Draft Cultural Heritage Resources Effects Assessment Report

Twin Creeks Environmental Centre Landfill Optimization Project Environmental Assessment

WM Canada

Watford, Ontario

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Executive Summary

Archaeological Services Inc. was contracted by HDR Corporation on behalf of WM Canada (WM) to prepare this Draft Cultural Heritage Resources Effects Assessment Report as part of the Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project Environmental Assessment (EA). The EA is being carried out in accordance with the requirements of the *Ontario Environmental Assessment Act* (*OEAA*) and the EA Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on December 13, 2022. The Cultural Heritage Resources scope for this project consists of the identification of known and potential built heritage resources (BHR) and cultural heritage landscapes (CHL) within the study area, documented within the Cultural Heritage Resources Existing Conditions Report, and identification of potential adverse effects through the completion of this Cultural Heritage Resources Effects Assessment Report.

The purpose of this Effects Assessment Report is to present the:

- potential environmental effects of the alternative methods on the BHRs and CHLs;
- comparison of the net effects of each alternative method;
- selection of a Preferred Alternative;
- assessment of the environmental effects of the Preferred Alternative; and
- commitments and monitoring.

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed optimization would provide additional airspace of approximately 14 million cubic metres (m^3), which could extend the site life by approximately 12 years (from 2031 to 2043), and may be achieved through alternative landfill configurations (alternative methods) within the existing 301-hectare TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, or annual fill rate.

Three alternative methods for carrying out the optimization were developed to a preliminary conceptual design level in the Conceptual Design Report (CDR). Alternative Method 1 involves vertical expansion of the landfill by 44.5 m, from 280 masl to 324.5 masl within the existing approved waste disposal footprint area, and, in the northeast corner of the site, the relocation of two swales and a new culvert under the service road. Alternative Method 2 involves the vertical expansion of the landfill by 39 m, from 280 masl to 319 masl within the existing approved waste disposal footprint, and, in the northeast corner of the site, the relocation of two swales and a new culvert under the service road. Alternative Method 3 involves the vertical expansion of the landfill by 80 m, from 280 masl to 360 masl within the existing approved waste disposal footprint, and, in the northeast corner of the site, the relocation of two swales and a new culvert under the service road.

The study areas for Cultural Heritage Resources are as follows:

- On-site Study Area: the existing TCEC; and
- Off-site Study Area: the lands within the vicinity of the TCEC extending approximately 1 km out of the On-Site Study Area.

A net effects assessment was carried out for the three alternative methods following the methods outlined in the approved ToR incorporating the information contained in the CDR, and the Cultural Heritage Resources Existing Conditions Report. The results of the net effects assessment were used in a comparative evaluation of the three alternative methods.

Alternative Methods 1, 2, and 3 were determined to have no net effects from direct or indirect impacts on the identified BHRs and CHLs, therefore there is no substantial difference between the proposed alternative methods from a Cultural Heritage Resources perspective. The three Alternative Methods were also compared to a “Do Nothing” Alternative, and, as no net effects were anticipated as a result of Alternative Methods 1, 2, or 3, it was determined that there is also no substantial difference between the three proposed Alternative Methods and the “Do Nothing” Alternative from a Cultural Heritage Resources perspective. As there are no net effects anticipated from any of the three alternative methods, no additional commitments, mitigation, or monitoring are required.

No additional cultural heritage approvals are required beyond the EA approval. As part of the EA approval, the Cultural Heritage Resources Existing Conditions Report and the Cultural Heritage Resources Effects Assessment Report will be submitted to the Ministry of Citizenship and Multiculturalism (MCM) for review and comment.

Acronyms, Units and Glossary

Acronyms

Acronym	Definition
ASI	Archaeological Services Incorporated
BHR	Built Heritage Resource
CDR	Conceptual Design Report
CHL	Cultural Heritage Landscape
EA	Environmental Assessment
LFG	Landfill Gas
MCM	Ministry of Citizenship and Multiculturalism
MECP	Ministry of Environment, Conservation and Parks
OEAA	Ontario Environmental Assessment Act
TCEC	Twin Creeks Environmental Centre
ToR	Terms of Reference
WM	WM Canada

Units

Unit	Definition
km	kilometre
m	metre
m^3	cubic metres
masl	metres above sea level

Glossary

Term	Definition
Approval	Permission granted by an authorized individual or organization for an undertaking to proceed. This may be in the form of program approval, certificate of approval or provisional certificate of approval.
Built Heritage Resource	"…a building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Indigenous community. built heritage resources are located on property that may be designated under Parts IV or V of the *Ontario Heritage Act*, or that may be included on local, provincial, federal and/or international registers" (Ministry of Municipal Affairs and Housing, 2020, p. 41).

Glossary

Term	Definition
Capacity (Disposal Volume)	The total volume of air space available for disposal of waste at a landfill site for a particular design (typically in m^3); includes both waste and daily cover materials, but excludes the final cover.
Cultural Heritage Landscape	"…a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Cultural heritage landscapes may be properties that have been determined to have cultural heritage value or interest under the *Ontario Heritage Act*, or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms" (Ministry of Municipal Affairs and Housing, 2020, p. 42).
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 (EA)	A systematic planning process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment.
Evaluation criteria	Evaluation criteria are considerations or factors taken into account in assessing the advantages and disadvantages of various alternatives being considered.
Impact	Includes negative and positive, direct and indirect effects to an identified built heritage resource and cultural heritage landscape. Direct impacts include destruction of any, or part of any, significant heritage attributes or features and/or unsympathetic or incompatible alterations to an identified resource. Indirect impacts include, but are not limited to, creation of shadows, isolation of heritage attributes, direct or indirect obstruction of significant views, change in land use, land disturbances (Ministry of Citizenship and Multiculturalism, 2006b). Indirect impacts also include potential vibration impacts.
Indicators	Indicators are specific characteristics of the evaluation criteria that can be measured or determined in some way, as opposed to the actual criteria, which are fairly general.
Known Built Heritage Resource or Cultural Heritage Landscape	A known built heritage resource or cultural heritage landscape is a property that has recognized cultural heritage value or interest. This can include a property listed on a Municipal Heritage Register, designated under Part IV or V of the *Ontario Heritage Act*, or protected by a heritage agreement, covenant or easement, protected by the *Heritage Railway Stations Protection Act or the Heritage Lighthouse Protection Act*, identified as a Federal Heritage Building, or located within a U.N.E.S.C.O. World Heritage Site (Ministry of Citizenship and Multiculturalism, 2022).
Landfill gas (LFG)	The gases produced from the wastes disposed in a landfill; the main constituents are typically carbon dioxide and methane, with small amounts of other organic and odour-causing compounds.
Landfill site	An approved engineered site/facility used for the final disposal of waste. Landfills are waste disposal sites where waste is spread in layers, compacted to the smallest practical volume, and typically covered by soil.

Glossary

Term	Definition
Mitigation	Measures taken to reduce adverse impacts on the environment.
Potential Built Heritage Resource or Cultural Heritage Landscape	A potential built heritage resource or cultural heritage landscape is a property that has the potential for cultural heritage value or interest. This can include properties/project area that contain a parcel of land that is the subject of a commemorative or interpretive plaque, is adjacent to a known burial site and/or cemetery, is in a Canadian Heritage River Watershed, or contains buildings or structures that are 40 or more years old (Ministry of Citizenship and Multiculturalism, 2022).
Terms of Reference (ToR)	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Undertaking	Is defined in the Environmental Assessment Act as follows: • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities; • A major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations; or • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program ("enterprise").
Vibration Zone of Influence	Area within a 50-metre buffer of construction-related activities in which there is potential to affect an identified built heritage resource or cultural heritage landscape. A 50-metre buffer is applied in the absence of a project-specific defined vibration zone of influence based on existing secondary source literature (Carman et al., 2012; Crispino & D'Apuzzo, 2001; Ellis, 1987; Rainer, 1982; Wiss, 1981). This buffer accommodates the additional threat from collisions with heavy machinery or subsidence (Randl, 2001).
Waste	Refuse from places of human or animal habitation; unwanted materials left over from a manufacturing process.

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1 Introduction

Archaeological Services Inc. (ASI) was contracted by HDR Corporation on behalf of WM Canada (WM) to prepare this Cultural Heritage Effects Assessment Report as part of the Twin Creeks Environmental Centre (TCEC) Landfill Optimization Project Environmental Assessment (EA). The EA is being carried out in accordance with the requirements of the *Ontario Environmental Assessment Act* (*OEAA*) and the EA Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on December 13, 2022.

The *OEAA* defines the environment in a broad, general sense that comprises physical, biological, and human considerations. In this EA, the environment has been separated broadly into the natural, socio-economic, cultural, and built aspects, with environmental components and evaluation criteria identified within each aspect as listed in **Table 1-1**, consistent with the approved ToR. The organization of the Effects Assessment Reports is also provided in **Table 1-1**.

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

Environmental Aspect	Environmental Component	Evaluation Criteria	Effects Assessment Report
Natural Environment	Atmospheric Environment	• Air Quality – Dust • Air Quality – Landfill Gas and Combustion By-Products • Air Quality – Blowing Litter • Odour • Noise	• Air Quality
			• Noise
	Hydrogeology	• Groundwater Quality • Groundwater Quantity	• Hydrogeology
	Surface Water Environment	• Surface Water Quality • Surface Water Quantity	• Surface Water Quality
			• Surface Water Quantity
	Ecological Environment	• Terrestrial Ecosystems • Aquatic Ecosystems	• Ecological Environment
Socio-Economic Environment	Social Environment	• Human Health • Effects on Local Community	• Human Health
			• Socio-Economic Environment
	Economic Environment	• Economic Effects on Local Community	
	Visual Landscape	• Visual Impact of Facility	• Visual Landscape
Cultural Environment	Cultural Environment	• Cultural Heritage Resources • Archaeological Resources	• Cultural Heritage Resources
			• Archaeological Resources
Built Environment	Transportation	• Traffic Operations	• Transportation
	Current and Planned Future Land Use	• Effects on Current and Future Land Uses	• Land Use

Cultural Heritage Resources, inclusive of built heritage resources (BHR) and cultural heritage landscapes (CHL), are non-renewable cultural resources that can be destroyed and/or adversely impacted by the construction and operation of a waste disposal facility. Activities related to construction and operation of the landfill may cause negative effects on BHRs and CHLs. The purpose of the Cultural Heritage Resources Existing Conditions Report is to identify known or potential BHRs and CHLs within the defined study areas, and provide an inventory of these BHRs and CHLs for the purpose of assessing methods, development of mitigation measures, and monitoring programs of the undertaking in the Cultural Heritage Resources effects assessment.

