VOLUME I

Draft - Proposed Terms of Reference

Environmental Assessment of the Proposed
Quarry Landfill Expansion, Stelco Lake Erie Works, Nanticoke

20136711

January 6, 2023

Executive Summary

INTRODUCTION

An Individual Environmental Assessment (EA) for the proposed expansion of the Quarry Landfill at the Lake Erie Works Facility (LEWF) (EA Study) is being undertaken by Stelco Inc. (Stelco, the proponent) and requires approval under the provincial *Environmental Assessment Act (EAA)*. The first phase in the EA process is preparation of a Terms of Reference (ToR). Work on the ToR, which is the framework for carrying out the EA, started in June 2021.

This is an Executive Summary of the content of the draft proposed ToR, which has been prepared by Stelco and will be circulated to government review agencies, Indigenous Communities, the Community Liaison Committee and the public for comment. The comments that will be received on the draft ToR will be considered by Stelco in making revisions and preparing the proposed ToR, which will then be submitted to the Minister of Environment, Conservation and Parks (Minister) for a decision. The approved ToR provides the framework or work plan that must be subsequently completed to prepare the EA, and the basis for its review and approval.

Description of the Existing Quarry Landfill

The existing Quarry Landfill is situated in a 5.5 hectare (ha), 34 metre (m) deep former limestone quarry at the west end of the LEWF. The landfill boundary corresponds to the vertical rock wall of the former quarry. Environmental Compliance Approval (ECA) (formerly Certificate of Approval (C of A)) No. A110119 for the Quarry Landfill was issued in 1984 for the disposal of 1,300,000 cubic metres (m^3) of “Blast Furnace (BF) Slag, steel making slag and other non-hazardous solid wastes having a leachate quality better than or equal to leachate from BF Slag and steel making slag” from “the Stelco Inc. Lake Erie Works site and the Stelco Inc. Hamilton Works Site” (Hamilton Works Facility (HWF)).

In 2012, amended ECA No. A110119 was issued for a new engineered landfill cell of 545,000 m^3 capacity, within the northern portion of the Quarry Landfill and within the total site capacity of 1,300,000 m^3. Construction of the new cell commenced in 2013 and was completed in 2014. Construction involved placement of clayey soil fill to form the cell base grades, and installation of a low permeability base liner and leachate collection system.

Landfilling resumed following construction of the new cell, consisting of various steel making secondary materials that have limited reuse potential. These materials are comprised of BF sludge, Off-gas sludge, casthouse baghouse dust and secondary ventilation system (SVS) baghouse dust.

There is an ongoing annual environmental monitoring program carried out at the Quarry Landfill for groundwater and surface water, the requirements of which are set out in ECA No. A110119. Based on the results of the 2021 monitoring program (RWDI, 2022), the overall site performance of the landfill is not having an adverse impact on nearby groundwater resources and surface water quality in Centre Creek is generally stable over time and not being adversely affected by the landfill.

THE EA PROCESS

The *EAA* is a provincial statute that sets out a planning and decision-making process to evaluate the potential environmental effects of a proposed undertaking or project (Ontario, 1990). Ontario Regulation (*O. Reg.) 101/07* for Waste Management Projects, which was made under the *EAA*, states (in part) that some waste management

projects, regardless of whether the proponent is public or private, are designated under the *EAA*. According to Section 4 of *O. Reg. 101/07* (Ontario, 2007), the increased landfill capacity proposed in this ToR is subject to an EA because more than 100,000 m^3 is proposed to be added to the total waste disposal volume for the Quarry Landfill.

Flexibility of the ToR to Accommodate New Circumstances

Assuming that the Minister of the Environment, Conservation and Parks approves this ToR, some minor adjustments might be required during the preparation of the EA. Flexibility in this ToR would include minor variations such as a change in EA methodology or consultation methods. In addition, circumstances may arise during the EA that do not allow commitments made during the ToR to be fulfilled; if this were to occur, the commitment may be subject to further refinement and adjustments during the EA.

The justification for any proposed minor modifications will be provided to and discussed with the Ministry of the Environment, Conservation and Parks (MECP) when and if they occur during the EA process, in advance of submitting the EA. Any modifications will be documented, together with the justification, in the EA study report.

The incorporation of flexibility in the ToR is not intended to allow significant changes in the scope of the project, but rather to allow for minor adjustments to or departures from the ToR during the EA without having to start the ToR/EA process over again.

PROPOSED QUARRY LANDFILL EXPANSION

The proposed EA Study is the EA for the proposed expansion of Stelco's Quarry Landfill at the LEWF for disposal of non-hazardous secondary steel making waste for a 15 to 25 year planning period. Stelco is seeking to accommodate disposal corresponding to the consumption of approximately 1,185,000 to 1,685,000 m^3 of additional secondary materials (excluding final cover and to be confirmed during the EA Study). Current projections estimate that the approved capacity of the existing Quarry Landfill will be reached during 2023. The total additional capacity includes approximately 435,000 m^3 of legacy residual steel making secondary materials from the HWF.

In addition to the significant diversion of 93% of its secondary steel making residual waste that has already been achieved by Stelco, the proponent will continue their efforts to divert secondary steel making materials from disposal but ultimately some amount of residual disposal need is expected.

The description and rationale will evolve during the preparation of the Environmental Assessment. Therefore, the final description of the proposed project and the rationale for it will be included in the Environmental Assessment.

DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS AND POTENTIAL EFFECTS

The EAA defines the environment in a broad, general sense. The environmental components for this ToR and EA consist of: atmosphere, geology and hydrogeology, surface water, biology, agriculture, land use, cultural heritage, socio-economic, transportation and technical considerations. Section 4 of the ToR presents an overview of existing environmental conditions on and in the area of the Quarry Landfill, and a more detailed description of the environmental conditions will be provided in the EA report.

DESCRIPTION OF AND ASSESSMENT OF 'ALTERNATIVES TO' THE PROJECT

In terms of 'Alternatives To', Stelco has considered the range of alternatives that are reasonably available to it as a private company as follows:

- Alternative 1 – Landfill Site Closure and Export of Waste for Disposal
- Alternative 2 – Landfill Site Expansion
- Alternative 3 – Establish New Landfill Site at a Different Stelco Property or a New Property
- Alternative 4 – Alternative Waste Management Technologies
- Alternative 5 – Enhanced Waste Diversion
- Alternative 6 – Do-Nothing (In EAs, the Do-Nothing alternative is considered in the evaluation of 'Alternatives To' as a benchmark against which the potential environmental impacts and the advantages and disadvantages of the alternatives being considered can be measured and compared.)

Through a preliminary screening process, Alternatives 3, 4 and 5 were removed leaving a comparison of Alternatives 1 and 2 with consideration of Alternative 6 to be completed. Details of the comparative evaluation of 'Alternatives To' including advantages and disadvantages are provided in Sections 5.4 and 5.5 of the ToR. Of the 14 sub-components that were comparatively assessed, eight were ranked as equally preferred for Alternatives 1 and 2. These included components or sub-components that are often considered to be most important such as geology and hydrogeology, air quality and noise. Of the six sub-components where there are differences in preference, Alternative 2 - landfill expansion, was more preferred for four of the sub-components while Alternative 1 - landfill closure and export waste, was more preferred for two of the sub-components. This is a relatively close assessment; however, Alternative 2 - landfill expansion was identified as the overall preferred 'Alternative To'. Landfill expansion will allow Stelco to retain control of secondary materials management from their steel making operations, as other alternative sites do not currently have an approved operating life/capacity that will be required to match the long term 15 to 25 year disposal requirements of Stelco. An expanded landfill owned and operated by Stelco can be designed and operated in compliance with provincial regulations. Despite having some potential negative impacts associated with landfill expansion, the Do Nothing alternative is expected to lead to potentially uncontrolled environmental impacts, have effects of environmental impacts that would take increased effort and time to mitigate compared to adopting one of the other alternatives, and Stelco would not fulfill one of its basic operational responsibilities as a corporation to manage disposal for or delegate responsibility to properly manage its secondary materials.

DESCRIPTION AND RATIONALE FOR POTENTIAL 'ALTERNATIVE METHODS'

In EA terminology, 'Alternative Methods' are the different ways that the project can be implemented.

'Alternative Methods' are the different ways that the expansion of the Quarry Landfill could be implemented. Stelco will determine 'Alternative Methods' of achieving the purpose of the undertaking, which is to expand the Quarry Landfill to gain an additional 15 to 25 years of disposal capacity plus receipt of material from HWF involving 1,185,000 to 1,685,000 m^3 of additional airspace.

During the initial stage of the EA, different landfill expansion alternatives within the existing LEWF will be identified and described at a sufficient level of detail (i.e., conceptual designs) so that potential effects of the expanded landfill on each environmental component can be assessed and compared. The landfill expansion alternatives will be developed at a conceptual level to cover the range of possible alternatives whose characteristics are different enough for comparison purposes. The expansion alternatives will consist of variations in and combinations of landfill height, landfill area, and configuration.

EA METHODOLOGY

EA Approach

The EA work will be undertaken in a series of nine steps:

Step 1 – Characterize the existing environmental conditions

Step 2 – Identify the 'Alternative Methods' of landfill expansion (and incorporate conceptual design mitigation measures)

Step 3 – Qualitative evaluation of 'Alternative Methods'

Step 4 – Compare the 'Alternative Methods' for landfill expansion and identify the preferred alternative

Step 5 – Refine the mitigation measures and determine the net effects of the preferred alternative

Step 6 – Describe the preferred 'Alternative Method' for landfill expansion

Step 7 – Consideration of climate change

Step 8 – Cumulative Impact Assessment

Step 9 – Preparation of the EA Study Report

Details of these steps are provided in Section 7.5 of the ToR.

Study Areas

The EA study area is the area within which activities associated with the proposed project will occur and where potential environmental effects will be studied. Three preliminary generic study areas for the assessment, which may be refined and will be confirmed during the EA, have been identified as follows:

- Site Study Area – The existing Quarry Landfill and adjacent area of land within which landfill expansion may occur.
- Site-vicinity Study Area – The lands in the area immediately adjacent to the Site Study Area that have the potential to be directly or indirectly affected by the landfill expansion and activities within the Site Study Area.
- Wider Study Area – lands generally beyond the Site-vicinity Study Area, which could extend to include the area of Haldimand County as well as City of Hamilton and roads in between as pertains to the movement of waste from HWF to LEWF.

The ToR provides technical work plans for each of the environmental components that will be undertaken during the EA study as outlined in Section 7.6.

CONSULTATION DURING THE TOR

The ToR describes the draft Consultation Plan prepared and undertaken by Stelco for the development of this ToR, as well as the program proposed for the subsequent EA process.

Engagement and consultation with the public and other stakeholders is a key component of the EA process. It enables stakeholders to participate in the planning process and enhance the quality of the project. The key instruments in the Consultation Plan that were used to engage the public and other stakeholders and elicit feedback during the ToR preparation were Virtual Consultation Event #1, Technical Bulletin #1, the project website and emails. The public provided some valuable feedback during Virtual Consultation Event #1 including ranking the importance of environmental components used to assess 'Alternatives To' that was used in the ToR.

A list of potentially affected Indigenous Communities was developed in consultation with the MECP and the Ministry of Indigenous Affairs during the development of this ToR. A program to engage and consult with the three identified Indigenous Communities was carried out considering their specific needs and specific issues. The Indigenous Communities were consulted on how they would like to be involved in the EA process. Stelco staff were available to meet with interested Indigenous Communities and discuss the proposed project at any time during the development of the ToR. Meetings with two of the identified Indigenous Communities occurred.

PROPOSED CONSULTATION PLAN FOR EA

Following approval of this ToR and during preparation of the EA, a consultation program will be continued to engage the public, the Government Review Team, Indigenous Communities, as well the various groups and committees during the EA process. Input will be obtained through a number of engagement activities, which will be generally similar to the activities completed during preparation of the ToR.

The Draft EA will be circulated for a seven week public comment period prior to finalization and submission to the MECP for approval. In addition, consultation specific to individual Indigenous Communities will also be carried out.

Consultation (community engagement) with the public, Indigenous Communities, Government Review Team members, and Community Liaison Committee will be ongoing throughout the EA process.

OTHER REGULATORY APPROVALS

In addition to EA approval, the proposed undertaking is expected to require other regulatory approvals. The other regulatory approvals specific to the proposed EA Study will be determined during the EA process. Stelco proposes to seek EA approval prior to proceeding with the other approval processes.

EA SCHEDULE

Following circulation of the draft ToR for comments, the proposed ToR is subject to a 30-day comment period that will be followed by the Minister's decision. With submission of the proposed ToR in 2022, the Minister's decision is anticipated in early to mid 2023. The EA studies will be carried out following ToR approval and then the draft and final EA will be submitted for the Minister's approval. Processes to obtain the other approvals required to implement the EA Study will proceed after EA approval

COMMITMENTS AND MONITORING STRATEGY

As outlined in Section 12.0 of the ToR, sixteen commitments have been developed during the ToR.

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APPENDIX B
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APPENDIX C
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APPENDIX E
Technical Bulletin #1

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ACRONYMS

Acronym	Definition
AADT	Average Annual Daily Traffic
BF	Blast Furnace
BHR	Built Heritage Resources
BMP	Best Management Practices
BOF	Basic Oxygen Furnace
C of A	Certificate of Approval
CHL	Cultural Heritage Landscapes
CLC	Community Liaison Committee
CLI	Canada Land Inventory
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
EAA	*Environmental Assessment Act* (Ontario)
ECA	Environmental Compliance Approval
EFW	Energy from Waste
EPA	*Environmental Protection Act (Ontario)*
ESA	Environmentally Significant Area
GCL	Geosynthetic Clay Liner
FLR	Field Liaison Representative
GHG	Greenhouse Gases
GRT	Government Review Team
H	Horizontal
HDPE	High-density Polyethylene
LIO	Land Information Ontario
LOS	Level of Service
MECP	Ministry of the Environment, Conservation and Parks (formerly MOECC)
MHSTCI	Ministry of Heritage, Sport, Tourism and Cultural Industries
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MTO	Ministry of Transportation Ontario
NHIC	Natural Heritage Information Centre
NoC	Notice of Commencement
OG	Off-Gas
OHA	*Ontario Heritage Act*
O. Reg.	Ontario Regulation
OWRA	Ontario Water Resources Act
POR	Points of Reception

Acronym	Definition
PPS	Provincial Policy Statement
SAR	Species at Risk
SWH	Significant Wildlife Habitat
SWM	Stormwater management
SWMS	Stormwater management system
SVS	Secondary Ventilation System
ToR	Terms of Reference
V	Vertical

UNITS OF MEASURE

Acronym	Definition of Units
cm	centimetre
ha	hectare
km	kilometre
m	metre
mm	millimetre
masl	metres above sea level
m^3	cubic metre
mg/L	milligram per Litre

GLOSSARY OF TERMS

Term	Definition
'Alternative Methods'	Alternative methods of carrying out the proposed undertaking are different ways of doing the same activity associated with an undertaking. Alternative methods could include consideration of one or more of the following: alternative technologies; alternative methods of applying specific technologies; alternative sites for a proposed undertaking; alternative design methods; and, alternative methods of operating any facilities associated with a proposed undertaking.
'Alternatives To'	Alternatives to the proposed undertaking are functionally different ways of approaching and dealing with a problem or opportunity.
Aquifer	A layer of permeable soil, i.e., sand and/or gravel, or bedrock through which groundwater flows and can yield enough water to supply wells for use.
Berm	At a landfill site, a narrow mound or ridge comprised of soil (for example, a screening berm used to block the view of the landfill activities from off-site)
Borehole	A hole drilled into the ground to obtain information on the soil, bedrock and groundwater conditions and characteristics. A borehole can be completed as a groundwater monitoring well.
Buffer Area	The part of the landfill site not used for waste disposal, usually between the perimeter of the disposal area and the facility property boundary.

Term	Definition
Certificate of Approval (Waste)	An approval issued by the Ministry of the Environment for the establishment and operation of a waste management site/facility. Now referred to as an Environmental Compliance Approval.
Stelco	Stelco (the proponent); used when referencing the corporate administrative body.
Criteria	A description of each environmental component to be considered in the environmental assessment, consisting of the rationale for including the component and the indicator(s) to be used in the assessment.
Cumulative Effects	The net effects of the proposed undertaking combined with the predicted effects of other existing and identified certain and probable projects in the area of the proposed undertaking, where the effects would overlap.
Disposal Area	The area within the facility property approved for the disposal of residual waste; also referred to as the waste footprint.
Environment	As defined by the *Environmental Assessment Act*, environment means: ■ Air, land or water; ■ Plant and animal life, including human life; ■ The social, economic and cultural conditions that influence the life of humans or a community; ■ Any building, structure, machine or other device or thing made by humans; ■ Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or ■ Any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach).
Environmental Assessment	An environmental assessment, commonly known as an individual EA, is a study that is completed by the proponent to assess the potential environmental effects (positive or negative) of an individual project.
Environmental Compliance Approval	An approval issued by the Ministry of Environment, Conservation and Parks for the establishment and operation of a waste management site/facility.
Environmental Components	Environmental components are different aspects of the natural, social, economical, cultural and built environments.
Groundwater	Water below the ground surface contained in the pore spaces in soil or in openings within the bedrock.
Haul Route	Public roadways used by vehicles transporting waste to a landfill site.
Indicators	Specific characteristics of the environmental components that can be measured, qualified, quantified or determined in some way.
Landfill	An approved site used for the long-term disposal of residual waste.
Landfill Capacity	The volume approved for disposal of residual wastes and daily or intermediate cover materials, typically described in cubic metres. Also referred to as the approved airspace.
Landfill Expansion	An increase in the approved landfill capacity.
Leachate	The liquid produced when water (typically rainwater or snowmelt) passes through a landfill where it has come in contact with the waste.
Leachate Collection System	The system used to collect leachate generated by a landfill, usually consisting of a network of piping and drainage stone beneath or around the perimeter of the disposal area.
Mitigation Measures	Design features and/or operational approaches used to control the potential effects of the landfill on the environment.

Term	Definition
Monitoring Well	An installation at a selected depth in a borehole in which the groundwater level can be measured and groundwater samples obtained for chemical analysis to determine its quality. At a landfill, this information is typically monitored at some frequency over time and is referred to as a groundwater monitoring program.
Non-hazardous Solid Waste	Waste generated from any source that is defined as non-hazardous and solid by the regulations of Ontario.
Ontario Regulation 232/98	The regulation that governs the design, operation, closure and post-closure of new or expanding waste disposal sites in the province of Ontario.
Proponent	A person, corporation, government agency or other legal entity who: a) Proposes to carry out an undertaking; or b) Is the owner or person having charge, management or control of an undertaking. For this undertaking (project), the proponent is Stelco.
Reasonable Use Guideline (or Concept)	The Ministry of Environment, Conservation and Parks guideline used to determine the acceptable level of impact from landfill leachate on off-site groundwater quality, and used to assess compliance of landfill sites in terms of effects on groundwater resources.
Receptor	A specific location where the effect(s) from a waste management facility may be received. Also referred to as Points of Reception (PORs). A term typically used when considering air and noise components of the environment.
Residual Waste	The waste material that cannot be diverted through recycling or other processes and requires disposal.
(the) Site	(the) Quarry Landfill.
Site Life	The period of time during which the Quarry Landfill can continue to accept wastes.
Stormwater Management System	An engineered system to manage/control the quantity and/or quality of stormwater runoff from the site, typically consisting of ditches and ponds that discharge to the natural environment.
Surface Water	Water on top of or flowing across the ground surface, i.e., lakes, rivers, ditches.
Terms of Reference	A document prepared by the proponent and submitted to the Ministry of Environment, Conservation and Parks for approval. The Terms of Reference (ToR) document sets out the framework for the planning and decision-making process to be followed by the proponent during the preparation of an EA. In other words, it is Stelco's (the proponent's) work plan for what is going to be studied. If approved, the EA must be prepared according to this ToR. The ToR also provides the framework for evaluating the EA.
(the) Undertaking	The activities associated with the EA for the proposed expansion of the Quarry Landfill, as described in this ToR. Also referred to as the 'project'.
Waste Generation Rate	The quantity of waste generated by Stelco on a daily or annual basis, typically described in tonnes (or kilograms) per year.

1.0 INTRODUCTION

This is the Terms of Reference (ToR) document (i.e., the work plan or framework for work) for the proposed expansion of the Quarry Landfill by Stelco Inc. (Stelco, the proponent) at their Lake Erie Works Facility (LEWF), which is described as the project or undertaking. Stelco is proposing to expand the existing Quarry Landfill to continue to accommodate the on-site disposal of solid non-hazardous steel making secondary materials generated at the facility that cannot be reused or recycled, as well as the disposal of historical non-hazardous steel making secondary materials from the Hamilton Works Facility (HWF) located approximately 70 kilometres (km) from the Site. Current projections estimate that the approved capacity of the existing Quarry Landfill will be reached during 2023.

As part of their steel making operations, Stelco has made significant efforts to minimize the quantity of residual material requiring disposal. Stelco currently recycles or reuses approximately 93% of the secondary materials they generate; however, the remaining 7% of non-hazardous steel making secondary material is residual and that requires management and is reasonably expected to continue to require management in future.

This ToR is the first step in the process required by the *Environmental Assessment Act (EAA)* (1990) for approval of the Project. The ToR sets out the study process to be followed in conducting the individual Environmental Assessment (EA), including a description of how the public stakeholders, Indigenous Communities and government review team (GRT) agencies will be consulted.

