of Winchester and Chesterville communal sewage treatment systems in the Township; and in the absence of a receiving watercourse for treated	This statement implies that a year-round watercourse is needed for an on-site leachate treatment facility. If contingencies are required in the future because of adverse impact, a leachate collection and treatment system may be required, and it is possible to discharge treated landfill leachate	Acknowledged, noting that it is our experience that demonstrating compliance with dry ditch discharge criteria from a treatment facility is difficult and costly and not at all an easy approval to navigate or attain from the MECP. Minor updates to the sections noted have been made to reflect that year round flow is not	Comment has been satisfied. Refer to item 1 response.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
	Design of Expansion Alternatives	effluent from an on-site leachate treatment facility that has year round flow, the only economically viable approach for the Township is to continue operating an expanded Boyne Road Landfill as a natural attenuation site."	effluent from an on-site treatment facility to a receiving watercourse that does not have year round flow. Dry ditch discharge criteria are conservative and can be considered in consultation with Regional Technical Support staff in scenarios where there is no permanently flowing water course for wastewater assimilation.	necessary for discharge of treated leachate.	
11.	Volume 1, Section 17.0, Other Approvals	Section 17.0 (Other Approvals): The snow storage facility is located on lands to the north of the existing landfill footprint. There is little information provided regarding the snow storage facility, it's drainage patterns to surface water receivers, and interaction with off-site flows from the existing landfill to the Volks Municipal Drain.	To the best of my knowledge, the MECP issues Section 53 Ontario Water Resources Act Approval for stormwater associated with snow dumps.	Acknowledged. It has been clearly described in Section 12.5 of Volume 1 how leachate-impacted water will be prevented from discharging to the Volks Municipal Drain associated with this landfill expansion and this EA. The snow storage facility is not a component of this project or EA, is not on lands associated with the proposed landfill expansion and hence should not be discussed	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
				in Section 17.0. No change proposed to the EASR.	
12.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water Monitoring Program	Section 16.1.2.1: Page 16-1 notes that the proposed surface water monitoring programs for the landfill expansion are summarized in the draft EA and will be finalized and confirmed during the ECA amendment application for the expansion. The EA also notes that the surface water trigger mechanisms will also be reviewed and modified as appropriate at that time. The proposed surface water monitoring program is to maintain the existing stations (SW1, SW4, SW3) and parameters and frequency, but remove SW2 (adjacent to the site) and is proposing to add a sampling location at the outfall of the SWMP. The SMWP outfall is proposed to be sampled four times per year (once in spring	When a contingency measure is implemented (e.g., installing a culvert or lined open ditch to ensure surface water drainage along Boyne Road does not interact with leachate impacted groundwater), monitoring programs are adjusted accordingly to monitor the success and effectiveness of the implemented measure. While the surface water monitoring location adjacent to the site (SW2) may need to be adjusted to accommodate the contingency measure, there will be a need to monitor the effectiveness of this contingency action to ensure it works as intended to prevent leachate impacted groundwater from	It is acknowledged and agreed that monitoring should be carried out to assess the effectiveness of engineered controls, noting that in this case the measures being proposed within a section of the Volks Drain are part of the expansion design and no longer a contingency measure. If the culvert option is selected, it is not possible to have a sampling location within the culvert. If the lined ditch option is selected, it is considered that continued monitoring at SW3 located just downstream of the design feature will assess its effectiveness. However to appease the MECP an additional monitoring location has been added at the downstream end of the culvert or lined ditch. This location will be	Several design details have been provided at the EA stage in relation to base elevations of proposed perimeter ditches, the proposed stormwater management pond (SWMP), and SWMP outlet elevation along with proposed perimeter ditch fill material. These design details will undergo technical and engineering review at the ECA stage to ensure potentially leachate impacted groundwater will not interact with the proposed stormwater management features for the site (proposed perimeter ditches and SMWP).

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		and fall and two other times per year after significant rainfall events) and analyzed for the same set of parameters as other surface water monitoring locations.	interacting with surface water drainage along Boyne Road.	called SW5 and is shown in an approximate location of Figure 16.1 in Volume 1. The exact location can be determined during EPA application.	
13.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water Monitoring Program	Comment: Currently, any runoff drainage pathways from the snow storage facility in relation to the existing landfill surface water monitoring stations in Volks Municipal Drain are unknown. This information is needed to undertake a review of the surface water monitoring program locations associated with the existing landfill.	--	As described in the annual monitoring reports, there has been visual surveys done during snow melt to check for the presence of drainage from the snow disposal area to the Volks Municipal Drain; none have been observed. This has been considered in the location of the surface water monitoring locations. No changes proposed to the EASR.	
14.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water Monitoring Program	Comment: Since at least 2017, the annual reports have been comparing the trigger concentrations based on both a 75th percentile and an Upper Tolerance Limit statistic. The Upper Tolerance Limit trigger concentration appears to be less	--	Acknowledged, while the Upper Tolerance Limit trigger concentration can be less conservative in comparison to a 75^{th} percentile approach the Upper Tolerance Limit trigger concentration is a more statistically representative method of	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		conservative in comparison to a 75th percentile approach.		background concentration calculation. As noted in Section 16.1 of Volume 1 the trigger mechanism will be reviewed and updated if required during the ECA application process for the landfill expansion. No changes to the EASR proposed.	
15.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water Monitoring Program And Volume 1, Section 9.3.3, Description of the Environment Potentially Affected for Landfill Expansion – Surface Water – Surface Water Quality	Comment: In Section 9.3.3 (Surface Water Quality) it is indicated that an UTL calculation using background surface water quality data at SW1 is used to evaluate if Policy 2 conditions exist. This should also indicate that annual monitoring reports also use a 75th percentile statistic to characterize background surface water quality data and evaluate impacts.	It would be useful at the ECA pre-submission consultation stage to identify whether the two statistical methods result in differing Policy Status and/or increased risk to the environment	See response to Comment 5. It is agreed that these two methods can be discussed at the ECA pre-submission consultation stage.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
16.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water Monitoring Program	Comment: The parameter list for surface water impact assessment requires some additional laboratory parameters (arsenic, conductivity, mercury and pH) to meet the full list of Schedule 5, Column 3 parameters in Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites, 2012.	The parameter list for surface water impact assessment requires some additional laboratory parameters (arsenic, conductivity, mercury and pH) to meet the full list of Schedule 5, Column 3 parameters in Landfill Standards	Within Section 16.1 an explanation was provided as to why the generic monitoring programs set out in *O.Reg.* 232/98 were not being suggested for this site. Namely, this is because of the long, 30 year continuous history of monitoring data available at this site. On other sites proposed for expansion that similarly have a long history of monitoring data, compliance with the full list of parameters set out in O.*Reg. 232/98* has not been a requirement. The additional parameters suggested are not expected to provide any additional relevant information for such a small, rural landfill. No changes to the EASR proposed.	The EA acknowledges that a detailed report will be required to demonstrate the proposed design will comply with O.Reg 232/98 during the ECA application process. Furthermore, at the ECA stage there will be a requirement to document that the proposed design will be able to meet surface water quality management goals in the receiver under the expansion scenario.
17.	Volume 1, Section 16.1.2, Monitoring and Contingency – Surface Water	Comment: The draft EA acknowledged that the use of chloride as a leachate indicator is complicated by road salting activities and	Monitoring of perfluoroalkyl and polyfluoroalkyl substances (PFAS) in surface water may be	The analysis of PFAS in groundwater was described in Section 9.2.2.2.6 of Volume 1. Multiple PFAS	The lack of PFAS monitoring in the existing surface water monitoring program is a concern. PFAS compounds are commonly found in

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
	Monitoring Program	the snow dump on the north side of Boyne Road adjacent to the site.	useful for distinguishing leachate impacts from that of other sources considering the concentration of PFAS detected in the leachate well.	compounds were detected in the leachate quality well but only two of the four downgradient wells sampled and at these locations the concentrations were relatively low. PFAS was considered for the future landfill expansion surface water monitoring program, but it was decided that current results were not significant enough at this time to warrant their inclusion. Should the planned improvements to the Volks Municipal Drain not demonstrate the expected improvement in surface water quality within the drain, PFAS could be added to the monitoring program at a later date. No changes proposed to the EASR.	landfill leachates and are a good tool to distinguish between landfill leachate impacts and non-landfill sources. There are nearby sources of common leachate indicator parameters (e.g., road salting, snow storage facility, and agricultural operations). The reviewer does not support deferring PFAS monitoring in the surface water receiver until after the planned improvements in Volks Municipal Drain have taken place and have not demonstrated the expected improvement in surface water quality within the drain. Baseline concentrations of PFAS compounds in Volks Municipal Drain on the north side of Boyne Road will be needed to evaluate existing impacts on surface water quality and will also be useful to track any expected improvements in surface water quality in future because of planned improvements to Volks

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
					Municipal Drain. Without baseline PFAS concentrations in Volks Municipal Drain, it is unlikely that improvements could be detected in surface water quality and/or attributed to the landfill and/or distinguished from other sources. This can be addressed during the next annual report review and/or during a future ECA application.
18.	Volume 1, Section 16.2.2, Monitoring and Contingency – Contingency Measures – Surface Water	Section 16.2.2 identifies proposed contingency measures to address potential surface water impacts. The draft EA indicates contingency measures will be finalized and confirmed during the ECA amendment application for the expansion. The proposed contingency plan for surface water impacts is described as follows: In the event of a trigger concentration being exceeded at the outfall of the stormwater	Re-circulating leachate impacted stormwater back through the waste mound is not an acceptable contingency practice to the best of my knowledge. A contingency measure which is not provided is early site closure and is one that is usually presented in a contingency plan.	This would not be re-circulating leachate-impacted water but infiltrating stormwater that for whatever reason does not meet the discharge criteria. It is WSP/Golder's recent experience that short term re-circulation of stormwater is an accepted contingency, noting that this has never been accepted on a long term basis. Section 16.2.2 has been updated to reflect this is a proposed short term	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		management pond, the result would be confirmed through re-sampling. If the second result is confirmed the pond would be operated in batch discharge mode with the gate valve closed. During batch discharge mode, surface water sampling would occur prior to discharge. Discharge would occur when the concentration for each trigger parameter is less than the corresponding trigger concentration. If impounded water does not meet the trigger concentration it could be slowly infiltrated back into the landfill or possibly pumped into a tanker and hauled to the municipality's sewage lagoons.		contingency. Since this section describes contingency for the stormwater management pond only, early closure of the landfill has little to no relevance to improving surface water quality that is most likely associated with elevated TSS.	

