



## Supporting Document 3-8

# Cultural Heritage Resources Effects Assessment Report

Eastern Ontario Waste Handling Facility Future  
Development Environmental Assessment

GFL Environmental Inc.

*Moose Creek, Ontario*

September 14, 2022

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## Acknowledgements

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## Executive Summary

Archaeological Services Inc. (ASI) was contracted by GFL Environmental Inc. (GFL) to conduct an assessment of the effects of the future development of the Eastern Ontario Waste Handling Facility (EOWHF) on known and potential cultural heritage resources as part of the EOWHF Future Development Environmental Assessment (EA). The EA is being carried out in accordance with the requirements of the *Environmental Assessment Act* and Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks on January 14, 2021.

This Cultural Heritage Effects Assessment Report assesses the effects of the EOWHF future development on the cultural heritage resources portion of the Cultural Environment. The effects of the future development on Archaeological Resources are assessed in a separate report.

The study areas include the existing EOWHF site and the future development lands as well as potentially-affected surrounding areas. The On-site and Off-site Study Areas identified for the EA in the approved ToR are as follows:

- On-site Study Area – the existing EOWHF, and the future development area comprising the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10 east of the EOWHF; and
- Off-site Study Area – the lands in the vicinity of the future development extending approximately 1 kilometre from the On-site Study Area.

The Cultural Heritage Existing Conditions Report (ASI, 2022) identified three cultural heritage resources with potential for cultural heritage value or interest, located within the Off-site Study Area. No cultural heritage resources were identified within the On-site Study Area.

Key design considerations include any construction or operation activities that could affect identified cultural heritage resources. The construction and operation of Alternative Methods 1 and 2 will take place within the existing On-site Study Area. Construction and operation of the EOWHF future development will be planned and undertaken to avoid impacts to identified cultural heritage resources. Both alternative methods will continue to use established operating procedures currently in place at the EOWHF. No additional large equipment will be required for either alternative method. Neither alternative method considers an increase in landfill height. The net effects analysis for Alternative Methods 1 and 2 were based on the proposed construction and operational activities outlined in the Conceptual Design Report.

There are no potential effects to identified cultural heritage resources from construction or operational activities associated with either Alternative Methods 1 and 2. There is no substantial difference between the two alternative methods, and no preferred alternative has been identified. No mitigation measures are proposed for the cultural heritage resource component of the Cultural Environment as no effects are predicated as a result of the EOWHF future development.

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# Acronyms, Units and Glossary

## Acronyms

Acronym	Definition
ASI	Archaeological Services Inc.
CDR	Conceptual Design Report
EAA	Environmental Assessment Act
EOWHF	Eastern Ontario Waste Handling Facility
GFL	GFL Environmental Inc.
GHG	Greenhouse Gas
HDR	HDR Corporation
LCS	Leachate collection system
LFG	Landfill gas
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
OES	Ontario Electronic Stewardship
PIF	Project Information File
ToR	Terms of Reference

## Units

Unit	Definition
km	kilometre
m	metre

## Glossary

Term	Definition
Approval	Permission granted by an authorized individual or organization for an undertaking to proceed. This may be in the form of program approval, certificate of approval or provisional certificate of approval
Bulking Material	Material such as woodchips added to high nitrogen materials like food scraps to provide a carbon source and increase the porosity of the compost.
Built Heritage Resource	"...a building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Indigenous community. built heritage resources are located on property that may be designated under Parts IV or V of the <i>Ontario Heritage Act</i> , or that may be included on local, provincial, federal and/or international registers" (Government of Ontario, 2020, p. 41).