1.1 Identification of the Proponent

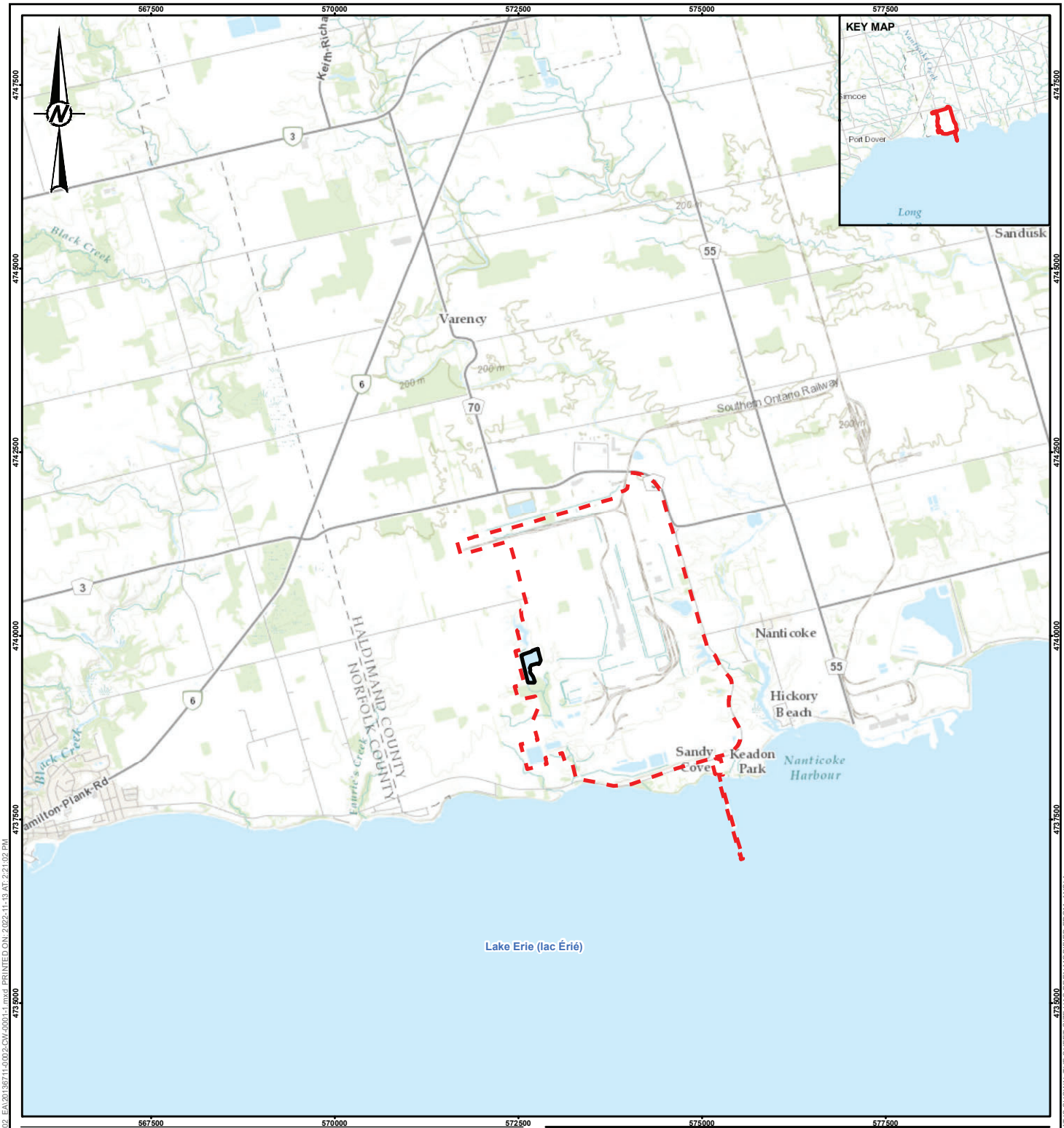
Stelco is the proponent for the proposed project. The contacts for this project are as follows:

Petar Kolundzija
Manager – Environmental Affairs
Stelco Inc.
2330 Haldimand Road 3
Nanticoke, ON, N0A 1L0
Telephone: 1-905-577-4407
E-mail: consultation@stelco.com

Trish Edmond, P.Eng.
EA Manager
Golder Associates Ltd.
1931 Robertson Road
Ottawa, ON, K2H 5B7
Telephone: 1-800-275-3281
E-mail: trish.edmond@wsp.com

1.2 Description of the Existing Quarry Landfill

The existing Quarry Landfill is situated in a 5.5 hectare (ha), 34 metre (m) deep former limestone quarry at the west end of the LEWF. The landfill boundary corresponds to the vertical rock wall of the former quarry. Environmental Compliance Approval (ECA) (formerly Certificate of Approval (C of A)) No. A110119 for the Quarry Landfill was issued in 1984 for the disposal of 1,300,000 cubic metres (m^3) of *"Blast Furnace (BF) Slag, steel making slag and other non-hazardous solid wastes having a leachate quality better than or equal to leachate from Blast Furnace Slag and steel making slag".* The location of the existing landfill is shown below in Figure 1-1.



LEGEND

- APPROVED QUARRY LANDFILL BOUNDARY (5.5 ha)
- APPROXIMATE PROPERTY BOUNDARY

DRAFT

0 1,500 3,000

1:75,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17N, VERTICAL DATUM: CGVD28

CLIENT
STELCO INC.

PROJECT
PROPOSED TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED QUARRY LANDFILL EXPANSION, LAKE ERIE WORKS, NANTICOKE, ON

TITLE
SITE LOCATION PLAN

CONSULTANT
wsp

YYYY-MM-DD	2022-11-13
DESIGNED	TE
PREPARED	MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
20136711	0002	A	1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

25mm

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PATH: S:\Clients\Stelco\Quarry Landfill\99 PROJ\20136711 Landfill Expansion\40 PROD\0002 EA\20136711-0002-GW-4001-r.mxd PRINTED ON: 2022-11-13 AT: 2:21:02 PM

1.2.1 Site Development History

Landfilling commenced in 1984, with the material type limited to BF slag only (i.e., no other steel making materials were landfilled). The BF Slag is granular in nature and was initially placed throughout the former quarry, except at the south end that remained as an open pond area referred to as the Quarry Pond. Landfilling of BF Slag continued to the end of 2003. Over the following years to the end of 2011, the upper/unsaturated portion of the BF Slag (above the Quarry Pond water level) was excavated and processed for sale as aggregate. The submerged portion of the BF Slag was left in place. No additional materials were placed in the landfill during this period.

In 2012, amended ECA No. A110119 was issued for a new engineered landfill cell of 545,000 m^3 capacity, founded on the remaining BF Slag within the northern portion of the Quarry Landfill. The design of the new cell was presented in a Design and Operations Plan (Golder, 2010). A key condition of the amended ECA was that the original approved fill capacity of 1,300,000 m^3 for the overall Quarry Landfill not be exceeded (i.e., the amended ECA was not for an expansion of the landfill). Construction of the new cell commenced in 2013 and was completed in 2014. Construction involved temporary dewatering of the Quarry Pond (to temporarily lower water levels in the existing BF Slag), excavation/ processing of additional BF Slag within the northern portion of the landfill (for sale as aggregate), regrading of the remaining BF Slag including placement of clayey soil fill to form the cell base grades, and installation of a low permeability base liner and leachate collection system.

Landfilling resumed following construction of the new cell, with the fill area limited to the new cell. However, unlike the historical operations that involved landfilling of only BF Slag, the materials placed in the new cell consist of various steel making secondary materials from the LEWF that have limited reuse potential. These materials include BF sludge, Off-gas sludge, casthouse baghouse dust and secondary ventilation system (SVS) baghouse dust.

Figure 1-2 illustrates the existing Quarry Landfill.

1.2.2 Landfill Site and Landfill Components

The existing Quarry Landfill cell constructed in 2013/2014 described above has a base liner system that consists of a single composite liner system comprised of a 1.5 millimetre (mm) (60 mil) thick textured high-density polyethylene (HDPE) geomembrane underlain by a geosynthetic clay liner (GCL). A 0.3 m thick protection layer comprised of screened BF Slag (6 mm maximum particle size) overlies the geomembrane.

The leachate collection system is on the cell floor above the base liner system and consists of the following layers starting with the lower-most layer:

- 0.5 m thick drainage layer consisting of 50 mm washed clear natural stone;
- non-woven geotextile filter fabric; and,
- 0.3 m thick filter layer comprised of screened BF Slag (6 mm maximum particle size)

Leachate is pumped from a sump at the low point of the cell via a riser pipe that extends up the interior slope of the perimeter berm. The leachate is conveyed via forcemain to the LEWF wastewater treatment plant. The landfill final cover design consists of a 0.6 m (minimum) thick layer of clayey soil overlain by a 0.15 m thick topsoil layer vegetated with grass, which is consistent with *Ontario Regulation (O.Reg.) 232/98* (Ontario, 1998) (also summarized in the MECP Landfill Standards (MECP, 2012)). Runoff from the final cover would be directed via drainage ditches to Centre Creek.

LEGEND

- CREEK
- APPROVED QUARRY LANDFILL BOUNDARY (5.5 ha)
- APPROXIMATE PROPERTY BOUNDARY

DRAFT

0 500 1,000

1:15,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17N, VERTICAL DATUM: CGVD28

CLIENT
STELCO INC.

PROJECT
PROPOSED TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED QUARRY LANDFILL EXPANSION, LAKE ERIE WORKS, NANTICOKE, ON

TITLE
EXISTING QUARRY LANDFILL

CONSULTANT

wsp

YYYY-MM-DD	2022-11-13
DESIGNED	TE
PREPARED	MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
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1.2.3 Current Landfill Performance

The current top of material elevation in the new cell is approximately 189 metres above sea level (masl). As of January 20, 2022, the estimated remaining capacity in the new cell is approximately 36,570 m^3, which corresponds to a remaining life within 2023 (RWDI, 2022). Note that daily cover materials are not used as the material is generally granular in nature and does not have an organic content.

Leachate collected from the sump of the new cell is monitored for chemical quality on a quarterly basis. The leachate typically has a pH in the range of 11 to 13, and relatively low levels of total dissolved solids (typically 1,500 milligrams per Litre (mg/L) to 2,300 mg/L) and Dissolved Organic Carbon (typically 50 mg/L to 100 mg/L). The primary dissolved constituents are chloride (typically 150 mg/L to 300 mg/L), sodium (typically 200 mg/L to 300 mg/L) and total ammonia-N (typically 30 mg/L to 50 mg/L).

There is an ongoing annual environmental monitoring program carried out at the Quarry Landfill for groundwater and surface water. The requirements of which are set out in ECA No. A110119. Based on the results of the 2021 monitoring program (RWDI, 2022), the overall site performance is as follows:

- Groundwater monitoring indicates that parameter concentrations are generally stable over time in the area of the landfill site, the landfill is not having an adverse impact on nearby groundwater resources, and the site is in compliance with the MECP Reasonable Use Guideline B-7 (MECP, 1994).
- Surface water monitoring indicates that water quality in the Quarry Pond has improved since the construction of the new lined landfill cell, and surface water quality in Centre Creek is generally stable over time and not being adversely affected by the landfill.

Additional details regarding existing conditions of the geology, hydrogeology and surface can be found in Sections 4.3 and 4.4 of this report, respectively.

2.0 THE EA PROCESS

This section describes the EA process that applies to the project.

2.1 Ontario EAA

The *EAA* is a provincial statute that sets out a planning and decision-making process to evaluate the potential environmental effects of a proposed undertaking or project (Ontario, 1990). *O. Reg. 101/07* for Waste Management Projects, which was made under the *EAA*, states (in part) that some waste management projects, regardless of whether the proponent is public or private, are designated under the *EAA*. Various projects are then exempted. According to Section 4 of *O. Reg. 101/07* (Ontario, 2007), the increased landfill capacity proposed in this ToR is subject to an EA because more than 100,000 m^3 will be added to the total waste disposal volume for the Quarry Landfill (see Section 3.0 for additional description of volume required). Also, according to *O. Reg. 101/07*, the project is not exempt and is not subject to fulfilling the requirements of the environmental screening process. Accordingly, Stelco's project is subject to an individual EA process.

An EA under the *EAA* is a planning study that assesses environmental effects and advantages and disadvantages of a proposed project. The environment is considered in broad terms that include the natural, social, cultural and economic aspects of the environment. In an individual EA, the first step in the process is to develop a ToR for the EA studies (this document is the ToR). One Virtual Consultation Event was hosted by Stelco and one Technical Bulletin was distributed as part of the consultation process for the development of the ToR. This proposed draft ToR is being submitted to the MECP, the GRT, Indigenous Communities and the public for review. The final proposed ToR will be submitted to the Minister of Environment, Conservation and Parks who will decide whether to approve, approve with conditions, or not approve this ToR. If approved, the ToR becomes the framework for preparation and review of the EA. An overview of the entire approval process was presented to the public as part of Virtual Consultation Event #1 and is available in Volume III Appendix D.

2.2 Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (Canada, 2012) is a federal statute that requires federal agencies to conduct an EA for designated projects and activities and projects on federal lands. The expansion of a landfill is not a designated project, and the proposed undertaking does not involve any federal lands; therefore, it is our assessment that no federal EA is required. It is noted that Environment and Climate Change Canada has been receiving updates about this provincial EA.

2.3 Organization of the TOR

This submission of documents to the MECP consists of three volumes: Volume I – Terms of Reference; Volume II – Supporting Documents for the development of this ToR; and Volume III- Consultation Record.

Volume I is organized into the following sections:

- Section 1.0 provides an introduction to this ToR, identifies the proponent, presents the purpose of the undertaking at a high level and describes the existing site.
- Section 2.0 describes the EA process, presents the purpose and organization of this ToR, includes the submission statement (i.e., how this ToR is being submitted for approval), provides justification for focusing the EA, and discusses flexibility in this ToR.
- Section 3.0 provides the purpose of the undertaking and rationale and description of the project.

- Section 4.0 provides an overview of the existing environmental conditions and potential effects.
- Section 5.0 presents the 'Alternatives To' and an assessment of the 'Alternatives To' the project.
- Section 6.0 provides a description of and the rationale for the potential 'Alternative Methods' of carrying out the project;
- Section 7.0 provides an overview of the proposed methods for conducting the EA, including the comparative evaluation of alternatives, as well as the definition of study areas.
- Section 8.0 presents the consultation plan for developing this ToR including results of consultation undertaken to date.
- Section 9.0 provides the consultation plan to be undertaken during the EA.
- Section 10.0 provides an overview of other regulatory approvals required for the undertaking to proceed.
- Section 11.0 presents the proposed schedule for preparing the EA.
- Section 12.0 provides statements of commitments and monitoring strategies by Stelco to be completed during the EA.
- Section 13.0 lists the documents referenced in this ToR.

Volume II contains supporting documents that are referred to within this ToR.

Volume III presents the record of the consultation process for the development of this ToR. This includes a summary of events, stakeholder feedback received, and how stakeholder feedback was incorporated into the development of this ToR or a rationale for why it was not considered appropriate for inclusion.

2.4 ToR Submission Statement and How the Environmental Assessment will be Prepared

The ToR submission statement indicates how the EA will be prepared. This ToR was prepared in considering the *Code of Practice – Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* (ToR Code of Practice; MECP, 2014).

This ToR is submitted to the MECP for approval in accordance with *O. Reg. 101/07*, and specifically pursuant to subsection 6(2)(c) of the EAA, which allows the proponent to "*…set out in detail the requirements for the preparation of the environmental assessment*" (Ontario, 1990). Subsections 6(2)(c) and 6.1(3) of the EAA enable proponents to 'focus' the EA and 'Alternatives To' to address their specific needs and circumstances.

Stelco commits to preparing and submitting an EA to the MECP for review and approval in accordance with the approved ToR as required by subsection 6.1(1) of the EAA, and in accordance with the requirements of subsection 6.1(2) of the EAA.

The subsections that will be addressed by the EA are listed in Table 2-1. The exceptions are subsections 6.1(2)(b)(iii) and 6.1(2)(d), which describe and provide the rationale for the 'Alternatives To' the undertaking and advantages and disadvantages of the 'Alternatives To'. The 'Alternatives To' requirement is addressed by this ToR (Section 5.0).

Table 2-1: Requirements for the EA

Subsection of EAA (Ontario1990)	EA Requirements
6.1(2)*(*a)	A description of the purpose of the undertaking.
6.1(2)(b)(i)	A description of and statement of the rationale for the undertaking.
6.1(2)(b)(ii)	A description of and statement of the rationale for the 'Alternative Methods' of carrying out the undertaking.
6.1(2)(b)(iii)	A description of and a statement of the rationale for the 'Alternatives To' the undertaking.
6.1(2)(c)(i)	A description of the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly by the undertaking, the 'Alternative Methods' of carrying out the undertaking and the 'Alternatives To' the undertaking.
6.1(2)(c)(ii)	A description of the effects that will be caused or that might reasonably be expected to be caused to the environment by the undertaking, the 'Alternative Methods' of carrying out the undertaking and the 'Alternatives To' the undertaking.
6.1(2)(c)(iii)	The actions or mitigation measures that are necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment by the undertaking, the 'Alternative Methods' of carrying out the undertaking and the 'Alternatives To' the undertaking.
6.1(2)(d)	An evaluation of the advantages and disadvantages to the environment of the undertaking, the 'Alternative Methods' of carrying out the undertaking and the 'Alternatives To' the undertaking.
6.1(2)(e)	A description of any consultation about the undertaking by the proponent and the results of the consultation.

The *ToR Code of Practice* (MECP, 2014) outlines considerations for focusing a ToR. It allows a proponent to proceed under subsections 6(2)(c) and 6.1(3) if the proponent is further along in the defined planning process and additional detail is known regarding the proposed project. Stelco intends to proceed under subsections 6(2)(c) and 6.1(3) of the EAA, which allows the proponent to focus the EA. Specifically, Stelco intends to exclude any additional assessment of 'Alternatives To' during the EA because:

During the preparation of the ToR, Stelco completed an assessment of the functionally different ways of providing future disposal of residual steel making materials generated from the ongoing operations at their LEWF, as well as the potential disposal of historical non-hazardous steel-making secondary materials from the HWF. This assessment concluded that expansion of the existing Quarry Landfill is the preferred 'Alternative To'. This assessment is presented in Section 5.0 of this ToR. This assessment was shared with the stakeholders during consultation associated with preparation of this ToR.

2.5 Flexibility of the ToR to Accommodate New Circumstances

The ToR Code of Practice (MECP, 2014) and subsection 6.1(1) of the EAA states that the EA must be prepared in accordance with the approved ToR; however, circumstances may arise that could necessitate minor revisions to this ToR. Accordingly, the ToR Code of Practice (MECP, 2014) states that it is important to incorporate flexibility into the ToR to accommodate new circumstances.

Assuming that the Minister of the Environment, Conservation and Parks approves this ToR, some minor adjustments might be required during the preparation of the EA. Flexibility in this ToR would include minor variations such as a change in EA methodology or consultation methods. In addition, circumstances may arise during the EA that do not allow commitments made during the ToR to be fulfilled; if this were to occur, the commitment may be subject to further refinement and adjustments during the EA.

For example, the work plans in this ToR are described at a general level of detail. During the EA, and in consultation with the MECP, other GRT members, the public and/or Indigenous Communities, the work plans may be modified or described in greater detail. Another example would be where it was advisable to change study area boundaries should new information become available. EA studies may show effects that are greater or less than anticipated and might require adjustments to the work plans. New or additional data sources might also become known, and it would be beneficial to incorporate these into the EA studies.

As another example, modifications to the proposed public consultation program might include the incorporation of additional workshops or meetings in response to a higher level of public interest or concern, or the change in format of consultation events to better suit the public's needs. Such modifications would be considered minor changes to this ToR.

Any proposed minor modifications to this ToR would be documented and discussed in advance with the MECP and would not require an amendment to the approved ToR. The modifications described above and other similar modifications would be considered minor changes that could be included within the overall scope of this ToR without seeking approval for a formal amendment to the ToR.

The justification for any proposed minor modifications will be provided to and discussed with the MECP when and if they occur during the EA process, in advance of submitting the EA. Any modifications will be documented, together with the justification, in the EA study report.

The incorporation of flexibility in the ToR is not intended to allow significant changes in the scope of the project, but rather to allow for minor adjustments to or departures from the ToR during the EA without having to start the ToR/EA process over again.

3.0 PROPOSED QUARRY LANDFILL EXPANSION

3.1 Purpose of the Undertaking

Stelco is proposing an expansion of the Quarry Landfill at its LEWF to accommodate the continued on-site disposal of non-hazardous steel making secondary materials generated at the facility that cannot be reused or recycled. Stelco is also proposing to include the disposal at the expanded Quarry Landfill of historical non-hazardous steel making secondary materials from the HFW located approximately 70 km from the LEWF. Through completion of the EA, Stelco will be able to continue to provide environmentally sound management of its steel making waste residuals from future operations at the LEWF, and also for those historical steel making residuals presently situated at HWF site that require management.

The purpose of this EA is to provide environmentally safe and cost-effective long-term residual steel making waste management for Stelco for a 15 to 25 year planning period. The planning period will be further assessed and defined during the EA. Stelco will consider the stated purpose of this EA during the EA process and will refine the purpose if required. The final purpose statement will be provided in the EA study report.

3.2 Description of and Rationale for the Project

The proposed project is the expansion of the Quarry Landfill within Stelco's current property boundaries; there will be no need for Stelco to acquire additional lands for this purpose. The proposed project, which will be assessed and refined during the EA process, consists of a sequence of construction and operational components, which can generally be described as follows:

- A capacity expansion to the Quarry Landfill of approximately 750,000 m^3 to 1,250,000 m^3 corresponding to 15 to 25 years of capacity for residual material generated from the LEWF and up to 435,000 m^3 legacy residual material from the HWF for a total capacity required of 1,185,000 to 1,685,000 m^3. The capacity required will be refined during the EA.
- Assuming all approvals are in place by the end of 2025 and the expanded landfill cell is constructed and ready to receive waste, it is conceivable that the material from HWF could be moved between the beginning of 2025 and end of 2028. This assumption will be refined during the EA to enable a complete identification of expected number of trucks per day.
- Construction of appropriate engineered containment in an expanded landfill to accommodate and manage the steel making waste materials.
- Filling of the expanded landfill to its approved capacity.
- Progressive placement of final cover on the expanded landfill as disposal to final approved waste contours are reached in areas of the landfill.
- Post-closure care and maintenance of both the existing and expanded Quarry Landfill.

In summary, the proposed project consists of the continuation of construction activities and landfilling operations that have been and are currently being carried out by Stelco at the existing Quarry Landfill.

In addition to the significant diversion (93%) that has already been achieved, Stelco will continue their efforts to increase the diversion of secondary steel making secondary materials from disposal but ultimately some amount of residual disposal need is expected. It is possible that other potential diversion opportunities could arise from the *Waste-Free Ontario Act* (Ontario, 2016) or Stelco's own research. Additional discussion of diversion opportunities as it relates to 'Alternatives To' considerations is provided in Section 5.3.5 of this ToR.

4.0 DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS AND POTENTIAL EFFECTS

The *EAA* defines the environment in a broad, general sense. The environmental components for this ToR and EA includes: atmosphere, geology and hydrogeology, surface water, biology, agriculture, land use, cultural heritage, socio-economic, transportation and technical considerations.

This section presents an overview of existing environmental conditions on and in the area of the Quarry Landfill. As described in the *MECP Code of Practice* (MECP, 2014), Stelco will present a more detailed description of the environmental conditions in the EA Report.