Ministry of the Environment, Conservation and Parks

Conservation and Source Protection Branch

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Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction de la protection de la nature et des sources

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Ontario

June 22, 2022

MEMORANDUM

To: Jordan Hughes, Project Officer
Environmental Assessment Branch

From: Vesna Alimpic, Program Analyst
Conservation and Source Protection Branch

Re: CSPB Comments - Environmental Assessment of the Township of North Dundas Waste Management Plan

In response to your request for review of the Environmental Assessment (EA) of the Township of North Dundas Waste Management Plan by Conservation and Source Protection Branch (CSPB), the following comments are provided.

Drinking Water Source Protection Requirements

The *Clean Water Act, 2006* (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas are delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs), and surface water Intake Protection Zones (IPZs). Other vulnerable areas that can be delineated under the CWA for municipal drinking water systems include Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs). In addition, event-based modelling areas (EBAs) and Issues Contributing Areas (ICAs) may also occur, overlapping with one of the four above-named vulnerable areas.

The source protection information atlas (SPIA) is publicly available and can be used to locate delineated vulnerable areas in Ontario.
https://www.lioapplications.lrc.gov.on.ca/SourceWaterProtection/index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-CA
https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?site=SourceWaterProtection&viewer=SWPViewer&locale=en-US

Projects that are subject to the *Environmental Assessment Act* that fall under a Class EA, or one of the Regulations, have the potential to impact sources of

drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems), and source protection plan policies could apply.

Specifically, projects that result from individual environmental assessments may include activities that, if located in a vulnerable area, may be considered a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and could be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Waste Management Plans (where a plan includes a drinking water risk) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

Please note that where it has been determined that the project is within a vulnerable area, consideration of source protection must be clearly documented within the project file or environmental study report, as applicable. Specifically the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to sources of drinking water (this should be consulted on with the appropriate source protection authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the project file or environmental study report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

The local source protection authority can provide proponents with assistance in determining whether an activity associated with the construction or operation of the project may be considered to be a drinking water threat as per the CWA and will be able to help determine whether there are policies in the source protection plan that may apply. Please note, even if the project activities in a vulnerable area are deemed not to pose a risk to drinking water, there may be other policies that apply and so consultation with the local source protection authority is important.

Project Specific Comments and Considerations

The Environmental Assessment Study Area, Boyne Road Landfill, is located in the **South Nation Source Protection Area** and is therefore subject to the approved **Raisin-South Nation Source Protection Region Source Protection Plan.**

The Township currently uses the Boyne Road Landfill which has been operating as an approved landfill for the disposal of solid, non-hazardous waste since 1965. The purpose to this EA is to provide environmentally safe and cost-effective long-term waste management for the Township of North Dundas for a 25 year planning period. The proposed alternatives for long-term waste management are: existing landfill site closure and export of waste for disposal; landfill site expansion and existing landfill site closure and alternative waste management technologies. The EA states that the preferred alternative is landfill site expansion.

Boyne Road Landfill is located at Lot 8, Concession VI in the former Township of Winchester. As shown in Figure 1 in Appendix A, the study area falls within Wellhead Protection Area (WHPA) D with vulnerability score 4, Intake Protection Zone (IPZ) 3 with vulnerability score 7, Highly Vulnerable Aquifer (HVA) scoring 6 and a Significant Groundwater Recharge Area (SGRA).

Given that the preferred alternative is not located in groundwater protection zones WHPA A-C with vulnerability score 8 or higher, and is not in surface water protection zones IPZ 1-3 and WHPA-E with vulnerability score 9 or higher, **the expansion of the** Boyne Road Landfill **is not a significant drinking water threat**. This means threats can be moderate/low and select policies may still apply. In addition, within Highly Vulnerable Aquifers there may be other kinds of drinking water systems present that are not explicitly addressed by the source protection plan and the proponent should take these into consideration. EA projects should protect sensitive hydrologic features including current or future sources of drinking water not explicitly addressed in source protection plans, such as private systems – individual or clusters, and designated facilities within the meaning of O. Reg. 170/03 under the *Safe Drinking Water Act* – i.e., camps, schools, health care facilities, seasonal users, etc.

In the EA of the Township of North Dundas Waste Management Plan, the proponent has discussed source water protection thoroughly as part of section 13.2.4 Source Water Protection. The proponent correctly identifies the location of the site area in WHPA-D with a vulnerability score of 4 and notes that the current Source Protection Plan does not have applicable policies for waste management in WHPA-D. The proponent is reminded that the site is also located in vulnerable areas IPZ-3, HVA scoring 6 and an SGRA and encouraged to include this information in the EA.

The proponent should consult with the local source protection authority if they have not already done so.

Thank you for considering the Conservation and Source Protection Branch's comments on the EA of the Township of North Dundas Waste Management Plan. If you have any questions or concerns about the above information, please do

not hesitate to contact myself or Jennifer Moulton, Manager, Conservation and Source Protection Branch.

Vesna Alimpic
Program Analyst, Conservation and Source Protection Branch
705-491-2781
sourceprotectionscreening@ontario.ca

Cc: Jennifer Moulton, Manager, Source Protection Section, CSPB
Mary Wooding, Liaison Officer, CSPB