## Glossary

Term	Definition
Capacity (Disposal Volume)	The total volume of air space available for disposal of waste at a landfill site for a particular design (typically in m <sup>3</sup> ); includes both waste and daily cover materials, but excludes the final cover.
Composting	The controlled microbial decomposition of organic matter, such as food and yard wastes, in the presence of oxygen, into finished compost (humus), a soil-like material. Humus can be used in vegetable and flower gardens, hedges, etc.
Composting facility	A facility designed to compost organic matter either in the presence of oxygen (aerobic) or absence of oxygen (anaerobic).
Cultural Heritage Landscape	"...a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Cultural heritage landscapes may be properties that have been determined to have cultural heritage value or interest under the <i>Ontario Heritage Act</i> , or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms" (Government of Ontario, 2020, p. 42).
Cultural Heritage Resource	Includes above-ground resources such as built heritage resources and cultural heritage landscapes, and built or natural features below-ground including archaeological resources (Government of Ontario, 2020).
Environment	As defined by the Environmental Assessment Act, environment means: <ul style="list-style-type: none"> <li>• air, land or water;</li> <li>• plant and animal life, including human life;</li> <li>• the social, economic and cultural conditions that influence the life of humans or a community;</li> <li>• any building, structure, machine or other device or thing made by humans;</li> <li>• any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or</li> <li>• any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach).</li> </ul>
Environmental Assessment	A systematic planning process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment
Evaluation criteria	Evaluation criteria are considerations or factors taken into account in assessing the advantages and disadvantages of various alternatives being considered
Greenhouse gas	Any of the gases whose absorption of solar radiation is responsible for the greenhouse effect, including carbon dioxide, methane, ozone, and the fluorocarbons.
Impact	Includes negative and positive, direct and indirect effects to an identified cultural heritage resource. Direct impacts include destruction of any, or part of any, significant heritage attributes or features and/or unsympathetic or incompatible alterations to an identified resource. Indirect impacts include, but are not limited to, creation of shadows, isolation of heritage attributes, direct or indirect obstruction of significant views, change in land use, land disturbances (Ministry of Tourism and Culture, 2006). Indirect impacts also include potential vibration impacts (See Section 3 for complete definition and discussion of potential impacts).
Indicators	Indicators are specific characteristics of the evaluation criteria that can be measured or determined in some way, as opposed to the actual criteria, which are fairly general

## Glossary

Term	Definition
Known Cultural Heritage Resource	A known cultural heritage resource is a property that has recognized cultural heritage value or interest. This can include a property listed on a Municipal Heritage Register, designated under Part IV or V of the <i>Ontario Heritage Act</i> , or protected by a heritage agreement, covenant or easement, protected by the <i>Heritage Railway Stations Protection Act</i> or the <i>Heritage Lighthouse Protection Act</i> , identified as a Federal Heritage Building, or located within a UNESCO World Heritage Site (Ministry of Tourism, Culture and Sport, 2016).
Landfill gas	The gases produced from the wastes disposed in a landfill; the main constituents are typically carbon dioxide and methane, with small amounts of other organic and odour-causing compounds
Landfill site	An approved engineered site/facility used for the final disposal of waste. Landfills are waste disposal sites where waste is spread in layers, compacted to the smallest practical volume, and typically covered by soil.
Leachate	Liquid that drains from solid waste in a landfill and which contains dissolved, suspended and/or microbial contaminants from the breakdown of this waste.
Methane gas	A colourless, odourless highly combustible gas often produced by the decomposition of decomposable waste at a landfill site. Methane is explosive in concentrations between 5% and 15% volume in air.
Mitigation	Measures taken to reduce adverse impacts on the environment.
Potential Cultural Heritage Resource	A potential cultural heritage resource is a property that has the potential for cultural heritage value or interest. This can include properties/project area that contain a parcel of land that is the subject of a commemorative or interpretive plaque, is adjacent to a known burial site and/or cemetery, is in a Canadian Heritage River Watershed, or contains buildings or structures that are 40 or more years old (Ministry of Tourism, Culture and Sport, 2016).
Proponent	A person who: <ul style="list-style-type: none"> <li>• carries out or proposes to carry out an undertaking; or</li> <li>• is the owner or person having charge, management or control of an undertaking.</li> </ul>
Receptor	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Significant	With regard to cultural heritage and archaeology resources, significant means “resources that have been determined to have cultural heritage value or interest. Processes and criteria for determining cultural heritage value or interest are established by the Province under the authority of the <i>Ontario Heritage Act</i> . While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation” (Government of Ontario, 2020, p. 51).
Terms of Reference	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Undertaking	Is defined in the Environmental Assessment Act as follows: <ul style="list-style-type: none"> <li>• An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities;</li> <li>• A major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations; or</li> <li>• An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program ("enterprise").</li> </ul>