The methods and data sources that will be used to characterize the existing conditions during the EA are described in Table 7-1. The following is an overview of existing conditions.

4.1 Identification of Components Considered

The environment is defined as those components of the natural, social, economic, cultural and built environment that may be affected by the undertaking. This section presents an overview of existing environmental conditions within the area near and around the existing Quarry Landfill as shown on Figure 1-2.

Stelco was formed in 1910 by the merger of the former Montreal Rolling Mills, the Hamilton Steel and Iron Company, and a handful of secondary companies located from Gananoque to Brantford. The Stelco Lake Erie Works facility is North America's newest greenfield integrated steel mill. It has been in operation since 1980, and is located approximately 5.5 km east of Port Dover, within the community of Nanticoke, Ontario. The Quarry Landfill is situated within a former 5.5 ha limestone quarry.

4.2 Atmosphere

The atmosphere component comprises air quality (including odour and greenhouse gases (GHG)) and noise. Within the area of the existing Quarry Landfill, air quality and noise is expected to be typical of rural industrial southern Ontario with transportation, industrial operations and agricultural activities contributing to baseline air quality levels at the LEWF, and noting that nearby industrial activities will be contributing to baseline air quality and noise levels as well. The existing Quarry Landfill operations and any future landfill expansion are expected to be small contributors to air quality and noise as compared to the other activities occurring on and in the area of the LEWF.

The closest provincial air quality monitoring stations to Stelco are located in Simcoe, Hamilton and Brantford, and are a part of the National Air Pollution Surveillance (NAPS) Program monitoring network. Other stations within the NAPS monitoring network that are farther away from the nearest stations may be considered as having similar environmental conditions (e.g., geography) to the LEWF. Depending on data available from the National Air Pollution Surveillance Program stations, they may best represent conditions at the Quarry Landfill.

There is also an ambient air quality monitoring network in Nanticoke operated by local industry known as the Nanticoke Environmental Committee.

With regards to GHG emissions, it is most appropriate to consider emissions on a national or provincial scale. Some of the primary sources of greenhouse gas emissions in Canada and Ontario are from anthropogenic sources that include combustion heating, the transportation sector (e.g., vehicles on 400 series highways in Ontario) and large industrial activities (e.g., manufacturing facilities). The existing landfill is not a contributor to greenhouse gases or odour due to the type of secondary materials disposed. The future landfill expansion will

consider greenhouse gases as they relate to transportation of secondary materials from the HWF and the loss of any carbon sink for the expansion of the landfill.

Existing approved sources of air emissions at the existing landfill consist of:

- Traffic, loading and unloading, on-site vehicle emissions, and landfill waste receipt activities; and,
- Landfill final cover activities.

4.3 Geology and Hydrogeology

The LEWF lies within the physiographic region known as the Haldimand Clay Plain (Chapman and Putnam, 1984). This physiographic region is characterized as having massive to laminated lacustrine clay and silty clay deposits overlying limestone bedrock, with some localized areas having a stoney silt till between the clay deposits and bedrock.

The upper limestone bedrock sequence at the Quarry Landfill consists of the middle Devonian Dundee Formation underlain by the Devonian Bois Blanc Formation. The Dundee Formation is a medium grey to light brown, thickly-bedded, fine to medium crystalline, cherty limestone of approximately 7.5 m thickness. It dips gently to the south-southwest towards Lake Erie. The Blanc Formation is similar to the Dundee Formation, but with more abundant chert nodules and shale partings. The Dundee Formation and Bois Blanc Formations are separated by a thin grey to black shale layer, as observed on the exposed vertical walls of the Quarry Pond.

The topographic relief of the LEWF is very low and generally slopes downwards to the south (towards Lake Erie) at approximately 2 to 4 m per km. Additional topographic relief is provided by local stream valleys cut into the clay deposits. Ground surface elevations generally range between 200 to 180 masl.

The clay deposit in the area surrounding the Quarry Landfill thickness typically ranges from 5 to 10 m, except in the area flanking the east side of the Quarry Pond (an open pond located directly south of the Quarry Landfill) where the overburden was stripped during the quarrying operation, and in the Centre Creek valley south of the landfill. A well-developed system of near vertical fractures exists in the clay deposits, extending 3 to 4 m below ground surface. Where present, the stoney silt till layer between the clay deposits and underlying bedrock is generally less than 1.5 m thick.

Natural groundwater flow in the area of the Quarry Landfill occurs primarily along fractures within the clay overburden and underlying bedrock. The principal direction of natural groundwater flow is downward through the clay overburden into the upper bedrock, and then horizontal (southward) along bedrock fractures discharging to Centre Creek and Lake Erie.

The Nanticoke community relies on groundwater from a combination of drilled wells and cisterns for potable water supply water, in addition to supplies from surface water taken from Lake Erie as part of a Permit To Take Water.

Natural background groundwater quality at the Site (as monitored by a nest of landfill monitoring wells upgradient of the Quarry Landfill) is defined by the dominant groundwater constituents of calcium, alkalinity and sulphate. The concentrations of multiple parameters, including alkalinity, total dissolved solids, sulphate, mercury, iron, lead, cadmium, and chromium, are typically reported exceeding their Ontario Drinking Water Quality Standards (ODWQS) (*O.Reg. 169/03*) (Ontario, 2003). The natural groundwater in the area of the Quarry Landfill is not considered suitable as a source of potable water as a result. Generally, measured groundwater downgradient of the Quarry Landfill is within the range of background quality concentrations, with the exception of slightly higher

chemical oxygen demand in the downgradient groundwater. Based on the 2021 and available historical monitoring results, a distinct landfill leachate influence from the Quarry Landfill on the nearby groundwater resources does not appear to be occurring (RWDI, 2022).

Figure 4-1 shows locations of existing groundwater and surface water monitoring associated with the Quarry Landfill.

4.4 Surface Water

In regard to surface water, the LEWF is located within the Long Point Region Watershed, all within the regulatory jurisdiction of the Long Point Region Conservation Authority. The overall local drainage is towards the south, with the drainage towards Lake Erie and to Centre Creek which ultimately discharges into Lake Erie. Drainage of this largely rural agricultural area is via a network of constructed municipal drains, which have a low Department of Fisheries and Oceans (DFO) drain classification as related to aquatic habitat. Centre Creek flanks the west side of the landfill and flows in a southerly direction with only intermittent flow observed in the area of the Quarry Landfill.

The water quality of Centre Creek in the vicinity of the Quarry Landfill is monitored monthly as part of an environmental monitoring program for the LEWF. Historically, concentrations of select metals, aluminum, iron, zinc, and vanadium, are detected at concentrations greater than the Provincial Water Quality Objectives (PWQO) (MECP, 1994a) at locations both upstream and downstream of the Quarry Landfill. The upstream concentrations of aluminum, iron, zinc and vanadium have been detected in higher concentrations upstream of the Quarry Landfill, than within the leachate concentrations monitored in the unlined portion of the landfill; indicating the concentrations of these select metals may be present in surface water in the vicinity of the existing landfill and are not present as a result of the landfill. Additionally, identified leachate indicator parameters are generally consistent in concentrations at upstream and downstream monitoring locations.

The Quarry Pond is located directly south of the Quarry Landfill. The Quarry Pond is recharged primarily by direct precipitation over the Quarry Landfill, with additional recharge as a result of groundwater inflow along the quarry sidewalls. The Quarry Pond has no surface water outflow. Historically, the Quarry Pond has reported elevated concentrations for select parameters (pH, chloride, fluoride, sulphate, chemical oxygen demand, and dissolved organic carbon) as a result of potential influence from the Quarry Landfill. In recent years, the improved surface water quality results in the Quarry Pond indicate that the pond is not being influenced by leachate from the new unlined portion of the landfill site (RWDI, 2022).

Figure 4-1 shows locations of existing groundwater and surface water monitoring associated with the Quarry Landfill.

4.5 Biology

The County is located in Ecoregion 7E (Lake Erie – Lake Ontario), which covers approximately 2.2% of Ontario, extending from Windsor and Sarnia east to the Niagara Peninsula. The majority of this ecoregion exists as cropland and pasture (78%) with developed land (7%). Forest covers the remaining areas with dense deciduous forest, sparse deciduous forest and mixed deciduous forest (10.3%, 1.0% and 0.8 %, respectively) (MNRF, 2009).

LEGEND

- APPROXIMATE BOREHOLE / MONITORING WELL LOCATION AND DESIGNATION
- APPROXIMATE SURFACE WATER MONITORING LOCATION AND DESIGNATION
- APPROXIMATE VIBRATING WIRE PIEZOMETER LOCATION AND DESIGNATION
- APPROXIMATE QUARRY LEACHATE SUMP LOCATION
- CREEK
- APPROXIMATE LINED CELL OF QUARRY LANDFILL BOUNDARY
- APPROVED QUARRY LANDFILL BOUNDARY (5.5 ha)
- APPROXIMATE PROPERTY BOUNDARY

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NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17N, VERTICAL DATUM: CGVD28

CLIENT

STELCO INC.

PROJECT

PROPOSED TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED QUARRY LANDFILL EXPANSION, LAKE ERIE WORKS, NANTICOKE, ON

TITLE

EXISTING GROUNDWATER AND SURFACE WATER MONITORING LOCATIONS

CONSULTANT

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APPROVED	----

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The LEWF is located within Niagara Forest Section of the Deciduous Forest Region, which contains a wide variety of broadleaved trees. The region is dominated by sugar maple (Acer saccharum) and American beech (Fagus grandifolia), white elm (Ulmus americana), basswood (Tilia americana), red ash (Fraxinus pennsylvanica), white oak (Quercus alba), and butternut (Juglans cinerea). Among these are the tulip-tree (Liriodendron tulipifera), cucumber-tree (Magnolia acuminata), pawpaw (Asimina triloba), red mulberry (Morus rubra), Kentucky coffee tree (Gymnocladus dioicus), black gum (Nyssa sylvatica), blue ash (Fraxinus quadrangulate), sassafras (Sassafras albidum), mockernut (Carya tomentosa), pignut hickories (Carya glabra), and the black oaks (Quercus velutina) and pin oaks (Quercus palustris). Additionally, black walnut (Juglans nigra), sycamore (Platanus occidentalis) and swamp white oak (Quercus bicolor) are within the region with some scattered conifers (Pinophyta), eastern white pine (Pinus strobus), tamarack (Larix laricina), eastern red cedar (Juniperus virginiana), and eastern hemlock (Tsuga canadensis) (Rowe, 1972). Forested areas are located south and to the northeast of the existing Quarry Landfill.

The LEWF includes one Ministry of Natural Resources and Forestry (MNRF) unevaluated wetland approximately 550 m southeast of the Quarry Landfill. The Nanticoke Creek Mouth Provincially Significant Wetland (PSW) is present approximately 2.5 km to the east of the existing Quarry Landfill and one non-provincially significant wetland is present to the south of the LEWF approximately 1.6 km from the existing Quarry Landfill, namely the Stelco Creek Wetland. No Areas of Natural and Scientific Interest (ANSI) are within the vicinity of the LEWF. The LEWF is located wholly within the Long Point Region Watershed. These natural features are illustrated on Figure 4-2.

4.6 Land Use Planning

The LEWF is located within the community of Nanticoke and on a broader scale is a part of the Haldimand County. The County lies on the north side of Lake Erie, east of Norfolk County, south of Hamilton and west of Niagara Region.

The Quarry Landfill (5.5 ha) is situated near the west boundary of the LEWF (931 ha) and more centrally when compared to the southern and northern boundaries of the LEWF. Within the facility site, a slag processing plant is located southeast of the Quarry Landfill, and a wastewater treatment lagoon and separate lagoon landfill are located south of the Quarry Landfill and Quarry Pond. The entire LEWF is designated as “Major Industrial” in the Haldimand County Official Plan (HCOP) (Haldimand, 2019) and is also zoned in the “Industrial Influence Area”.

Permitted uses within the “Major Industrial” designation include:

- Steel, metal production and ancillary facilities;
- Petrochemical processing and ancillary facilities;
- Electrical power generation and ancillary facilities; and,
- Port and dock facilities.

The “Industrial Influence Area” is an area delineated as 3 km around the exterior properties of the steel mill, oil refinery, hydro generating stations and sites for the purpose of restricting new land uses which are incompatible with the major industrial operations, i.e. to ensure that development in the Major Industrial and Industrial designations is continued. The “Industrial Influence Area Extension”, a portion of the “industrial Influence Area” (as originally defined in the former city of Nanticoke Official Plan), is located in Norfolk County, located approximately 3 km west of the LEWF.

The property adjacent to the west side of the LEWF and the Quarry Landfill is zoned as major industrial, although it is currently being used for agricultural purposes. The land to the east of the LEWF (located south of the hamlet of Nanticoke) is zoned for agriculture and consists of gently rolling active agricultural fields. An industrial park borders the north side of the LEWF, which is zoned appropriately for industrial uses. The nearest residences are located approximately 2.5 km southeast of the existing Quarry Landfill.

4.7 Agriculture

As per historical soils mapping of the Regional Municipality of Haldimand-Norfolk (Land Resource Research Institute, 1984), the Quarry Landfill and the LEWF are located in the large Haldimand clay plain and consists primarily of Smithville soils, Haldimand Soils, and Lincoln Soils. These soils are composed of mainly lacustrine heavy clay, with thin silty clay loam and silty clay forming a veneer over most heavy clay layers. In a few places, sandy textures between 40 to 100 cm thick overlie these clays. These soils are reported to have moderately well to imperfect soil drainage. These soils are designated as fair agricultural soils, limited mainly by their high clay contents or excess moisture. Grain and silage corn, spring grains, whiter wheat and forages are the most common crops on these soils for this area.

The majority of the LEWF is marked as “Urban Land” in historical soil mapping and land inventory records due to the longstanding industrial developments in this area, predating the site from historical soil mapping or agriculture assessment.

4.8 Cultural Heritage

4.8.1 Archaeology

Previous archaeological assessments have been carried out by non-Stelco parties near the project’s vicinity as part of other projects in the industrial park. In October 2008, a Stage 1 archaeological assessment was carried out for Bruce Power for a large parcel of land located west of the LEWF (Lots 21 to 24, Concession 1 and 2) as part of a preliminary evaluation of site feasibility for the Nanticoke New Build site. The investigation determined that all of the lands had archaeological potential, and it was recommended that a Stage 2 assessment be conducted in advance of ground disturbance.

In 2009, the Stage 2 assessment for the Nanticoke New Build project was completed for Bruce Power, who subsequently canceled their proposed nuclear new build project and canceled further assessment for the project. The assessed area included multiple agricultural fields surrounding the LEWF to the west, including the agricultural plains located directly west of the Quarry Landfill and Quarry Pond. The Stage 2 assessment that was completed resulted in the identification of 219 locations, including 206 pre-contact Aboriginal sites, three historic Euro-Canadian sites and 10 multi-component pre-contact Aboriginal and historic Euro-Canadian sites. In summary, 104 of the 219 archaeological locations identified within the study area were recommended for Stage 3 assessment if development in this area proceeds in the future. Eight of these identified locations for Stage 3 assessment are located within approximately 500 metres west, northwest or southwest of the Quarry Landfill and Quarry Pond limits.

An additional Stage 1 archaeological assessment was completed in 2022 by a third part for Haldimand County related to the proposed Lake Erie Industrial Park Wastewater Treatment System. The study area was south of the Quarry Landfill and Quarry Pond. Again, the assessment determined the lands contained a mixture of areas that have retained archaeological potential, areas of no archaeological potential, and previously assessed lands of further concern.

LEGEND

- CREEK
- WOODED AREA
- APPROVED QUARRY LANDFILL BOUNDARY (5.5 ha)
- APPROXIMATE PROPERTY BOUNDARY

WETLAND SIGNIFICANCE

- UNEVALUATED WETLAND
- EVALUATED WETLAND (NO SIGNIFICANCE)
- PROVINCIALLY SIGNIFICANT WETLAND (PSW)

DRAFT

0 500 1,000

1:15,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17N, VERTICAL DATUM: CGVD28

CLIENT
STELCO INC.

PROJECT
PROPOSED TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED QUARRY LANDFILL EXPANSION, LAKE ERIE WORKS, NANTICOKE, ON

TITLE
LAKE ERIE WORKS FACILITY NEARBY SIGNIFICANT NATURAL FEATURES

CONSULTANT

wsp

YYYY-MM-DD	2022-11-13
DESIGNED	TE
PREPARED	MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
20136711	0002	A	4-2

4.8.2 Built Heritage Resources and Cultural Heritage Landscapes

The areas surrounding the Quarry Landfill include gravel roads (connected to main roads of the LEWF), small stockpiles of material, the constructed Quarry Pond, and gently rolling active agricultural fields. The cultural heritage existing conditions review identified no built heritage resources (BHR) nor cultural heritage landscapes (CHL) adjacent to or within the vicinity of the Quarry Landfill site.

Per the Provincial Policy Statement (PPS) (Ontario, 2020), BHR "means a building, structure, monument, installation or any manufactured or constructed part or 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 *Ontario Heritage Act* (*OHA*) (Ontario, 1990c), or that may be included on local, provincial, federal and/or international registers." The PPS also defines CHL as: "means 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 *OHA*, or have been included on federal and/or international registers, and/or protected through official plan, zoning bylaw, or other land use planning mechanisms".

In line with the definitions of BHR and CHL above, the cultural heritage existing conditions review consulted municipal heritage committee resources, historical mapping, Haldimand County Official Plan (Haldimand County Planning & Economic Development Department, 2019), and existing cultural heritage resource assessments for adjacent study areas to the Quarry Landfill and LEWF, including the waste water treatment plant to the south of the Quarry Landfill and the connector project located directly east of the LEWF and Industrial Park. Heritage Haldimand, the municipal heritage committee, provided a list of cultural heritage resources which are designated under Part IV and Part V of the *Ontario Heritage Act* or considered culturally significant as places of worship or cemeteries. The nearest identified BHR is the Low Residence, a historical building located 2.5 km southeast of the existing Quarry Landfill, which is also owned and maintained by Stelco.

4.9 Socio-economic

4.9.1 Local Economy, Residents and Community

The socio-economic component considers the impact of the proposed landfill expansion on the local economy in terms of employment and municipal finances as well as the effects on residences and communities. Haldimand County is located in South Central Ontario and forms the southern boundary of the Greater Golden Horseshoe. The nearest community is the former city and current Hamlet of Nanticoke, located approximately 3 km east of the existing Quarry Landfill. The population of the former city of Nanticoke was last estimated before it was subdivided in 2001 at approximately 23,588 (Statistics Canada, 2001). What was the city of Nanticoke is now split between Haldimand County and Norfolk County. The population of Haldimand County was last estimated in 2017 at approximately 47,586 (Haldimand County, 2019).

The Greater Golden Horseshoe Growth Plan (MMAH, 2020) outlines where and how to grow for municipalities within this subject area, which includes Haldimand County. The Growth Plan directs growth to settlement areas and encourages growth by directing the development of sensitive land uses, major retail uses, and major offices uses to avoid, or when avoidance is not possible, minimize and mitigate adverse impacts on industrial, manufacturing or other uses that are particularly vulnerable to encroachment.

There are no schools, hospitals, or religious buildings within the vicinity of the of the existing Landfill. The nearest residences are located approximately 2.5 km southeast of the Quarry Landfill.

Regarding businesses operations, the Quarry Landfill is part of the LEWF operations, which itself is located inside the Lake Erie Industrial Park along with a number of smaller businesses. The Lake Erie Industrial Park land holdings represent one of Ontario's largest greenfield tracks designated for industrial development. The LEWF and industrial park is a major employer for surrounding communities. Other neighbouring land uses include agricultural uses including greenhouses, soya, grain, cornfields and various cash crops.

4.9.2 Visual

Due to its location within the Lake Erie Industrial Park, the Quarry Landfill is not easily seen from any public vantage point. The nearest public roads are approximately 2 km to the south (New Lake Shore Road) or approximately 3 km to the north (Ontario Highway 3). Due to the vegetation, brush and tree cover located in the agricultural plains which separates the Quarry Landfill from these public roads, the landfill is not distinctly visible to the public.

Other works features in the industrial park take visual precedence over the existing Quarry Landfill due to their mechanical appearance and increased elevations over the horizon, drawing the viewer's attention away from the landfill and thereby reducing the landfill's already low visual impact.

The lined cell of the existing Quarry Landfill is relatively small in dimensions, measuring only approximately 200 m in length and width, and with the peak of the final contour design measuring only 5-8 m above the natural ground surface elevations (187 masl to 195 masl).

4.10 Transportation

Presently, for the existing Quarry Landfill there is no waste movement from HWF to LEWF. Ontario Highway 6 provides a main northeast-southwest link from Hamilton to Nanticoke connecting Nanticoke to the larger northern highways (400-series highways). Ontario Highway 3 provides a main east-west link through the central part of Haldimand County, connecting with the Queen Elizabeth Way (QEW) furthest to the east and to Highway 401 further to the west. The LEWF can be accessed from both Highway 6 and 3 by County Road 55 (Nanticoke Road).

The nearest airport to the LEWF is the Simcoe Airport being approximately 16 km away however impacts to airports are not expected as the secondary material being disposed is not putrescible.

4.11 Technical Considerations

As already outlined in Section 1.2.2, the current fill area of the existing Quarry Landfill consists of a base liner system composed of a single composite liner system comprised of a 1.5 mm (60 mil) thick textured HDPE geomembrane underlain by a GCL. A 0.3 m thick protection layer comprised of screened BF Slag (6 mm maximum particle size) overlies the geomembrane.

The leachate collection system is on the cell floor above the base liner system and consists of the following layers starting with the lower-most layer:

- 0.5 m thick drainage layer consisting of 50 mm washed clear natural stone;
- non-woven geotextile filter fabric; and,
- 0.3 m thick filter layer comprised of screened BF Slag (6 mm maximum particle size).

Leachate is pumped from a sump at the low point of the cell via a riser pipe that extends up the interior slope of the perimeter berm. The leachate is conveyed via forcemain to the LEWF wastewater treatment plant. The landfill final cover design consists of a 0.6 m (minimum) thick layer of clayey soil overlain by a 0.15 m thick topsoil layer vegetated with grass, which is consistent with *Ontario Regulation (O.Reg.) 232/98* (Ontario, 1998)

5.0 DESCRIPTION OF AND ASSESSMENT OF 'ALTERNATIVES TO' THE PROJECT

5.1 Development of 'Alternatives To'

For Stelco, the 'Alternatives To' are fundamentally different approaches for long term waste management of residual steel making waste.