The purpose of this Effects Assessment Report is to present the potential environmental effects of the alternative methods on the known and potential BHRs and CHLs identified in the Cultural Heritage Resources Existing Conditions Report, a comparison of the net effects of each alternative method, the selection of a Preferred Alternative, the assessment of the environmental effects of the Preferred Alternative, and commitments and monitoring.

This Cultural Heritage Resources Effects Assessment Report is one component of the EA. The EA Study Report will incorporate the information presented herein as appropriate, and this report will be included with the EA Study Report as a supporting document.

1.1 Project and Alternative Methods

There are approximately 8 years of approved landfill airspace capacity remaining at the TCEC (i.e., capacity will be reached in approximately 2031). The proposed landfill optimization would provide additional airspace of approximately 14 million cubic metres (m^3), which could extend the site life by approximately 12 years (from 2031 to 2043) and may be achieved through alternative landfill configurations (alternative methods) within the existing 301-hectare TCEC site area. No changes are proposed to the size of the TCEC site area, approved service area, haul route, or annual fill rate.

Three alternative methods for carrying out the landfill optimization were developed to a preliminary conceptual design level in the Conceptual Design Report (CDR) and are described below as they are relevant to Cultural Heritage Resources.

1.1.1 Alternative Method 1

The geometry of Alternative Method 1 is shown in plan view in **Figure 1-1**. Under the proposed vertical expansion, the existing approved waste disposal footprint area of the TCEC would not change, but rather, the maximum permitted height of waste would be increased by 44.5 m, from 280 masl (the current approved elevation for top of waste) to 324.5 masl, which is the maximum elevation of the top of the final cover for Alternative Method 1.

Four stormwater management ponds that are situated at the corners of the Expansion Landfill footprint collect runoff from the surface of the landfill and release flows through culvert outlets. The full buildout of the landfill in the northeast corner will move the

bordering swales to the east as shown in Figure **1**-**2**. The proposed vertical landfill expansion will impact the stormwater management system by altering catchment areas within the landfill site. All four stormwater management ponds on the landfill site have enough capacity under Alternative Method 1 scenarios and they do not require alteration or enlargement. The existing swales around the landfill site currently are also able to safely convey the 25-year design storm without overtopping, so modification to the existing cross-section geometries of the swales is not warranted. The relocated swales (SWC1A) and SWG2A) and new culvert will also be able to convey these flows appropriately.

No additional ancillary facilities, beyond those already existing on the site, will be required for Alternative Method 1.

Figure 1-1. Alternative Method 1

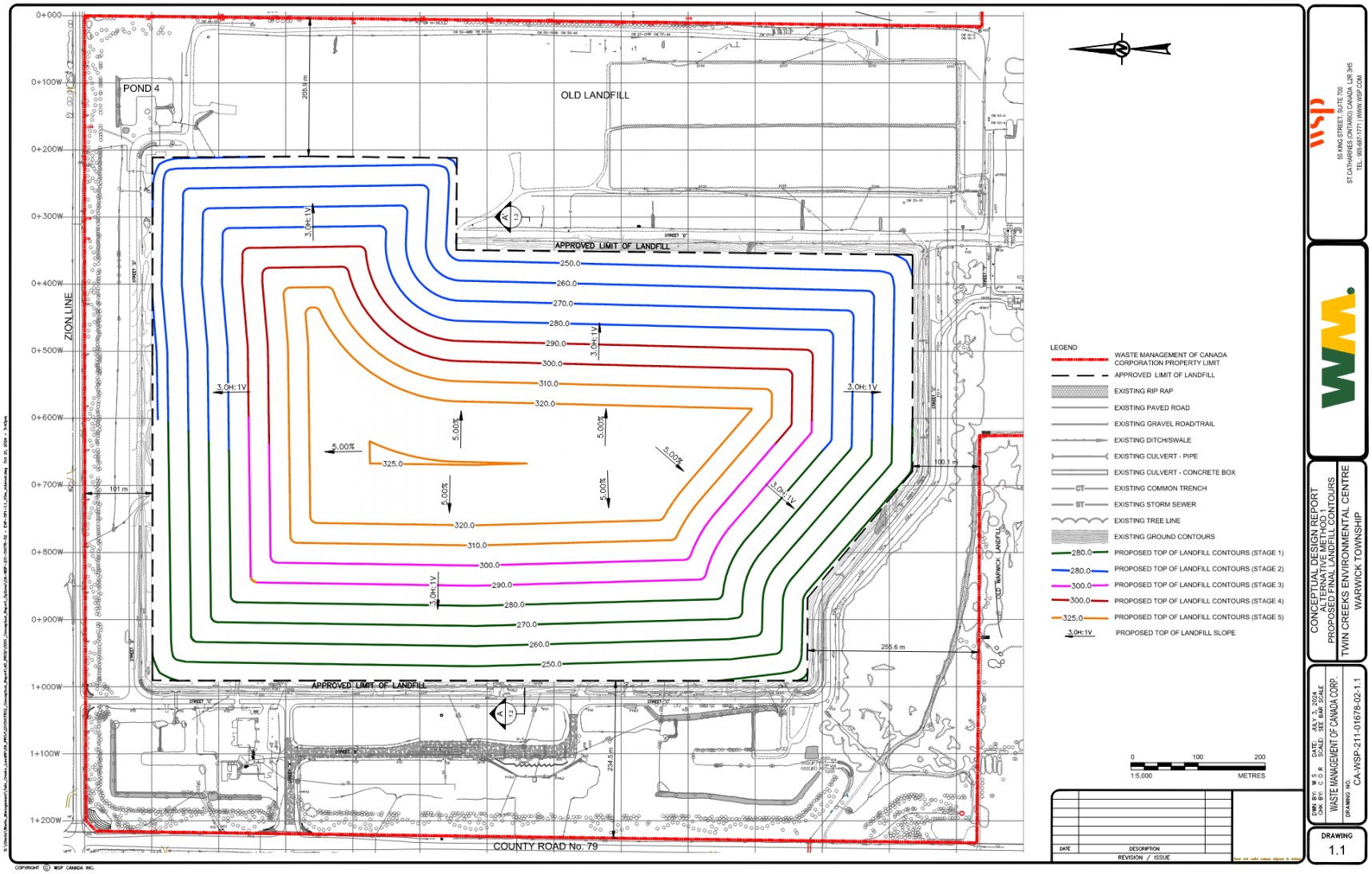
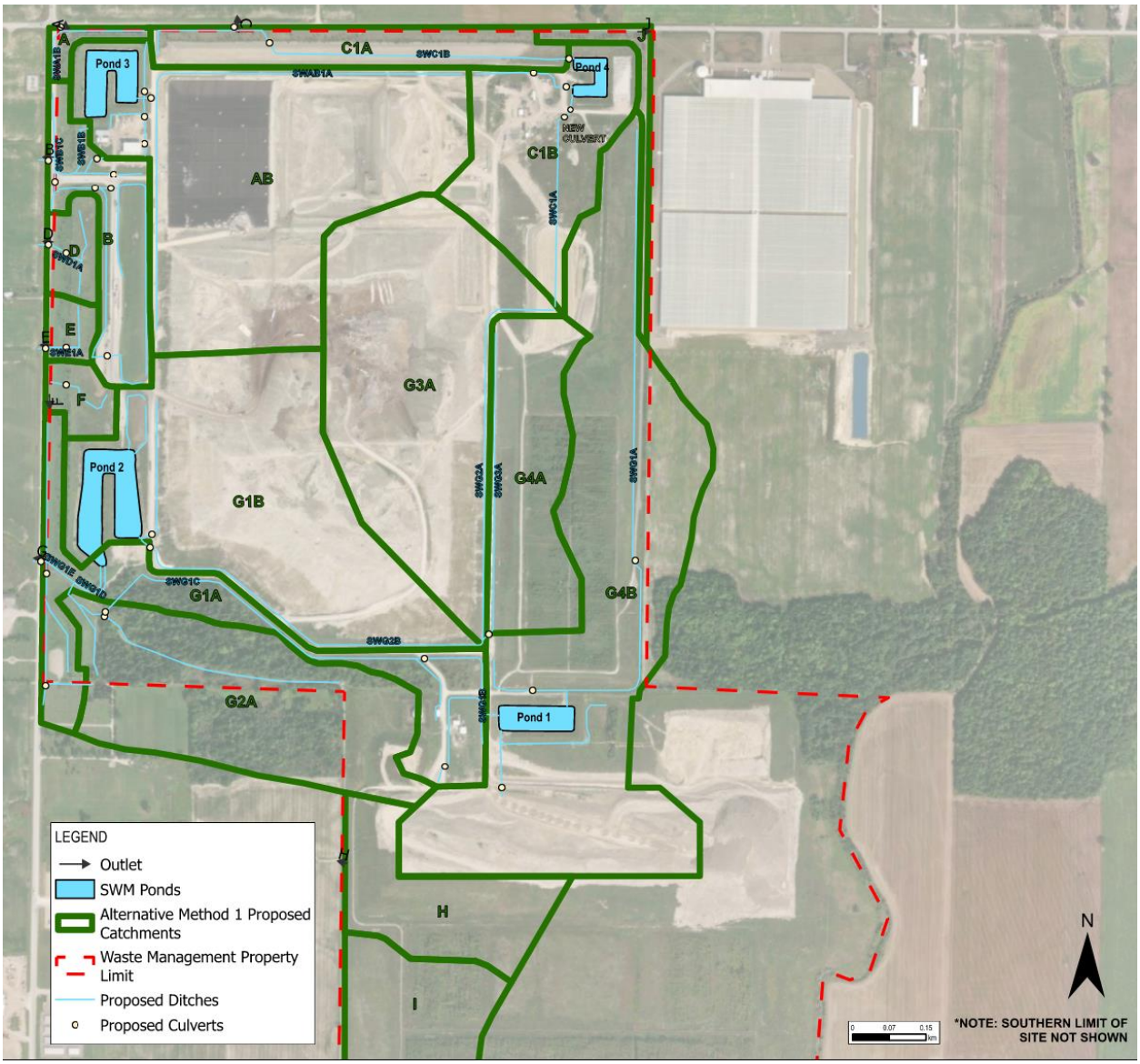


Figure 1-2. Stormwater Management for Alternative Method 1



1.1.2 Alternative Method 2

The geometry of Alternative Method 2 is shown in plan view in **Figure 1-3**. Under the proposed vertical expansion, the existing approved waste disposal footprint area of the TCEC would not change, but rather, the maximum permitted height of waste would be increased by 39 m, from 280 masl (the current approved elevation for top of waste) to 319 masl, which is the maximum elevation of the top of the final cover for Alternative Method 2.