## Glossary

Term	Definition
Vibration Zone of Influence	Area within a 50 metre buffer of construction-related activities in which there is potential to affect an identified cultural heritage resource. A 50 metre buffer is applied in the absence of a project-specific defined vibration zone of influence based on existing secondary source literature and direction provided from the Ministry of Heritage, Sport, Tourism and Culture Industries (Carman et al., 2012; Crispino & D'Apuzzo, 2001; P. Ellis, 1987; Rainer, 1982; Wiss, 1981). This buffer accommodates the additional threat from collisions with heavy machinery or subsidence (Randl, 2001).
Waste	Refuse from places of human or animal habitation; unwanted materials left over from a manufacturing process.





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# 1 Introduction

Archaeological Services Inc. (ASI) was contracted by GFL Environmental Inc. (GFL) to conduct an assessment of the effects of the future development of the Eastern Ontario Waste Handling Facility (EOWHF) on known and potential cultural heritage resources as part of the EOWHF Future Development Environmental Assessment (EA).

The EA is being carried out in accordance with the requirements of the *Environmental Assessment Act* (EAA) and Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on January 14, 2021.

The environment was divided into environmental aspects, components and evaluation criteria as listed in **Table 1-1**. Existing conditions reports and effects assessment reports have been prepared to address the environmental components.

**Table 1-1. Environmental Aspects, Components and Evaluation Criteria**

Environmental Aspect	Environmental Component	Evaluation Criteria
Natural Environment	Atmospheric Environment	<ul style="list-style-type: none"> <li>• Air Quality</li> <li>• Noise</li> <li>• Odour</li> </ul>
	Geology and Hydrogeology	<ul style="list-style-type: none"> <li>• Groundwater Quality</li> <li>• Groundwater Quantity</li> </ul>
	Surface Water Environment	<ul style="list-style-type: none"> <li>• Surface Water Quality</li> <li>• Surface Water Quantity</li> </ul>
	Ecological Environment	<ul style="list-style-type: none"> <li>• Terrestrial Ecosystems</li> <li>• Aquatic Ecosystems</li> </ul>
Socio-Economic Environment	Economic	<ul style="list-style-type: none"> <li>• Economic Effects on / Benefits to Local Community</li> </ul>
	Social	<ul style="list-style-type: none"> <li>• Effects on Local Community</li> <li>• Visual Impact of Facility</li> </ul>
Cultural Environment	Cultural Environment	<ul style="list-style-type: none"> <li>• Cultural Heritage Resources</li> <li>• Archaeological Resources</li> </ul>
Built Environment	Transportation	<ul style="list-style-type: none"> <li>• Effects from Truck Transportation along Access Roads</li> </ul>
	Current and Planned Future Land Use	<ul style="list-style-type: none"> <li>• Effects on Current and Planned Future Land Uses</li> </ul>
	Aggregate Extraction and Agricultural	<ul style="list-style-type: none"> <li>• Aggregate Resources</li> <li>• Effects on Agricultural Land</li> </ul>

This Cultural Heritage Effects Assessment Report assesses the effects of the EOWHF Future Development Project on the cultural heritage resources portion of the Cultural Environment. The effects of the Project on archaeological resources are assessed in a separate report.

The purpose of the proposed undertaking is to provide approximately 15.1 million cubic metres (m<sup>3</sup>) of additional landfill disposal capacity at the existing EOWHF over a 20-year

planning period, with operations anticipated to begin in 2025 and closure anticipated in 2045. The undertaking will enable GFL to continue to provide disposal services for residual non-hazardous solid waste to their customers once the landfill reaches its currently approved disposal capacity and continue to provide economic support to the local community over the long term. No changes to the approved fill rates or site access routes are proposed.