Appendix A – SPIA Map of EA

Appendix A – SPIA Map of EA site area

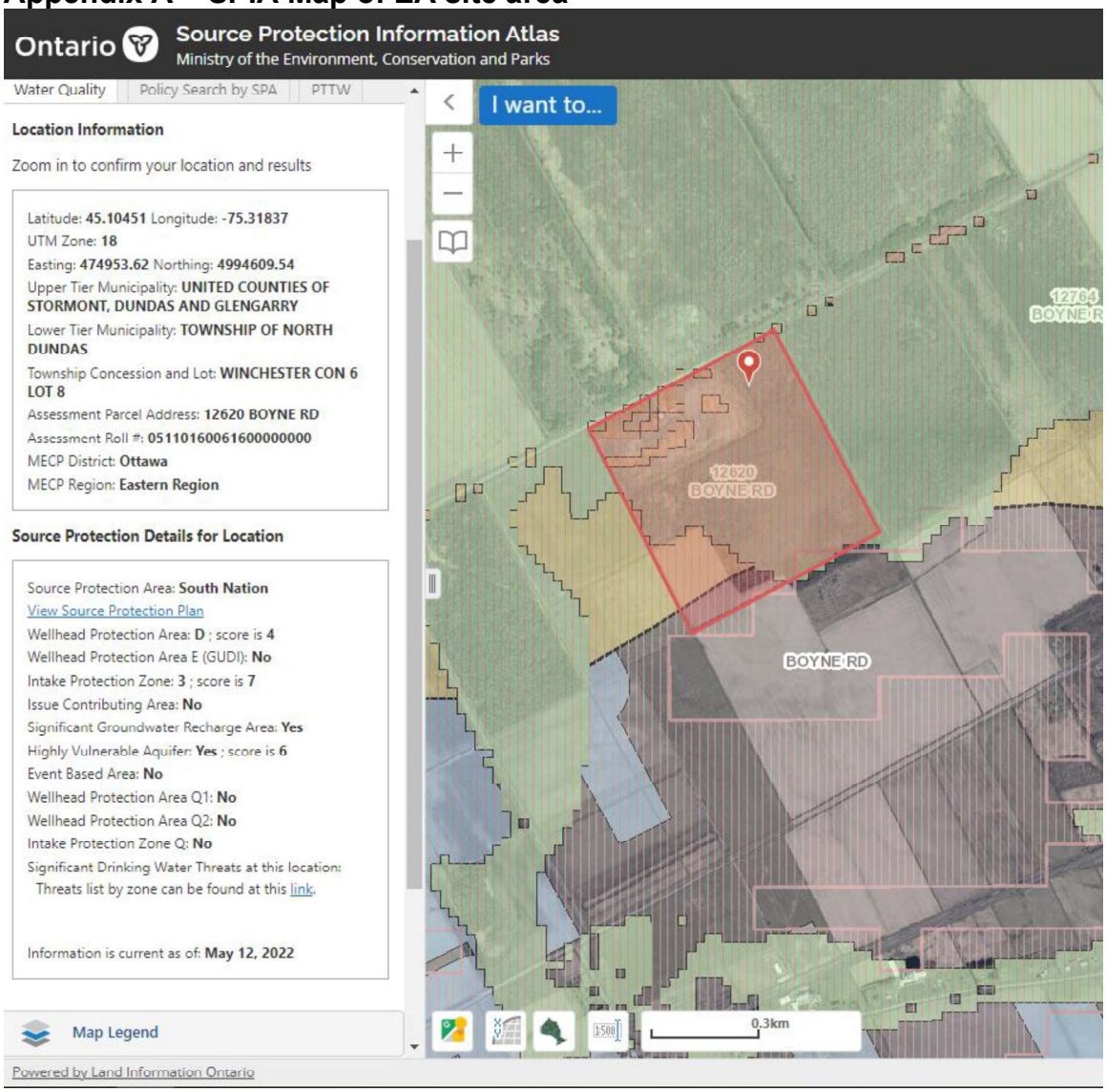

Figure 1 SPIA map showing location of Boyne Road Landfill. Proposed project area (shown in red polygon) is located in WHPA D with vulnerability score 4 (yellow shade), IPZ 3 with vulnerability score 7 (light blue shade), HVA scoring 6 (pink hatching) and a SGRA (green shade).

November 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
Ministry of the Environment, Conservation and Parks Conor Gamelin, Programs and Services Delivery Intern, Conservation and Source Protection Branch (for) Vesna Alimpic					
1.	Draft EA	Given that the preferred alternative is not located in groundwater protection zones WHPA A-C with vulnerability score 8 or higher, and is not in surface water protection zones IPZ 1-3 and WHPA-E with vulnerability score 9 or higher, the expansion of the Boyne Road Landfill **is not a significant drinking water threat.** This means threats can be moderate/low and select policies may still apply.	--	Acknowledged.	CSPB has reviewed the Environmental Assessment (EA) of the Township of North Dundas Waste Management Plan sections related to water resources and source protection. We note that all previous comments have been addressed in the October 2022 Final Draft.

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
2.	Draft EA	In addition, within Highly Vulnerable Aquifers there may be other kinds of drinking water systems present that are not explicitly addressed by the source protection plan and the proponent should take these into consideration. EA projects should protect sensitive hydrologic features including current or future sources of drinking water not explicitly addressed in source protection plans, such as private systems – individual or clusters, and designated facilities within the meaning of O. Reg. 170/03 under the Safe Drinking Water Act – i.e., camps, schools, health care facilities, seasonal users, etc.	There may be other kinds of drinking water systems present that are not explicitly addressed by the source protection plan and the proponent should take these into consideration.	Acknowledged. The proponent has considered the MECP Reasonable Use Guideline B-7 as is required for all existing and expanding landfills for the protection of groundwater at the property boundary to take account of other kinds of drinking water systems that may be present now or in the future.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
3.	Volume 1, Section 13.2.4, Impact Assessment of the Preferred Undertaking – Geology and Hydrogeology – Source Water Protection	In the EA of the Township of North Dundas Waste Management Plan, the proponent has discussed source water protection thoroughly as part of section 13.2.4 Source Water Protection. The proponent correctly identifies the location of the site area in WHPA-D with a vulnerability score of 4 and notes that the current Source Protection Plan does not have applicable policies for waste management in WHPA-D.	The proponent is reminded that the site is also located in vulnerable areas IPZ-3, HVA scoring 6 and an SGRA and encouraged to include this information in the EA.	Acknowledged. Instead of putting this information in Section 13.2.4. which is the impact assessment of the preferred expansion alternative, this information has been added to Section 9.2.2.3 of Volume 1, which is the geology and hydrogeology background section.	
4.	Draft EA	--	The proponent should consult with the local source protection authority if they have not already done so.	Acknowledged and consultation has been undertaken.	

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Ontario

MEMORANDUM

Date: June 1, 2022

To: Jordan Hughes
Project Officer, Environmental Assessment Branch

From: Abdul Quyum
Senior Review Engineer (A), Environmental Permissions Branch

RE: Draft EA Review – Boyne Road Landfill Expansion
The Township of North Dundas, ON

As requested, I have reviewed the following:

- *Draft Environmental Assessment of the Township of North Dundas Waste Management Plan, Volume 1, May 2022.*

The focus of the review was to provide comments on portions the report which deal with components of landfill design and operations. A detailed evaluation of the landfill design, development and operations will be undertaken at the time of amendment to the existing environmental compliance approval (Part V, Environmental Protection Act (EPA)).

Site Description/background:

The Boyne Road Landfill (ECA#A482101) has been operating since 1965 and is located on Lot 8, Concession VI, in the Township of North Dundas, Ontario. The Township currently operates a transfer and recycling facility (the household hazardous waste (HHW), Waste Electrical and Electronic Equipment) and solid, non-hazardous waste from residential and some industrial, commercial and institution (IC&I) sectors. The service area is the Township of North Dundas. The HHW facility also serves the Township of South Dundas. As of 2020, the in-place volume of waste is 560,000.0 cubic meter.

The landfill is a naturally attenuating site without any engineered barrier or leachate collection system. At present, the site has an approved disposal area of 8.1 ha within a total land area of 97.13 ha. In addition, the Township has acquired the groundwater easement rights in contamination attenuation zone (CAZ).

This individual EA is to assess waste management options for a 25 year period (2023-2048) for the Township of North Dundas. The expansion scenario considered three options which included lateral and vertical expansion of the waste footprint (Option 1, 2 and 3). In all three options considered, the site will meet the minimum 30 m buffer zone requirements.

Comments:

1. Section 1.3.2, Residual Waste Disposal (Boyne Road Landfill Site):

   It is indicated that the site has been performing in compliance of the Guideline B-7 for groundwater impact and there has been a discontinuous marginal impact above the Provincial Water Quality Objectives (PWQO) in the surface water related to landfill leachate. This is to be confirmed by regional technical support.

2. Section 9.8.3, Visual:

   The site does not appear to be fully screened as it is visible at a number of points along the site. For landfill sites located in rural areas, the site screening is usually done via natural vegetative (tree/shrubs) cover. As indicated, the site screening will be done via natural vegetative growth, i.e., tree growth. This is an acceptable waste screening practice and will be addressed during Part V, EPA, approval stage.

3. Section 12, Description of the Preferred Undertaking:

   The currently approved capacity is 643,050 cubic meter. Under the preferred expansion option, the landfill lateral footprint area will increase by 3.8 ha, i.e., a total landfill area of 11.9 ha capable of providing additional capacity including a daily cover of 417,700 cubic meters beyond 2023 and 450,000 cubic meters beyond 2020, with a peak elevation of 15 m above the existing grade, which is 2.5 m higher than the currently approved finished elevation. The total site capacity after expansion will be 1,060,750 cubic meters. It is not clear if the capacity increase includes final cover. This should be clarified. The site total approved area of 97.13 ha will be increased to 113.3 ha by adding municipality owned lands to the east and southeast of the site. The vertical and lateral expansion will occur on the southside of the existing waste footprint area. A perimeter ditch will be constructed to collect and re-direct the stormwater to a proposed stormwater management facility to be constructed on the northeast of the site. Under preferred expansion option, the buffer zone to the west will be 30 m, 257 m to the southeast, and 313 m to the southwest. This cannot be confirmed as a buffer zone has not been shown on Figure 12-1. The buffer zone under expansion scenario should be shown on Figure 12-1. The landfill configuration under expansion will comply with the side and top area slope requirements of 25% (1V:4H) and 5% (1V:20H), respectively

4. Section 12.2, Leachate Management and Groundwater Protection

   Since this is a naturally attenuating landfill site and will continue to be operated as is, the leachate collection and treatment control are not required apart from continued assessment of the extent of the CAZ based on the evaluation of the existing data for groundwater impact and its delineation. It is

indicated that an additional 400 m of CAZ lands to the south of the existing delineated CAZ of about 300 m will be required to comply with the Guideline B-7 requirement. The timing of the CAZ expansion or groundwater easement rights will be assessed based on the routine collection and evaluation of the groundwater quality data and its assessment. This approach at this stage is deemed reasonable.

With respect to the groundwater protection, the design includes a 1 m impermeable pad on top of the existing ground surface to provide an adequate vertical separation distance between the base of the waste and seasonally highest recorded water level. The consultant should provide seasonal water elevation data on Figure 12-3 to confirm whether a 1 m impermeable pad would provide adequate vertical separation between the seasonal highest groundwater elevation and the base of the waste. For leachate impacted groundwater discharging into a ditch along the northern portion of the waste fill area, a culvert will be installed along east-west drainage ditch which will cut-off shallow groundwater discharge to surface water in the ditch. This will likely help to reduce groundwater leachate induced impact on surface water receiver along the northern part of the waste fill area that is associated with a radial outward flow.

5. Section 12.4, Landfill Gas (LFG) Management:

   With respect to landfill gas migration, the lateral migration via vadose zone is not expected to occur because groundwater conditions (water level) are not favorable for lateral gas migration through vadose zones and hence, gas venting into the atmosphere is likely. The adverse impact associated with lateral landfill gas migration via subsurface to the neighboring properties is not likely. A gas monitoring program will be included in the EPA approval to ensure compliance with landfill methane gas migration at the property boundary as well as in on-site structures. This will be done at the ECA amendment approval stage.