The stormwater impacts of Alternative Method 2 would be similar to that of Alternative Method 1 in several ways. The factors altering the magnitude and timing of the peak flows (although not the total runoff volume) are the same. The redistributed catchment areas for Alternative Method 2 are shown on Figure **1**-**4**. The existing stormwater management ponds and swales will have enough capacity to process their respective design storms under Alternative Method 2. The relocated swales (SWC1A and SWG2A) and new culvert will also be able to convey these flows appropriately.

No additional ancillary facilities, beyond those already existing on the site, will be required for Alternative Method 2.

Figure 1-3. Alternative Method 2

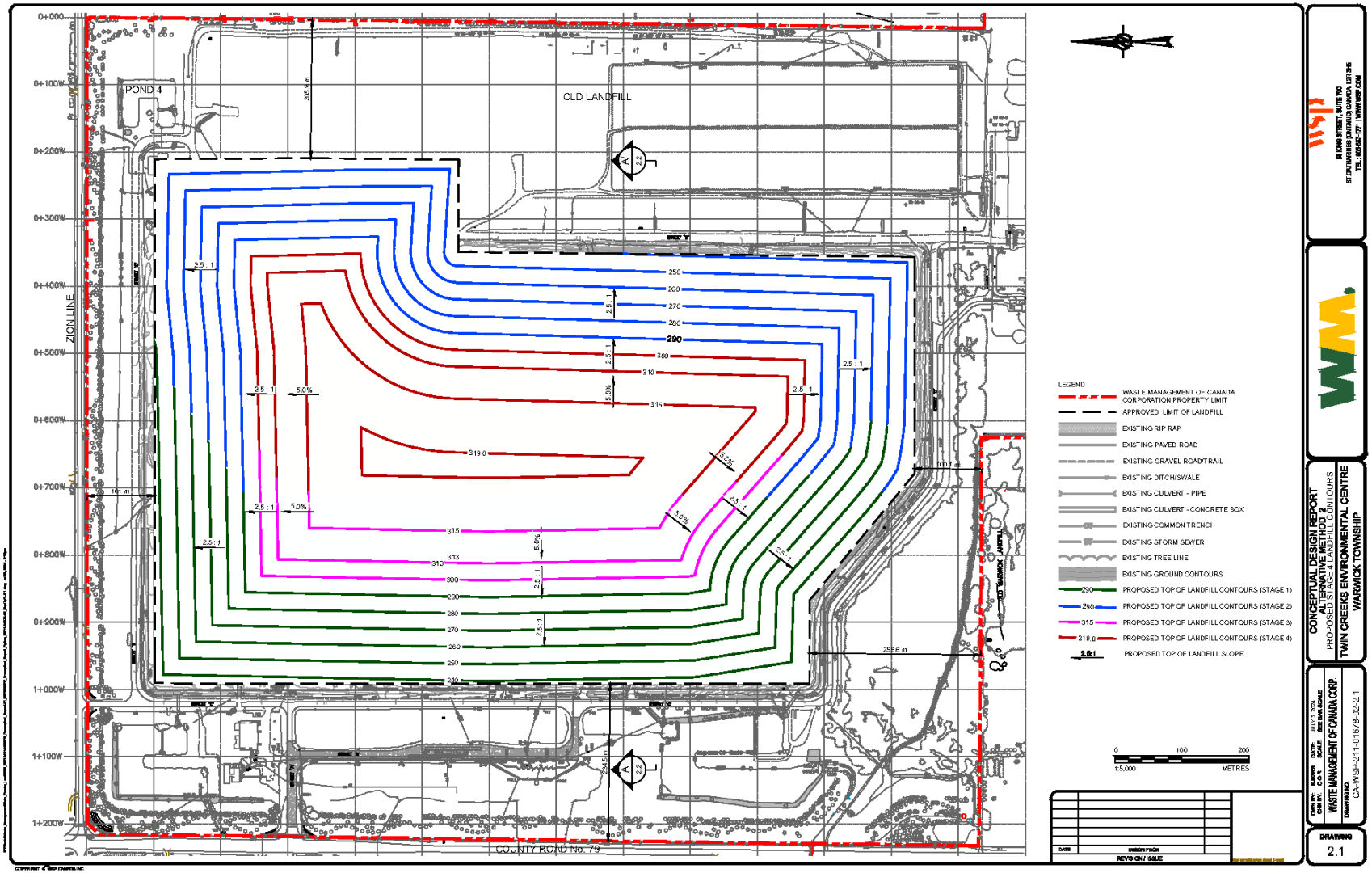
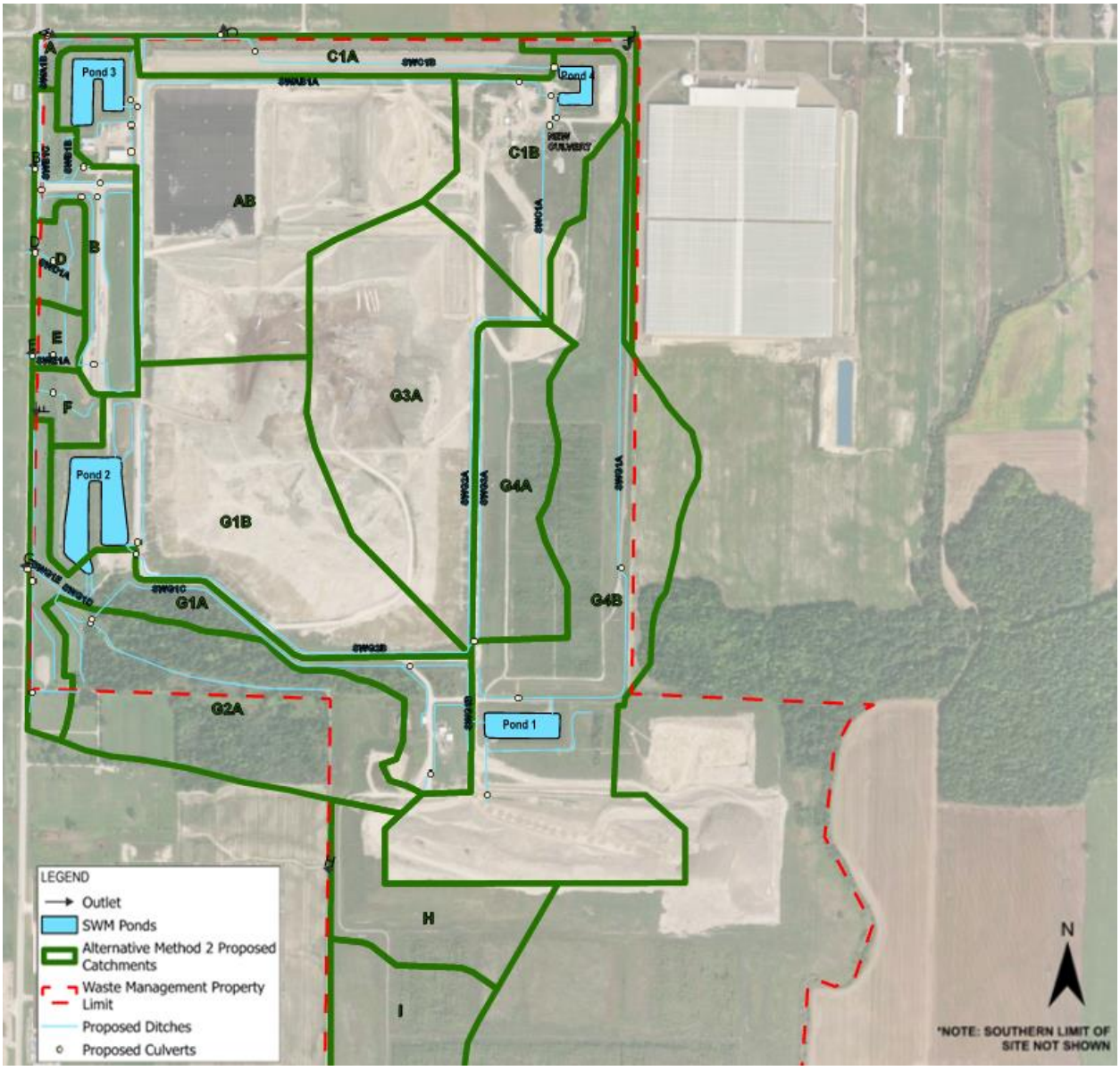


Figure 1-4. Stormwater Management for Alternative Method 2



1.1.3 Alternative Method 3

The geometry of Alternative Method 3 is shown in plan view in **Figure 1-5**. Under the proposed vertical expansion, the existing approved waste disposal footprint area of the TCEC would not change, but rather, the maximum permitted height of waste would be increased by 80 m, from 280 masl (the current approved elevation for top of waste) to 360 masl, which is the maximum elevation of the top of the final cover for Alternative Method 3.

The impacts of Alternative Method 3 would be similar to that of Alternative Methods 1 and 2 in several ways. The factors altering the magnitude and timing of the peak flows (although not, again, the total runoff volume) are consistent. The redistributed catchment areas for Alternative Method 3 are shown on Figure **1**-**6**. The existing stormwater management ponds and swales will have enough capacity to process their respective design storms under Alternative Method 3. The relocated swales (SWC1A) and SWG2A) and new culvert will also be able to convey these flows appropriately.