Two alternative methods for carrying out the undertaking were identified in the approved ToR and are developed to a preliminary conceptual design level in the Conceptual Design Report (CDR). Both alternative methods provide a landfill volume of approximately 15.1 million m<sup>3</sup> based on the approved fill rate of 755,000 tonnes per year over a 20-year planning period. Studies completed for the EOWHF have indicated that, based on the underlying soils, the design alternatives are limited to varying lateral configurations with a consistent height. Both alternative methods will continue to use established operating procedures currently in place at the EOWHF and would maximize the use of existing site infrastructure.

Alternative Method 1 (**Figure 1-1**) consists of implementing the future development through five stages: one stage adjacent to and north of the existing landfill (Stage 5); and four stages oriented east-west within the future development lands (Stages 6 through 9). Stages 6 through 8 will be identical in size, while Stages 5 and 9 will be smaller. A stormwater management system will be constructed consisting of conveyance ditches around the perimeter of each stage and a retention pond located northwest of Stage 8. The existing pond located northeast of Stage 5 will be modified to attenuate peak flows if required.

Alternative Method 2 (**Figure 1-2**) consists of implementing the future development through four stages: one stage adjacent to and north of the existing landfill (Stage 5); and three stages oriented north-south within the future development lands (Stages 6 through 8). Stages 6 and 7 will be identical in size, while Stages 5 and 8 will be smaller. A stormwater management system will be constructed consisting of conveyance ditches around the perimeter of each stage and a retention pond located north of Stages 6 and 7. The existing pond located northeast of Stage 5 will be modified to attenuate peak flows if required.

For both alternative methods, the design of the stages will be consistent with the existing landfill design. Visual screening will be constructed along the north and east perimeters and a portion of the south perimeter consisting of earthen berms and/or vegetation plantings. A new road entrance will be constructed from Laflèche Road, which will include a new scale facility.

The purpose of this Effects Assessment Report is to present the potential environmental effects of the alternative methods on cultural heritage, a comparison of the net effects of each alternative method, the selection of a preferred alternative, an assessment of the environmental effects of the preferred alternative, commitments and monitoring, and approvals. The results from this study will be documented in an EA Study Report in accordance with the approved ToR, which will be submitted to the MECP for review.

Figure 1-1. Alternative Method 1



**LEGEND**

- GFL SITE LIMITS
- PROPOSED ACCESS ROAD
- PROPOSED DRAINAGE DITCH
- EXISTING DRAIN
- + EL. 95.50 EXISTING SPOT ELEVATION
- EL. 95.50 PROPOSED SPOT ELEVATION



ISSUE	DATE	DESCRIPTION
H	2022-06-02	ISSUED FOR REVIEW
G	2022-05-13	ISSUED FOR REVIEW
F	2022-03-04	ISSUED FOR REVIEW
E	2021-11-17	ISSUED FOR REVIEW
D	2021-08-09	ISSUED FOR REVIEW
C	2021-08-03	ISSUED FOR REVIEW
B	2021-06-15	ISSUED FOR REVIEW
A	2021-03-24	DRAFT FOR DISCUSSION

DESIGN	AJC
DRAWN	AJC
CHECKED	MS
APPROVED	LF
PROJECT NUMBER	10287067

PLANNING PURPOSES ONLY  
 NOT FOR CONSTRUCTION

**GFL ENVIRONMENTAL EASTERN ONTARIO  
 WASTE HANDLING FACILITY  
 FUTURE LANDFILL EXPANSION  
 CONCEPT**

**PROPOSED TOP OF FINAL  
 CONTOURS  
 ALTERNATIVE 1 PLAN**

0 150 300 m FILENAME: C-103.dwg  
 SCALE: 1:150,000

DRAWING

Figure 1-2. Alternative Method 2



ISSUE	DATE	DESCRIPTION
H	2022-06-02	ISSUED FOR REVIEW
G	2022-05-13	ISSUED FOR REVIEW
F	2022-03-04	ISSUED FOR REVIEW
E	2021-11-17	ISSUED FOR REVIEW
D	2021-08-09	ISSUED FOR REVIEW
C	2021-06-29	ISSUED FOR REVIEW
B	2021-06-15	ISSUED FOR REVIEW
A	2021-03-28	DRAWN FOR DISCUSSION