5.2 Environmental Components, Criteria and Indicators for 'Alternatives To'

A broad set of criteria were developed for comparative evaluation of the 'Alternatives To'. These evaluation criteria cover the components that comprise the natural, social, economic, cultural and built environment.

The environmental components, evaluation criteria and indicators were outlined in Virtual Consultation Event #1 and shared with the GRT, Indigenous Communities and the public. There were no additional environmental components, evaluation criteria or indicators identified from this consultation process.

The final environmental components are as shown in Table 5-1 below with the relevant evaluation criteria, rationale, indicators and data sources to be used for the comparative assessment.

Table 5-1: Environmental Components, Criteria, Indicators and Data Sources for 'Alternatives To' Assessment

Environmental Component	Evaluation Criteria/ Criterion	Rationale for Including the Criteria/Criterion	Indicators	Data Sources
Atmosphere	■ Potential effects on air quality (including dust, and GHG). ■ Potential effects on noise.	■ Associated activities may produce dust and GHG. ■ Waste management operations may also produce noise at levels that are undesirable to off-site sensitive receptors .	■ Qualitative amount and/or type of emissions generated/ offset due to alternative. ■ Qualitative amount of non-renewable resources conserved. ■ Qualitative relative expected amount of noise from alternative.	■ Quarry Landfill studies/reports. ■ Applicable provincial regulations, standards and guidelines. ■ Aerial mapping.
Geology and Hydrogeology	■ Potential effects on groundwater resources.	■ Contaminants from site operations may enter the groundwater and impact off-site groundwater.	■ Qualitative possible effect on groundwater quality at the property boundary.	■ Quarry Landfill studies/reports. ■ Aerial mapping. ■ Borehole logs. ■ Published geology and hydrogeology maps and reports.

Environmental Component	Evaluation Criteria/ Criterion	Rationale for Including the Criteria/Criterion	Indicators	Data Sources
Surface Water	■ Potential effects on surface water resources.	■ Contaminants from site operations may enter the groundwater and discharge to surface water or runoff directly and impact surface water. ■ Surface water quantity may change at a site because of site development.	■ Qualitative possible effect on surface water quality and/or quantity within the area.	■ Quarry Landfill studies/reports. ■ Aerial mapping. ■ Topographic Maps. ■ Published hydrology maps and reports.
Biology	■ Potential effects on natural environment features (aquatic and terrestrial ecosystems).	■ Contaminants from site operations may adversely affect aquatic or terrestrial life (including rare or endangered species).	■ Qualitative evaluation of possible disturbance of terrestrial and/or aquatic environment.	■ Haldimand County Official Plan. ■ Long Point Region Conservation reports, mapping and data. ■ Quarry Landfill studies/reports ■ Published natural environment reports for the area.
Agriculture and Land Use	■ Potential effects on existing land use and agriculture.	■ The agricultural land base or agricultural operations may be impacted by the site operations. ■ Other land uses, such as residential, may be impacted by the site operations.	■ Approximate number or types of land use conflicts.	■ Haldimand County Official Plan. ■ Aerial and topographic mapping.
Cultural Heritage	■ Potential effects on archaeology. ■ Potential effects on cultural environment including cultural heritage landscapes and built heritage resources.	■ Previously identified or high likelihood archaeology resources may be altered or effected by site operations. ■ Previously identified or high likelihood heritage landscapes and resources may be altered or impacted by site operations.	■ Approximate degree of archaeological potential. ■ Approximate degree of potential for cultural heritage landscape/ built heritage resources.	■ Haldimand County Official Plan. ■ Archaeological Screening where available. ■ Published archaeology reports for the County.

Environmental Component	Evaluation Criteria/ Criterion	Rationale for Including the Criteria/Criterion	Indicators	Data Sources
Socio-economic	■ Potential site operational effects on sensitive off-site receptors (i.e., noise, visual).	■ Facilities may potentially affect the use and enjoyment of sensitive uses in the vicinity of the site.	■ Approximate proximity of alternative to potential off-site sensitive receptors.	■ Haldimand County Official Plan. ■ Aerial mapping. ■ Applicable provincial regulations, standards and guidelines.
Transportation	■ Potential effect on road network	■ Facility operations may affect the traffic in the surrounding area through changes in truck traffic to/from site facilities, including potential increases in traffic associated with providing the services.	■ Qualitative assessment of additional tonnage and resulting number of trucks to site associated with the alternative.	■ Haldimand County Official Plan. ■ Online interactive mapping. ■ Approximate amount of waste to manage and distance to handling location.
Technical Considerations	■ Relative ability of Stelco to operate. ■ Relative technical risks associated with the operation of the alternative. ■ Relative costs and timing of approvals. ■ Relative cost of implementation (capital and operational costs).	■ Different methods of waste management can have different risks or effects based on the status of development of the technology, relative maintenance requirements and/or expertise required to operate. ■ Site operations can influence employment and business in the wider regional area. ■ Different methods of waste management can have different costs based on the method, type and amount of engineering required.	• Availability of examples where technology used with similar tonnage. ■ Types of barriers to implementation. ■ Approximate cost per tonne. ■ Anticipated types of approvals required for alternative and level of effort to obtain the approvals.	■ Quarry Landfill studies/ reports. ■ Applicable provincial regulations, standards, and guidelines. ■ Practitioner expertise.

5.3 Identification and Feasibility of 'Alternatives To'

In terms of 'Alternatives To', Stelco has considered the range of alternatives that are typically available for managing steel making secondary materials and has determined that there are six 'Alternatives To' that should be considered, including the Do Nothing alternative and a waste diversion alternative. The MECP Code of Practice for Preparing and Reviewing Environmental Assessment Terms of Reference (2014) provides guidance for consideration of a reasonable range of alternatives. The Code of Practice recognizes that private companies may not be able to implement some alternative ways of managing waste. It is noted that being a private commercial business, some of these 'Alternatives To' may not be actually reasonable or feasible solutions for Stelco; this is discussed further below.

The 'Alternatives To' considered by Stelco consist of the following:

- Alternative 1 –Closure of Existing Landfill Site and Export Waste for Off-site Disposal
- Alternative 2 – Landfill Site Expansion
- Alternative 3 – Establish New Landfill Site at Newly Purchased Property
- Alternative 4 – Alternative Waste Management Technologies
- Alternative 5 – Enhanced Waste Diversion
- Alternative 6 – Do Nothing

This section describes each of the 'Alternatives To' and screens their reasonableness or feasibility for Stelco to undertake as their approach to long term waste management. The 'Alternatives To' remaining after this screening have been carried forward for comparative evaluation in Section 5.4.

5.3.1 Alternative 1 – Closure of Existing Landfill Site and Export Waste for Off-site Disposal

Under Alternative 1, the existing Quarry Landfill would be closed. Stelco would likely continue to operate waste diversion activities at the landfill site or elsewhere on their property, and the remaining waste would be exported to an appropriately licensed landfill for disposal. Stelco presently accepts non-hazardous steel making secondary materials from its LEWF at the existing Quarry Landfill. Under Alternative 1, it was assumed that Stelco would continue to operate the Quarry Landfill until it reaches its currently approved capacity of 1,300,000 m^3.

Public and private waste facilities (landfills) within approximately 100 km of the existing Quarry Landfill allowed to accept steel making secondary material / waste and with the appropriate service area in their respective ECAs are outlined in Table 5-2.

Table 5-2: Landfills or Transfer Stations Capable of Accepting Stelco LEWF Steel making Secondary Materials

Waste Disposal Facility	Location	Total Approved Capacity (m^3)	Approved Fill Rate (Tonnes Per Year)
GFL Stoney Creek Regional Facility	Hamilton	6,700,000 + 3,680,000 (EA approved)	750,000
WCC Ridge Landfill	Blenheim	28,900,000	1,300,000

It is noted that this listing is limited as many local or nearby municipally owned or operated waste management facilities are unable to accept the Stelco secondary material because it is not a waste type listed within their respective ECAs. The two landfills noted in Table 5-2 were contacted directly and confirmed their ability to receive this waste, although they did note it is a difficult waste type for them to work with. The WCC Ridge Landfill has about 20 years of remaining capacity while the Stoney Creek facility has approximately 15 years remaining capacity. It is therefore concluded that Alternative 1 is a feasible alternative for Stelco to consider.

5.3.2 Alternative 2 – Landfill Site Expansion

Under Alternative 2, the process to obtain approval for an increase in the disposal capacity of the Quarry Landfill would be undertaken so that waste disposal would continue at this location under the ownership of Stelco. An envelope that could be used to accommodate the estimated 1,185,000 m^3 to 1,685,000 m^3 additional landfill airspace required for the 15 to 25 year planning period plus material from HWF will be developed and considered noting that the volume will be refined during the EA.

To determine the technical and economic feasibility of this alternative, an initial technical evaluation of the expected design and operational requirements to successfully obtain approval of an expansion under the *EAA* (Ontario, 1990) and following the requirements of *O.Reg. 232/98* Landfill Standards was undertaken in 2020 (Volume II Supporting Document #1 – Feasibility of Quarry Landfill Expansion). The feasibility study examined two areas for a potential expansion of the Quarry Landfill, assuming a target additional airspace of 870,000 m^3, which was the volume identified at that time.

The first area (described as Expansion Area 1) had an approximately 5 ha waste fill area and flanked the east boundary of the existing Quarry Landfill adjacent to the Quarry Pond. This area is bordered by the Centre Creek valley to the south, Townline Road to the east and the new landfill cell to the north. The northern portion of this area was stripped of overburden material as part of the former quarry operation and is exposed bedrock. The southern portion is a natural forested area.

The increase in waste fill volume capacity within Expansion Area 1 was estimated at 520,000 m^3, less than the targeted volume of 870,000 m^3 for this initial assessment. The maximum airspace available in the area adjoining the east side of the existing Quarry Landfill was limited by natural, physical and geometrical constraints.

The second area (described as Expansion Area 2) had an approximately 8ha waste fill area and is located east of Townline Road, across from the existing Quarry Landfill and north of “G” Road West. As such, this would be a new landfill area that is physically separate from the existing Quarry Landfill (but would still constitute a landfill expansion). This is a currently unused open area with grass vegetation. The area dips gently to the south from an elevation of 193 masl at the north end to 185 masl at the south end. A shallow drainage ditch traverses this area from north to south and connects to Centre Creek south of the Quarry Landfill. Based on records of previous hydrogeological investigations, this potential expansion area was inferred to have approximately 3 m to 6 m of silty clay overburden directly overlying limestone bedrock.

The increase in waste fill volume capacity with Expansion Area 2 was estimated at 1,010,000 m^3, which exceeds the volume of 870,000 m^3 targeted for the initial assessment.

For both initial expansion Alternatives 1 and 2, a bottom liner and leachate collection system as was used in the new cell were considered necessary to provide the required engineered leachate containment and control.

The areas north and south of the existing Quarry Landfill have Centre Creek running through them and therefore were not considered to have potential for the purpose of expansion. The area to the west of the Quarry Landfill is outside the Stelco property boundary and, as such, was also not considered for possible expansion.

Based on the results of the initial technical evaluation, Alternative 2 was considered to be a reasonable solution, with the understanding that Stelco would utilize currently owned property in the vicinity of the Quarry Landfill.

Since completion of Supporting Document #1 in 2020 the potential volume requiring disposal has been revised as mentioned above to be between 1,185,000 m^3 to 1,685,000 m^3. Despite this increase in volume requiring disposal, it is envisioned that the lands to the east of the existing Quarry Landfill would still have the required space to allow for this slightly larger capacity. Additionally, another option that could be considered in the EA is a combination of what was previously described as Alternatives 1 and 2. It was concluded that landfill expansion was a technically feasible alternative for Stelco to pursue.

5.3.3 Alternative 3 – Establish New Landfill Site at a New Property

Under Alternative 3, Stelco evaluated the potential to establish a disposal site at a different Stelco property or at a new property. Stelco does not have the ability to expropriate land to site a new landfill; therefore, its ability to develop landfill capacity is inherently constrained to properties owned by the company. New landfill capacity could be developed in this scenario by constructing a new landfill on a Stelco property. At commencement of this ToR in 2021, Stelco owned the HWF. However at the time of draft ToR submission in late fall 2022, the HWF property had been sold and was no longer in control of Stelco. There is not another Stelco-owned property that would be suitable for establishment of a new landfill site.

As such, using another Stelco property for a new landfill is not considered a feasible alternative.

5.3.4 Alternative 4 – Alternative Waste Management Technologies

Under Alternative 4, Stelco evaluated the potential to use an alternative waste management technology such as an energy from waste facility (EFW, where waste is combusted at extremely high temperature, resulting in heat that can be used in a steam powered generator, for example) at the LEWF. Under Alternative 4, the Quarry Landfill would therefore be closed after it reaches current approved capacity. However, considering the length of time required to select a technology provider, obtain approval and build such a facility, it is expected that a short-term alternative would have to be facilitated in the interim period, likely exporting waste, while approvals and agreements for alternative waste management technologies are set in place.

There are various EFW processes on the market used for municipal solid waste, commonly separated into two categories: conventional combustion (i.e., mass burn incineration) and advanced combustion (e.g., gasification, plasma arc gasification, and pyrolysis), with mass burn incineration being the most well established and commercially proven worldwide. EFW facilities are not uncommon in Canada but are much more prevalent in the waste management practices in the United States and Europe. Most EFW processes have not been demonstrated successful at a commercial scale operation in Ontario. It is noted that the two approved EFW in Ontario (Algonquin Power EFW Facility in Brampton and Durham-York Energy Centre in Clarington) have a processing capacity of 140,000 to 182,500 tonnes of waste per year, about one and a half to two times the current waste disposal needs of Stelco. As such, and in view of thermal facilities currently licensed and operating in Ontario (albeit for private entities or municipalities), the only thermal treatment technology that will be considered in this assessment is mass burn incineration (i.e., incineration).

In general, EFW facilities are designed to combust waste continuously and operate at a steady state processing rate for their lifetime, which is preferred for minimizing pollutants, maximizing energy recovery and reducing fuel consumption for start-up procedures. The Stelco residual waste does not contain an organic component and, therefore, is not an ideal combustion candidate; nevertheless, it is considered to be possible. Although the incineration process is highly scalable, it is more adapted for a large base load processing need. Smaller facilities can be designed for batch consumption and will only operate when sufficient volumes of waste have been accumulated, but this is more typical for remote locations or locations where there is limited access to landfill disposal. These smaller batch systems can have difficulty achieving air quality objectives.

It is noted that Stelco does not own or operate any EFW facilities, and it is not in their primary area of business. Due to high capital and operating costs, Stelco also believes that thermal treatment will not provide a cost competitive way to provide residual disposal services. Furthermore, there is uncertainly of the validity of EFW techniques for non-hazardous steel making secondary materials when these techniques have more readily been used for municipal solid waste. For all these reasons, EFW is not considered feasible as an alternative for Stelco.

5.3.5 Alternative 5 – Enhanced Waste Diversion

This alternative would require Stelco to consider and look for opportunities to increase diversion from disposal, evaluating current legislation and funding mechanisms and assessing diversion opportunities in alignment with the corporation. As Stelco is a business managing its own waste, diversion and re-use of material is to their advantage in lieu of disposal.

Presently, secondary materials that are recycled consist of coke breeze, iron ore pellet fines, flue dust, blast furnace granulated slag that makes a useful product for the cement sector as it reduces the amount of clinker required, caster scale and mill scale. Additionally, basic oxygen furnace (BOF) slag coarse, slag fines, metallic coarse and metallic fines as well as kish slag fines, kish slag coarse, metallic fines and metallic coarse are also re-used. Blast furnace sludge and off-gas (OG) sludge as well as casthouse and SVS baghouse dusts are the residual wastes that presently require landfilling. It is noted that presently the diversion rate is approximately 93% of the materials noted above and Stelco continues to seek re-use possibilities.

With the exception of a zero-waste solution, this alternative does not have the ability to fully address the stated problem being assessed but can reduce the amount of post-diversion waste requiring management. A zero-waste solution is not presently considered possible or available to Stelco given its products that are generated with the by-products described above.

This waste diversion alternative can be used to estimate the amount of residual waste requiring management; however, it is not in itself a means of managing residual waste and cannot be compared as a standalone alternative. For this reason, Alternative 5 will not be included in the comparative evaluation of waste management ‘Alternatives To’.

5.3.6 Alternative 6 – Do Nothing

In EAs, the Do Nothing alternative is considered in the evaluation of ‘Alternatives To’ as a benchmark against which the potential environmental impacts and the advantages and disadvantages of the alternatives being considered can be measured and compared. For Stelco, the Do Nothing alternative would be to close the Quarry Landfill when it reaches its approved capacity and not pursue any other solution for waste management. It is noted that one of Stelco’s basic operational requirements as a corporation is to be able to provide disposal for or delegate responsibility to properly manage its waste materials. As such, the Do Nothing alternative is not an

‘Alternative To’ that could be considered to resolve the long-term waste management problem; rather, as stated above, it provides a basis of comparison as part of the EA process.

5.4 Comparative Evaluation of ‘Alternatives To’

The potential effects and/or implications of each of the remaining Alternatives 1 and 2 has been generally identified and described for each of the evaluation criteria. A qualitative assessment methodology was applied to complete a comparative assessment of remaining Alternatives 1 and 2. Information on Alternative 6 is also provided as a basis of comparison. The methodology consists of assigning an overall relative rating from most preferred to least preferred for each alternative, first for each of the criteria and then for the environmental component. Qualitative comparative rating of potential impact uses the descriptors “more preferred”, “less preferred” and “equally preferred”. Based on the description of potential impact for each criterion, the assignment of the qualitative descriptors should be readily apparent and understandable.

The comparative assessment of feasible ‘Alternatives To’ for each criterion is presented in Table 5-3.

Table 5-3: Comparison of Feasible 'Alternatives To'

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Potential effects on air quality (including dust and GHG)		
Comments	Closure of the existing landfill will eliminate the landfill site operations as a possible source of any off-site dust impacts. Increased emissions of GHG from hauling efforts.	Landfill expansion will continue to produce dust at levels comparable to the current waste management practices (off-site dust is noted as an issue of concern in consultation from Virtual Consultation Event #1, although it is unclear if this is dust from the landfill or dust from other sources, particularly considering the distance of receptors from the landfill). Available landfill expansion areas are not forested for the most part, so there would be limited to no loss of GHG sequestration associated with an expansion.	Landfill would be capped and closed and the landfill site operations would be eliminated as a possible source of any off-site dust impacts. Non-hazardous steel making secondary materials would accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Criteria	Potential effects on noise		
Comments	Closure of the existing landfill would eliminate the landfill site operations as a possible source of any off-site noise impacts. Potential for new haul route noise.	Landfill expansion will continue to produce noise at levels comparable to the current waste management practices (noise is noted as an issue of concern in consultation from Virtual Consultation Event #1 from one individual, although it is unclear if this noise is from the landfill or noise from other sources, particularly considering the distance of the receptor from the landfill).	Landfill would be capped and closed; no noise as all but post-closure maintenance activities would stop. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall Atmosphere Environmental Component Rating	Equally preferred	Equally preferred.	

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Potential effects on groundwater resources		
Comments	Groundwater quality at current landfill site is in compliance with current monitoring requirements and should gradually improve following site closure. The site to which waste is exported will need to adhere to relevant environmental standards and guidelines and comply regarding potential impact to off-site groundwater. The receiving site may need to alter leachate treatment to accommodate the newly imported material types.	Leachate can affect groundwater in the vicinity of the waste site. The expanded landfill capacity would be developed to comply with provincial standards and guidelines to protect off-site groundwater quality.	Landfill would be capped and closed; leachate generation and migration in groundwater would be ongoing as described for Alternative 1. Risk of leachate generation and groundwater impacts from unregulated waste management practices. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall Groundwater Environmental Component Rating	Equally preferred	Equally preferred	
Criteria	Potential effects on surface water resources		
Comments	Surface water quality at current landfill site is in compliance with current monitoring requirements and should gradually improve following site closure. The site to which waste is exported will need to adhere to relevant environmental standards and guidelines regarding potential impact to surface water. The receiving site may need to alter leachate treatment to accommodate the newly imported material types.	Impacted groundwater can affect surface water in the vicinity of the waste site. The expanded landfill capacity will be developed to comply with provincial standards to protect surface water quality. An expanded landfill will be designed to consider climate change and match post development flows to pre-development flows.	Landfill would be capped and closed; effects on surface water would be as described for Alternative 1. If Stelco does not pursue another waste management alternative, risk of leachate generation and surface water impacts from unregulated waste management practices. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall Surface Water Environmental Component Rating	Equally preferred	Equally preferred	

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Potential effects on natural environment features (aquatic and terrestrial ecosystems)		
Comments	Existing landfill and landfill to which waste is exported could potentially impact aquatic resources if leachate enters the environment.	Expansion of landfill site could result in disruption and/or destruction of habitat and disrupt the terrestrial environment. Any clearing would be carried out in accordance with provincial and local requirements. Expanded landfill could potentially impact aquatic resources if leachate impacts surface water at sufficiently high concentrations. The expanded landfill capacity will be developed to comply with provincial standards to protect surface water quality.	Landfill would be capped and closed. Increased risk of waste/leachate effects on natural environment from unorganized waste management practices can be expected. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	More preferred	Less preferred	-
Overall Biology Environmental Component Rating	More preferred	Less preferred	
Criteria	Potential effects on existing land use and agriculture		
Comments	The closed landfill site would not be suitable for agricultural or other land uses and would likely remain as its current land use designation. The landfill site to which waste is exported is also unlikely to be suited for agriculture or other uses post-closure. Official planning assesses and designates surrounding land uses to be compatible with both waste disposal sites.	Current landfill site property is designated in an area for major industrial use and is suitable for landfilling. There is sufficient area on the Stelco property to accommodate landfill expansion.	Landfill would be capped and closed; effects on land uses in vicinity of the existing landfill site would be as described for Alternative 1. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall land use and agriculture environmental component rating	Equally preferred	Equally preferred	