No additional ancillary facilities, beyond those already existing on the site, will be required for Alternative Method 3.

Figure 1-5. Alternative Method 3

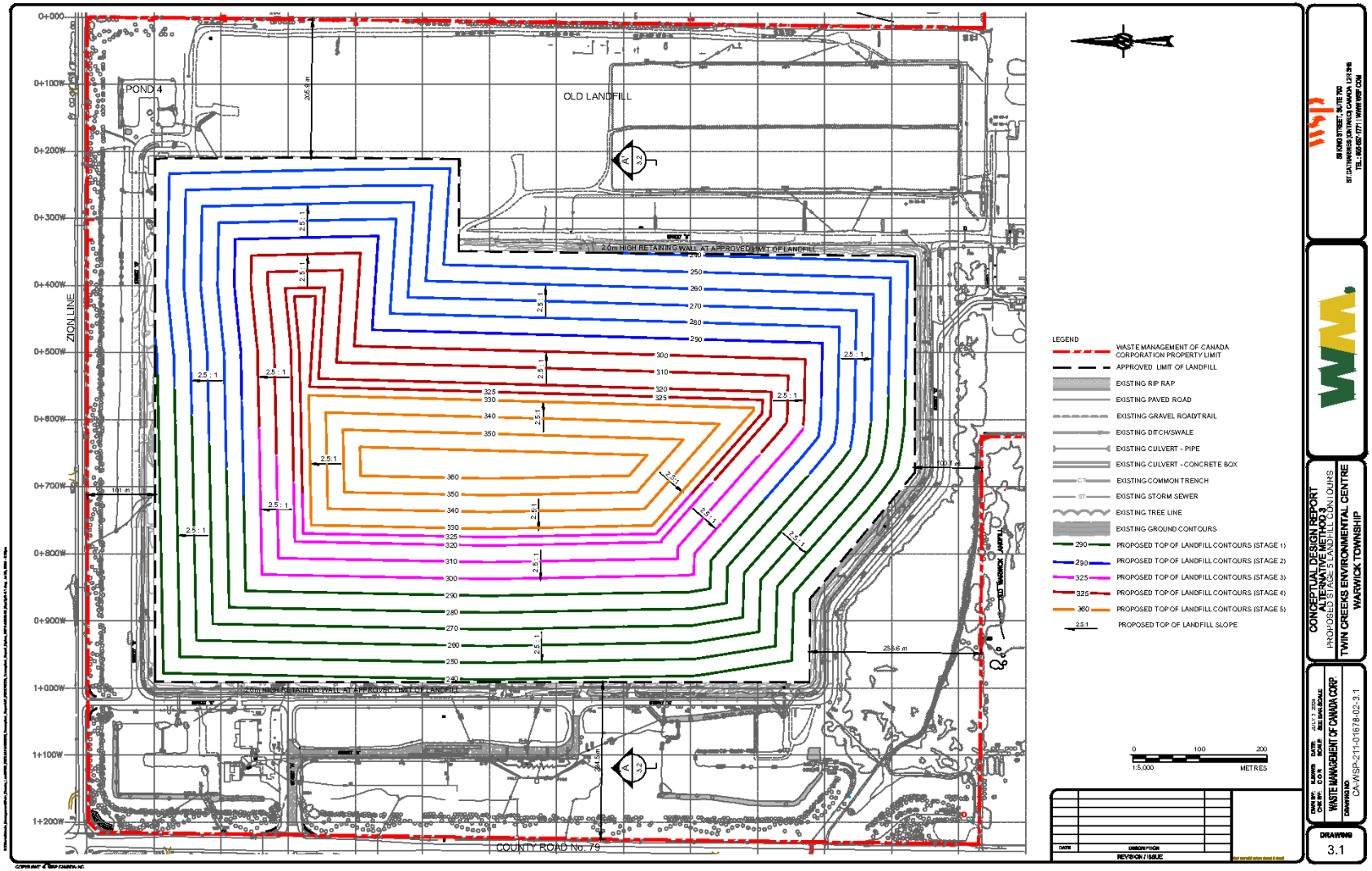
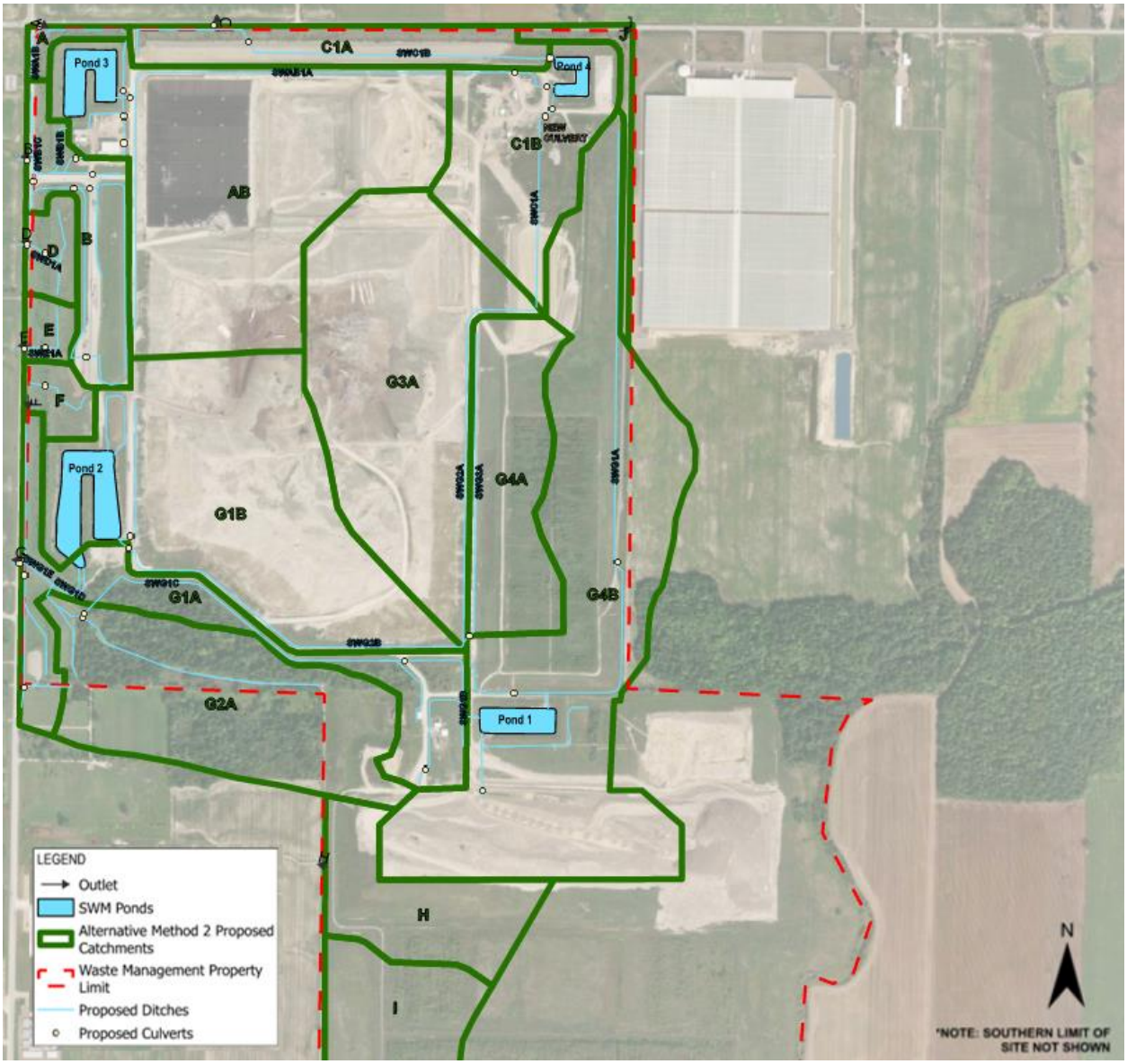


Figure 1-6. Stormwater Management for Alternative Method 3



2 Effects Assessment Methods

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

- predict the potential environmental effects for each alternative method (**Section 2.1**);
- identify the Preferred Alternative method based on a comparative evaluation of the potential environmental effects of each alternative method (**Section 2.2**);
- conduct an effects assessment on the Preferred Alternative method, including the identification of mitigation measures and monitoring programs (**Section 2.3**); and
- compare the effects of the Preferred Alternative method to those of the 'do nothing' alternative (i.e., the Expansion Landfill as approved) (**Section 2.4**).

2.1 Predict Potential Environmental Effects for Alternative Methods

The potential environmental effects for each alternative method are identified within the study areas based on the application of the evaluation criteria, indicators and data sources in the approved ToR and based on the maximum allowable waste receipt level for the TCEC landfill. The potential effects can be positive or negative, direct or indirect, and short- or long-term. Mitigation measures are identified to minimize or mitigate the potential effects and then the net effects are evaluated taking into consideration the application of mitigation measures. The study areas, evaluation criteria, indicators, data source, and key design considerations and assumptions for Cultural Heritage Resources are provided below.

2.1.1 Study Areas

The TCEC landfill is located within the Township of Warwick, in the County of Lambton, approximately 1 km north of the Village of Watford. The TCEC is situated south of Highway 402 and southeast of the intersection of Nauvoo Road and Zion Line. The municipal street address of the TCEC is 5768 Nauvoo Road, Watford, Ontario. The area being considered for the landfill optimization is the approved Expansion Landfill footprint located within the northern portion of the 301 ha TCEC site.