DESIGN	AJC
DRAWN	AJC
CHECKED	MS
APPROVED	LF
PROJECT NUMBER	10287067

PLANNING PURPOSES ONLY  
 NOT FOR CONSTRUCTION

GFL ENVIRONMENTAL EASTERN ONTARIO  
 WASTE HANDLING FACILITY  
 FUTURE LANDFILL EXPANSION  
 CONCEPT

PROPOSED TOP OF FINAL  
 CONTOURS  
 ALTERNATIVE 2 PLAN

SCALE 1:150,000  
 FILENAME C:104.dwg

DRAWING

## 2 Effects Assessment Methods

Using the evaluation criteria, indicators, rationale and data sources from the approved ToR and the existing conditions from the Cultural Heritage Existing Conditions Report (ASI 2022), the effects assessment is carried out as follows:

- predict the potential environmental effects for each alternative method (Section 3);
- identify the preferred alternative based on a comparative evaluation of the potential environmental effects of each alternative method (Section 4); and
- conduct an effects assessment on the preferred alternative, including the identification of mitigation measures and monitoring programs (Sections 4 and 5).

### 2.1 Predict Potential Environmental Effects for Alternative Methods

The potential environmental effects for each alternative method are identified based on the application of the evaluation criteria, indicators and data sources in the approved ToR and based on the maximum allowable waste receipt level for the EOWHF landfill. The potential effects can be positive or negative, direct or indirect, and short- or long-term. Mitigation measures are identified to minimize or mitigate the potential effects and then the net effects are evaluated taking into consideration the application of mitigation measures.

#### 2.1.1 Study Areas

The existing EOWHF is located within the Township of North Stormont, approximately 5 km north-northwest of the village of Moose Creek, Ontario, and 5 km east of the village of Casselman, Ontario, on the western half of Lot 16 and Lots 17 and 18, Concession 10, Township of North Stormont, United Counties of Stormont, Dundas and Glengarry, near the intersection of Highway 417 and Highway 138. The municipal street address for the facility is 17125 Laflèche Road, Moose Creek, Ontario. The lands to the east of the existing EOWHF being considered for the future development include the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10. The existing EOWHF encompasses a site area of 189 hectares, while the lands to the east of the existing EOWHF being considered for future development include approximately 240 hectares.

The study areas include the existing site as well as potentially affected surrounding areas. The On-site and Off-site Study Areas identified for the EA in the approved ToR are as follows (**Figure 2-1**):

- On-site Study Area – the existing EOWHF, and the future development area comprising the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10 east of the EOWHF; and
- Off-site Study Area – the lands in the vicinity of the future development extending approximately 1 kilometre from the On-site Study Area.

These study areas were used for the purposes of the cultural heritage effects assessment.

**Figure 2-1. Study Areas for the Cultural Heritage Effects Assessment**



## 2.1.2 Evaluation Criteria, Indicators and Data Sources

The evaluation criteria, rationale, indicators and data sources used for the cultural heritage resource component of the Cultural Environment effects assessment as per the approved ToR are provided in **Table 2-1**.

**Table 2-1. Evaluation Criteria, Indicators and Data Sources for the Cultural Environment**

Evaluation Criteria	Rationale	Indicators	Data Sources
<b>Cultural Environment</b>			
Cultural Heritage Resources	Activities related to construction and operation of the landfill may result in direct or indirect impacts to identified cultural heritage resources.	Proximity of known and potential cultural heritage resources to the landfill site (known/potential cultural heritage resources will be assessed for potential direct or indirect impacts)	<ul style="list-style-type: none"> <li>• Published data sources</li> <li>• Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) - Built Heritage and Cultural Heritage Landscapes Checklist</li> <li>• MHSTCI - Ontario Heritage Tool Kit</li> <li>• Cultural Heritage assessment</li> <li>• Commemorative statements</li> <li>• Proposed facility characteristics</li> <li>• Landfill design and operations data</li> </ul>

### 2.1.3 Key Design Considerations and Assumptions

The alternative methods of carrying out the undertaking are described in detail in the CDR. Regarding the alternative methods, the key design considerations and assumptions as they relate to the cultural heritage resource component of the Cultural Environment are described below. Key design considerations include any construction or operation activities that could affect cultural heritage resources.