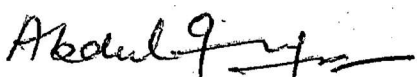
6. Section 12.7, Maintenance and Monitoring and Section 16, Monitoring and Contingency:

   A site-specific groundwater and surface water monitoring program is being implemented as part of the current waste disposal and management operations at the site. It is indicated that the adequacy of the current monitoring program or any modifications to it will be reevaluated, after review of the available monitoring data, at the EPA approval stage. In addition, groundwater and surface water trigger mechanism and contingency plan will be reviewed and modified at that time. The suggested monitoring approach is deemed reasonable. I agree that the generic monitoring program outlined in O. Regulation 232/98, as amended, is not needed because the leachate, groundwater and surface quality appear to have been adequately characterized and well understood. The adequacy of the groundwater and surface water monitoring program outlined in sections 16.1.1. and 16.1.2.1 is expected to be reviewed by regional technical support staff.

7. Section 13.3.1, Stormwater Management System Design:

   The stormwater management will be done by collecting storm water in a pond to be located on the northeast corner of the site and discharging to a roadside ditch. A detailed design of the wetland

type pond will be required at the EPA approval stage to ensure it is of an adequate capacity and will provided adequate treatment before discharging to the natural environment. Whether the proposed stormwater management pond will provide an effective control and containment, is to be assessed by the regional surface water reviewer. The stormwater management pond will require s. 53, OWRA, approval and the proponent has acknowledged this under other approvals required for this site for capacity expansion.



Abdul Quyum, P. Eng., P. Geo. (AB)
Senior Review Engineer (A)

Revised November 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
Ministry of the Environment, Conservation and Parks Abdul Quyum, Senior Review Engineer (A) – Environmental Permissions Branch					
1.	Volume 1, Section 1.3.2, Introduction – Current Waste Management System – Residual Waste Disposal (Boyne Road Landfill Site)	It is indicated that the site has been performing in compliance of the Guideline B-7 for groundwater impact and there has been a discontinuous marginal impact above the Provincial Water Quality Objectives (PWQO) in the surface water related to landfill leachate. This is to be confirmed by regional technical support.	--	Acknowledged. Regional Technical Support has commented on this draft EA.	MECP Waste review is satisfied, and comments have been adequately addressed.
2.	Volume 1, Section 9.8.3, Description of the Environment Potentially Affected for Landfill Expansion – Socio-economic – Visual	The site does not appear to be fully screened as it is visible at a number of points along the site. For landfill sites located in rural areas, the site screening is usually done via natural vegetative (tree/shrubs) cover.	As indicated, the site screening will be done via natural vegetative growth, i.e., tree growth. This is an acceptable waste screening practice and will be addressed during Part V, EPA, approval stage.	Acknowledged.	
3.	Volume 1, Section 12,	The currently approved capacity is 643,050 cubic metres. Under	It is not clear if the capacity increase includes final	The capacity increase does not include final	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
	Description of the Preferred Undertaking	the preferred expansion option, the landfill lateral footprint area will increase by 3.8 ha, i.e., a total landfill area of 11.9 ha capable of providing additional capacity including a daily cover of 417,700 cubic metres beyond 2023 and 450,000 cubic metres beyond 2020, with a peak elevation of 15 m above the existing grade, which is 2.5 m higher than the currently approved finished elevation. The total site capacity after expansion will be 1,060,750 cubic metres. The site total approved area of 97.13 ha will be increased to 113.3 ha by adding municipality owned lands to the east and southeast of the site. The vertical and lateral expansion will occur on the southside of the existing waste footprint area. A perimeter ditch will be constructed to collect and re-direct the stormwater to a proposed stormwater management facility to be constructed on the northeast of the site. Under preferred expansion option, the buffer zone to the west will be 30 m, 257 m to the southeast, and 313 m to the	cover. This should be clarified. The buffer zone under expansion scenario should be shown on Figure 12-1.	cover, as is stated in Sections 10.2 and 12.1.This has been further clarified in Section 12. A note has been added to Figure 12-1 to clearly identify the buffer zone.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
		southwest. This cannot be confirmed as a buffer zone has not been shown on Figure 12-1. The landfill configuration under expansion will comply with the side and top area slope requirements of 25% (1V:4H) and 5% (1V:20H), respectively.			
4.	Volume 1, Section 12.2, Description of the Preferred Undertaking – Leachate Management and Groundwater Protection	Since this is a naturally attenuating landfill site and will continue to be operated as is, the leachate collection and treatment control are not required apart from continued assessment of the extent of the CAZ based on the evaluation of the existing data for groundwater impact and its delineation. It is indicated that an additional 400 m of CAZ lands to the south of the existing delineated CAZ of about 300 m will be required to comply with the Guideline B-7 requirement. The timing of the CAZ expansion or groundwater easement rights will be assessed based on the routine collection and evaluation of the groundwater quality data and its assessment. This approach at this stage is deemed reasonable.	The consultant should provide seasonal water elevation data on Figure 12-3 to confirm whether a 1 m impermeable pad would provide adequate vertical separation between the seasonal highest groundwater elevation and the base of the waste.	The requested information has been added to Figure 12-3. For clarification, the pad below the expanded landfill area is proposed to be composed of permeable (not impermeable) material.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
		With respect to the groundwater protection, the design includes a 1 m impermeable pad on top of the existing ground surface to provide an adequate vertical separation distance between the base of the waste and seasonally highest recorded water level. For leachate impacted groundwater discharging into a ditch along the northern portion of the waste fill area, a culvert will be installed along east-west drainage ditch which will cut-off shallow groundwater discharge to surface water in the ditch. This will likely help to reduce groundwater leachate induced impact on surface water receiver along the northern part of the waste fill area that is associated with a radial outward flow.			

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
5.	Volume 1, Section 12.4, Description of the Preferred Undertaking – Landfill Gas (LFG) Management	With respect to landfill gas migration, the lateral migration via vadose zone is not expected to occur because groundwater conditions (water level) are not favorable for lateral gas migration through vadose zones and hence, gas venting into the atmosphere is likely. The adverse impact associated with lateral landfill gas migration via subsurface to the neighboring properties is not likely. A gas monitoring program will be included in the EPA approval to ensure compliance with landfill methane gas migration at the property boundary as well as in on-site structures. This will be done at the ECA amendment approval stage.	--	Acknowledged, noting it may not be possible to install gas monitoring probes screening the vadose zone at this site because of the very high water table, and hence landfill gas monitoring at the property boundary may not be possible.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
6.	Volume 1, Section 12.7, Description of the Preferred Undertaking – Maintenance and Monitoring and Volume 1, Section 16, Monitoring and Contingency	A site-specific groundwater and surface water monitoring program is being implemented as part of the current waste disposal and management operations at the site. It is indicated that the adequacy of the current monitoring program or any modifications to it will be reevaluated, after review of the available monitoring data, at the EPA approval stage. In addition, groundwater and surface water trigger mechanism and contingency plan will be reviewed and modified at that time. The suggested monitoring approach is deemed reasonable. I agree that the generic monitoring program outlined in O. Regulation 232/98, as amended, is not needed because the leachate, groundwater and surface quality appear to have been adequately characterized and well understood. The adequacy of the groundwater and surface water monitoring program outlined in sections 16.1.1. and 16.1.2.1 is expected to be reviewed by regional technical support staff.	--	Acknowledged and Technical Support Staff have reviewed the draft EA.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Review Response
7.	Volume 1, Section 13.3.1, Impact Assessment of the Preferred Undertaking – Surface Water – Stormwater Management System Design	The stormwater management will be done by collecting stormwater in a pond to be located on the northeast corner of the site and discharging to a roadside ditch. A detailed design of the wetland type pond will be required at the EPA approval stage to ensure it is of an adequate capacity and will provided adequate treatment before discharging to the natural environment. Whether the proposed stormwater management pond will provide an effective control and containment, is to be assessed by the regional surface water reviewer. The stormwater management pond will require s. 53, OWRA, approval and the proponent has acknowledged this under other approvals required for this site for capacity expansion.	--	Acknowledged.	

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M E M O R A N D U M

July 6, 2022

TO: Candice McKay
Sr Environmental Officer
Cornwall Area Office
Eastern Region

FROM: Ross Kircher
Air Quality Analyst
Technical Support Section
Eastern Region

RE: North Dundas Waste Management Plan
Draft EA Study Report (EASR), Boyne Rd Expansion
The Corporation of the Township of North Dundas
636 St. Lawrence St, Winchester, Ontario
ECHO Ref #: 1-99238030

I have reviewed the draft *Environmental Assessment of the Township of North Dundas Waste Management Plan*. The Draft EA Study Report (EASR) is dated May 17, 2020, and includes the following supporting documents relevant to the air quality component of the EASR:

- *Background Air Quality,* prepared by Golder Associates (Golder), dated May 2022. This report is included as Appendix B-1 of Volume 2 of the Draft EA;
- *Emissions Calculations,* prepared by Golder, dated May 2022. This report is included as Appendix B-2 of Volume 2 of the Draft EA;
- *Dispersion Modelling,* prepared by Golder, dated May 2022. This report is included as Appendix B-3 of Volume 2 of the Draft EA;
- *Estimation of Landfill Gas Generation (LandGEM),* prepared by Golder, dated May 2022. This report is included as Appendix B-4 of Volume 2 of the Draft EA;

Comments from an air quality perspective on the above documents are included below.