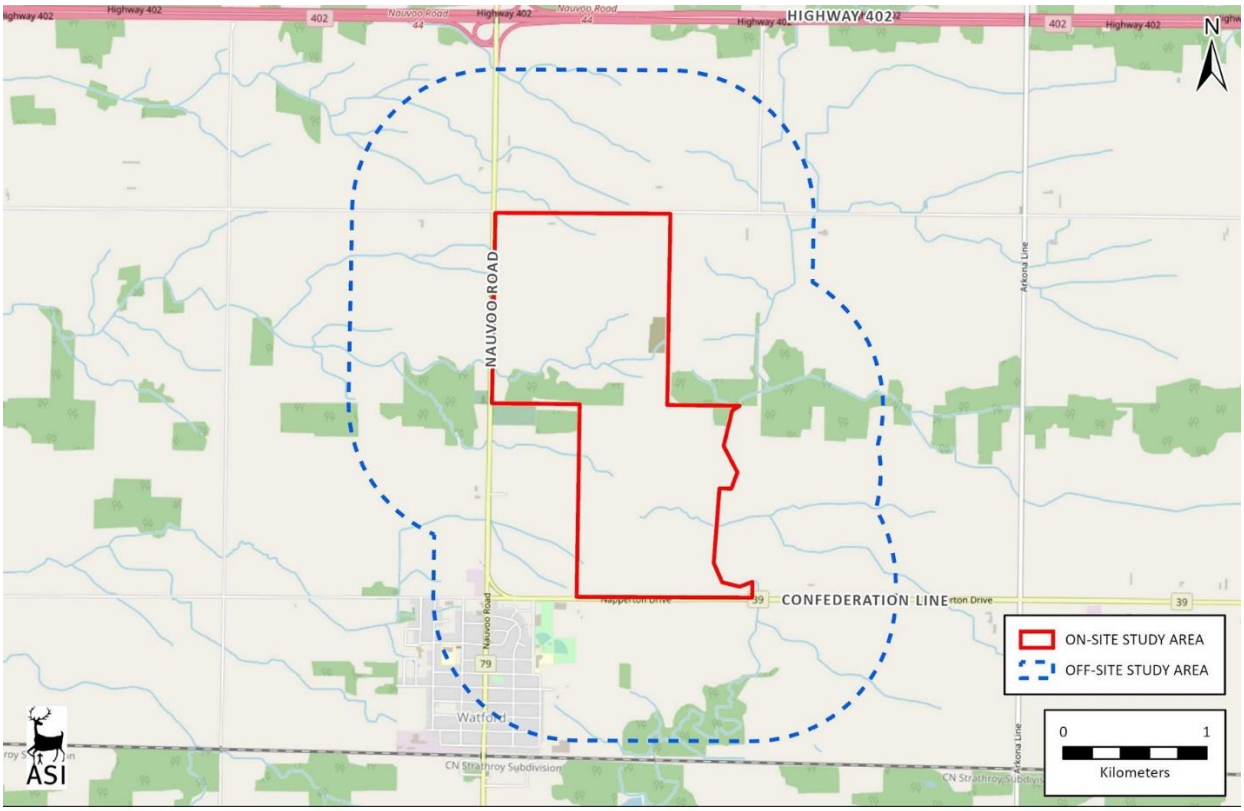
The study areas include the existing TCEC site as well as the potentially-affected surrounding areas. The general On-site and Off-site Study Areas identified for the EA in the approved ToR are as follows:

- On-site Study Area: the existing TCEC;

- Off-site Study Area: the lands within the vicinity of the TCEC extending approximately 1 km out from the On-site Study Area.

These study areas were used for the purposes of the Cultural Heritage effects assessment (**Figure 2-1**).

Figure 2-1: On-site and Off-Site Study Area for Cultural Heritage



2.1.2 Evaluation Criteria, Indicators, and Data Sources

The evaluation criteria, rationale, indicators, and data sources used for Cultural Heritage Resources as per the approved ToR are provided in **Table 2-1**.

Table 2-1. Evaluation Criteria, Indicators, and Data Sources for Cultural Heritage Resources

Evaluation Criteria	Rationale	Indicators	Data Sources
Cultural Environment			
Cultural Heritage			

Cultural Heritage Resources (Built Heritage Resources and Cultural Heritage Landscapes)	Activities related to construction and operation of the landfill may result in direct or indirect effects on identified built heritage resources and cultural heritage landscapes.	• Proximity of known or potential cultural heritage resources to the landfill (known/potential built heritage resources and cultural heritage landscapes will be assessed for potential direct or indirect effects).
		  • Direct impacts may include: the destruction of any, or part of any, significant heritage attributes or features; and alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance.
		  • Indirect impacts may include: shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden; and isolation of a heritage attribute from its surrounding environment, context or a significant relationship; direct or indirect obstruction of significant views or vistas within, from, or of built and natural features; a change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces; and land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.
			• Published data sources
			• Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes (MCM, 2016)
			• Ontario Heritage Tool Kit (MCM, 2006)
			• Commemorative statements
			• Proposed facility characteristics
			• Landfill design and operations data
			• Viewshed analysis
			• Previous EA reports
			• Municipal Heritage Inventories and Staff Reports
			• Provincial and Federal Heritage Registers and Inventories
			• Township of Warwick, MCM, Ontario Heritage Trust, and Walpole Island First Nation consultation
			• Field survey results
			• Historical mapping, historical topographical maps and aerial photographs

2.1.3 Key Considerations and Assumptions

The key existing conditions elements, design considerations, and assumptions for the Cultural Heritage Resources effects assessment are described below. This Cultural Heritage Resources Effects Assessment considers only above-ground cultural heritage resources, below-ground resources/sites relating to Indigenous and Euro-Canadian settlement are considered in the associated Archaeological Resources Effects Assessment completed by ASI concurrently with this report.

2.1.3.1 Key Elements of Existing Conditions

A review of historical maps and background documents revealed a study area with a history of Indigenous land use dating back millennia and a rural land-use history dating to the early to mid-nineteenth century. A full inventory of identified BHRs and CHLs from the Cultural Heritage Resources Existing Conditions Report is included in **Appendix B**.

Three potential BHRs and 16 potential CHLs were identified within the project study areas. Of the identified BHRs and CHLs, one resource (CHL 1) is located within the On-Site Study Area. The remaining 18 identified BHRs and CHLs are located within the Off-Site Study Area. Known and potential BHRs and CHLs include 10 farmscapes (CHLs 1, 3, 4, 7-9, 11, 13, 15, and 17), three cemeteries (CHLs 2, 6, and 18), two farmhouses (BHRs 1 and 2), one church (BHR 3), one roadscape (CHL 5), one race track (CHL 12), and one historical settlement centre (CHL 19).

2.1.3.2 Key Design Considerations

Key design considerations include any construction or operation activities that could affect Cultural Heritage Resources. The net effects analysis for Alternative Methods 1, 2, and 3 are based on the proposed construction and operational activities outlined in the CDR including:

- Landfill design and geometry;
- Waste disposal footprint area;
- Site development;
- Ancillary facilities;
- Construction activities relating to waste placement, stormwater management, gravel access roads, and Landfill Gas management; and
- Vibration related to any and all construction activities.

2.1.3.3 Key Assumptions

The construction and operation of Alternative Methods 1, 2, and 3 will take place within the existing On-site Study Area. The landfill expansion will occur within the existing approved Expansion Landfill footprint.

2.2 Comparative Evaluation and Identification of the Preferred Alternative

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

The net environmental effects are used to compare the three alternative methods to one another at the criteria and indicator level for each discipline. The following two step methodology was applied to carry out the comparative evaluation for Cultural Heritage Resources:

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

2.3 Effects Assessment of the Preferred Alternative

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

2.4 Comparison of the Preferred Alternative against the ‘Do Nothing’ Alternative

The effects of the Preferred Alternative are compared against the predicted effects of the currently approved Expansion Landfill based on similar environmental criteria and indicators, with the understanding that the criteria and indicators used in the current effects assessment may differ from those used for the effects assessment of the Expansion Landfill. The effects are compared against each other in terms of magnitude, extent, and duration. The advantages and disadvantages of the Preferred Alternative compared to the ‘Do Nothing’ alternative are identified. The comparison of the effects of the Preferred Alternative against the ’Do Nothing’ alternative will be compiled and presented in the EA Study Report.

3 Net Effects Assessment

To identify the potential effects of the Project on known and potential BHRs and CHLs, the conceptual design of each alternative method for the landfill optimization is examined to determine if it will have an effect on:

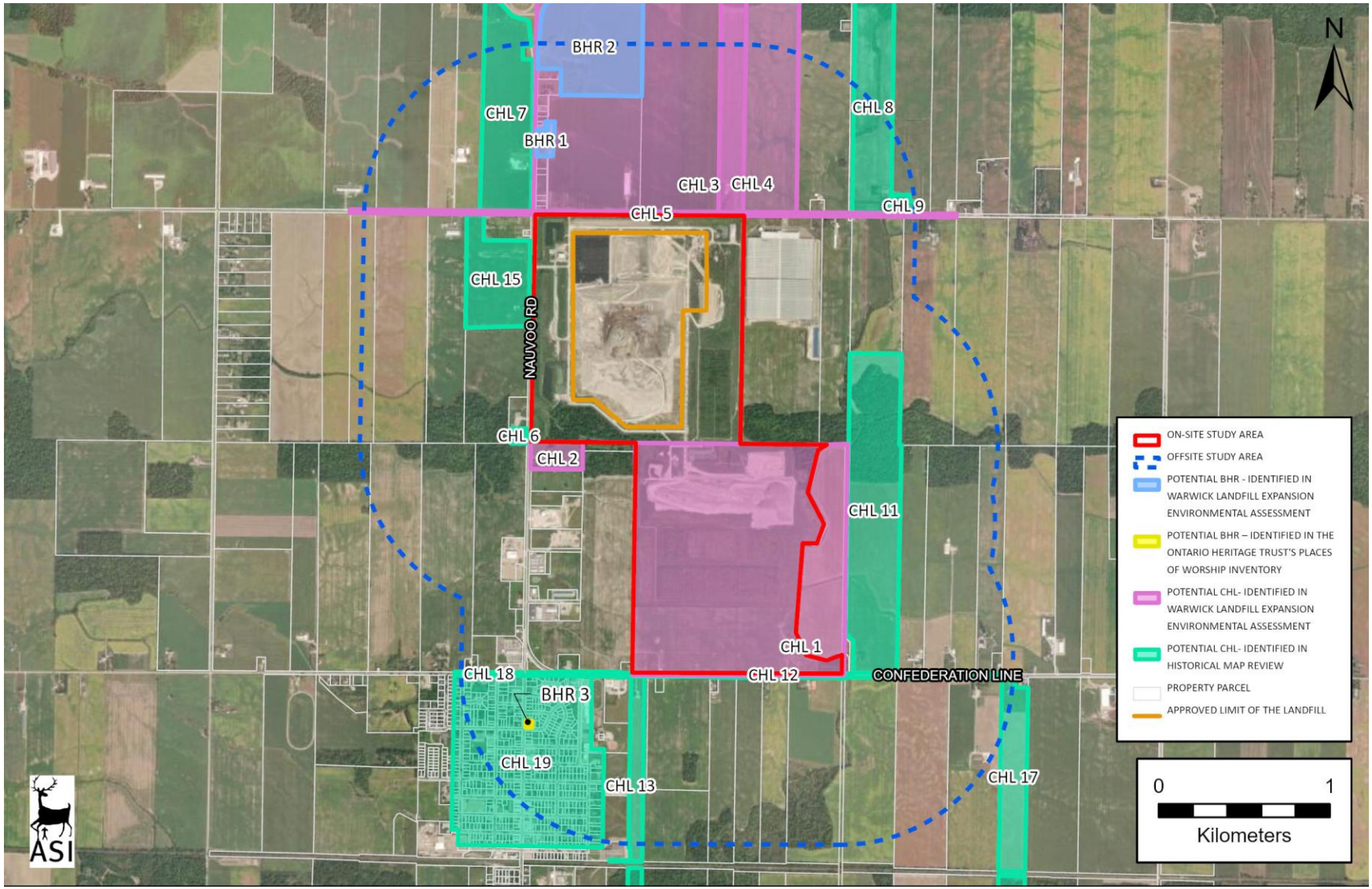
- Known and potential BHRs in the On-Site and Off-Site Study Areas and predicted direct and indirect impacts; and
- Known and potential CHLs in the On-Site and Off-Site Study Areas and predicted direct and indirect impacts.