#### Summary of Existing Conditions

The Cultural Heritage Existing Conditions Report (ASI 2022) identified three cultural heritage resources with potential for cultural heritage value or interest, located within the Off-site Study Area (**Figure 2-2**). These include:

- CHR 1 – A farmscape identified during field review during a previous heritage assessment. It has an unknown address, described as being located on the south side of Concession Road 7 between 37 and 49 Concession Road 7;
- CHR 2 – A residence and former farmscape identified during field review, located at 17423 Allaire Road; and
- CHR 3 – A farmscape identified during field review, located at 1790 County Road 8.

No cultural heritage resources were identified within the On-site Study Area.



Figure 2-2. Cultural Heritage Resource Locations



## Design Considerations and Assumptions

Key design considerations include any construction or operation activities that could affect identified cultural heritage resources. The construction and operation of Alternative Methods 1 and 2 will take place within the On-site Study Area. Construction and operation of the EOWHF Future Development will be planned and undertaken to avoid impacts to identified cultural heritage resources. Both alternative methods will continue to use established operating procedures currently in place at the EOWHF. No additional large equipment will be required for either alternative method. Neither alternative method considers an increase in landfill height.

Vehicles currently travel to the site via Highway 417, Highway 138 and Lafleche Road, or via Highway 401, Highway 138 and Lafleche Road. No changes to traffic volumes beyond currently-approved levels or changes to waste haul routes are anticipated as a result of the EOWHF future development.

Both alternative methods will result in construction of phased landfill envelopes consistent with existing landfill design, new stormwater management system, new access road and internal road network, new scale facility, soil storage pad, and visual screening along the north and east perimeters and a portion of the south perimeter consisting of earthen berms and/or vegetation plantings.

## 2.2 Comparative Evaluation and Identification of the Preferred Alternative

The two alternative methods are comparatively assessed and evaluated using the criteria and indicators to determine the preferred alternative. The differences in the potential environmental effects following the implementation of potential mitigation/management measures (i.e., net effects) are used to identify and compare the advantages and disadvantages of each alternative method.

The net environmental effects are utilized in a comparison of the two alternatives to one another at the criteria and indicator level for each discipline. The following two step methodology was applied in order to carry out the comparative evaluation for the cultural heritage resource component of the Cultural Environment:

1. Identify the predicted net effect(s) associated with each alternative for each indicator and assign a preference rating (i.e., Preferred, Not Preferred, No Substantial Difference); and
2. Rate each alternative at the criteria level (i.e., Preferred, Not Preferred, No Substantial Difference) based on the identified preference rating for each indicator and provide a rationale.

## 2.3 Effects Assessment of the Preferred Alternative

An assessment of the environmental effects of the preferred alternative is carried out considering the same criteria, indicators and data sources, taking into account potential mitigation/management measures and cumulative effects. The effects assessment of the preferred alternative will be presented in the EA Study Report.

# 3 Net Effects Assessment

The results of the net effects assessment for each alternative method are provided in Sections 3.1 and 3.2.

To assess the potential impacts of the EOWHF Future Development Project, identified cultural heritage resources are considered against a range of possible negative impacts, based on the *Ontario Heritage Tool Kit Info Sheet #5: Heritage Impact Assessments and Conservation Plans* (Ministry of Tourism and Culture, 2006). These include:

Direct impacts:

- Destruction of any, or part of any, significant heritage attributes or features; and
- Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.