Background

- The Township of North Dundas (the Township) operates several waste diversion programs, including curbside pickup of residential and institutional, commercial, & industrial (IC&I) businesses. The Township operates the Boyne Road Landfill, which also serves the neighboring township of South Dundas.

- The Boyne Road Landfill is located approximately 2km east of the Village of Winchester. It has been operating since 1965 as a disposal site for solid, non-hazardous waste. The Boyne Road Landfill has an approved disposal area of 8.1 ha, and a total site area of 97.13 ha. The Township has also acquired groundwater easements, referred to as Contamination Attenuation Zones. The site operates under environmental compliance approval (ECA) #A482101. The existing landfill operates without an engineered bottom liner, and without a leachate and/or landfill gas (LFG) collection system.

- The original (1971) approved site capacity was approximately 395,000 cubic metres (m^3) of waste. As of December 2018, the volume of waste currently in place was 533,780m^3, which corresponds to an overfill of approximately 139,000m^3. It is this overfill situation which triggered the EA process.

- Nearby land use is predominantly rural/agricultural, but includes some nearby residential areas.

- The Draft EASR was completed according to the approved Terms of Reference (ToR).

- Included in the ToR as Volume 2 is *Waste Management Alternatives Evaluation*, prepared by Golder Associates (Golder) and dated November 2015. A preliminary study was carried out which identified nearby potential receptors within the vicinity of the site. A description of the atmospheric assessment to be carried out in the EA was also included, which identified potential emission sources associated with landfill expansion. Golder suggested that potential air and odour emissions would be evaluated using an area of coverage described in Section 14 of O. Reg. 419/05 and compared against applicable Ontario Air Quality Standards.

- In addition to the approved ToR, work plans were developed for each environmental component, including air quality, in collaboration with the MECP and other stakeholders.

Overview

- The EA Study Report (EASR) assesses the Township's waste management plan for disposal of post-diversion waste for a 25-year planning period, from 2023 to 2048. The Township is seeking to accommodate disposal of approximately 417,700m^3 of waste from 2023 to 2048.

- The study areas where existing conditions and potential effects of the expansion are assessed are identified as:

    - Site Study Area: A portion of the existing Boyne Road Landfill site where the landfill could be expanded, consisting of the existing waste footprint and an area 300m south;
    - Site-vicinity study area: The lands in the area immediately adjacent (within 500m) to the site study area that may be directly affected by the landfill expansion and activities.
    - Wider study area: An area that comprises the broader community beyond the site vicinity and may include the entirety of the Township of North Dundas, depending on environmental component.

- The Township advanced several alternatives in the EASR, including:

1. Landfill site closure and exporting of waste for disposal;
2. Landfill site expansion;
3. Establish a new landfill site in the Township;
4. Alternative management technologies (thermal treatment);
5. Enhanced at-source waste diversion, and;
6. Do nothing.

- Landfill site expansion was identified as the preferred alternative. Golder identified several alternative methods the achieve the expansion, and selected primarily horizontal expansion as the preferred method.

- The horizontal expansion design consists of vertical expansion above the southern half of the current waste contours, joining with a horizontal expansion to the south. The crest of the waste mound in the primarily horizontal expansion is reached approximately 220m south of Boyne Rd.

- The required footprint for this alternative is approximately 3.8ha, for a total landfill footprint of 11.9ha. The total landfill capacity for waste and daily cover, including the additional 417,700 m3 beyond 2023 provided by the expansion is 1,060,750 m3.

- The landfill site property is currently 97.13 ha. It is proposed to add an additional 16.21ha of Township-owned property to the east and southeast to the landfill property, resulting in a proposed total landfill property area of 113.3 ha. This alternative provides a 30m buffer to the west (followed by the CAZ), a 257m buffer to the east, and a 313m buffer to the south.

- It is proposed that the expanded landfill continue to operate as a natural attenuation site. Golder notes that additional property an/or CAZ easements may be necessary. The design of the expansion includes a 1m thick pad of imported fill material above the existing ground surface to provide a base for waste disposal.

- O.Reg. 232/98 requires a landfill gas (LFG) collection system for new or expanding landfills with a total waste disposal capacity greater than 1.5 million cubic metres. The Boyne Road Landfill does not meet this threshold; therefore, LFG collection is not required as part of this undertaking. Golder notes that there is a high-water table almost at ground surface on and in the area of the landfill site, and therefore off-site lateral migration of landfill gas through the subsurface is not expected.

- The expanded landfill will continue to operate during the same hours as the existing landfill. The existing waste diversion facilities will continue to operate in the central portion of the landfill area.

- The landfill will be progressively closed in phases after the final waste contours have been reached. Final cover will consist of 0.6m of soil and topped with 0.15m of soil capable of sustaining vegetation.

- Predicted effects of the proposed expansion on each of the components were assessed in accordance with the requirements set out in the approved ToR the work plans for specific environmental components. The atmosphere component is comprised of two sub-components: air quality (including dust, odour, greenhouse gas (GHG)), and noise.

- The effects of the proposed landfill expansion on air quality were identified through comparing the existing landfill and the proposed expansion, using the following three steps:

    1. Calculating representative emissions rates for each of the significant sources;
    2. Carrying out atmospheric dispersion modelling to predict off-Site concentrations of the indicator compounds, and;

    3. Comparison of predicted concentrations to existing conditions and the Applicable Guidelines

- All potential sources of emissions from the proposed landfill expansion were considered, however, sources with emissions that are expected to be either negligible or infrequent were omitted from the air quality assessment. Emissions during existing operations and after expansion are expected to be greater than during the post-operation phase (i.e., closure). Therefore, the air emissions and associated effects during the operational phase represent the greatest potential impacts.

- Predicted off-site concentrations of indicator compounds were compared to applicable guidelines, including Ontario Ambient Air Quality Criteria (AAQC), and the Canadian Ambient Air Quality Standards (CAAQCs) to assess potential effects of the proposed expansion.

- Climate change effects were considered by assessing activities associated with the proposed expansion that produce GHGs, including: landfill gas generation and release, fuel combustion for on-site transportation, fuel combustion for comfort heating in on-site buildings, and land clearing as part of landfill expansion.

Appendix B-1 Background Air Quality (Golder, May 2022)

Summary

- Background air quality was characterised using observations from the Environment and Climate Change Canada (ECCC) National Air Pollution Surveillance Network (NAPS) air quality monitoring stations. The closest air quality monitoring station to the Boyne Rd Landfill is located at 960 Carling Avenue in Ottawa, Ontario (Ottawa Central Station). Two other NAPS stations were selected for inclusion in the determination of background air quality: Bedford and Third Street in Cornwall, Ontario (Memorial Park Cornwall Station); and 1128 de la Guerre in Saint-Anicet, Quebec (Saint-Anicet Station). These monitoring stations are located approximately 45km north-northwest, 47km east-southeast, and 76km to the east, respectively.

- The available air monitoring data represents the combined effect of emissions from sources near to each of the monitoring stations, as well as the effect of the emissions transported into the region.

- Golder has derived a wind rose for the site using 2016-2020 data from the ECCC meteorological monitoring station in Kemptville, ON. Predominant wind direction is from the southwest.

- Golder notes that the Ottawa Central and Memorial Park Cornwall NAPS stations are closest to the Boyne Rd site and are therefore likely to be representative of impacts from regional-scale transport of indicator compounds. However, Golder also notes that these monitoring stations are located in areas with significantly different surrounding land uses and activities and are therefore more likely to be influenced by nearby sources of emissions like commercial/industrial activity and vehicular traffic. As such, Golder has concluded that the Saint-Anicet station provides the most representative data for the Background Air Quality assessment, with the exception of particulate species, which were assessed using data from the Ottawa Central station.

- Indicator compounds chosen for the Air Quality assessment are broadly descriptive of the major emissions from the facility, including dust, LFG, and combustion byproducts, and include:

    1. Suspended Particulate Matter (SPM);
    2. Particulate matter <10 micrometers (PM10);
    3. Fine particulate matter <2.5 micrometers (PM2.5);
    4. Nitrogen dioxide (NO2);
    5. Sulphur dioxide (SO2);
    6. Carbon monoxide (CO);
    7. Ozone (O3);
    8. Hydrogen sulphide (H2S);
    9. Vinyl chloride (C2H3Cl)

- The background stations above do not monitor SPM, PM10, or H2S. Golder estimated background concentrations of PM10 and SPM using ratios of these species to PM2.5, as described in *Lall et al.* (2004)- namely, that PM2.5 typically comprises 30% of the mean ambient SPM concentration and 54% of the mean ambient PM10 concentration in Canadian locations. Background H2S concentrations have been derived using ECCC's *draft screening assessment for H2S* (2017) and converted to relevant averaging periods using MECP methodologies in the *Air Dispersion Modelling Guideline for Ontario* (2017).