The results of the net effects assessment for each alternative method are provided in **Sections 3.2** through **3.4**, below.

3.1 Future Baseline Conditions

The future baseline conditions are assumed to be the same as the existing conditions described in the Cultural Heritage Resources Existing Conditions Report. The existing approved waste disposal footprint area of the TCEC would not change when the project begins, or in any alternative method in the proposed vertical expansion. The Cultural Heritage Resources existing conditions and future baseline conditions are depicted in **Figure 3-1**.

Figure 3-1. On-site Study Area for Cultural Heritage



3.2 Alternative Method 1

The assessment of effects for Alternative Method 1 is described below for the environmental criteria and indicators of Cultural Heritage Resources and is summarized in **Table 3-1**.

3.2.1 Built Heritage Resources and Cultural Heritage Landscapes

BHRs and CHLs are non-renewable cultural resources that can be destroyed and/or adversely impacted by the construction and operation of a waste disposal facility. Activities related to construction and operation of the landfill may cause negative effects on BHRs and CHLs.

3.2.1.1 Direct Impacts

Alternative Method 1 is not anticipated to result in direct impacts to BHRs 1-3 or CHLs 1-19. While a large portion of CHL 1 (Lot 20-21, Concession 4) is within the On-Site Study Area, none of the proposed work associated with Alternative Method 1 is anticipated to be within the limits of the CHL. CHL 1 has already undergone considerable alterations associated with ongoing operations at the TCEC site since it was first identified as a potential CHL in 2005, including the addition of a stormwater management pond and drainage ditches at the northwest corner, and is therefore no longer representative of the CHL's historical agricultural use.

No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through direct impacts are anticipated as a result of the work associated with Alternative Method 1.

3.2.1.2 Indirect Impacts

Indirect impacts to CHL 5 (Zion Line) are anticipated as a result of the proposed work associated with Alternative Method 1. These indirect impacts include changes to the viewscapes over agricultural fields from the roadway. These indirect impacts are not anticipated to adversely impact the heritage attributes of the CHL as the views toward the TCEC site have already been significantly impacted by the construction of the waste management facility and the existing views in that direction from Zion Line. The relationship between Zion Line and the surrounding area is no longer representative of the historical agricultural context of the roadway, and as such, this is not considered to be an adverse impact and no mitigation is required.

Alternative Method 1 is not anticipated to result in indirect impacts to BHRs 1-3 or CHLs 1-4 and 6-19. No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through indirect impacts are anticipated as a result of the work associated with Alternative Method 1.

3.2.2 Summary

A summary of the effects assessment of Alternative Method 1 is summarized below in **Table 3-1**.

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

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
BHRs and CHLs	Direct Impacts	• The construction and operation of Alternative Method 1 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4.	• No direct impacts are anticipated to the identified BHRs and CHLs.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.
	Indirect Impacts	• Vibration related to any and all construction activities. • The construction and operation of Alternative Method 2 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4. • Shadows and obstructed views created by the vertical expansion of the landfill.	• Indirect impacts to CHL 5 through changes to historical agricultural viewscapes. Impacts have been determined to not adversely impact the CHL's heritage attributes.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.

3.3 Alternative Method 2

The assessment of effects for Alternative Method 2 is described below for the environmental criteria and indicators of Cultural Heritage Resources and is summarized in **Table 3-2**.

3.3.1 Built Heritage Resources and Cultural Heritage Landscapes

BHRs and CHLs are non-renewable cultural resources that can be destroyed and/or adversely impacted by the construction and operation of a waste disposal facility. Activities related to construction and operation of the landfill may cause negative effects on BHRs and CHLs.

3.3.1.1 Direct Impacts

Alternative Method 2 is not anticipated to result in direct impacts to BHRs 1-3 or CHLs 1-19. While a large portion of CHL 1 (Lot 20-21, Concession 4) is within the On-Site Study Area, none of the proposed work associated with Alternative Method 2 is anticipated to be within the limits of the CHL. CHL 1 has already undergone considerable alterations associated with ongoing operations at the TCEC site since it was first identified as a potential CHL in 2005, including the addition of a stormwater management pond and drainage ditches at the northwest corner, and therefore is no longer representative of the CHL's historical agricultural use.

No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through direct impacts are anticipated as a result of the work associated with Alternative Method 2.

3.3.1.2 Indirect Impacts

Indirect impacts to CHL 5 (Zion Line) are anticipated as a result of the proposed work associated with Alternative Method 2. These indirect impacts include changes to the viewscapes over agricultural fields from the roadway. These indirect impacts are not anticipated to adversely impact the heritage attributes of the CHL as the views toward the TCEC site have already been significantly impacted by the construction of the waste management facility and the existing views in that direction from Zion Line. The relationship between Zion Line and the surrounding area is no longer representative of the historical agricultural context of the roadway, and as such, this is not considered to be an adverse impact and no mitigation is required.

Alternative Method 2 is not anticipated to result in indirect impacts to BHRs 1-3 or CHLs 1-4 and 6-19. No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through indirect impacts are anticipated as a result of the work associated with Alternative Method 2.

3.3.2 Summary

A summary of the effects assessment of Alternative Method 2 is summarized below in **Table 3-2**.

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

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
BHR and CHLs	Direct Impacts	• The construction and operation of Alternative Method 1 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4.	• No direct impacts are anticipated to the identified BHRs and CHLs.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.
	Indirect Impacts	• Vibration related to any and all construction activities. • The construction and operation of Alternative Method 2 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4. • Shadows and obstructed views created by the vertical expansion of the landfill.	• Indirect impacts to CHL 5 through changes to historical agricultural viewscapes. Impacts have been determined to not adversely impact the CHL's heritage attributes.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.

3.4 Alternative Method 3

The assessment of effects for Alternative Method 3 is described below for the environmental criteria and indicators of Cultural Heritage Resources and is summarized in **Table 3-3**.

3.4.1 Built Heritage Resources and Cultural Heritage Landscapes

BHRs and CHLs are non-renewable cultural resources that can be destroyed and/or adversely impacted by the construction and operation of a waste disposal facility. Activities related to construction and operation of the landfill may cause negative effects on BHRs and CHLs.

3.4.1.1 Direct Impacts

Alternative Method 3 is not anticipated to result in direct impacts to BHRs 1-3 or CHLs 1-19. While a large portion of CHL 1 (Lot 20-21, Concession 4) is within the On-Site Study Area, none of the proposed work associated with Alternative Method 3 is anticipated to be within the limits of the CHL. CHL 1 has already undergone considerable alterations associated with ongoing operations at the TCEC site since it was first identified as a potential CHL in 2005, including the addition of a stormwater management pond and drainage ditches at the northwest corner, and is therefore no longer representative of the CHL's historical agricultural use.

No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through direct impacts are anticipated as a result of the work associated with Alternative Method 3.

3.4.1.2 Indirect Impacts

Indirect impacts to CHL 5 (Zion Line) are anticipated as a result of the proposed work associated with Alternative Method 3. These indirect impacts include changes to the viewscapes over agricultural fields from the roadway. These indirect impacts are not anticipated to adversely impact the heritage attributes of the CHL as the views toward the TCEC site have already been significantly impacted by the construction of the waste management facility and the existing views in that direction from Zion Line. The relationship between Zion Line and the surrounding area is no longer representative of the historical agricultural context of the roadway, and as such, this is not considered to be an adverse impact and no mitigation is required.

Alternative Method 3 is not anticipated to result in indirect impacts to BHRs 1-3 or CHLs 1-4 and 6-19. No mitigation is required and no net effects to the identified heritage attributes of the BHRs and CHLs through indirect impacts are anticipated as a result of the work associated with Alternative Method 3.

3.4.2 Summary

A summary of the effects assessment of Alternative Method 3 is summarized below in **Table 3-3**.

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

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
BHRs and CHLs	Direct Impacts	• The construction and operation of Alternative Method 1 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4.	• No direct impacts are anticipated to the identified BHRs and CHLs.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.
	Indirect Impacts	• Vibration related to any and all construction activities. • The construction and operation of Alternative Method 2 will take place within the existing On-site Study Area. • The landfill expansion will occur within the existing approved Expansion Landfill footprint. • The buildout of the landfill in the northeast corner will move the bordering swales to the east and new culvert will be constructed south of stormwater management pond 4. • Shadows and obstructed views created by the vertical expansion of the landfill.	• Indirect impacts to CHL 5 through changes to historical agricultural viewscapes. Impacts have been determined to not adversely impact the CHL's heritage attributes.	• None required	• No net effects to the heritage attributes of identified BHRs and CHLs.