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Potential effects on archaeology		
Comments	Minimal, if any, site alteration needed to close the landfill site. Approval of the site to which waste would be exported would have received the required provincial approvals regarding archaeology.	Expansion of landfill site could result in new areas of landfill footprint but within areas of the Stelco property previously disturbed and developed. Approval of the site expansion requires provincial approvals regarding archaeology.	Landfill would be capped and closed; effects on archaeology would be as described for Alternative 1. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Criteria	Potential effects on cultural heritage landscapes and built heritage resources		
Comments	Minimal, if any, site alteration expected to close landfill site. Landfill is well within Stelco property boundary and is estimated to have minimal to no impact on built heritage resources and cultural heritage landscapes. Approval of the site to which waste would be exported would have received the required provincial approvals regarding cultural heritage.	Expansion of landfill site could result in new areas of landfill footprint but within areas of the Stelco property previously disturbed and developed. Given the landfill location within Stelco property, it is estimated the landfill expansion will have minimal to no impact on built heritage resources or cultural heritage landscapes. Approval of the site expansion requires provincial approvals regarding cultural heritage.	Landfill would be capped and closed; effects on cultural heritage would be as described for Alternative 1. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall cultural heritage environmental component rating	Equally preferred	Equally preferred	

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Potential site operational effects on sensitive receptors (i.e., noise, visual)		
Comments	Closure of landfill site will eliminate the landfill site operations as a possible source for off-site dust or noise effects. Few to no existing sensitive receptors in proximity of current landfill due to lack of neighbours on adjacent properties. Additional hauling for exporting waste could lead to additional noise along haul routes. Two responses to Virtual Consultation Event #1 would prefer export of waste.	Landfill expansion expected to have similar minimal effects on sensitive existing off-site receptors as current landfill site. Few to no existing sensitive receptors in proximity of current landfill due to lack of neighbours on adjacent properties. Complaints of dust and noise received during Virtual Consultation Event #1, but it is unclear if they are from the landfill or other potential sources. Historically Stelco LEWF has received complaints about dust, but the Quarry Landfill has never been identified as the source of the dust. Expansion will include a haul of material from the HWF.	Landfill would be capped and closed; effects in vicinity of the landfill site would be as described for Alternative 1. Non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Less preferred	More preferred	-
Overall Socio-economic environmental component rating	Less preferred	More preferred	
Criteria	Potential effect on road network		
Comments	Changing of the landfill site from one on-site to one that is off-site will increase hauling traffic, in addition to possibly longer hauling routes from the HWF that will result in increased traffic impacts along the selected haul routes.	Expansion of current landfill site would maintain current on-site traffic and reduce traffic on surrounding roads if waste needed to be exported. Increased hauling traffic would be expected from hauling material from the HWF but no more so than exporting waste.	Closure of landfill would result in the end of waste hauling vehicle traffic on public roads; however, non-hazardous steel making secondary materials would continue to accumulate on-site and require management.
Qualitative Rating	Less preferred	More preferred	-
Overall Transportation environmental component rating	Less preferred	More preferred	

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Relative technical risks associated with the operation of the alternative		
Comments	Risks would be associated with exporting waste to an off-site location (such as increased traffic to handle export methods, available capacity and possibly leachate treatment requirements at the receiving site). Also, longevity or service life of the receiving site.	Common risks and responsibilities associated with landfilling are expected (leachate management, management of nuisances such as dust and noise).	Unorganized waste management within Stelco would lead to increased future difficulty in managing environmental impacts from waste.
Qualitative Rating	Less preferred	More preferred	-
Criteria	Relative Cost and timing of approvals		
Comments	Closure plan for existing landfill will need to be submitted before approved capacity is reached. Preparation of closure plan is expected to take 3 to 4 months and approval of closure plan will take another 9 to 12 months. Approximate total approvals cost is estimated to be 20 to 30 times less than the cost associated with Alternative 2.	Expansion of the current landfill site will require completion and approval of an EA (4 to 5 years total, likely in 2024 to 2025) followed by an amendment to the site's existing ECA (1 year).	Landfill would be capped and closed; costs associated with approvals for closure would be as described for Alternative 1. Unorganized waste management could result in future approvals costs.
Qualitative Rating	More preferred	Less preferred	-
Criteria	Relative Cost of Implementation (capital and operational costs)		
Comments	The 25-year cost of Alternative #1 is 14-15-times more expensive than the 25-year cost associated with Alternative #2. Costs associated with Alternative 1 include the capital closure expenditure as well as the estimated costs and fees associated with the disposal of waste at an off-site landfill. The costs do not include the transportation of material to the off-site landfill which would be an additional cost borne by the company.	Costs include the initial capital associated with construction and closure to reach the desired capacity. Some of these capital costs associated with additional construction and progressive closure will occur throughout the 25-year period. Estimated costs also include the annual operating costs of the on-site landfill which are anticipated to be comparable to the current operating costs.	Landfill would be capped and closed; capital costs associated with closure would be as described for Alternative 1. There are no other capital costs; however, unorganized waste management could lead to costs for cleanup or management in the future.
Qualitative Rating	Less preferred	More preferred	–

Consideration	Alternative 1: Landfill Site Closure and Export of Waste for Disposal[1]	Alternative 2: Landfill Site Expansion	Alternative 6: Do Nothing
Criteria	Relative ability of Stelco to operate		
Comments	To export waste, Stelco would need to set up a deal for waste transport and disposal, which is readily in their control.	Stelco has been operating their existing landfilling operations since 1984 and since 2012 with engineering controls and is well positioned to continue with landfilling operations.	No additional activities are required.
Qualitative Rating	Equally preferred	Equally preferred	-
Overall Technical Considerations environmental component rating	Less preferred	More preferred	-

Notes:

[1] None of the waste management sites identified for waste export have an existing approved operating life long enough to meet Stelco's requirements for long term waste management if 25 years is considered.

A graphical summary of the results of Table 5-3, as well as the public feedback on the relative importance of the various environmental components and sub-components gathered during Virtual Consultation Event #1, are provided in Table 5-4. The outcome of this comparative evaluation is the identification of the preferred 'Alternative To' for long term waste management for Stelco.

Table 5-4: Summary of 'Alternatives To' and Feedback

Component	Sub-component	Alternative 1: Landfill Site Closure and Export of Waste for Disposal	Alternative 2: Landfill Site Expansion	Public Ranking Group[1]
Atmosphere	Air quality/ Greenhouse Gas	🟡	🟡	Very important
	Noise	🟡	🟡	Very important
Geology and Hydrogeology		🟡	🟡	Very important
Surface Water		🟡	🟡	Very important
Biology		🟢	🔴	Very important
Agriculture and Land Use		🟡	🟡	Very important
Cultural Heritage	Archaeology	🟡	🟡	Very important
	Cultural heritage landscapes, built heritage resources	🟡	🟡	Very important
Socio-Economic	Nuisance factors (i.e., dust, noise, visual)	🔴	🟢	Very important
Transportation	Traffic	🔴	🟢	Very important
Technical Considerations	Ability to operate	🟡	🟡	Important
	Technical risks	🔴	🟢	Important
	Cost and timing of approvals	🟢	🔴	Less Important
	Capital and operating costs	🔴	🟢	Less Important

Notes:

🟡 represents equally preferred

🟢 represents more preferred

🔴 represents less preferred

1. Three individuals or groups responded to the request for rankings.

5.5 Advantages and Disadvantages

As part of the comparative assessment, the advantages and disadvantages of each 'Alternative To' are described. The Do Nothing alternative is included in this comparison. This advantage-disadvantage assessment is presented in Table 5-5.

Table 5-5: Advantages and Disadvantages of 'Alternatives To'

Alternative	Advantages	Disadvantages
Alternative 1: Landfill Site Closure and Export of Waste for Disposal	■ None or minimal disruption of local habitat. ■ Minimal on-site operational efforts required for Stelco. ■ Relatively fast transition (including approvals) from current waste management service. ■ Lower capital expenditures. ■ Preferred by some members of the public based on feedback to Virtual Consultation Event #1.	■ Additional greenhouse gas emissions from hauling vehicles to new landfill. ■ Consumption of fossil fuels from hauling efforts a longer distance. ■ Higher operating costs than current practices. ■ Less control over long-term waste management planning for Stelco.
Alternative 2: Landfill Site Expansion	■ Land use already designated for waste disposal. ■ Less of an increase in operational effort. ■ Stelco has sufficient land to support a successful expansion. ■ Lower operating costs. ■ Waste management operations remain under Stelco control. ■ No traffic from LEW off-site. ■ Stormwater management will consider climate change.	■ Longer approvals process, with some uncertainty of outcome. ■ Lateral landfill expansion can possibly affect the natural environment and archaeology resources. ■ Some public would rather an alternative solution based on feedback to Virtual Consultation Event #1. ■ Higher capital and approvals costs.
Alternative 6: Do Nothing		■ Would lead to potentially significant uncontrolled environmental impacts. ■ Effects of environmental impacts would take increased effort and time to mitigate than adopting one of the other alternatives. ■ Stelco would not fulfill its operational responsibility as a corporation to provide disposal for or delegate the responsibility for managing its waste.

5.6 Preferred Alternative

As shown in Table 5-4, there are nine components and 14 sub-components of the environment used to evaluate ‘Alternatives To’.

Of the 14 sub-components that were comparatively assessed, eight were ranked as equally preferred for the two ‘Alternatives To’. These included components or sub-components that are often considered to be most important such as geology and hydrogeology, air quality and noise. Of the six sub-components where there are differences in preference, Alternative 2, landfill expansion, was more preferred for four of the sub-components while Alternative 1, landfill closure and export waste, was more preferred for two of the sub-components. This is a relatively close assessment; however, Alternative 2, landfill expansion was identified as the overall preferred ‘Alternative To’. Landfill expansion will allow Stelco to retain control of waste management from their steel making operations as other alternative sites do not currently have an approved operating life/capacity that will be required to match the long term 25 year disposal requirements of Stelco. An expanded landfill owned and operated by Stelco can be designed and operated in compliance with provincial regulations.

6.0 DESCRIPTION AND RATIONALE FOR POTENTIAL 'ALTERNATIVE METHODS'

In EA terminology, 'Alternative Methods' are the different ways that the project can be implemented.

The *ToR Code of Practice* (MECP, 2014) states that a range of alternatives should be considered, which address the need and are within the proponent's ability to implement. The alternatives should be determined by the significance of potential environmental effects of the project and the circumstances specific to the proposal, such as the proponent's situation, timing and financing.

At the ToR stage, Stelco has chosen to identify the categories or types of 'Alternative Methods'.

The individual alternatives will be identified, refined and confirmed during the EA. Since Stelco has already conducted a screening of 'Alternatives To' and identified expansion of the Quarry Landfill as the preferred alternative for residual waste management, only 'Alternative Methods' associated with this alternative are presented in this ToR.

'Alternative Methods' are the different ways that the expansion of the Quarry Landfill could be implemented. Stelco will determine 'Alternative Methods' of achieving the purpose of the undertaking, which is to expand the Quarry Landfill to gain an additional 15 to 25 years of disposal capacity plus receipt of material from HWF involving 1,185,000 to 1,685,000 m^3 of additional airspace in total.

During the initial stage of the EA, different landfill expansion alternatives, within the existing LEWF will be identified and described at a sufficient level of detail (i.e., conceptual designs) so that potential effects of the expanded landfill on each environmental component can be assessed and compared. The landfill expansion alternatives will be developed at a conceptual level to cover the range of possible alternatives whose characteristics are different enough for comparison purposes. The expansion alternatives will consist of variations in and combinations of landfill height, landfill area, and configuration.

It is noted that alternatives are limited to lateral expansion to the south and/or east as mentioned in Section 5.3.2. The development of the alternative expansion configurations (height and slope angles) will include consideration of the geotechnical aspects (i.e., stability and settlement). The characteristics of the existing and proposed site design and engineering system requirements, including conceptual design mitigation measures (i.e., mitigation measures at the conceptual design stage), can affect the environment and site activities such as operational and maintenance requirements. These potential effects will be assessed in the EA.

Preliminary design concepts for the 'Alternative Methods' were considered in Supporting Document #1 in Volume II of this ToR, as discussed in Section 5.3.2, to illustrate possible ways that 870,000 m^3 (the volume under consideration in 2020) of airspace could be configured as an expansion to the Quarry Landfill.

There are a number of factors that will govern the configuration and number of different 'Alternative Methods' of landfill expansion. The lateral expansion of the Quarry Landfill is limited by the following (refer to Figure 1-2):

- The currently approved landfill is being considered for a limited vertical expansion of an additional 40,000 m^3 of airspace and as such has no additional space for vertical expansion.
- The potential area for horizontal expansion extends beyond the current landfill property east-ward and southeast-ward. The areas north and south of the existing Quarry Landfill have Centre Creek running through them and therefore are not considered to have potential for the purpose of expansion. The area to the west of the Quarry Landfill is outside the Stelco property boundary and, as such, is also not considered for possible expansion.

- The geometrical factors need to comply with the requirements of *O. Reg. 232/98*, i.e., landfill sideslopes of 4 horizontal (H):1 vertical (V) or flatter, landfill top slopes not flatter than 20H:1V, below grade sideslopes not steeper than 3H:1V.
- Preliminary geotechnical assessment indicates that the underlying soils do not present a practical design constraint to the height of landfill sideslopes in terms of stability or in terms of subgrade settlement.
- Horizontal expansion areas will continue to utilize a single composite liner system above which will be constructed a leachate collection piping system with a continuous drainage blanket as set out in *O. Reg. 232/98* (similar to the approach in the current lined cell area).
- *O. Reg. 232/98* recommends a buffer width of at least 100 m between the disposal area and the property boundary, and with justification can be reduced to a minimum buffer width of 30 m.

7.0 EA METHODOLOGY

This section presents the proposed methodology for the completion of the EA and the associated technical studies.

7.1 EA Approach

It is proposed that the EA work will be undertaken in a series of seven steps (further details are provided in Section 7.6) as follows:

- Step 1 – Characterize the existing environmental conditions;
- Step 2 – Identify the 'Alternative Methods' of landfill expansion (and incorporate conceptual design mitigation measures);
- Step 3 – Qualitative evaluation of 'Alternative Methods';
- Step 4 – Compare the 'Alternative Methods' for landfill expansion and identify the preferred alternative;
- Step 5 – Refine the mitigation measures and determine the net effects of the preferred alternative;
- Step 6 – Describe the preferred 'Alternative Method' for landfill expansion;
- Step 7 – Consideration of climate change;
- Step 8 – Cumulative impact assessment; and,
- Step 9 – Preparation of the EA Study Report.

Consultation with the public, Indigenous Communities, GRT members, LEWF Community Liaison Committee (CLC), and other stakeholders will be ongoing throughout the EA process.

7.2 Study Areas

The proposed methodology that will be used to conduct the EA is provided in the following sections. The EA, which will be carried out in accordance with the approved ToR, will involve the identification of the preferred 'Alternative Method' for the project and the assessment of the effects of the project.

The study area is the area within which activities associated with the proposed project will occur and where potential environmental effects will be studied. Three preliminary generic study areas for the assessment have been identified as follows:

- **Site Study Area** – The existing Quarry Landfill and adjacent area of land within which landfill expansion may occur.
- **Site-vicinity Study Area** – The lands in the area immediately adjacent to the Site Study Area that have the potential to be directly or indirectly affected by the landfill expansion and activities within the Site Study Area. As described below, the extent of the Site-vicinity Study Area will be determined for each of the environmental components described in Section 7.3.
- **Wider Study Area** – lands generally beyond the Site-vicinity Study Area, which could extend to include the area of Haldimand County as well as City of Hamilton and roads in between as pertains to the movement of waste from HWF to LEWF.

The rationale for the definition of these preliminary generic study areas is as follows:

- **Site Study Area** – The area of land within which 'Alternative Methods' of landfill expansion may occur has been defined and will be limited to a defined location within the existing LEWF property.
- **Site-vicinity Study Area** – The MECP Guideline D-4 Land Use on or Near Dumps describes that the most significant potential impacts typically occur within 500 m of the perimeter of the waste disposal area on a landfill site. For this reason, this Guideline distance is often used by Ontario municipalities in their Official Plans to establish a holding zone around landfills; development within these zones requires proponents to demonstrate that their proposed development will not be adversely affected by the landfill site and its operations. For most environmental components, a Site-vicinity Study Area of 500 m from the Site Study Area limits is appropriate. For specific environmental components, the appropriate Site-vicinity Study Area is greater than 500 m from the existing or potential expanded disposal area. It should also be recognized that the Quarry Landfill has been in operation for over 35 years, and monitoring and operational data demonstrates compliance with the requirements of its ECA and the limited extent for potential adverse environmental impacts to occur off-Site.
- **Wider Study Area** – An area that takes in the broader community generally beyond the immediate site-vicinity and for specific environmental components may include the entire municipality.

The preliminary extent of the study area proposed for each of the environmental components to be studied during the EA, together with a rationale, is provided in Table 7-1 below.

Table 7-1: Proposed Preliminary Study Areas

Environmental Component	Preliminary Area(s) to be Studied	Rationale
Atmosphere	Site and Site-vicinity	Air and noise emissions are required to meet provincial requirements at the landfill site boundary or closest sensitive receptors (which are more than 2.5 km from the existing landfill).
	Site- vicinity	To assess haul route noise. See discussion under Transportation for a description on the Site-vicinity Study Area for the haul routes.
Geology and Hydrogeology	Site	Potential effects on groundwater quality have to comply with the MECP Reasonable Use Guideline at the landfill site boundary.
Surface Water	Site and Site-vicinity	Necessary to include the drainage boundaries of the subwatersheds within which the site is located.
Biology	Site and Site-vicinity	Potential effects on biological resources are expected to be limited to 120 m from the Site Study Area that is the regulatory setback distance from wetlands, water courses for Conservation Authorities and for SAR assessments.
Land Use	Site and Site-vicinity	Since there are provincial requirements that govern the potential emissions or discharges from a landfill site, potential effects on land use are expected to be limited to 500 m from the Site Study Area as suggested by Guideline D-4.

Environmental Component	Preliminary Area(s) to be Studied	Rationale
Agriculture	Site and Site-vicinity	Since there are provincial requirements that govern the potential emissions or discharges from a landfill site, potential effects on agriculture are expected to be limited to 500 m from the Site Study Area as suggested by Guideline D-4.
Archaeology	Site	Potential disturbance of archaeological resources will be limited to areas associated with the landfill expansion.
Culture	Site and Site-vicinity	In accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) requirements for cultural studies, the area of study will extend to the extent of all properties adjacent to the landfill boundary.
Socio-economic	Site, Site-vicinity and Wider	To consider the potential effects of the landfill expansion within 500 m of the Site Study Area as suggested by Guideline D-4 and on the broader community.
Visual	Site-vicinity	Off-site vantage points from where the landfill expansion may be visible from as far as 5 km.
Transportation	Site-vicinity	To consist of the haul routes associated with the landfill receipt of material from HWF, City of Hamilton to Highway 6, to County Road 55, to County Road 3.
Design and Operations	Site	This component relates only to activities associated with the landfill expansion itself

The Site Study Area as presently identified for an area of landfill expansion and any ancillary features plus buffer and the area extending 500 m beyond the Site Study Area are illustrated on Figure 7-1. The Wider Study Area is not depicted on this figure.

These preliminary study areas will be refined and confirmed in consultation with the GRT, members of the public and Indigenous Communities during the EA.

LEGEND

- CREEK
- APPROVED QUARRY LANDFILL BOUNDARY (5.5 ha)
- APPROXIMATE PROPERTY BOUNDARY
- PRELIMINARY LANDFILL EXPANSION AREA
- 500 m POSSIBLE SITE-VICINITY STUDY AREA

DRAFT

0 500 1,000

1:15,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2022
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 17N, VERTICAL DATUM: CGVD28

CLIENT
STELCO INC.

PROJECT
PROPOSED TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF THE PROPOSED QUARRY LANDFILL EXPANSION, LAKE ERIE WORKS, NANTICOKE, ON

TITLE
PRELIMINARY STUDY AREA

CONSULTANT
wsp

YYYY-MM-DD	2022-11-13
DESIGNED	TE
PREPARED	MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
20136711	0002	A	7-1

7.3 Environmental Components, Criteria and Indicators for 'Alternative Methods'

As noted in Section 6.0, the environment is defined as those environmental components that may be affected by the project. The environmental components and sub-components that will be evaluated during the EA are presented in Table 7-2. Small changes from the environmental components used to assess 'Alternatives To' to those proposed for the EA methodology are proposed as follows:

- Surface water will be split into two sub-components: quality and quantity.
- Biology will be split into two sub-components: terrestrial and aquatic ecosystems.
- The land use and agriculture environmental component will be split into two main environmental components, namely: agriculture and land use.
- The cultural heritage landscapes and built heritage resources sub-component will be further divided such that cultural heritage landscapes and built heritage resources are individual sub-components.
- Socio-economic will be split into three sub-components: local economy, residents and community (nuisance), and visual.
- Technical considerations will change from four sub-components to two sub-components: engineered containment and financial.

The environmental components include natural, social, economic, cultural and built environment within this EA cover the broad definition of the environment and are:

- Atmosphere (air quality and noise);
- Geology and hydrogeology;
- Surface water (surface water quality and quantity);
- Biology (terrestrial and aquatic ecosystems);
- Land use;
- Agriculture;
- Cultural heritage (archaeology, built heritage landscapes and cultural heritage landscapes);
- Socio-economic (local economy, residents and community, visual);
- Transportation (traffic); and,
- Design and operations (engineered containment and financial).

Table 7-2 outlines each environmental component, including a statement rationalizing why each was included in the EA and the indicators that will be used for determination of potential impacts in the assessment. The data sources that will be used for assessing each of these environmental components are provided in Table 7-2. These components and indicators were proposed by Stelco's EA study team during the development of the ToR and presented to the public within Technical Bulletin #1 for comment. No feedback was received from the public. These criteria and indicators are preliminary and subject to refinement, and will be confirmed during the EA.