- Where required, Golder converted monitoring data reported in parts-per-million and parts-per-billion to micrograms per cubic meter (ug/m3) using the molecular weight of each compound and assuming standard atmospheric conditions (1atm of pressure and 25C).

- Golder computed the 90th percentile of the 1-hour, 8-hour, and 24-hour measurements over approximately 5 year periods to represent the typical background air quality concentrations for indicator compounds, as this value is exceeded only 10% of the time. Annual average concentrations were used for annual background levels (Alberta Environment, 2013) based on the limited measurement data.

- Monitoring data from the Saint-Anicet station for the years 2014 through 2018 (where available) were used to calculate 90^{th} percentile background concentrations for most indicator compounds. However, CO and C2H3Cl background concentrations were derived using data from the Saint-Anicet station from 2011-2015, and 2009-2013, respectively. PM2.5, PM10, and SPM background concentrations were derived using data from the Ottawa Central station from 2013-2017.

- 1-hr SO2 concentrations were converted to 10-minute concentrations using MECP methodologies in the *Air Dispersion Modelling Guideline for Ontario* (2017).

- Golder provides a summary of background air quality concentrations in Table B1-18 of Appendix B1.

Comments & Recommendations

- Overall, the *Background Air Quality* study is robust, and I am confident that it adequately summarizes the ambient conditions that may be present at the Boyne Rd site for a reasonable suite of indicator compounds. I do, however, note the following:
    1. The 1hr and 8hr 90th percentile concentrations for CO are identical. This should be confirmed, as all other averaging periods reported different concentrations.
    2. The 24hr 90th percentile concentration for SO2 is higher than the 1hr 90th percentile concentration. This should be confirmed, as this pattern is very atypical of monitoring data.

Appendix B-2 Emission Calculations (Golder, May 2022)

Summary

- The calculated emission rates were used as inputs for dispersion modelling to predict the indicator compound concentrations resulting from the existing and proposed expanded landfill. Emissions were assessed for activities, processes and equipment/vehicle specifications provided by the Township of North Dundas and the Golder design team. Accepted emission factors from U.S. AP-42 (U.S. EPA 1995), were used where appropriate.

- All potential sources of emissions for the proposed expansion were considered; however, only significant sources were included in the dispersion modelling assessment. Sources with emissions rates that are expected to be either negligible or infrequent were not included.

- Significant sources included the landfill cap, landfill working area, paved & unpaved roads, storage piles, and comfort heating. Sources not included in the assessment included on-site vehicles, construction and post-closure phases, and emissions from the public drop off area.

- Tables B2-3 and B2-4 describes the data sources and rationale for emission rate development for the existing and expanded landfill, respectively. Emissions were derived using data from site plans, the US EPA LandGEM model, MECP Guidance, US EPA AP-42 emission factors, historical data, and information provided by the Township of North Dundas.

- Emissions from the landfill cap include fugitive release of LFG. Emission rates from the landfill cap were based on LFG generation rates of 1,526,524m^3/yr and 2,025,457m^3/yr for the existing and expanded landfill, respectively. These values were calculated using LandGEM. LandGEM details are described separately in Appendix B-4. Golder applied the default concentrations of LFG constituents from US EPA AP-42 Chapter 2.4 (Table 2.4-2) to the LFG generation rates above to determine emission rates of each indicator

compound. Golder assumed odour concentrations in LFG were approximately 10,000OU/m^3, based on MECP guidance.

- Landfill working face emissions include odour and particulate, generated from material transfer activities and exposed waste. Golder used US EPA AP-42 methodology to calculate emission rates of SPM, PM10, and PM2.5 for waste deposition and material movement activities. Golder used a maximum wind speed of 9.07m/s for the waste deposition EF calculation, based on the pre-processed meteorological data used in the modelling assessment. Moisture and silt content of cover material was assumed to be 12% and 9%, respectively. Golder assumed working face odour emissions of 0.898OU/m^2/s, based on emission factors for other representative landfills in Ontario (WMCC, 2012). Golder assumed an active working face area of 200m^2.

- Combustion emissions are generated from tailpipes of vehicles travelling on-site. Emission rates from non-road equipment (i.e., compactor and loader) were calculated using emission factors from US EPA. Golder assumed one 284 horsepower (hp) compactor, and one 80hp front end loader. Golder applied generalized particle size distribution factors for stationary internal combustion engines (US EPA AP-42 Table B.2-2) to calculate PM10 emissions.

- Combustion emissions are also generated from on-road vehicles travelling on site access roads. Golder used traffic volumes provided by the Township of North Dundas, based on the Traffic Study completed as part of the EA. Vehicle weights for each class of vehicle were estimated. Table B2-8 describes the weights, and peak trips for the existing and expansion scenario, respectively. Emission factors were calculated for each vehicle class using US EPA MOVES3 model. Road segment length was also provided by the Township- 610m for the existing landfill and 864m for the expansion scenario.

- Fugitive emissions are generated from movement of vehicles on unpaved roads. Golder used US EPA AP-42 Chapter 13.2.2 methodologies to calculate emission factors for unpaved road segments. Unpaved road source height was assumed to be 3m, and lane width was assumed to be 7.3m, both provided by the Township of North Dundas. Silt content for unpaved roads was assumed to be 6.4%. Golder assumed a dust suppressant control efficiency of 40% for unpaved roads for the existing landfill scenario, and 0% in the expanded landfill scenario.

Comments & Recommendations

- Overall, the *Emission Calculations* study is robust, and I am confident that it adequately summarizes the emissions generated from significant sources at the Boyne Rd site for existing and expansion scenarios. I do, however, note the following:
    1. LFG generation rates are calculated using LandGEM. No other detail was provided in *Emissions Calculations*, however, Golder has included a LandGEM study as Appendix B4.
    2. It is unclear why control efficiency of 40% was applied to the existing scenario and 0% applied to the expansion scenario.
    3. Assumptions of odour flux from the working face and waste density are based on the West Carleton Environmental Centre EA (WMCC, 2012). I note that these assumptions are valid only if the waste composition is similar to that of the WCEC.

4. Emission rate calculations for comfort heating were not included in *Emissions Calculations*. An explanation for how emissions were estimated for this source should be provided.

Appendix B-3 Dispersion Modeling (Golder, May 2022)

Summary

- The modelling approach follows generally accepted practices for conducting EAs and, where appropriate, follows *Air Dispersion Modeling Guideline for Ontario* (*ADMGO,* MECP, 2017). Electronic dispersion modelling files were provided for each indicator compound for the expansion scenario.

- Predicted offsite concentrations of indicator compounds were assessed using AERMOD version 19191, and AERMAP version 18081. A 5-year pre-processed meteorological dataset (2016-2020), provided by MECP, was used. This data set was processed with AERMET v19191. Digital terrain data for the site was obtained from the MECP (file CDEM_DEM_040I).

- Discrete receptors representing off-site residences (sensitive receptors) were included in the dispersion model. The closest receptor A nested grid of receptors, sized and spaced as per *ADMGO,* was also included to assess compliance with O.Reg.419/05.

- Hourly emission rates estimated in *Appendix B2* were applied to relevant sources in the dispersion modelling assessment.

- The existing landfill cap and operations were modelled as area sources with release heights of 9.13m and 10.88m above grade, respectively. The expansion landfill cap and operations were modelled as area sources with release heights of at 11.14m and 12.89m, respectively.

- Storage piles and propane space heating have been modelled as volume sources with release heights of 3m, and 5m above grade, respectively.

- The roads at Boyne Road Landfill have been modelled following the line volume source approach, where the roads are represented as a series of individual volume sources creating a line that follows the road. The roads were divided into volume sources with a release height of 2.53m, which was calculated by multiplying the assumed height of the vehicles (2.98 m) by 1.7 and dividing by 2 as per the MECP and USEPA Guidance. The roads are assumed to be 7.3 m wide (for 2 lanes). The emission rate for each entire road segment was divided between the volume sources.

- Road and the landfill operations sources were modelled with an hourly emissions profile. These sources were assumed to only be generating emissions between 8:00-17:00. At other hours of the day, emissions from these sources were assumed to be zero.

- Where applicable, Golder has converted 1-hr predicted concentrations to 10-minute averages using the conversion approach described in the *ADMGO*.

- Predicted concentrations of nitrogen dioxide (NO2) were calculated from modelled nitrogen oxides (NOx) concentrations using the Ozone Limiting Method (OLM). Background ozone concentrations from *Appendix B1* were used.

- Golder modelled three scenarios- the existing landfill with all significant sources, the expansion landfill with all significant sources, and the expansion landfill with only sources required to be assessed for compliance under O.Reg.419/05 (omitting on-site mobile and roadway sources).

Comments & Recommendations

- Results from dispersion modelling were not included in *Dispersion Modelling* study. Rather, a summary of results is included in section 13.1 of the main EASR (Volume 1).

- Overall, the *Dispersion Modelling* study is robust, and I am confident that it adequately summarizes the predicted impacts from the Boyne Rd site for existing and expansion scenarios. I do, however, note the following:
    1. Additional rationale should be provided regarding the selection of release heights of the landfill cap and working face area sources in both existing and expansion scenarios.
    2. No details regarding meteorological anomaly removal or other post-processing of AERMOD output data were included.
    3. Only modelling results from the expansion scenario and O.Reg.419/05 scenario were included, therefore I am unable verify the modelling approach described was undertaken to assess the impacts of the existing scenario.