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

The comparative evaluation of the net effects of each alternative method and the identification of a Preferred Alternative are carried out in accordance with the methods described in Section 2.2. The three alternative methods are comparatively assessed and evaluated using the criteria and indicators to determine the Preferred Alternative. The differences in the potential environmental effects remaining following the implementation of potential mitigation/management measures (i.e., net effects) are used to identify and compare each alternative method. The comparative evaluation of the alternative methods for Cultural Heritage Resources is provided in **Table 4-1**, below.

Table 4-1. Comparative Evaluation of the Net Effects of the Alternative Methods for Cultural Heritage.

Evaluation Criteria	Indicator	Net Effects of Alternative Methods		
		Alternative Method 1	Alternative Method 2	Alternative Method 3
Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL)	Direct Impacts	No net effects to the identified BHRs and CHLs associated with Alternative Method 1. **No Substantial Difference**	No net effects to the identified BHRs and CHLs associated with Alternative Method 2. **No Substantial Difference**	No net effects to the identified BHRs and CHLs associated with Alternative Method 3. **No Substantial Difference**
	Indirect Impacts	No net effects to the identified BHRs and CHLs associated with Alternative Method 1. **No Substantial Difference**	No net effects to the identified BHRs and CHLs associated with Alternative Method 2. **No Substantial Difference**	No net effects to the identified BHRs and CHLs associated with Alternative Method 3. **No Substantial Difference**
	Criteria Rating & Rationale	***There is no substantial difference between the alternative methods for the BHRs and CHLs.*** No net effects are anticipated to the identified BHRs and CHLs from any of the three alternative methods.		
Preferred Alternative: There is no substantial difference between the alternative methods for Cultural Heritage Resources; therefore, no Preferred Alternative is identified.				

None of the proposed alternative methods are anticipated to result in net effects from direct or indirect impacts to the identified BHRs and CHLs, therefore, there is no substantial difference between the alternative methods for Cultural Heritage Resources. No Preferred Alternative is identified for Cultural Heritage Resources.

5 Effects Assessment of the Preferred Alternative

The comparative evaluation of net effects above in **Sections 3** and **4** determined that none of the alternative methods are anticipated to result in net effects, therefore there is no substantial difference between the alternative methods from a Cultural Heritage perspective and no Preferred Alternative was identified.

6 Comparison of the Preferred Alternative against the ‘Do Nothing’ Alternative

The effects of the Preferred Alternative are compared against the predicted effects of the currently approved Expansion Landfill based on similar environmental criteria and indicators, with the understanding that the criteria and indicators used in the current effects assessment may differ from those used for the effects assessment of the Expansion Landfill. The effects are compared against each other in terms of magnitude, extent, and duration below. The advantages and disadvantages of the Preferred Alternative compared to the ‘Do Nothing’ Alternative are identified.

6.1 Effects of the ‘Do Nothing’ Alternative

The “Do Nothing” Alternative is not anticipated to result in any net effects from direct or indirect impacts to identified BHRs and CHLs.

6.2 Comparison of the Preferred Alternative against the ‘Do Nothing’ Alternative

There is no substantial difference between the alternative methods (i.e., no Preferred Alternative). There are no net effects from direct or indirect impacts to identified BHRs or CHLs from the “Do Nothing” Alternative or the three proposed Alternative Methods, from a Cultural Heritage Resources perspective.

6.3 Advantages and Disadvantages of the Preferred Alternative

The differences in net effects between the Preferred Alternative and the 'Do Nothing Alternative' are used to determine the advantages and disadvantages of the Preferred Alternative. The advantages and disadvantages of the Preferred Alternative (Alternative Methods 1, 2, and 3) are listed in **Table 6-1**.

Table 6-1. Advantages and Disadvantages of the Preferred Alternative

Evaluation Criteria	Advantages	Disadvantages
Cultural Heritage	• There are no known advantages associated with any of the proposed alternative methods from a Cultural Heritage Resources perspective.	• There are no known disadvantages associated with any of the proposed alternative methods from a Cultural Heritage Resources perspective.

There are no known advantages or disadvantages associated with Alternative Methods 1, 2, or 3 compared to the "Do Nothing" Alternative from a Cultural Heritage Resources perspective.

7 Commitments and Monitoring

As there are no net effects anticipated from any of the three alternative methods, no additional commitments or monitoring are required from a Cultural Heritage Resources perspective.

8 Cultural Heritage Approvals

No additional approvals are required in addition to the EA approval. As part of the EA approval process:

- The Cultural Heritage Existing Conditions Report and the Cultural Heritage Effects Assessment Report will be submitted to the Ministry of Citizenship and Multiculturalism (MCM) for review and comment.

9 References

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A

Qualified Persons Involved in the Project

Qualified Persons Involved in the Project

Lindsay Graves, M.A., C.A.H.P.
Senior Cultural Heritage Specialist, Assistant Manager - Cultural Heritage Division

The Senior Project Manager for this Cultural Heritage Report is **Lindsay Graves** (M.A., Heritage Conservation), Senior Cultural Heritage Specialist and Assistant Manager for the Cultural Heritage Division. She was responsible for: overall project scoping and approach; development and confirmation of technical findings and study recommendations; application of relevant standards, guidelines and regulations; and implementation of quality control procedures. Lindsay is academically trained in the fields of heritage conservation, cultural anthropology, archaeology, and collections management and has over 15 years of experience in the field of cultural heritage resource management. This work has focused on the assessment, evaluation, and protection of built heritage resources and cultural heritage landscapes. Lindsay has extensive experience undertaking archival research, heritage survey work, heritage evaluation and heritage impact assessment. She has also contributed to cultural heritage landscape studies and heritage conservation plans, led heritage commemoration and interpretive programs, and worked collaboratively with multidisciplinary teams to sensitively plan interventions at historic sites/places. In addition, she is a leader in the completion of heritage studies required to fulfill Class Environmental Assessment processes and has served as Project Manager for over 100 heritage assessments during her time at A.S.I. Lindsay is a member of the Canadian Association of Heritage Professionals.

John Sleath, M.A.
Cultural Heritage Specialist, Project Manager - Cultural Heritage Division

The Project Manager for this Cultural Heritage Report is John Sleath (MA), who is a Cultural Heritage Specialist and Project Manager within the Cultural Heritage Division with ASI. He was responsible for the day-to-day management activities, including scoping of research activities and site surveys and drafting of study findings and recommendations. John has worked in a variety of contexts within the field of cultural heritage resource management for the past 14 years, as an archaeologist and as a cultural heritage professional. An exposure to both land-based and underwater archaeology and above ground cultural heritage assessments has provided John with a holistic understanding of heritage in a variety of contexts. In 2015 John began working in the Cultural Heritage Division researching and preparing a multitude of cultural heritage assessment reports and for which he was responsible for a variety of tasks including: completing archival research, investigating built heritage and cultural heritage landscapes, report preparation, historical map regression, and municipal consultation. Since 2018 John has been a project manager responsible for a variety of tasks required for successful project completion. This work has allowed John to engage with stakeholders from the public and private sector, as well as representatives from local municipal planning departments, museums, and Indigenous communities. John has conducted hundreds of cultural heritage assessments across Ontario, with a focus on transit and rail corridor infrastructure including bridges and culverts.

Leora Bebko, M.M.St.
Cultural Heritage Technician, Technical Writer and Researcher - Cultural Heritage Division

One of the Cultural Heritage Technicians for this project is **Leora Bebko** (M.M.St.), who is a Cultural Heritage Technician and Technical Writer and Researcher within the Cultural Heritage Division. She was responsible for preparing and contributing research and technical reporting. In Leora's career as a cultural heritage and museum professional she has worked extensively in public programming and education within built heritage spaces. Leora is particularly interested in the ways in which our heritage landscapes can be used to facilitate public engagement and interest in our region's diverse histories. While completing her Master of Museum Studies she was able to combine her interest in heritage architecture and museums by focusing on the historic house museum and the accessibility challenges they face. As a thesis project, Leora co-curated the award-winning exhibit *Lost & Found: Rediscovering Fragments of Old Toronto* on the grounds of Campbell House Museum. Since completing her degree she has worked as a historical interpreter in a variety of heritage spaces, learning a range of traditional trades and has spent considerable time researching heritage foodways and baking in historic kitchens. In 2022, she joined ASI's Cultural Heritage team as a Cultural Heritage Technician.

B

Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
Built Heritage Resources					
BHR 1	Farmhouse	5876 Nauvoo Road	Potential BHR - Identified in Warwick Landfill Expansion Environmental Assessment (2005)	This BHR is located on the east side on Nauvoo Road, north of Zion Line. The BHR is a vernacular Italianate buff brick residence, c. 1890 (ASI 2005). Potential heritage attributes include the building's height and massing, fenestration, buff brick construction, and hipped roof.	**Figure 5-17. Western elevation of the residence at 5876 Nauvoo Road** 
BHR 2	Farmhouse	5966 Nauvoo Road	Potential BHR - Identified in Warwick Landfill Expansion Environmental Assessment (2005)	This BHR is located on the east side of Nauvoo Road, south of Highway 402. The BHR is a vernacular residence, of frame or brick construction, built in the late nineteenth century (ASI 2005). Potential heritage attributes include the buildings height and massing, fenestration, front verandah with decorative pillars, and hipped roof.	**Figure 5-18. Obscured view of the southern and western elevations of the residence at 5966 Nauvoo Road** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