Table 7-2: Proposed Environmental Components, Rationale and Indicators for 'Alternative Methods' Assessment

Component/ Sub-component	Rationale for Including the Evaluation Criterion/Criteria	Evaluation Criterion/Criteria	Indicator(s)
Atmosphere/ Air Quality and GHG	Landfill expansion and associated operations can produce gases containing contaminants that degrade air quality if they are emitted to the atmosphere. Construction activities associated with landfill expansion and continued landfill operation can lead to levels of particulates (dust) in the air.	■ Potential effects on air quality (including dust, GHG)	■ Expected concentrations of air quality indicator compounds (selected regulated air contaminants to represent this type of project), including dust, at the property boundary and nearby sensitive receptors. ■ Expected GHG emissions.
Atmosphere/ Noise	Landfill expansion and associated operations will generate noise that will be emitted into the atmosphere and could impact neighbouring sensitive receptors.	■ Potential effects on noise	■ Noise Levels at neighbouring noise sensitive existing receptors or vacant lots (with appropriate zoning that may accommodate the future construction of sensitive noise receptors).
Geology and Hydrogeology/ Groundwater Quality	Contaminants associated with the landfill expansion and associated operations could enter the groundwater and impact off-site groundwater or surface water.	■ Potential effects on groundwater resources	■ Expected effect on groundwater quality at the landfill site property boundary.
Surface Water/ Surface Water Quality	Contaminants associated with the landfill expansion and associated operations could seep or runoff into surface water and adversely affect water quality and aquatic life.	■ Potential effects on surface water resources	■ Expected effect on surface water quality in Centre Creek and within the Site-vicinity Study Area.
Surface Water/ Surface Water Quantity	Operations associated with the landfill expansion could alter runoff and peak flows.	■ Potential effects on surface water resources	■ Expected change in runoff to and peak flows in drainage features. ■ Expected degree of off-site effects on surface water quantity within the Site-vicinity Study Area.
Biology/ Aquatic Ecosystems	Landfill expansion could remove or disturb the functioning of natural aquatic habitats and species, including rare, threatened, or endangered species.	■ Potential effects on natural environment features (aquatic and terrestrial ecosystems)	■ Expected change in surface water quality and/or quantity within the Site Study Area and the Site-vicinity Study Area. ■ Expected impact on aquatic habitat and biota, including rare, threatened, or endangered species within the Site Study Area and the Site-vicinity Study Area.
Biology/ Terrestrial Ecosystems	Landfill expansion could remove or disturb the functioning of natural terrestrial habitats and vegetation, including rare, threatened or endangered species.	■ Potential effects on natural environment features (aquatic and terrestrial ecosystems)	■ Expected impact on terrestrial vegetation communities, wildlife habitat, and wildlife, including rare, threatened or endangered species within the Site and Site-vicinity Study Areas.
Agriculture	The agricultural land base or agricultural operations may be impacted by the landfill expansion and associated operations.	■ Potential effects on existing agriculture	■ Expected effect on agricultural land base and agricultural operations within the Site and Site-vicinity Study Areas.
Cultural Heritage Resources/ Archaeological Resources	A horizontal landfill expansion has the potential to affect archaeological resources.	■ Potential effects on archaeology	■ Expected archaeological resources potentially affected on-site.
Cultural Heritage Resources/ Cultural Heritage Landscapes	Identified cultural heritage landscapes can be altered by the landfill expansion. Depending on the nature of identified cultural heritage landscapes, there could be an impact by the ongoing operation of the landfill.	■ Potential effects on cultural heritage landscapes	■ Expected impact on identified cultural heritage landscapes within the Site-vicinity Study Area.
Cultural Heritage Resources/ Built Heritage Resources	Heritage attributes of identified built heritage resources could be impacted by the landfill expansion and associated operations.	■ Potential effects on built heritage resources	■ Expected impact on the heritage attributes of identified built heritage resources within the Site-vicinity Study Area.
Land Use Planning/ Current and Planned Future Land Uses	Waste disposal facilities could potentially be incompatible with municipal land use policy framework.	■ Potential effects on existing land use	■ Expected incompatibility with existing or known future land use.

Component/ Sub-component	Rationale for Including the Evaluation Criterion/Criteria	Evaluation Criterion/Criteria	Indicator(s)
Socio-economic/ Local Economy	The continued operation of the landfill can influence employment and business in the wider regional area.	■ Relative potential changes in employment, impacts to local commercial businesses and capital costs.	■ Expected effect on local employment. ■ Expected effects on local businesses and commercial activity.
Socio-economic/ Residents and Community	Waste disposal facilities can potentially affect the use and enjoyment of their properties by residents in the vicinity of the site.	■ Potential site operational effects on sensitive off-site receptors (i.e., noise, litter, air quality)	■ Displacement of residents. ■ Expected interference with use and enjoyment of residential properties (nuisance effects).
Socio-economic/ Visual	The landfill expansion can affect the local community by changes in the visual appearance of the site.	■ Potential changes in visibility of the landfill	■ Expected changes in landscape views from off-site.
Transportation/ Traffic	The receipt of material from other Stelco operations can impact the traffic in the surrounding area through changes in truck traffic to/from the landfill.	■ Potential effect on road network	■ Expected effect on traffic along haul routes.
Design and Operations/ Engineered Containment	Sites that require less engineering to provide protection of off-site groundwater or air quality are typically preferred from a public and regulatory perspective.	■ Potential requirements for engineering controls	■ Expected degree of engineered containment and/or controls required.
Design and Operations/ Financial	Different methods of landfill expansion can have different costs based on the design and associated requirements to construct the expansion.	■ Potential effects on capital costs	■ Estimated costs associated with implementation of expansion alternatives.

The nearest airport to the LEWF is the Simcoe Airport being approximately 16 km away however impacts to airports are not expected as the waste material being disposed is not putrescible and hence impact to airports has not been included.

If circumstances arise during the EA studies that require modifications to the criteria and/or indicators presented in the ToR, the reason for the modifications would be explained in the EA study report. If additional aspects of the environment that require evaluation are identified during the EA studies, additional criteria and indicators will be developed during the EA, as appropriate and included in the EA consultation process.

7.4 Time Frame

As noted previously, the Quarry Landfill is expected to reach capacity during 2023. While pursuing landfill expansion approvals, the LEWF will need to minimize waste production and send waste materials off-site for disposal at an alternate location for a period of time. Assuming that the necessary approvals and construction will take an additional three years and the desired 15 to 25 operating period the time frames are suggested as:

- operations (2026 to 2041 or 2051)
- post-closure (beyond 2041 or 2051)

Landfilling operation activities will occur throughout the expanded life of the Quarry Landfill (i.e., about 15 to 25 more years from 2026 to 2041 or 2051). Leachate collection and treatment, and site performance monitoring and maintenance activities, will also be ongoing throughout this time frame. During the post-closure period (i.e., beyond 2041 or 2051), the only activities anticipated are leachate collection and management and site performance monitoring and maintenance.

7.5 EA Scope of Work

As noted previously, Stelco is proposing to undertake the EA in seven steps as described in the following sections.

7.5.1 Step 1 – Characterize Existing Environmental Conditions

An initial overview of existing environmental conditions is provided in Section 4.0. The existing environment that could potentially be affected by the project will be further described for each of the environmental components. The work plans and methodologies that will be used to characterize existing conditions for each component are presented in Table 7-3.

7.5.2 Step 2 – Identify ‘Alternative Methods’ of Landfill Expansion

As noted previously, the ‘Alternative Methods’ are the different ways the project can be implemented.

Stelco will determine ‘Alternative Methods’ of achieving the purpose of the undertaking, which is to expand the Quarry Landfill to gain an additional 15 to 25 years of disposal capacity plus additional capacity for legacy HWF residual material, thereby allowing the site to operate through the year 2041 or 2051. During the initial stage of the EA, a reasonable range of expansion alternatives will be identified and described at a sufficient level of detail (i.e., conceptual designs) so that potential effects of the expanded landfill on each environmental component can be assessed and compared.

Following identification of a reasonable number of alternatives for expansion, the EA project team will conduct a preliminary assessment of potential effects of each alternative for the proposed project. Those works and activities that could potentially adversely affect the environment will be identified. Potential mitigation measures to avoid or reduce the impact will be identified. These proposed mitigation measures (referred to as conceptual mitigation measures) will be incorporated into the conceptual design of the alternatives. These measures could, for example, include appropriate modifications to the existing leachate collection system and/or new mitigation measures. The description and illustration of the conceptual design alternatives will be provided as a section in the EA and will serve as the common basis for predicting the environmental effects of the 'Alternative Methods'.

It should also be noted that landfills are included in the list of facilities to which *O. Reg. 419/05* (air pollution and local air quality) (Ontario, 2005) applies. As part of the EA, Stelco will ensure the requirements of this regulation are addressed in the assessment of potential effects.

7.5.3 Step 3 – Qualitative Evaluation of 'Alternative Methods'

The EA project team will qualitatively predict the effects for each 'Alternative Method' (i.e., including conceptual design mitigation measures) on the environment. The assessment will be done for each component based on the conceptual designs for each alternative, including mitigation (determined in step 2) and the existing environmental conditions (determined in Step 1).

If the assessment indicates that any additional mitigation measures are required to achieve site compliance with provincial standards, they will be developed, and the assessment repeated to incorporate these measures. The EA project team will update and revise the conceptual designs to include any additional mitigation measures. The final conceptual designs will be included in the EA.

In this step, each 'Alternative Method' of the Quarry Landfill expansion will be examined to determine if it would ultimately be approvable under the *EPA* (Ontario, 1990a). This screening step is included to eliminate any alternative that would not likely be approvable. Should an alternative be found to not be approvable due to unacceptable net effects (i.e., no further refinement of mitigation is possible) or technical reasons, then the alternative would be eliminated from further consideration. At this point, the EA project team may also consider additional 'Alternatives Methods for' the project that may have been identified by the public or other parties during the EA process.

7.5.4 Step 4 – Compare the 'Alternative Methods' of Landfill Expansion and Identify the Preferred Alternative

When the alternatives have been finalized, a comparative evaluation of 'Alternative Methods' will be conducted to identify the preferred alternative. The alternatives will be compared using the environmental sub-components and indicators presented in Table 7-2. Preliminary feedback on the relative importance of the assessment indicators was received from the public during Virtual Open House #1 conducted during the ToR as it pertains to evaluation of 'Alternatives To'. Further input will be obtained during the initial stages of the EA for consideration of component importance as it pertains to evaluation of 'Alternative Methods'. This comparative analysis will be undertaken by the EA project team and will include the Do Nothing alternative as defined in Section 5.3.6.

As part of this comparison, the advantages and disadvantages of each 'Alternative Method' will be described.

The outcome of this ranking exercise will then be used in the comparative evaluation to identify the overall preferred expansion alternative.

7.5.5 Step 5 – Refine the Mitigation Measures and Determine the Net Effects of the Preferred Alternative

The prediction of future environmental effects associated with the preferred 'Alternative Method' (assuming that conceptual design mitigation measures are in place) will be provided by each discipline lead as described in Table 7-3. Assessment of potential effects will be done using appropriate objectives, standards, policies and regulations. The remaining effects or net effects, if any, will be documented.

Also, a qualitative comparison will be made between the predicted effects of the preferred alternative and the Do Nothing alternative as defined in Section 5.3.6 considering the indicators for the environmental components.

7.5.6 Step 6 – Describe the Preferred 'Alternative Method'

The outcome of this step will be the description of the preferred landfill expansion alternative.

In addition, the quantity of leachate generation from the preferred landfill expansion alternative will be predicted, the quality of the leachate associated with the expansion and requiring treatment will be assessed, and a high level assessment of the capability of the existing forcemain to continue to convey the collected leachate to the LEWF wastewater treatment facility to continue to treat the leachate will be carried out and the results provided in the EA study report (Step 9).

7.5.7 Step 7 – Consideration of Climate Change

The 2017 Guide- Consideration of Climate Change in EA in Ontario (MECP, 2017) describes two basic aspects to be considered: 1) Project Effects on Climate Change, and 2) Climate Change Effects on the Project. For this EA, climate change will be assessed as follows:

Project Effects on Climate Change: the GHG sources that will be considered in the ToR include on-site traffic and any other potential sources for the preferred landfill expansion alternative, a quantitative assessment of GHG generation potential associated with the landfill expansion (on-site traffic and mobile equipment) will be prepared.

Climate Change Effects on the Project: The manner in which climate change has the greatest potential to affect this project is in terms of changes (increases) in precipitation events and associated effects on the performance of the site's stormwater management system (SWMS). It is proposed to conceptually design the SWMS for each of the landfill expansion alternatives in compliance with *O. Reg. 232/98*, which requires their SWMSs to be designed for the 100 year storm event. For the preferred landfill expansion alternative, it is then proposed to conduct a sensitivity analysis to assess the performance of the SWMS under the 250-year storm event for the preferred alternative. Depending on the findings of the analysis, the preferred landfill expansion alternative's stormwater (SWM) design may then be modified accordingly. Alternatively, if the SWMS design can be easily adapted in future and/or the potential effects of climate change can be acceptably mitigated, then the design may be left as per the *O. Reg. 232/98* requirements.

Consideration will also be given to the potential effects of climate change on other infrastructure associated with the site, as well as ways that the project could reduce GHG emissions or remove GHG from the atmosphere.

The total estimated GHG emissions associated with the expanded landfill will be compared to the Ontario-wide emissions of GHG.

7.5.8 Step 8 – Cumulative Impact Assessment

The net effects of the proposed project, as determined by the analysis conducted in Step 5, will be combined with the predicted effects of other existing and identified certain and probable projects in the area of the site, where the effects would overlap. The evaluation would consider potential effects on the various components to determine if there are any unacceptable predicted cumulative impacts, as measured against applicable regulatory standards. The study area for the cumulative impact assessment of the project will be determined based on the potential for the Quarry Landfill expansion effects to interact with those of other projects, as determined by the impact assessment studies for the proposed project. The most important consideration during the cumulative impact assessment will be the other existing site activities at the LEWF.

7.5.9 Step 9 – Preparation of EA Study Report

A Draft Study EA report will be prepared, consisting of the main EA study report, technical supporting documents as appropriate, and a Consultation Record. The EA study report will include a description of the EA planning process; a summary of consultation efforts; the characterization of existing conditions; a description of each 'Alternative Method' of landfill expansion; the qualitative evaluation of 'Alternative Methods'; the identification and description of the preferred Alternative Method; a summary of the methods and results of the technical studies to assess the impacts from the preferred alternative compared to the applicable regulations, standards and guidelines; consideration of climate change; cumulative impact assessment; and the identification of any proposed mitigation measures, monitoring requirements and commitments to be fulfilled by Stelco. The EA study report will contain an Executive Summary, a list of references consulted, and appropriate maps illustrating various aspects of the overall undertaking and aspects of the technical component studies.

7.6 Work Plans for the EA

This section presents the proposed approach and work plans for the EA. The proposed work plans present the scope of work required to complete the EA, including the general scope of technical studies for each of the environmental components, and how the effects prediction/assessment will be carried out. The EA methodology is described in the preceding Section 7.5 of this ToR.

The EA work plans provided in the ToR may be updated and revised throughout the EA process based on continuing discussions with GRT members, Indigenous Communities and the public and/or based on findings as work is completed. Section 2.5 of this ToR explains how updates and changes will be accommodated.

Table 7-3 describes the proposed work plans by environmental sub-component for the description of existing conditions, comparison of 'Alternative Methods' and the prediction/assessment of potential effects.

Table 7-3: Work Plans

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Atmosphere					
Air quality and GHG	■ Expected concentrations of air quality indicator compounds (selected regulated air contaminants to represent this type of project) at the property boundary. ■ Expected GHG emissions.	■ Compile and interpret existing Environment and Climate Change Canada or MECP's air quality monitoring data and meteorological data. ■ Review available air quality data from the LEW current landfill (if available) and at Ontario locations outside of the LEWF in a similar setting with a landfill. ■ Review aerial photographic mapping and zoning maps.	■ Identify the differences in potential air concentrations from emission sources based on their distance and direction to nearest receptors, the property boundary, and site characteristics such as height of the landfill that will influence dispersion. ■ Identify difference in the alternatives that will impact GHG such as the loss of forested areas. ■ Rank each alternative based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Select air indicator compounds (including dust) appropriate for the landfill expansion. ■ Complete air and emission estimates based on published emission factors and available literature. ■ Execute an air quality dispersion model for the currently approved landfill and for an expanded landfill. ■ Predict air quality effects for off-site receptors based on an expanded landfill operations scenario and compare them to applicable criteria. ■ Calculate GHG emissions based on the expanded landfill. ■ If required, identify mitigation or best management practices. ■ Develop monitoring, trigger and contingency plans, if relevant.	■ Environment Canada or MECP's regional air quality data, hourly meteorological data and climate normals. ■ Published emission factors. ■ Preferred 'Alternative Method' description. ■ Existing site-specific studies (if available). ■ Applicable provincial regulations, standards and guidelines.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Noise	■ Noise Levels at off-site Points of Reception (PORs), or vacant lots that accommodate the construction of PORs.	■ Review aerial imagery and zoning / land use mapping. ■ Review previously prepared noise studies (if available). ■ Undertake field program to quantify existing noise levels (if needed).	■ Identify existing and vacant lot PORs in the vicinity of the landfill. ■ Identify potential differences in expected noise levels off-site based on the distance and potential line-of-site exposure of the PORs to the landfilling equipment/activities. ■ Review the direct interaction of the proposed alternative method footprints and existing/potential PORs. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Nosie emission estimates based on available project-specific information, manufacturer's noise data, and consultant's database of similar noise sources. ■ Establish applicable noise limits in accordance with accepted MECP practices. ■ Develop a project/site-specific three-dimensional noise prediction model. ■ Using the site-specific noise model described above, model the predictable noise levels from the preferred landfill expansion at identified off-site PORs (existing or potential), and compare them to MECP noise guidelines. ■ If required, identify mitigation that can be implemented into the design. ■ Develop monitoring, trigger and contingency plans, if relevant.	■ Landfill equipment list and expected utilization. ■ Preferred 'Alternative Method' description. ■ Existing site-specific noise studies or baseline studies (if available/required). ■ Manufacturer's noise data. ■ Consultant's database of similar noise studies. ■ Ministry of Transportation Ontario (MTO) traffic count data or newer data collected as part of this EA. ■ Applicable provincial guidelines.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Biology					
Aquatic ecosystems[1]	■ Expected change in surface water quality and/or quantity within the Site Study Area and the Site-vicinity Study Area. ■ Expected impact on aquatic habitat and biota, including rare, threatened, or endangered species within the Site Study Area and the Site-vicinity Study Area.	■ Wetland boundary surveys. ■ Headwater Drainage Features assessment. ■ Fish habitat survey. ■ Fish communities survey. ■ Detailed work plan will be prepared and submitted to MNRF and MECP for review and concurrence, if requested.	■ Identify differences in potential impacts to watercourses and wetlands. ■ Waste footprint likely to cause alteration or destruction of existing habitat. ■ Differences in discharge rate from SWMS. ■ Change in water quality to receiving water courses. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Identify areas of potential disturbance including: ■ Potential direct habitat loss/disturbance. ■ Potential indirect habitat disturbance or indirect impact on fish. ■ Potential impacts to aquatic SAR habitat and species. ■ Identify appropriate mitigation measures, if needed. ■ Develop monitoring and contingency plans, if relevant.	■ Haldimand County Official Plan. ■ Field surveys. ■ MNRF Natural Heritage Information Centre (NHIC) Make-a-Map geographic explorer (MNRF, 2022) ■ Existing and readily available information (including watershed studies) and mapping available through the Long Point Conservation Authority. ■ DFO Aquatic Species at Risk Maps (DFO, 2022). ■ MNRF Fish On-Line (MNRF 2022a) ■ MNRF LIO Aquatic Resources Area Layer (MNRF 2022b). ■ Information contained in natural heritage related map layers from Ontario Base Map series, Natural Resource Values Information System (NRVIS) mapping and Land Information Ontario (LIO). ■ Existing high-resolution aerial imagery and mapping.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Terrestrial ecosystems[1]	■ Expected impact on terrestrial vegetation communities, wildlife habitat, and wildlife, including rare, threatened or endangered species within the Site and Site-vicinity Study Areas.	■ Botanical surveys. ■ Ecological land classification. ■ Herpetile surveys. ■ Bat surveys. ■ Breeding Bird Surveys. ■ ■ Wildlife habitat and visual encounter surveys. ■ Species at Risk (SAR) screening. ■ Detailed work plan will be prepared and submitted to MNRF for review and concurrence, if required.	■ Identify difference in the alternatives that will impact terrestrial features: ■ Change in the site development area for the landfill. ■ Change in the Waste Footprint Area of the landfill. ■ Impact to SAR. ■ Impact to Significant Wildlife Habitat (SWH). ■ Removal of natural vegetation. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Identify potential impacts to SAR, SWH, woodlands, and environmentally significant areas (ESA), including: ■ Potential direct habitat loss/disturbance. ■ Potential indirect habitat disturbance. ■ Potential impacts to terrestrial SAR habitat and species. ■ Potential vegetation removal. ■ Potential impacts to non-SAR wildlife and vegetation species ■ Identify appropriate mitigation measures, if needed. ■ Develop monitoring, and contingency plans, if relevant.	■ Haldimand County Official Plan. ■ Field surveys. ■ MNRF NHIC Make-a-Map geographic explorer (MNRF, 2022). ■ Existing and readily available information (including any watershed studies) and mapping available through the local Conservation Authority. ■ Atlas of Breeding Birds of Ontario (Cadman, et al. 2007). ■ eBird online database (eBird, 2022). ■ Atlas of the Mammals of Ontario (Dobbyn, 1994). ■ Bat Conservation International (BCI, 2021). ■ Ontario Butterfly Atlas (Jones et. al 2022). ■ Ontario Reptile and Amphibian Atlas (Ontario Nature, 2022). ■ Vascular Plants at Risk in Ontario (Leslie, 2018). ■ Information contained in natural heritage related map layers from Ontario Base Map series, NRVIS mapping and LIO. ■ Existing high-resolution aerial imagery and mapping.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Geology and Hydrogeology					
Groundwater quality	■ Expected effect on groundwater quality at the property boundary.	■ Complete new leachability testing of waste materials. ■ Review results of existing groundwater monitoring program. ■ Limited additional field work in the form of drilling in location of possible expansion for geological and hydrogeological testing.	■ Identify the differences between the alternatives that will affect the potential impact on groundwater quality such as waste footprint configuration, direction of groundwater flow, landfill cover type. ■ Estimate qualitatively how the differences will potentially affect the off-site groundwater quality. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Prepare a predictive model of landfill performance (contaminant transport model) as per *O. Reg. 232/98*. ■ Identify leachate indicator parameters. ■ Predict concentrations in the groundwater at the property boundary for identified key leachate indicator parameters. ■ Compare the predicted concentrations in the groundwater to the Reasonable Use Criteria. ■ Evaluate potential for groundwater discharge to surface water and consider potential impacts on surface water quality. ■ Revise and update mitigation measures, if necessary. ■ Compare predictive results against approved trigger mechanism and contingency plan, if required. ■ Predict how long Stelco needs to operate engineering controls, in particular the leachate collections system, to prevent the discharge of potential contaminants.	■ Published regional sources and data on regional geological and hydrogeological conditions, including source water protection zones in County Official Plans. ■ Review MNRF petroleum well records. ■ Provincial Quaternary and Bedrock Mapping. ■ Ontario Water Well Records (water supply wells are considered to be sensitive receptors in terms of potential impacts). ■ Landfill Annual Monitoring Reports. ■ Previous site characterization reports. ■ Borehole Logs. ■ Adjacent property assessment reports (if any are available).