Appendix B-4 Estimation of Landfill Gas Generation (LandGEM) (Golder, May 2022)

Summary

- Golder estimated the potential landfill gas (LFG) generation rates at the Boyne Road Landfill site in the Township of North Dundas using LandGEM v.3.03 (June 2020) developed by the US EPA.

- The key input parameters for the model are the historical and projected annual tonnages of waste disposed of in the landfill footprint, the LFG production potential and the LFG generation rate factor. The waste inputs for the LandGEM model have been provided in Table B4-2. Golder used Ministry accepted values of 125 m^3 of methane per tonne of waste and 0.040 $years^{-1}$ for the LFG production potential and generation rate, respectively.

- LFG generation rates were estimated for the Boyne Road Landfill based on the estimated historical and projected waste tonnages landfilled, assuming an operational lifespan of 84 years (i.e., 1964 to 2048).

- To estimate the landfilled tonnage, Golder used the following methodology:
    1. The calculated total volume of landfilled airspace used for waste and daily cover between 1965 and 2020 is 555,700m3.
    2. The volume of airspace used in each of 2009 to 2020 was calculated based on annual topographic surveys, with the calculated airspace consumed at the end of 2008 of 375,077m3.

3. Prior to 2009, there are only vehicle counts available to indicate waste received at the site.
4. The estimation of annual fill rate from 1996 to 2008 was based on the average annual fill rate for 2009 – 2011 and corrected for population growth in five-year increments. During this period, approximately 12,500 m3 of airspace was consumed annually.
5. For 1966 to 1995, it was assumed that there were progressive step changes to the annual fill rate, starting at 5000m3/year for 1966 to 1985, 6,500m3/year for 1976 to 1985 and 9,500m3/year for 1986 to 1995.
6. There have been annual surveys of airspace consumed for a number of years; using a compacted waste density of 0.7 tonnes/cubic metre and a 4:1 waste-to-cover ratio, these volumes were converted to tonnage to estimate the projected tonnage of waste during the expansion period from 2023 through 2048.

- LFG generated at the landfill site was assumed to be comprised of approximately 50% methane (CH4) by volume, based on the published data on typical LFG composition.

- The LandGEM calculated LFG generation rate for 2021 (1.52 million m3/yr) was used as the LFG emission rate in the emission rate calculation study. The LandGEM calculated LFG generation rate for 2049 (2.02 million m3/yr, the peak annual generation rate over the expanded landfill's lifetime) was used as the LFG emission rate in the emission rate calculation study.

Comments & Recommendations

- Overall, the *Estimation of Landfill Gas Generation* study is robust, and I am confident that it adequately estimates the predicted LFG generation rates and quantities over the historical and proposed expansion phases of the landfill, and are correctly translated into the other air quality components of the EASR. I do, however, note the following:
    1. The pattern of annual waste fill rates in the expansion phase is unclear. Namely, the estimated waste fill rate is 12960m3/yr in 2020, decreases by 80m3/yr each year until 2030, then increases by 80m3/yr each year again until closure in 2048. Additional rationale is needed.

Section 13.1- EASR Volume 1

Summary

- Results from dispersion modelling were not included in *Dispersion Modelling* study. Rather, a summary of results is included in section 13.1 of the main EASR (Volume 1).

- Golder included a summary of predicted effects at sensitive receptors for both existing and expansion scenarios, as well as an assessment of compliance under O.Reg.419/05. The results from these modelling scenarios are included in *Volume 1* of the EASR as tables 13-3, 13-4, and 13-6, respectively.

- In tables 13-3 and 13-4, predicted offsite concentrations were added to background concentrations, as calculated in Appendix B-2, to determine the cumulative concentrations expected at nearby sensitive receptors in each scenario. These cumulative impacts were compared against relevant air quality criteria (AAQC and CAAQS) for each indicator compound.

- Table 13-6, cumulative impacts were not assessed, as background concentrations are not a component of compliance assessment under O.Reg.419/05.

- For existing and expansion scenarios, the maximum cumulative concentrations of all indicator compounds were below relevant guidelines. As such, Golder concludes that predicted concentrations associated with the landfill expansion are expected to meet air quality criteria at sensitive receptors.

- Predicted maximum concentrations for all indicator compounds at sensitive receptors occurred at the closest residence west of the Boyne Road Landfill along Boyne Road.

- For the existing scenario, maximum predicted cumulative concentrations of SPM were the highest proportion of relevant criteria. A cumulative SPM 24-hr concentration of 82.5µg/m^3 (68.7% of criteria) was predicted for the existing scenario. For the expansion scenario, maximum predicted cumulative concentrations of SPM were also the highest proportion of relevant criteria. A cumulative SPM 24-hr concentration of 117.24µg/m^3 (97.7% of criteria) was predicted for the expansion scenario.

- The O.Reg.41905 assessment reported predicted offsite concentrations (beyond the property line, rather than at just sensitive receptors) for all indicator compounds at below criteria. Golder concludes that the proposed landfill expansion is expected to operate in compliance with Schedule 3 of O.Reg.419/05.

- Golder proposes a number of mitigation measures, consistent with best practices, as outlined in table 13-7 of *Volume 1* of the EASR. These mitigation measures were incorporated into the emissions estimates and therefore are included in the effects assessment(s) as well.

Comments & Recommendations

- Modelling files were not provided for the existing landfill scenario; therefore I am not able to comment on the accuracy and adequacy of the existing scenario results.

- Dispersion modelling files for the expansion scenario were provided, however, no output files detailing the predicted concentrations of indicator compounds at sensitive receptors was provided. Therefore, I am unable to comment on the accuracy of the results reported.

- 24-hr NO2 concentrations reported in Table 13-4 appear to have been incorrectly reported as the annual concentration instead (0.12µg/m3). As such, 24-hr concentrations of NO2 should be provided.

- It is clear from dispersion modelling that the proposed landfill expansion is likely to emit particulate in significant quantities, although background sources are also significant contributors.

- Provided a BMPP and dust control activities can be provided which support the mitigation measures, it is likely that the proposed expansion as currently modelled would meet criteria at discrete receptors. However, it is possible that a confluence of all nearby sources will lead to an increase in dust experienced by nearby receptors, possibly to levels above relevant AAQCs and CAAQs, as the currently modelled results are

extremely close the criteria for SPM (97.7%). Ambient dust monitoring may be considered if the proposed expansion is constructed and seeks approval to operate.

- Overall, the proposed expansion shows a marked increase to predicted cumulative concentrations of 24-hr SPM (42% increase relative to the existing scenario), 24-hr PM10 (28% increase), 1-hr NO2 (10% increase), 24-hr H2S (11% increase), and 24-hr and annual vinyl chloride (25% and 233% increase). Of these, SPM and PM10 are most significant, as Golder reported these compounds at 97.7% and 84.9% of relevant criteria.

Overall, I am generally supportive of the air quality studies which are included in the Boyne Rd landfill expansion EASR, with the above noted comments and recommendations. I conclude that it is likely that the proposed landfill, if constructed, will be a significant contributor to dust and odour in the local area. Dust, odour, and emissions control documents & instruments such as best management practices and Environmental Compliance Approval conditions will be key in preventing and mitigating air quality impacts.

If you have any questions concerning these comments, I would be pleased to discuss them with you.

Ross Kircher
Air Quality Analyst
Technical Support Section
Eastern Region

RJK/

ec: C. Klein
R. Orwin
T. Guo
T. Deweerd
B. Gilbert

c: File AQ ST NS 03 02 (Draft EA Study Report (EASR), Boyne Rd Expansion – May 2022)
ECHO Ref # 1-99238030

November 2022

Ministry of the Environment, Conservation and Parks

Proposal: North Dundas Waste Environmental Management Plan Environmental Assessment
Proponent: Township of North Dundas