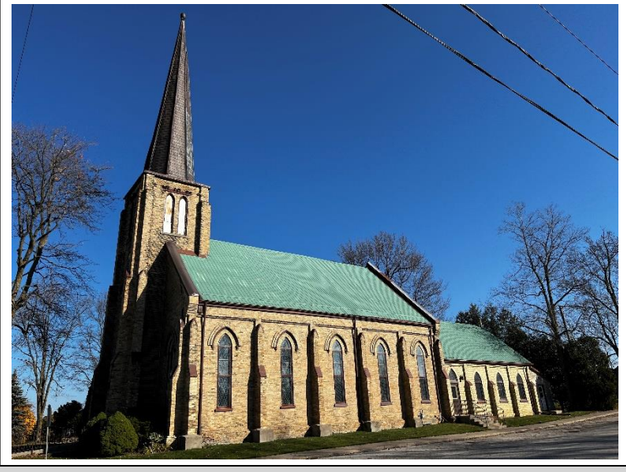
Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
BHR 3	Church	5378 Nauvoo Road	Potential BHR – Identified in the Ontario Heritage Trust's Places of Worship Inventory	This BHR is located on the northeast corner of Victoria Street and Nauvoo Road. The BHR is a Gothic Revival Church with a gabled roof and steeple. Potential heritage attributes include the building's height and massing, fenestration, buff brick construction, buttresses, and steeple.	**Figure 5-19. Southern and western elevations of the church at 5378 Nauvoo Road** 
Cultural Heritage Resources					
CHL 1	Agricultural	Lot 20-21, Con 4	Potential CHL- Identified in Warwick Landfill Expansion Environmental Assessment (2005)	CHL 1 is located on the north side of Confederation Line, east of Nauvoo Road. The CHL contains active agricultural lands suspected of being in continuous operation since the late nineteenth century. NOTE- The 2005 Environmental Assessment included the entire property parcel, the boundaries of which are depicted in Figure 5-44. However, since the 2005 assessment there have been changes to land use on this property, and only areas that remain under active agricultural cultivation are considered to retain potential cultural heritage value or interest.	**Figure 5-20. View of the agricultural fields on lots 20 and 21, Concession 4** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 2	Cemetery	5606 Nauvoo Road	Potential CHL-Identified in Warwick Landfill Expansion Environmental Assessment (2005)	CHL 2 is located on the east side of Nauvoo Road, south of the Twin Creeks Environmental Centre. The CHL contains Watford Cemetery. Watford Cemetery was established in 1888, although it contains some markers dating to the 1860s (ASI 2005). Potential heritage attributes may include the cemetery plots and grave markers, landscaping, entry gates, and pathways. NOTE: The boundaries for Watford Cemetery depicted in **Figure 5-43** are based on mapping provided by the Bereavement Authority of Ontario, who were consulted by ASI during preparation of the associated Stage 1 Archeological Assessment completed concurrently with this report for the TCEC Project.	**Figure 5-21. The gates of Watford Cemetery, looking east from Nauvoo Road** 
CHL 3	Agricultural	Lot 19 and 20, Con 2	Potential CHL-Identified in Warwick Landfill Expansion Environmental Assessment (2005)	CHL 3 is located on the northeast corner of Nauvoo Road and Zion Line. The CHL contains active agricultural lands suspected of being in continuous operation since the late nineteenth century.	**Figure 5-22. View of agricultural fields on Lots 19 and 20, Concession 2** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 4	Farmscape	8060 Zion Line	Potential CHL-Identified in Warwick Landfill Expansion Environmental Assessment (2005)	CHL 4 is located on the north side of Zion Line, west of Power Road. CHL 4 contains a farmscape featuring a vernacular farmhouse with Edwardian influence, constructed c. 1901-1939, a gable barn with vertical wooden boards and concrete foundation, constructed c.1901-1939 and active agricultural fields (ASI 2005). Potential heritage attributes include the farmhouse, barn, agricultural lands, and mature trees.	**Figure 5-23. View of the farmscape at 8060 Zion Line, looking north** 
CHL 5	Roadscape	Zion Line	Potential CHL-Identified in Warwick Landfill Expansion Environmental Assessment (2005)	Zion Line is a historically surveyed roadway in a rural agricultural setting that has retained a similar context since the late nineteenth century. Several BHRs and CHLs are located on Zion Road. Potential heritage attributes include the roadway, viewscapes over agricultural fields, and the presence of historic farmscapes along the road.	**Figure 5-24. Looking east down Zion Line** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 6	Cemetery	5621 Nauvoo Road	Potential CHL-Identified in historical map review	This CHL is located on the west side of Nauvoo Road, across from the south side of the Twin Creeks Environmental Centre. CHL 6 contains Our Lady Help of Christians Roman Catholic Cemetery, located in Lot 18, Con. 3. A cemetery is depicted in this location in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the cemetery plots and grave markers, landscaping, entry gates, and statuary. NOTE: The boundaries for Our Lady Help of Christians Roman Catholic Cemetery depicted in **Figure 5-41** and **Figure 5-43** are based on legal property parcel boundaries. The Bereavement Authority of Ontario were not consulted by ASI during preparation of the associated Stage 1 Archeological Assessment completed concurrently with this report for the TCEC Project, as it was determined to be outside the Stage 1 Archaeological Assessment study area. As this Cultural Heritage report includes the Off-Site Study Area, and the Archaeological Assessment is limited to the On-Site Study Area, it was excluded from the archaeological scope of work.	**Figure 5-25. Entrance gates to Our Lady Help of Christians Cemetery from Nauvoo Road** 
CHL 7	Farmscape	5859 Nauvoo Road	Potential CHL-Identified in historical map review	This CHL is located on the west side of Nauvoo Road, north of Zion Line. CHL 7 contains an early twentieth century single-storey residence, gable roofed barn with concrete foundations. The residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the residence, barn, outbuildings, and agricultural fields.	**Figure 5-26. View of the farmscape at 5859 Nauvoo Road, looking west** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 8	Farmscape	8210 Zion Line	Potential CHL-Identified in historical map review	This CHL is located on the north side of Zion Line, east of Power Road. CHL 8 contains a two-storey buff brick farmhouse, a gravel drive, outbuildings, and agricultural fields. The residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the residence, driveway, outbuildings, treed windbreaks, and agricultural fields.	**Figure 5-27. View of the farmscape at 8210 Zion Line, looking north** 
CHL 9	Farmscape	8234 Zion Line	Potential CHL-Identified in historical map review	This CHL is located on the north side of Zion Line, east of Power Road. CHL 9 contains a two-and-a-half storey buff brick farmhouse, mature treelines, and agricultural fields. The residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the farmhouse, outbuildings, treed windbreaks, and agricultural fields.	**Figure 5-28. View of the farmscape at 8234 Zion Line, looking northwest** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 11	Farmscape	8190 Confederation Line	Potential CHL-Identified in historical map review	This CHL is located on the north side of Confederation Line, approximately halfway between Nauvoo Road and Arkona Road. CHL 11 contains a two-storey frame residence, outbuildings, and silos. Residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure** 4-2). Potential heritage attributes include the residence, driveway, mature trees, and agricultural fields.	**Figure 5-29. View of the farmscape at 8190 Confederation Line, looking northeast** 
CHL 12	Race Course	Confederation Line east of Nauvoo Rd.	Potential CHL-Identified in historical map review	This CHL is located on the south side of Confederation Line, east of Centennial Avenue. CHL 12 contains a running track. A racecourse was depicted in this location in historical mapping from 1880 and throughout the twentieth century (**Figure 4-1** to **Figure** 4-5). Potential heritage attributes include the running track in a similar location as the historical racecourse.	**Figure 5-30.The running track on Nauvoo Road, looking south** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 13	Farmscape	7985 Confederation Line	Potential CHL-Identified in historical map review	The CHL is located on the south side of Confederation Line, east of Centennial Avenue. CHL 13 contains a residence that appears to be a frame residence behind a newer brick residence, with outbuilding and a long drive. Residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure** 4-2). Potential heritage attributes include the residence, outbuilding, gravel drive, and mature trees.	**Figure 5-31. View of the farmscape at 7985 confederation Line, looking south** 
CHL 15	Farmscape	5737 Nauvoo Road	Potential CHL-Identified in historical map review	This CHL is located on the west side of Nauvoo Road, across from the Twin Creeks Environmental Centre. CHL 15 contains a small single storey frame residence, an outbuilding, and agricultural fields. Residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the residence, outbuilding, agricultural fields, driveway, and mature trees.	**Figure 5-32. View of the farmscape at 5737 Nauvoo Road, looking west** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 17	Farmscape	8337 Confederation Line	Potential CHL-Identified in historical map review	This CHL is located on the south side of Confederation Line, west of Arkona Road. CHL 17 contains a single storey frame residence, outbuildings, fenced-in pastures, and agricultural fields. Residence is in a similar location to a structure depicted in the 1911 topographical map (**Figure 4-2**). Potential heritage attributes include the residence, outbuildings, pastures, agricultural fields, driveway, and mature trees.	**Figure 5-33. View of the farmscape at 8337 Confederation Line, looking south** 
CHL 18	Cemetery	Confederation Line west of Nauvoo Rd.	Potential CHL-Identified in historical map review	This CHL is located on the south side of Confederation Line, east of John Street. CHL 18 contains Watford Pioneer Cemetery Cairn. The cairn is brick with original grave markers. In the location of a cemetery depicted in 1880 Historical Atlas Mapping (**Figure 4-1**). Potential heritage attributes include the grave markers and brick cairn.	**Figure 5-34. The Watford Pioneer Cemetery Cairn, looking south** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
CHL 19	Settlement	Village of Watford	Potential CHL-Identified in historical map review	CHL 19 consists of the historic Village of Watford. The Village of Watford was established in the 1850s, and is depicted in the 1880 Historical Atlas (**Figure 4-1**). The Village of Watford contains an assembly of nineteenth and early twentieth-century commercial, residential, and institutional properties that form the historical core of the village and reflect its growth and development. The commercial buildings along Nauvoo Road feature similar scale, massing, and setbacks from the roadway. The residential buildings on Nauvoo Road as well as on the side streets also feature similar scale, massing and setbacks. The variety of architectural styles demonstrate the continued use and development of the Village of Watford from the mid-nineteenth century founding of the village.	**Figure 5-35. Village of Watford's historical commercial centre. Nauvoo Road, looking southwest from Erie Street**  **Figure 5-36. View of a parkette and the historic Schoolhouse, now Watford Museum, in the Village of Watford, looking northeast from the intersection of Nauvoo Road and Ontario Street** 

Table B-1. Inventory of Known and Potential Built Heritage Resources and Cultural Heritage Landscapes within the Off-Site Study Area

Feature ID	Type of Property	Address or Location	Heritage Status and Recognition	Description of Property and Known or Potential CHVI	Image
					Figure 5-37. Victoria Street, looking west from Main Street