Indirect impacts:

- Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden;

- Isolation of a heritage attribute from its surrounding environment, context or a significant relationship;
- Direct or indirect obstruction of significant views or vistas within, from, or of built and natural features;
- A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces; and
- Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.

Indirect impacts from construction-related vibration have the potential to negatively affect cultural heritage resources depending on the type of construction methods and machinery selected for the project and proximity and composition of the identified resources. Potential vibration impacts are defined as having potential to affect an identified cultural heritage resources where work is taking place within 50 metres of features on the property. A 50-metre buffer is applied in the absence of a project-specific defined vibration zone of influence based on existing secondary source literature and direction provided from the MHSTCI (Carman et al., 2012; Crispino & D'Apuzzo, 2001; P. Ellis, 1987; Rainer, 1982; Wiss, 1981). This buffer accommodates any additional or potential threat from collisions with heavy machinery or subsidence (Randl, 2001).

The project should endeavor to avoid adversely affecting cultural heritage resources and interventions should be managed in such a way that identified significant cultural heritage resources are conserved. When the nature of the project is such that adverse impacts are unavoidable, it may be necessary to implement alternative approaches or mitigation strategies that alleviate the negative effects on identified cultural heritage resources. Mitigation is the process of lessening or negating anticipated adverse impacts to cultural heritage resources and may include, but are not limited to, such actions as avoidance, monitoring, protection, relocation, remedial landscaping, and documentation of the cultural heritage resource if to be demolished or relocated.

### 3.1 Alternative Method 1

The net effects assessment for Alternative Method 1 is presented in **Table 3-1**.

**Table 3-1. Net Effects Assessment – Alternative Method 1**

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
Cultural Heritage Resources	Proximity of known and potential cultural heritage resources to the landfill site (known/potential cultural heritage resources will be assessed for potential direct or indirect impacts)	<ul style="list-style-type: none"> <li>• Three cultural heritage resources are located within the Off-site Study Area:                             <ul style="list-style-type: none"> <li>○ CHR 1,</li> <li>○ CHR 2,</li> <li>○ CHR 3</li> </ul> </li> <li>• No cultural heritage resources are identified within the On-site Study Area</li> <li>• The construction and operation of Alternative Method 1 will take place within the existing On-site Study Area</li> <li>• Construction and staging will be suitably planned and undertaken to avoid impacts to identified cultural heritage resources</li> <li>• There are no operational changes anticipated for the expanded landfill, and therefore no changes in general operational practices, on-site equipment, traffic volume or waste haul routes are expected as a result of Alternative Method 1</li> <li>• No changes to the landfill height are expected</li> <li>• The planned construction activities within the On-site Study Area will result in five phased landfill envelopes consistent with existing landfill design, stormwater management system, new access road from Laflèche Road and internal road network, new scale facility, soil storage pads, and visual screening along the north and east perimeters and a portion of the south perimeter consisting of earthen berms and/or vegetation plantings</li> </ul>	<ul style="list-style-type: none"> <li>• No direct impacts to identified cultural heritage resources are anticipated</li> <li>• No indirect adverse impacts on identified cultural heritage resources are anticipated, as there will be no changes to the landfill height and operational changes</li> <li>• The planned expanded landfill and associated construction activities will not result in vibration impacts to identified cultural heritage resources as they are located more than 50 metres from the future site</li> <li>• Given the distance between identified cultural heritage resources and the On-site Study Area, the presence of an existing landfill site, as well as the proposed visual screening around the site, no adverse impacts to the setting or character of identified cultural heritage resources are anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>• None required</li> </ul>	<ul style="list-style-type: none"> <li>• No net effects on cultural heritage resources</li> </ul>

## 3.2 Alternative Method 2

The net effects assessment for Alternative Method 2 is presented in **Table 3-2**.