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
Ministry of the Environment, Conservation and Parks Ross Kircher, Air Quality Analyst – Technical Support Section					
1.	Volume 2, Appendix B-1, Background Air Quality	Overall, the *Background Air Quality* study is robust, and I am confident that it adequately summarizes the ambient conditions that may be present at the Boyne Rd site for a reasonable suite of indicator compounds.	No change required.	Agreed and acknowledged.	Confirmed modelling results presented in EPR accurately reflect modelling work undertaken. MECP is satisfied and comments have been adequately addressed.
2.	Volume 2, Appendix B-1, Background Air Quality	The 1hr and 8hr 90th percentile concentrations for CO are identical.	This should be confirmed, as all other averaging periods reported different concentrations.	The data was reviewed and the CO concentrations for 1hr and 8hr are the same and data is correct. The reason that they end up being the same value is a result of resolution of the data (i.e. 1 decimal place for ppb) and many values that are zero or no entry. No changes to Volume 2 proposed.	
3.	Volume 2, Appendix B-1, Background Air Quality	The 24hr 90th percentile concentration for SO2 is higher than the 1hr 90th percentile concentration.	This should be confirmed, as this pattern is very atypical of monitoring data.	The Emissions workbook was reviewed and the 24 hr 90th percentile SO2 background concentration is higher than 90th percentile 1 hr SO2 concentration and the data is	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
				correct. The reason this is happening is similar to CO and the resolution on the data.	
4.	Volume 2, Appendix B-2, Emission Calculations	Overall, the *Emission Calculations* study is robust, and I am confident that it adequately summarizes the emissions generated from significant sources at the Boyne Rd site for existing and expansion scenarios.	No change required.	Agreed and acknowledged.	
5.	Volume 2, Appendix B-2, Emission Calculations	LFG generation rates are calculated using LandGEM. No other detail was provided in *Emissions Calculations*, however, Golder has included a LandGEM study as Appendix B4.	--	Acknowledged.	
6.	Volume 2, Appendix B-2, Emission Calculations	It is unclear why control efficiency of 40% was applied to the existing scenario and 0% applied to the expansion scenario.	--	This was a typo in Volume 2 Appendix B-2; 40% was applied to both scenarios. The text in Appendix B-2 has been updated and the reference indicated.	
7.	Volume 2, Appendix B-2, Emission Calculations	Assumptions of odour flux from the working face and waste density are based on the West Carleton Environmental Centre EA (WMCC, 2012). I note that these assumptions are valid only if the waste composition is similar to that of the WCEC.	--	The waste composition for North Dundas is municipal solid waste which is similar to West Carleton Environmental Centre and the odour flux from the working face and density are considered comparable.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
8.	Volume 2, Appendix B-2, Emission Calculations	Emission rate calculations for comfort heating were not included in *Emissions Calculations*.	--	Volume 2, Appendix B-2 has been updated to include information about comfort heating emission rate calculations. Office buildings have electric comfort heating and no emissions. Vehicle and equipment storage buildings use propane heating sources. Note that the propane sources were included in the assessment provided.	
9.	Volume 2, Appendix B-3, Dispersion Modeling	Results from dispersion modelling were not included in *Dispersion Modelling* study. Rather, a summary of results is included in section 13.1 of the main EASR (Volume 1).	--	Acknowledged. Volume, Appendix B-3 is not a stand alone document and should be read in conjunction with the main EASR Volume 1. No changes proposed.	
10.	Volume 2, Appendix B-3, Dispersion Modeling	Overall, the *Dispersion Modelling* study is robust, and I am confident that it adequately summarizes the predicted impacts from the Boyne Rd site for existing and expansion scenarios.	--	Agreed and acknowledged.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
11.	Volume 2, Appendix B-3, Dispersion Modeling	--	Additional rationale should be provided regarding the selection of release heights of the landfill cap and working face area sources in both existing and expansion scenarios.	Text was added to Section 2.2.1, Volume 2, Appendix B-3 to explain the rationale of the selected release heights. The final target elevations for the Existing Landfill were estimated using the 2020 Boyne Landfill Surface Contours figure. An average Active Fill Waste Height was estimated using six cross sections of the landfill (3 east-west and 3 north-south). For the Expansion Landfill scenario, the same methodology (average of 6 cross-sections) was used to estimate the final target heights of the Fill Waste. Cross-sections of Proposed Expansion figure was used.	
12.	Volume 2, Appendix B-3, Dispersion Modeling	No details regarding meteorological anomaly removal or other post-processing of AERMOD output data were included.	--	Meteorological anomalies were not removed and no post processing was carried out. No changes proposed.	
13.	Volume 2, Appendix B-3, Dispersion Modeling	Only modelling results from the expansion scenario and O.Reg.419/05 scenario were included, therefore I am unable verify the modelling approach	--	O.Reg. 419/05 modelling was not considered for the existing scenario. The existing modelling will be provided to the MECP via email.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
		described was undertaken to assess the impacts of the existing scenario.			
14.	Volume 2, Appendix B-4, Estimation of Landfill Gas Generation (LanGEM)	Overall, the *Estimation of Landfill Gas Generation* study is robust, and I am confident that it adequately estimates the predicted LFG generation rates and quantities over the historical and proposed expansion phases of the landfill, and are correctly translated into the other air quality components of the EASR.	--	Agreed and acknowledged.	
15.	Volume 2, Appendix B-4, Estimation of Landfill Gas Generation (LanGEM)	The pattern of annual waste fill rates in the expansion phase is unclear. Namely, the estimated waste fill rate is 12960m3/yr in 2020, decreases by 80m3/yr each year until 2030, then increases by 80m3/yr each year again until closure in 2048.	--	A clearer representation of waste fill rate versus year can be found in Section 7 of Volume 1. It is noted that from 2021 up to 2030 the diversion rate is increasing from 23% of the municipal waste to 33% of the municipal waste. During this time period the increasing diversion rate is outpacing or greater than the projected increase in waste generation as a result of population growth. As such, in net terms it appears like waste fill rates are decreasing. In 2030 there is no further increase in diversion rate anticipated and at this point the increase in annual	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
				waste fill rates is directly related to population increase. No changes to Volume 2, Appendix B-4 proposed.	
16.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	Modelling files were not provided for the existing landfill scenario; therefore I am not able to comment on the accuracy and adequacy of the existing scenario results.	--	The modelling files for the existing landfill scenario will be provided in an email.	
17.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	Dispersion modelling files for the expansion scenario were provided, however, no output files detailing the predicted concentrations of indicator compounds at sensitive receptors was provided. Therefore, I am unable to comment on the accuracy of the results reported.	--	This information is available in the modeling files and Instructions on how to retrieve this information will be provided in an email.	
18.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	24-hr NO2 concentrations reported in Table 13-4 appear to have been incorrectly reported as the annual concentration instead (0.12µg/m3).	--	Volume 1, Section 13.1 Table 13-4 did contain a typo and the correct 24-hr NO2 value is 3.54 ug/m3 and has been updated accordingly.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
19.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	It is clear from dispersion modelling that the proposed landfill expansion is likely to emit particulate in significant quantities, although background sources are also significant contributors.	--	Agree and acknowledged.	
20.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	Provided a BMPP and dust control activities can be provided which support the mitigation measures, it is likely that the proposed expansion as currently modelled would meet criteria at discrete receptors. However, it is possible that a confluence of all nearby sources will lead to an increase in dust experienced by nearby receptors, possibly to levels above relevant AAQCs and CAAQs, as the currently modelled results are extremely close the criteria for SPM (97.7%).	Ambient dust monitoring may be considered if the proposed expansion is constructed and seeks approval to operate.	Understood.	

Comment #	Reference to EA	Comments & Rationale	Proposed Action/Solution	Proponent's Response	Technical Reviewer's Response
21.	Volume 1, Section 13.1, Impact Assessment of the Preferred Undertaking – Atmosphere	Overall, the proposed expansion shows a marked increase to predicted cumulative concentrations of 24-hr SPM (42% increase relative to the existing scenario), 24-hr PM10 (28% increase), 1-hr NO2 (10% increase), 24-hr H2S (11% increase), and 24-hr and annual vinyl chloride (25% and 233% increase). Of these, SPM and PM10 are most significant, as Golder reported these compounds at 97.7% and 84.9% of relevant criteria.	--	Agreed and acknowledged.	

Hughes, Jordan (MECP)

Subject: Draft EA for the North Dundas Waste Technical Review

From: Hann, Carolyn (MECP) <Carolyn.Hann@ontario.ca>
Sent: July-18-22 11:54 AM
To: Hughes, Jordan (MECP) <Jordan.Hughes@ontario.ca>
Subject: RE: Draft EA for the North Dundas Waste Technical Review

Hi Jordan,

I have had a chance to review the Draft EA for the North Dundas Waste Technical Review from the perspective of the Species at Risk Branch reviewing information related to species at risk and the *Endangered Species Act, 2007* (ESA) and have the following comments:

- What were the outcomes of the Eastern Whip-poor-will surveys carried out in 2018 on May 30, June 3 and June 26?

- It is noted that no Butternut or American Ginseng were found during Plant Community Surveys carried out in 2018 on May 30, June 8 and June 21 and in 2019 on September 19 however in section 9.4.4.5.6 of the *Environmental Assessment of the Township of North Dundas Waste Management Plan* it is noted that both species could be present in the site-vicinity. Please clarify. Will either of these species be impacted by the landfill expansion project? If there are concerns that the species may be in the site-vicinity and could be impacted additional surveys should be carried to determine if there will be impacts to the species or their habitat and to assist in guidance with respect to requirements for authorization under the ESA.

- Little Brown Myotis has been detected on site and maternity roost habitat has been identified on site. As the habitat is not limiting for this species in the greater area and if the proponent can avoid impacts to individuals by the removal of habitat outside of the active bat season (April 1 to September 30) it is possible that an authorization would not be required under the ESA.

- Eastern Small-footed Myotis has been detected on site. Please provide more information about available habitat features that may be present on site that support the species. Habitat for this species may be limiting in the area and more information is required to provide guidance with respect to authorization requirements under the ESA.

- If the proposed project will impact individual species at risk or species at risk habitat an authorization may be required under the ESA. Please ensure that if an authorization is required under the ESA that sufficient time to obtain an authorization is factored into the project timeline. To start the process an Information Gathering Form should be submitted to SAROntario@ontario.ca.

If you have further questions or concerns or would like to discuss these comments further please let me know.

Best,

Carolyn Hann
A/ Species at Risk Specialist | Permissions and Compliance Section | Ontario Ministry of Environment, Conservation and Parks | 10-1 Campus Drive, Kemptville, Ontario, K0G 1J0 | PH: 613.355.7312 | Email: carolyn.hann@ontario.ca