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Surface Water					
Surface water quality	■ Expected effect on surface water quality in Centre Creek and within the site-vicinity.	■ Review the results of existing surface water monitoring program. ■ Limited additional field work related to municipal drains or surface water bodies.	■ Identify the differences that may impact changes in surface water quality such as expansion area layout and location. ■ Estimate qualitatively how the differences will affect the surface water quality. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Evaluation of required construction of new on-site facilities (pond(s)) and the facility's ability to mitigate potential changes to surface water quality. ■ Modeling of proposed surface water facilities (pond(s)) and comparison with MECP and watershed specific design criteria. ■ Update trigger mechanism and contingency plan, if required. ■ Update surface water monitoring program, if required.	■ Topographic maps. ■ Air photos. ■ Annual Monitoring Reports. ■ Existing Design and Operations Reports. ■ Surface water drainage mapping. ■ Agricultural farm drain mapping. ■ Watershed/subwatershed reports, including the 2008 Long Point Region Watershed Characterization Report. ■ Local climate data. ■ Published water quantity and flow information from the MECP, Environment Canada and local Conservation Authorities. ■ Site reconnaissance. ■ Flow observations during sampling program.
Surface water quantity	■ Expected change in runoff to and peak flows in drainage features. ■ Expected degree of off-site effects on surface water quantity within the Site-vicinity Study Area.	■ Field review of stormwater management and drainage outlet locations, if required. ■ Review existing surface water management features and practices.	■ Identify the differences that may impact changes in surface water quantity such as expansion area, expansion location, proposed side slopes of the landfill, and potential effects on the existing drainage ditch adjacent to the landfill footprint. ■ Estimate qualitatively how the differences may potentially affect the surface water quantity.	■ Predict and assess future surface water peak flows and quantity conditions associated with the preferred landfill expansion alternative for a range of storm events (e.g., 2, 5, 10, 25, and 100 year) as required by *O.Reg. 232/98*, as well as consideration of climate change effects. ■ Evaluate the need for stormwater management infrastructure to meet *O.Reg. 232/98*.	

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
			■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Modelling of proposed stormwater management system and comparison with MECP specific design criteria.	
Agriculture					
Agriculture	■ Expected effect on agricultural land base and agricultural operations within the Site and Site-vicinity Study Areas.	■ A field survey of the study areas to document types of farms, farm improvements, cropping patterns, buildings, etc. ■ Review aerial photographic mapping, Official Plans and Zoning By-law, Canada Land Inventory (CLI) mapping and Soils of Haldimand-Norfolk County mapping.	■ The potential effect of the proposed project alternatives on the existing and potential agricultural use of on-Site and off-site lands will be assessed. ■ Differences between alternatives will be identified, for example, proximity to livestock, use of prime agricultural areas (soil capability), degree of infrastructure/investment, impact on agricultural system (fragmentation). ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Based on the proposed landfill operational practices and/or results of predictive assessments of potential nuisance effects as caried out by other components; the technical and operational considerations component; and groundwater and surface water considerations, the potential effects of the preferred expansion method on existing and proposed on-site and off-site agricultural use will be assessed.	■ Existing site-specific studies, if available. ■ Applicable provincial regulations, standards and guidelines. ■ Provincial Policy Statement (2020). ■ Haldimand County Official Plan. ■ Haldimand County Zoning By-laws. ■ Aerial photographic and topographic mapping. ■ Available soils mapping (Soils of The Regional Municipality of Haldimand-Norfolk, CLI), municipal drain mapping. ■ Field reconnaissance. ■ Interviews with farmers, if necessary.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
		■ Interviews with municipal staff, Ontario Ministry of Agriculture, Food and Rural Affairs, Federation of Agriculture and if necessary, property owners.			■ Relevant information available from Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and Ontario Federation of Agriculture (OFA).
Cultural Heritage					
Archaeology	■ Expected archaeological resources potentially affected on-site.	■ Review and update existing background research including archaeological, historical, and environmental literature. ■ Review updated list of registered archaeological sites within 1 km of the landfill site. ■ Complete Stage 1 Archaeology Assessment. If necessary, complete subsequent Stages of archaeological assessment.	■ Identify archaeological sites that are anticipated to be impacted by expansion alternatives. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Archaeological sites that will be impacted by the preferred expansion alternative may require further assessment to determine spatial extent, complete a full evaluation of significance, and determine the need for strategies to mitigate impacts and provide future conservation.	■ Existing site-specific archaeological assessment reports. ■ Ontario Archaeological Sites Database. ■ Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTCI) *Standards and Guidelines for Consultant Archaeologists*. ■ Haldimand County Official Plan.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Cultural Heritage Landscapes	■ Expected impact on identified cultural heritage landscapes within the Site-vicinity Study Area.	■ Background research of archival, published and unpublished sources, municipal heritage policies, and historic maps and aerial imagery. ■ Consultation with municipal heritage planner, if available. ■ Review of identified cultural heritage resources as part of Official Plan. ■ Field investigations to document and evaluate existing conditions.	■ Identify the risk of potential direct or indirect impacts using guidance and types identified in the MHSTCI *Ontario Heritage Tool Kit: Heritage Resources in the Land Use Planning Process.* ■ Rank each 'Alternative Method' based on differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Determine the potential magnitude, reversibility, extent, duration, and frequency of each type of impact, if present. ■ Methods to predict potential effects following guidance provided in the MHSTCI *Ontario Heritage Tool Kit: Heritage Resources in the Land Use Planning Process*. ■ Methods to consist of identifying key vistas and views, sources of direct and indirect impact resulting from construction and operation, and preferred landfill expansion and conservation measures to reduce or avoid impact to cultural heritage landscapes. ■ Complete a cultural heritage resources impact assessment.	■ Description of proposed expansion alternatives (including construction operations to determine sources of impacts). ■ Preferred landfill design. ■ Existing site-specific studies, if available. ■ Applicable provincial plans, acts, regulations, standards and guidelines, and policies. ■ Haldimand County Official Plan. ■ Local Historical Society, if available.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Built Heritage Resources	■ Expected impact on identified cultural heritage resources within the Site-vicinity Study Area.	■ Background research of archival, published and unpublished sources, municipal heritage policies, and historic maps and aerial imagery. ■ Consultation with municipal heritage planner, if available. ■ Review of identified cultural heritage resources as part of Official Plan. ■ Field investigations to document and evaluate existing conditions.	■ Identify the risk of potential direct or indirect impacts using guidance and types identified in the MTCS *Ontario Heritage Tool Kit: Heritage Resources in the Land Use Planning Process.* ■ Rank each 'Alternative Method' based on differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Determine the potential magnitude, reversibility, extent, duration, and frequency of each type of impact, if present. ■ Methods to predict potential effects will follow guidance provided in the MHSTCI *Ontario Heritage Tool Kit: Heritage Resources in the Land Use Planning Process.* ■ Methods to consist of identifying resources, sources of direct and indirect impact resulting from construction and operation, and preferred options and conservation measures to reduce or avoid impact to protected heritage resources or newly identified resources of cultural heritage value or interest. Complete a cultural heritage resources impact assessment.	■ Description of proposed expansion alternatives (including construction operations to determine sources of impacts). ■ Preferred landfill design. ■ Existing site-specific studies, if available. ■ Applicable provincial plans, acts, regulations, standards and guidelines, and policies. ■ Haldimand County Official Plan. ■ Local Historical Society, if available.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Land Use					
Current and planned future land uses	■ Expected incompatibility with existing or known future land use.	■ Review aerial photographic mapping, Official Plan and Zoning By-law. ■ Compile parcel fabric mapping from County. ■ Review Provincial Guidelines ■ Review Provincial Policy Statement 2020. ■ Interviews with municipal staff to confirm development activity planned in the site-vicinity.	■ Differences between alternatives will be identified with respect to land use compatibility. ■ Rank each 'Alternative Method' based on differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Based on the proposed operational practices and/or results of predictive assessments of potential nuisance effects as carried out by other components and the design and operation component, the potential compatibility of the preferred method with existing and proposed surrounding land use will be assessed.	■ Preferred 'Alternative Method' landfill design. ■ Existing site-specific studies, if available. ■ Applicable provincial regulations, standards and guidelines. ■ Provincial Policy Statement (2020). ■ Haldimand County Official Plan. ■ Land Use Compatibility, Guideline D-1. ■ Land Use On or Near Landfills and Dumps, Guideline D-4. ■ Aerial photographic and topographic mapping ■ Field reconnaissance. ■ Discussion with County planning department.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Socio-economic					
Local Economy	■ Expected effect on local employment. ■ Expected effects on local businesses and commercial activity.	■ Review of current and projected employment numbers (during both construction and operation phases). ■ Review of local business.	■ Identify total change in employment hours/full time equivalent positions during both construction and operational phases by alternative design. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Qualitative assessment of effects on local businesses (positive and negative) from changes at the landfill site, (e.g., loss of patronage, operational impacts, increased use of local vendors). ■ Impacts on employment as determined by change in employment numbers and resultant economic impact at the local level.	■ Site visit. ■ Aerial photographs. ■ Statistics Canada data. ■ Current employment numbers and projections.
Residents and Community	■ Displacement of residents. ■ Expected interference with use and enjoyment of residential properties and outdoor recreation spaces (e.g. from nuisance effects).	■ Review aerial photography to identify closest residential properties. ■ Windshield survey of study area to identify residences and businesses (including farms) as well as any other community facilities in the site-vicinity.	■ Establish closest residential receptors to each alternative design. ■ Rank each 'Alternative Method' based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Review of findings from other disciplines – noise, visual, air quality to ascertain any potential nuisance effects on residential and recreational receptors from landfill expansion. ■ Evaluate level of nuisance effects once mitigation measures and best management practices (BMPs) have been implemented to determine change from baseline (current) conditions. ■ Evaluate if the preferred alternative could cause displacement of residents.	■ Site visit. ■ Aerial photographs. ■ Site related complaints. ■ Discipline findings – noise, air quality, land use, cultural, visual, agriculture. ■ Existing site related BMPs. ■ Statistics Canada data.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Visual	■ Expected changes in landscape views from off-Site.	■ Field investigations to identify key viewpoints and obtain photos. ■ Use software to produce representative 3D perspective images for each viewpoint.	■ Identify the differences in potential visual impacts based on the distance and direction to nearest off-site receptors, the property boundary, and site characteristics such as height of the expanded landfill. ■ Rank each alternative based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Prepare 3D models from each viewpoint for the preferred landfill expansion 'Alternative Method' and render them with appropriate surface material / vegetation cover (turf, meadow, trees, etc.). ■ Compare the landfill expansion model of the preferred 'Alternative Method' with the existing site conditions model and describe potential impacts. ■ Apply conceptual level mitigation measures to preferred landfill expansion alternative, if required. Identify the degree of visual impact.	■ Google Earth. ■ Aerial photos. ■ ACAD drawings of existing landfill and proposed expansion alternatives. ■ Site photos.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Design and Operations					
Engineered Containment	▪ Expected degree of engineered containment and/or controls required.	▪ Calculate landfill footprint areas, excavation volumes, height, and airspace for each alternative.	▪ The expected cut and fill and any additional earthworks for each 'Alternative Method' will be estimated. ▪ Expected differences in operations between alternatives. ▪ Rank each alternative based on the differences. ▪ Describe advantages and disadvantages of the 'Alternative Methods'.	▪ Prepare overall materials balance (excavation, cover and fill requirements). ▪ Establish a geotechnical model for the Site and complete a geotechnical assessment of preferred alternative (the expected settlement performance and stability of the landfill configuration). ▪ Assess the effects that short and long-term settlements may have on the operations of the new cells. ▪ Develop an estimate of the quantity of leachate generated from the expansion. ▪ Prepare conceptual design of leachate collection system.	▪ Annual environmental monitoring reports. ▪ Results of Hydrologic Evaluation of Landfill Performance model. ▪ Currently approved design and operations report. ▪ Existing site-specific studies (on-site subsurface investigations, geotechnical reports). ▪ Topographic mapping, soils mapping, available water well records. ▪ *O. Reg. 232/98*. ▪ Commercial software specifically developed to assess slope stability.
Financial	▪ Costs associated with implementation of expansion alternatives.	▪ Estimated cost for alternative designs.	▪ Identify potential cost implications of alternatives. ▪ Rank each 'Alternative Method' based on the differences. ▪ Describe advantages and disadvantages of 'Alternative Methods'.	▪ Develop an estimate of probable cost for construction and operation for the preferred alternative.	▪ Existing cost information from Stelco. ▪ Description of preferred 'Alternative Method' landfill design.

Component / Sub-component	Indicator(s)	Data Collection and Field Work	Qualitative Evaluation of 'Alternative Methods'	Prediction of Potential Effects for the Preferred 'Alternative Method'*	Data Sources
Transportation					
Traffic	■ Expected effect on traffic along the Haul Route(s).	■ Obtain available traffic data for selected intersections and corridors within haul route study area. ■ Conduct traffic count estimates if recent or sufficient data does not exist.	■ Assess existing traffic conditions based on haul routes and other common users. ■ Identify the differences in traffic operations by evaluating the alternatives for landfill expansion. ■ Rank each alternative based on the differences. ■ Describe advantages and disadvantages of the 'Alternative Methods'.	■ Assess existing hourly and daily carrying capacity of the haul route study area roads. ■ Assess existing intersection level of service and other performance metrics for the select haul route study area intersections to confirm overall intersection and critical movement performance (capacity and delay) ■ Assess future traffic operation and safety requirements of defined study area (adjacent roadway and haul route) conditions. ■ Assess potential intersection geometric requirements for mitigation. Undertake warrants to confirm any required improvements, i.e., auxiliary lane and/or intersection control requirements, as necessary.	■ Turning Movement Count, average annual daily traffic (AADT), and signal timing data, if available. ■ Additional tonnage and resulting number of trucks to site due to expansion. ■ Collision history statistics, if available. ■ Existing site-specific and related studies, consultant observations, and available County planning and engineering documents. ■ Traffic counts if necessary.

Notes:

1 For aquatic and terrestrial ecosystems these are all the potential field surveys and the final list of surveys will be scoped based on the habitats that are present.

8.0 CONSULTATION DURING THE TOR

The Consultation Record for the development of this ToR is provided in Volume III of the ToR documentation. This section of the ToR presents an overview of the results of consultation and engagement carried out during the development of this ToR, in consideration of the *MECP's Code of Practice: Consultation in Ontario's Environmental Assessment Process* (Consultation Code of Practice; MECP, 2014a). Stelco has developed a Consultation Plan for the development of this ToR as well as the subsequent EA process. A copy of this draft Consultation Plan is provided in Volume III Appendix A. The consultation plan is considered draft as it is a living document and subject to updates through the EA process.

A summary of the consultation and engagement activities conducted during the development of the ToR is provided in Section 8.1. For ease of reference, the engagement activities are presented sequentially from the beginning of this ToR process.

For this Individual EA, the Ministry has delegated the procedural aspects of consultation with Indigenous Communities to Stelco. The general procedures can be summarized as follows: in consultation with the Ministry, develop the list of Indigenous Communities potentially affected by the project; consult with the Indigenous Communities on how they would like to be involved in the EA process; distribute notices of events associated with the EA and follow up with the Communities to solicit their input and participation, and; carry out consultations specific to the individual Indigenous Communities. Consultation that has occurred with Indigenous Communities during the ToR has been summarized separately in Section 8.1.5.

8.1 Record of Consultation Activities during the ToR

Engagement of and consultation with the public and other stakeholders is a key component of the EA process. It enables stakeholders to participate in the planning process and enhance the quality of the project. The key vehicles in the Consultation Plan that were used to engage the public and the other stakeholders and elicit feedback were the virtual consultation event, the existing CLC, the technical bulletin, letter/email correspondence, Stelco's website (the EA Website) and newspaper advertisements.

It is noted that the CLC is an existing liaison committee whose purpose is to ensure that the diverse interests of multiple local stakeholders are equally and adequately represented through diversification in membership throughout the ongoing operations at the Stelco LEWF by encouraging the participation of individuals representing the local community. Current participants in the CLC includes three Stelco staff, two MECP staff, one Conservation Authority representative, one Haldimand County staff, five residents and four local organization representatives.

The objectives of the Consultation Plan for preparation of this ToR were to:

- Engage stakeholders or right holders from the beginning of the process through the use of a variety of consultation events and activities including virtual open houses, technical bulletins, letters/emails, and the project website;
- To ensure that there are adequate opportunities for stakeholders or right holders to learn about the project and to provide input, feedback and comments concerning the project and EA process, and that these comments are considered by the EA project team;
- Engage local elected officials to ensure that they are provided with regular and timely information concerning this ToR development process;

- Engage stakeholders and right holders as early as possible in the development of this ToR for the EA and to facilitate their involvement in the process in ways that meet their needs;
- Ensure the engagement process is open, transparent and inclusive;
- Document all issues and concerns identified by the public, agencies right holders and other stakeholders and to demonstrate how these concerns and issues have been incorporated into the final ToR (this document); and,
- Fulfill the EA process public consultation requirements.

Details of the engagement related to the development of this ToR is documented within the Volume III Consultation Record. The text and tables in the following sections summarize the primary engagement activities that have occurred throughout the development of this ToR. There were no issues raised or disputes during preparation of the ToR that required any additional or outside resolution.

8.1.1 Notice of Commencement

A copy of the Notice of Commencement (NoC) can be found in Volume III Appendix C1. The EA process was initiated by publishing a Notice of Commencement (NoC) in the Haldimand Press and Simcoe Reformer newspaper on July 1 and 2, 2021, respectively (Volume III Appendix C2), as required under the *EAA*. The NOC provided a brief overview of the proposed undertaking, the location of the undertaking, the EA process, a description of how interested stakeholders can become involved in the project, information about the proponent, and how to contact the EA Project Team with comments and questions. The NoC was also posted on the project website on June 30, 2021 and can be found at: https://consultation.stelco.com/Home/Documents.

Additionally, introduction letters accompanied by the NoC were emailed or mailed between June 30, 2021 and August 10, 2021 to the GRT members, three Indigenous Communities and the CLC. See examples provided in Volume III Appendices C3 and C4.

There were four responses from the GRT. MHSTCI provided a generic letter confirming their interest, a reminder to screen for archaeological resources, to complete a criteria for evaluating potential for built heritage resources and cultural heritage landscapes and to consult with Indigenous Communities. MNRF provided a generic letter providing guidance in identifying and assessing natural features and resources as required by applicable polices and legislation including an attachment. OMAFRA emailed for more information on the project to understand if they had an interest in being consulted in the Hamilton Region. The project team responded and OMAFRA confirmed they wished to be consulted on this project. Hamilton Conservation emailed for more information on the project to understand if they had an interest in being consulted on the project. The project team responded, and Hamilton Conservation confirmed they do not wish to be consulted on this project. All of this correspondence can be found in Volume III Appendix C5

There was one response from Mississaugas of the Credit First Nation confirming receipt of the NoC and requesting a meeting. A copy of this correspondence along with the EA team response is provided in Volume III Appendix C6. More information about this is provided in Section 8.1.5.

8.1.2 Virtual Consultation Event #1

In the fall of 2021, the project team was planning an in person Open House however as a result of the COVID19 pandemic it was decided to switch to a virtual consultation event for public safety. This decision was made in consultation with the MECP. Virtual Consultation Event #1 occurred between November 15 and 28, 2021 and was provided on the project website: https://consultation.stelco.com/Home/Documents. The consultation event content and feedback form have been provided in Volume III Appendices D1 and D2, respectively. Note that the consultation event content on the website contains an audio file such that participants could also listen along to the content.

Virtual Consultation Event #1 was advertised in the Haldimand Press and Simcoe Reformer newspaper on November 11 and 12, 2021, respectively and copies of these advertisements are provided Volume III Appendix D3 Emails were sent to the GRT, Indigenous Communities, the CLC and neighbours between November 11, 2021 and November 15, 2021 and examples of this correspondence is provided in Volume III Appendix D4.

This virtual open house provided a general overview of the EA process, the current Quarry Landfill site features, assessment of the proposed ‘Alternatives To’, and how stakeholders can be involved in the EA process. The purpose of the virtual open house was to inform the public of the project and seek input on the EA Process, the proposed Consultation Plan, and the assessment of ‘Alternatives To’ residual waste disposal. This event was designed to provide opportunities for attendees to better understand the project, be able to provide feedback. A key difference of this virtual consultation event was that those who provided comments were promised a response from Stelco and the EA.

The Mississaugas of the Credit First Nation responded to the notice of Virtual Consultation Event requesting a meeting. A copy of this correspondence is provided in Volume III Appendix D5. More information about this is provided in Section 8.1.5.

A total of three responses from members of the public were received as part of Virtual Consultation Event #1. One of the responses was from a collective group of community members. Comments were received through completion of the formal feedback form as well one individual provided comments on the form and in a separate email. A copy of the feedback forms and emails as well as Stelco responses are included in Volume III Appendix D6. To summarize the public wanted more details on dust, noise, waste characteristics, groundwater and surface water monitoring data and confirmation of a climate change assessment in particular related to rainfall events and flooding. All of these items are planned for the EA studies as described in Section 7.6. The public noted potential for community impact and impact on their properties was important to them. One respondent wondered if the waste material could be used to raise the LEWF perimeter berms. As this project is about residual waste management using the material in berms is unlikely however overall berm height as associated with mitigating noise or dust from landfill operations will be considered. Several respondents suggested they preferred closing the existing Quarry Landfill. Lastly one respondent suggested they would like the project team to consider zoom meetings in the future. During the EA if planned in person open houses are not possible for any reason, zoom or similar on-line platform meeting venues will be considered as mentioned in Section 9.0.

The public was also asked to rank the importance of the environmental components and sub-components identified to be used in comparison of ‘Alternatives To’. A summary of those rankings is provided below in Table 8-1.

Table 8-1: Ranking of Environmental Components

Component	Sub-component	Public Ranking Group[1]
Atmosphere	Air quality/ Greenhouse Gas	Very important
	Noise	Very important
Geology and Hydrogeology		Very important
Surface Water		Very important
Biology		Very important
Agriculture and Land Use		Very important
Cultural Heritage	Archaeology	Very important
	Cultural heritage landscapes, built heritage resources	Very important
Socio-Economic	Nuisance factors (i.e., dust, noise, visual)	Very important
Transportation	Traffic	Very important
Technical Considerations	Ability to operate	Important
	Technical risks	Important
	Cost and timing of approvals	Less Important
	Capital and operating costs	Less Important

Notes:

[1] Three individuals or groups responded to the request for rankings. Options available were very important, important and less important.