**Table 3-2. Net Effects Assessment – Alternative Method 2**

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
Cultural Heritage Resources	Proximity of known and potential cultural heritage resources to the landfill site (known/potential cultural heritage resources will be assessed for potential direct or indirect impacts)	<ul style="list-style-type: none"> <li>• Three cultural heritage resources are located within the Off-site Study Area:                             <ul style="list-style-type: none"> <li>○ CHR 1,</li> <li>○ CHR 2,</li> <li>○ CHR 3</li> </ul> </li> <li>• No cultural heritage resources are identified within the On-site Study Area</li> <li>• The construction and operation of Alternative Method 2 will take place within the existing On-site Study Area</li> <li>• Construction and staging will be suitably planned and undertaken to avoid impacts to identified cultural heritage resources</li> <li>• There are no operational changes anticipated for the expanded landfill, and therefore no changes in general operational practices, on-site equipment, traffic volume or waste haul routes are expected as a result of Alternative Method 2</li> <li>• No changes to the landfill height are expected</li> <li>• The planned construction activities within the On-site Study Area will result in four phased landfill envelopes consistent with existing landfill design, stormwater management system, new access road from Laflèche Road and internal road network, new scale facility, soil storage pads, and visual screening along the north and east perimeters and a portion of the south perimeter consisting of earthen berms and/or vegetation plantings</li> </ul>	<ul style="list-style-type: none"> <li>• No direct impacts to identified cultural heritage resources are anticipated</li> <li>• No indirect adverse impacts on identified cultural heritage resources are anticipated, as there will be no changes to the landfill height and operational changes</li> <li>• The planned expanded landfill and associated construction activities will not result in vibration impacts to identified cultural heritage resources as they are located more than 50 metres from the future site</li> <li>• Given the distance between identified cultural heritage resources and the On-site Study Area, the presence of an existing landfill site, as well as the proposed visual screening around the site, no adverse impacts to the setting or character of identified cultural heritage resources are anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>• None required</li> </ul>	<ul style="list-style-type: none"> <li>• No net effects on cultural heritage resources</li> </ul>

## 4 Comparative Evaluation of Net Effects and Identification of the Preferred Alternative

A comparative evaluation of the net effects of each alternative method and the identification of a preferred alternative are carried out in accordance with the methods described in Section 2.2. The results of the comparative evaluation are provided below.

### 4.1 Comparative Evaluation Results

No preferred alternative is identified from a cultural heritage resource perspective as there are no substantial differences in the net effects between the alternative methods.

Three cultural heritage resources were identified within the Off-site Study Area for both alternative methods; however, no potential effects to cultural heritage resources are anticipated from either alternative method.

The results of the comparative evaluation for the cultural heritage resource component of the Cultural Environment are provided in **Table 4-1**.

**Table 4-1. Comparative Evaluation of Net Effects for the Cultural Environment: Cultural Heritage Resources**

Evaluation Criteria	Indicators	Net Effects of Alternative Methods	
		Alternative Method 1	Alternative Method 2
Cultural Heritage Resources	Proximity of known and potential cultural heritage resources to the landfill site	No net effects on cultural heritage resources <b>No Substantial Difference</b>	No net effects on cultural heritage resources <b>No Substantial Difference</b>
	<b>Criteria Rating &amp; Rationale</b>	<p><b><i>There is no substantial difference between the alternative methods with regards to cultural heritage resources.</i></b></p> <p>No preferred alternative is identified from a cultural heritage resources perspective as there is no substantial difference in the net effects between the alternative methods</p>	



## 4.2 Advantages and Disadvantages of the Preferred Alternative

The differences in net effects are used to identify and compare the advantages and disadvantages of each alternative method. As no net effects were identified, there is no substantial difference between the two alternative methods, and no preferred alternative has been identified.

## 5 Commitments and Monitoring

No mitigation measures are proposed for the cultural heritage resource component of the Cultural Environment as no effects are predicated as a result of the EOWHF future development. The commitments associated with the cultural heritage resource component of the Cultural Environment are listed in Section 5.1.

### 5.1 Cultural Heritage Commitments

The commitments associated with the Cultural Environment are as follows:

- Construction and operation will take place within the existing On-site Study Area; and
- Construction activities and operation of the EOWHF future development will be planned and undertaken to avoid impacts to the identified cultural heritage resources.

## 6 References

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