Based on the input received, environmental components including atmosphere, geology and hydrogeology, surface water, biology, agriculture and land use, cultural heritage, socio-economic and transportation were considered very important, while technical considerations were ranked important or less important.

8.1.3 Technical Bulletin #1

Technical Bulletin #1 was circulated in early June for review and comment between June 10 and 24, 2022 and was posted on the project website at: https://consultation.stelco.com/Home/Documents. The consultation event content and feedback form have been provided in Volume III Appendices E1 and E2, respectively.

Technical Bulletin #1 was advertised in the Haldimand Press and Simcoe Reformer newspaper on May 26 and May 27, 2022, respectively and a copy of the advertisements is available in Volume III Appendix E3.

Emails were sent to the GRT, Indigenous Communities, CLC members and registered neighbours near the Stelco LEWF with the technical bulletin notice on May 27, 2022, and examples of this correspondence is provided in Volume III Appendix E4.

This technical bulletin provided a summary of the public ranking of environmental components for the comparison of ‘Alternatives To’, the identified preferred ‘Alternative To’, high level work plans for the various environmental components, evaluation of ‘Alternative Methods’ in the EA and next steps of the ToR. The purpose of the

technical bulletin was to seek input on the identified preferred ‘Alternative To’, the environmental components being considered for evaluation of ‘Alternative Methods’ and the proposed work plans.

No feedback forms were received as part of Technical Bulletin #1 from the public.

Mississaugas of the Credit First Nation responded to the notice of Virtual Consultation Event acknowledging receipt of the email. A copy of this correspondence is provided in Volume III Appendix E5.

8.1.4 Other Engagement

During this ToR the CLC have been advised of ongoing activities and their opinions solicited as and when appropriate. When this EA project has been discussed it has been included in the CLC presentation material as included in Volume III Appendix F1. No specific feedback regarding the Quarry Landfill expansion EA has been received during these meetings.

8.1.5 Consultation with Indigenous Communities during the ToR Phase

A list of potentially affected Indigenous Communities was developed in consultation with the MECP and Ministry of Indigenous Affairs during the development of this ToR (see Volume III Appendix B1). A program to engage and consult with Indigenous Communities was carried out considering their specific needs and specific issues. The Indigenous Communities were consulted on how they would like to be involved in the EA process as documented in the draft Consultation Plan in Volume III Appendix A.

The following Indigenous Communities and groups were contacted as part of the distribution of the NOC:

- Mississaugas of the Credit First Nation (MCFN)
- Six Nations of the Grand River Elected Council (SNGREC)
- Haudenosaunee Confederacy Chiefs Council

Communication tools available to Indigenous Communities include meetings or presentations for individual Indigenous Communities, smaller discussion groups with interested persons/groups by phone and/or in-person on specific topics, site tours, copies of information and email correspondence.

Each of the communities identified were sent a NoC, notices of Virtual Consultation Event #1 and Technical Bulletin #1 (see Volume III Appendices C3, D4, and E4). Follow up occurred if and as necessary if no response was made as is documented in Volume III Appendix B1. Stelco staff were available to meet with interested Indigenous Communities and discuss the proposed project at any time during the development of the ToR.

To date, the MCFN and SNGREC have requested additional information and/or meetings with Stelco, and expressed their interest in being involved in the EA as further summarized below.

8.1.5.1 Mississaugas of the Credit First Nation

On December 2, 2021, Stelco met with the MCFN to discuss the proposed Quarry Landfill expansion project background, 'Alternatives To' being considered and components of the environment to study. A meeting summary of the discussion was prepared and circulated to MCFN to ensure it accurately reflected the discussion. The summary is provided in Volume III Appendix G1.

Areas of particular interest to the MCFN included protection of groundwater and surface water, and any planned archaeology or biological studies. There were three follow up actions as a result of this meeting as follows:

1) Golder/Stelco to procure a Field Liaison Representative (FLR) for future intrusive, biological and archaeological investigations.

2) MCFN to provide the contact information for the new Consultation Coordinator upon availability.

3) MCFN and Stelco to coordinate background information sessions.

The EA project team was in touch with MCFN in October 2022 to let them know that the FLR should be arranged in early 2023.

8.1.5.2 Six Nations of the Grand River Elected Council

On August 9, 2022, Stelco met with the SNGREC to discuss the proposed Quarry Landfill expansion project background, 'Alternatives To' being considered and components of the environment to study. A meeting summary of the discussion was prepared and circulated to SNGREC to ensure it accurately reflected the discussion. The summary is provided in Volume III Appendix G2.

Areas of particular interest to the SNGREC included archaeology, aquatics, cultural heritage, surface water and groundwater however SNGREC noted they are very busy and would like to be notified of events and in particular field work well in advance. There were four follow up actions as a result of this meeting as follows:

1) Golder to provide financial comparison of incineration versus landfill expansion.

2) The SNGREC contact should be circulated materials/field survey schedules and that individual will share with others in SNGREC as appropriate.

3) Stelco to discuss subsidizing SNGREC staffing costs for this project.

4) Stelco to provide SNGREC publicly available documents they have on the Nanticoke Development Proposal.

9.0 PROPOSED CONSULTATION PLAN FOR EA

Following approval of this ToR and during preparation of the EA, a consultation program will be continued to engage the public, businesses, the GRT, Indigenous Communities, as well the CLC interested during the EA process. Input will be obtained through a number of engagement activities, as proposed below. In addition to the engagement activities described below, consultation specific to individual Indigenous Communities will also be carried out. These additional activities are described in Section 9.1. The results of the engagement program conducted by Stelco during preparation of the EA will be presented in the EA Report.

The proposed consultation activities for the EA studies are as follows:

- **Open House #1** will present the approved ToR, describe the EA process, inform the public about each of the 'Alternative Methods' for landfill expansion being considered, the criteria for the comparative evaluation of those landfill expansion alternatives and invite participation and comment regarding the 'Alternative Methods' and comparison.
- **Open House #2** will present the results of the comparison of 'Alternative Methods', the proposed EA and inform the public about the identification of the preferred alternative for landfill expansion, as well as inform them of the results of the existing conditions studies and the predicted effects of the preferred alternative, and the commitments Stelco is making to mitigate any adverse effects.
- **Project Website** to inform the public on the EA process, public engagement activities and to solicit comments from the public.
- **Letters and emails** to the GRT members, Indigenous Communities and interested parties to provide information and invite feedback.
- **CLC Meetings** to discuss the EA project and provide feedback as applicable.
- **Circulation of Draft EA** for public comment prior to finalization and submission to the MECP. There will be a seven week review period provided for the draft EA.

Open houses are presently envisioned to be in person but if necessary could be virtual and virtual would consider a meeting platform such as zoom for participants to ask questions.

There are a number of key decision-making milestone points when consultation will occur during preparation of the EA. The main milestone is reviewing the developed 'Alternative Methods', the evaluation criteria and indicators to be applied to 'Alternative Methods' at Open House #1. In addition, the presentation of the recommended 'Alternative Method' identified through the comparative evaluation process and the proposed EA at Open House #4 is another key decision-making milestone.

During the EA there may be issues raised or disputes during preparation of the EA that may be difficult to resolve. Stelco will attempt to resolve all issues or disputes to reach a resolution that is amenable, recognizing that interests of multiple stakeholders and/or regulations may sometimes dictate a resolution that may not be desirable to all parties. In the event that a mutually agreeable resolution is not achieved, the matter will be referred to the MECP for guidance.

9.1 Proposed Indigenous Community Engagement Program for EA

It is recognized that Indigenous Communities have specific interests and rights with regard to consultation on projects that might potentially affect them. The consultation with Indigenous Communities will provide insight into the potential effects on Indigenous Communities, including the potential effects on use of lands for traditional purposes. It is also recognized that Indigenous Communities may have specific and differing needs with regard to how they would like to be consulted. To address these interests, Stelco will continue to inform Indigenous Communities about the proposed project and invite their participation in the EA process. The list of Indigenous Communities that will continue to be consulted during the EA is provided in Section 8.1.5.

Stelco will continue to meet with interested Indigenous Communities and discuss the proposed project at any time during the EA study process.

10.0 OTHER REGULATORY APPROVALS

In addition to EA approval, the Quarry Landfill expansion will require approval under the *EPA* and the *Ontario Water Resources Act* (OWRA). Stelco proposes to seek EA approval prior to proceeding with the *EPA* approval process. The following sections provide an overview of the approvals that may be required in addition to the EA approval process. The approvals required will be dependent on the preferred 'Alternative Method' of expansion and will be described in the EA Report. It is noted that the following list of other regulatory approvals may be refined as the EA study progresses, and the final description of other regulatory approvals will be described in the EA study report.

Because the proposed landfill expansion is located within the Stelco property, it is not expected that municipal planning approvals, i.e., re-zoning, will be required for the expansion.

10.1 Environmental Protection Act

The *EPA*, Section 27 stipulates that *"…no person shall use, operate, establish, alter, enlarge or extend a waste management system or a waste disposal site except under and in accordance with an environmental compliance approval [ECA]*." The application for an amendment to the waste ECA (ECA A110119) under Part 5 of the *EPA* must be supported by a detailed report that complies with *O. Reg. 232/98* Landfilling Sites and describes the proposed design and operations of the expanded Quarry Landfill site. For this privately-owned landfill site, an updated Financial Assurance estimate and report for the expansion must also be prepared and submitted in support of the amendment application.

In addition, the site will require an air and noise ECA as per Part 9 of the *EPA* unless the activities of the landfill are already included in a site wide air and noise ECA.

10.2 Ontario Water Resources Act

The *OWRA*, Section 53 states *"…no person shall use, operate, establish, alter, extend or replace new or existing sewage works except under and in accordance with an environmental compliance approval."* Sewage works in this context refer to collecting, transmitting, treating and/or disposing of stormwater. An ECA from the MECP for 'sewage works' is expected to be required for stormwater works associated with the expanded landfill. The application must be supported by a document describing the proposed stormwater management system, assessing potential impacts to the environment and demonstrating compliance with relevant environmental standards.

10.3 Conservation Authority Approvals

Conservation Authorities are responsible for issuing permits for any construction in, or alteration of, watercourses under *O. Reg. 178/06* (Ontario, 2006).

The site is located within the jurisdiction of the Long Point Region Conservation Authority. If required for the purposes of implementing the preferred alternative, Conservation Authority approval will be obtained. If the preferred "Alternative Method" for the landfill expansion requires the construction in or alteration of a watercourse within the conservation authority's jurisdiction, further review by the will be required to determine whether a permit under Section 28 of the *Conservation Authorities Act* (Ontario, 1990d) must be obtained prior to undertaking such works.

10.4 Federal Approvals

At this time, it is not expected that any federal approvals will be required.

11.0 EA SCHEDULE

EA timelines are dependent on the Minister's decision about this ToR and the EA cannot proceed without an approved ToR. A decision about the approval of this ToR is anticipated in early to mid 2023. The EA is expected to be completed and the application documents submitted in early 2024 or sooner if possible.

It is assumed that the EA application documents in final form will be reviewed by the GRT members, Indigenous Communities, CLC and the public. It is proposed that any supplementary evaluations, responses and/or clarifications required by this review process will be documented by addendum to the EA or other appropriate method.

As previously mentioned, the proposed project will also require approvals for the Quarry Landfill expansion under the *EPA* and the *OWRA*. Monitoring requirements for the proposed project will be developed as part of *EPA* or *OWRA* approvals processes. Stelco is proposing to submit applications for *EPA/OWRA* approval and supporting documents immediately following receipt of EA approval.

12.0 COMMITMENTS AND MONITORING STRATEGY

The EA Report will include a comprehensive list of commitments made by Stelco during the development of this ToR.

12.1 Commitments

An expanded list of commitments made during the development of this ToR is contained in Table 12-1.

Table 12-1 will be carried forward to the EA study report and the EA will include information on how the commitments made in the ToR have been addressed in the EA, and the location of this information within the EA documents.

The EA Report will also include a comprehensive list of commitments made by Stelco during the preparation of the EA studies and during consultation throughout the EA process. These commitments include, but are not limited to, the following:

- All commitments relating to impact management measures (such as mitigation measures);
- Additional works and studies to be carried out;
- Monitoring;
- Public consultation;
- Contingency planning; and,
- Documentation and correspondence.

Table 12-1: List of ToR Commitments

ID	ToR Commitment
1	The EA will be prepared in accordance with subsections 6(2)(c) and 6.1(3) of the *EA Act.*
2	Stelco will update and fully define landfill expansion capacity requirements in the EA including proposed service life.
3	When requested, Stelco will meet with individuals or groups at their convenience to assist them with understanding the project information and providing input; for example, if they are unable to participate in planned public consultation events or require more information.
4	Stelco will contact Indigenous groups to discuss their consultation needs and continue to involve them in the EA process.
5	Stelco will consider the stated purpose of this EA during the EA process and will refine the purpose if required. The final purpose statement will be provided in the EA study report.
6	During the EA, the preliminary criteria and indicators for each of the environmental components will be refined and described in the EA study report.
7	The preliminary Study Areas will be reviewed and confirmed during the EA and described in the EA study report.
8	A more detailed description of the environmental conditions will be prepared during the EA to reflect the confirmed Study Areas using a combination of sources of existing information and site-specific investigations and studies and provided in the EA study report.
9	The individual ‘Alternative Methods’ of expanding the Quarry Landfill will be identified, refined and confirmed during the EA, and described in the EA study report.

ID	ToR Commitment
10	Further input on the relative importance of the assessment indicators will be obtained during the initial stages of the EA.
11	During the EA, the capability of the Stelco Wastewater Treatment Facility to continue to receive the leachate generated from the preferred landfill expansion alternative will be evaluated. This will be described in the EA study report.
12	The preferred expansion alternative will be assessed from the perspective of climate change.
13	A cumulative impact assessment will be completed and described in the EA study report.
14	Post-closure commitments will be described in the EA study report
15	The list of ToR commitments will be provided in the EA study report together with the way in which these commitments were addressed during the EA and the location of the information within the EA documents. The EA Report will also include a list of commitments made by Stelco during the preparation of the EA studies and during consultation throughout the EA process
16	Stelco commits to developing a monitoring framework during the preparation of the EA.

12.2 Compliance and Effects Monitoring

Mitigation measures are designed to avoid or reduce potential adverse effects from the undertaking.

Stelco commits to developing a monitoring framework during the preparation of the EA. The monitoring framework will consider all phases of the proposed undertaking. The monitoring will include:

- Compliance monitoring; and,
- Effects monitoring.

A description of the proposed effects monitoring programs for the expanded landfill will be prepared. It is anticipated that the detailed effects monitoring requirements for the project will ultimately be determined through the conditions of *EPA/OWRA* approval. Compliance monitoring is an assessment of whether an undertaking has been constructed, implemented and/or operated in accordance with the commitments made during the preparation of the EA and the conditions of the *EAA*. Compliance monitoring and contingency measures will be designed to detect and immediately respond to potential problems and unanticipated effects. Effects monitoring will involve activities designed to determine and verify the anticipated effects of the undertaking.

13.0 REFERENCES

Bat Conservation International (BCI). (2022). Species Profiles (online). Available:http://www.batcon.org/resources/media-education/species-profiles.

Cadman, M.D., D. A. Sutherland , G. G. Beck , D. Lepage , and A. R. Couturier , editors. (2007). Co-published by Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp. ISBN 978-1-896059-15-0.

Chapman, L.J., and D.F. Putnam. (1984). The Physiography of Southern Ontario. Ontario Ministry of Natural Resources. 270 pp.

Department of Fisheries and Oceans Canada (DFO). (2022). Aquatic Species at Risk Map. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Dobbyn, J.S. (1994). Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Toronto. 120 pp.

eBird. (2021). eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: http://www.ebird.org

Golder Associates Ltd. (Golder). (2010). Design and Operations Plan Existing Quarry Landfill US Steel Canada Inc., Lake Erie Works. Golder #10-1111-0064. September 2010.

Government of Canada. (2012). *Canadian Environmental Assessment Act.* S.C. 2012, c. 19, s. 52.

Government of Ontario (Ontario). (1990). *Environmental Assessment Act,* R.S.O. 1990, Chapter E.18. Last consolidated January 2022.

Government of Ontario (Ontario). (1990a). *Environmental Protection Act,* R.S.O. 1990, Chapter E.19. Last consolidated July 2022.

Government of Ontario (Ontario). (1990b). *Ontario Water Resources Act,* R.S.O. 1990, Chapter O.40. Last consolidated June 2021.

Government of Ontario (Ontario). (1990c). *Ontario Heritage Act*, R.S.O. 1990, Chapter O.18. Last consolidated October 2021.

Government of Ontario (Ontario). (1990d). *Conservation Authorities Act*, R.S.O. 1990, Chapter C.27. Last consolidated October 2021.

Government of Ontario (Ontario). (1998). *Ontario Regulation 232/98. Landfilling Sites*. *Environmental Protection Act*. Last consolidated October 2011.

Government of Ontario (Ontario). (2003). *Ontario Regulation 169/03. Ontario Drinking Water Quality Standards. Safe Drinking Water Act.* Last consolidated January 2020.

Government of Ontario (Ontario). (2005). *Ontario Regulation 419/05: Air Pollution – Local Air Quality. Environmental Protection Act*. Last consolidated February 2022.

Government of Ontario (Ontario). (2006). *Ontario Regulation 178/06: Long Point Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Conservation Authorities Act.* Last consolidated February 2013.

Government of Ontario (Ontario). (2007). *Ontario Regulation 101/07: Waste Management Projects. Environmental Assessment Act*. Last consolidated July 2022

Government of Ontario (Ontario). (2008). *Ontario Regulation 216/08: Landfilling Sites. Environmental Protection Act.*

Government of Ontario (Ontario). (2016). *Waste-Free Ontario Act*, R.S.O. 2016, Chapter O.12.

Government of Ontario (Ontario). (2017). Strategy for a Waste-Free Ontario: Building the Circular Economy.

Government of Ontario (Ontario). (2020). Provincial Policy Statement, 2020.

Haldimand County Planning & Economic Development Department. (2019). *The Haldimand County Official Plan.* Last amended June 24, 2019.

Haldimand County. (2019). Haldimand County, Community Profile, McSweeney & Associates. Accessed: https://www.haldimandcounty.ca/wp-content/uploads/2019/02/Demographics.pdf

Jones, C., Layberry, R., and MacNaughton, A. (2021). Ontario Butterfly Atlas Online. Toronto Entomologists' Association. Available: http://www.ontarioinsects.org/atlas_online.htm

Lake Erie Source Protection Region. (2008). Long Point Region Watershed Characterization Report. Source Water. Available: https://www.sourcewater.ca/en/source-protection-areas/resources/Documents/Long_Point/LongPoint_Reports_Characterization.pdf

Land Resource Research Institute (Canada). (1984). Soils of the Regional Municipality of Haldimand-Norfolk. Ontario Institute of Pedology, C.J. Acton, E.W. Presant.

Leslie, J. (2018). Vascular Plants at Risks in Ontario. Available: https://static1.squarespace.com/static/5a6531d312abd9ae318d7cbf/t/5bfd60278985836d7a274a9d/1543331903837/2018.11.22_Vascular+Plants+At+Risk+In+Ontario_Low+Resolution.pdf

Ministry of the Environment, Conservation and Parks (MECP). (1994). Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities. Guideline B-7 (formerly Policy 15-08): MOE Program Development Branch: Ontario Ministry of the Environment and Energy, April 1994, 8 p.

Ministry of the Environment, Conservation and Parks (MECP). (1995). Ontario Guideline D-1, Land Use Compatibility. Available: https://www.ontario.ca/page/d-1-land-use-and-compatibility

Ministry of the Environment, Conservation and Parks (MECP). (1995a). Ontario Guideline D-4, Land Use On or Near Landfills and Dumps. Available: https://www.ontario.ca/page/d-4-land-use-or-near-landfills-and-dumps

Ministry of the Environment, Conservation and Parks (MECP). (1994a). Water Management: Policies, Guidelines, Provincial Water Quality Objectives. Updated 1999.

Ministry of the Environment, Conservation and Parks (MECP). (2012). Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites. Last Revision January 2012.

Ministry of the Environment, Conservation and Parks (MECP). (2014). Code of Practice for Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario. Revision 2 January 2014.

Ministry of the Environment, Conservation and Parks (MECP). (2014a) Consultation in Ontario's Environmental Assessment Process. Revision 1 January 2014.

Ministry of the Environment, Conservation and Parks (MECP). (2017). Considering climate change in the environmental assessment process. October 2017.

Ministry of Municipal Affairs and Housing (MMAH). (2020). A Place to Grow. Growth Plan for the Greater Golder Horseshoe. Office Consolidation 2020. Accessed: https://files.ontario.ca/mmah-place-to-grow-office-consolidation-en-2020-08-28.pdf

Ministry of Natural Resources and Forestry (MNRF). (2009). The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Science & Information Branch Inventory, Monitoring and Assessment Section. Technical Report SIB TER IMA TR-01. Crins, W.J., P.A. Gray, P.W.C. Uhlig, M.C. Wester.

Ministry of Natural Resources and Forestry (MNRF). (2022). Make-a-Map Geographic Explorer, Natural Heritage Information Centre. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

Ministry of Natural Resources and Forestry (MNRF). (2022a). Fish On-Line. https://www.lioapplications.lrc.gov.on.ca/fishonline/Index.html?viewer=FishONLine.FishONLine&locale=en-CA

Ministry of Natural Resources and Forestry (MNRF). (2022b). LIO Aquatic Resources Area Layer. https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=48.998431%2C-84.834657%2C4.61

Ontario Nature. (2022). Ontario Reptile and Amphibian Atlas (online). Available: http://www.ontarionature.org/protect/species/herpetofaunal_atlas.php

Rowe, J.S. (1972). Forest Regions of Canada. Ottawa, Ontario: Government of Canada, Department of Environment, Canadian Forestry Service, Publication No. 1300.

RWDI AIR Inc. (2022). Stelco Inc. Quarry Landfill 2022 Annual Report. RWDI # 2202778. March 30, 2022.

SNC Lavalin. (2006). Hamilton Groundwater Resources Characterization and Wellhead Protection.

Statistics Canada. (2001). Statistics Canada 2001 Census Data. Accessed: https://www12.statcan.gc.ca/English/profil01/CP01/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=3528033&Geo2=PR&Code2=35&Data=Count&SearchText=Nanticoke&SearchType=Begins&SearchPR=01&B1=Population&Custom=

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