TOWN OF BLIND RIVER

Blind River

Municipal Waste Management Plan Environmental Assessment

Environmental Assessment Report

August 2024
KEC Ref: 0508.08

Prepared by:

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EXECUTIVE SUMMARY

1.0 Introduction and Purpose

In operation since the early 1970s, the existing waste disposal site is nearing its capacity as established by the Environmental Compliance Approval (ECA) for the site. A Terms of Reference (ToR) was developed by the Town to lay-out how the obligations under the EA Act would be met and was accepted by the Ministry of Environmental Conservation and Parks (MECP). A phased EA plan was developed and implemented by the Town to complete the process described on the ToR. Throughout completion of the EA the public, Indigenous Communities, relevant agencies and those interested were consulted, as is summarized in the accompanying Consultation Report.

2.0 Description of the Problem/Opportunity

The Town of Blind River (Town) initiated the Environmental Assessment (EA) process to develop a solid Waste Management Plan in response to the identified decline in available municipal waste disposal capacity. The Waste Management Plan Service Area coincides with the limits of the Town of Blind River with a proposed planning period ranging from 25 to 40 years depending on the preferred alternative. The Town's current waste management program incorporates diversion and landfill disposal through weekly curb side recyclables and waste collection programs, respectively.

3.0 Waste Composition and Quantity

Descriptions of the waste composition, population predictions, waste disposal and generation rates and annual waste volumes were developed.

The Town's population has remained relatively stable over the last several decades, the most recent increases having occurred through annexation of once abutting rural townships.

There are approximately 2,417 households within the Study Area generating domestic solid waste in Blind River. Domestic wastes are also produced by an estimated 477 IC&I sector waste generators including retail stores, offices, schools, medical clinics, refineries, building contractors and automotive garages.

4.0 Description of the Environment

The Town of Blind River is located on the Trans-Canada Highway (King's Highway No. 17), approximately halfway between Sault Ste. Marie and Sudbury. The Huron Central Railway (HCR) right-of-way is located adjacent to and south of Highway 17 through the Study Area. Environmental inventories were completed for the Natural Environment, Social/Cultural Environment, Economic Environmental and Transportation Environment.

Natural environment features discussed included the following:

1. **Climate –** Situated in a region that experiences short, warm and sometimes hot summers and long winter season with cold temperatures and lake-effect snow.
2. **Geology/Hydrogeology** – The topography within the Study Area is typical of the Canadian Shield with undulating terrain and visible bedrock outcrops and ridges throughout. Overburden is predominantly morainal, glaciofluvial and glaciolacustrine sediments with thickness exceeding 30m in depressed areas.
3. **Surface Water Resources –** The Town is located within the Great Lakes Watershed, on the north shore of Lake Huron at the mouth of the Bind River and is largely bound by surface water bodies/courses.

4. **Vegetation –** The Study Area is classified as a subsection of the Great Lakes St. Lawrence Forest Region. Extensive and relatively recent disturbance in this region has resulted in the removal of much of the natural vegetation leaving a landscape dominated by pioneer and colonizing species.
5. **Terrestrial Biology –** The area surrounding the built-up community is generally sparsely developed and supports large game, inhabits a number of bird species with reptiles and amphibians also being common within the Study Area.
6. **Aquatic Animal Life and Fisheries –** Numerous lakes are located within the Study Area that support a variety of sport fish species which include lake trout, whitefish, yellow perch, brook trout, rock bass, walleye, and brown bullhead.
7. **Species at Risk –** There are several species within the Study Area that have been placed on the Ontario Species at Risk List. The Study Area includes species that have been classified as endangered, threatened, or species of special concern.
8. **Provincial Parks and Preserve Areas –** Matinenda Provincial Park, Mississagi Delta Provincial Nature Reserve and the North Channel Inshore Provincial Park are all located near the Study area while the Marsh Bay-Island Wetland is located within the southwest portion of the Study Area.

Social/Cultural environment features discussed included the following:

1. **Land Use –** The Town of Blind River is primarily a residential community with a small industrial component and commercial and institutional components that provide basic services to the permanent residents and visitors to the community.
2. **Indigenous Communities –** The Study Area is within the Robinson-Huron Treaty land with the surrounding area including lands of the Mississauga First Nation, the Serpent River First Nation and the Sagamok Anishnawbek First Nation.
3. **Utilities –** Properties within the built-up portion of the Study Area are serviced by communal water and sewage facilities while those in outlying (rural) areas are serviced by private water supplies and on-site sewage systems.
4. **Archaeological, Built and Cultural Heritage Potential –** A stage 1-2 archaeological assessment was completed for the preferred alternative and found that the study area does not retain archaeological potential and does not require further assessment. In addition, the Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (screening checklist) was completed for six candidate locations, including the preferred alternative, were determined to have low potential for built heritage and cultural heritage landscapes, therefore, no further technical cultural heritage studies have been undertaken.
5. **Recreation –** There are numerous recreational opportunities, municipal parks and public beaches located within the Study Area.

Currently, the Economic environment includes activities such as commercial service, tourism, the Cameco uranium refinery, and public-sector services. In addition to providing waste management services, the Town of Blind River also provides drinking water services (Municipal Drinking Water System) and waste water treatment services (Waste Water Treatment Plant).

5.0 Waste Management Plan Components and Programs ("Alternatives To")

Under 4 Waste Management Plan components (reduction/diversion, handling/collection, processing, disposal) a total of 19 alternative waste management programs were reviewed to develop reasonable shortlist of "alternatives to" the undertaking:

Table A: Long List of Waste Management Plan Components and Programs			
Reduction/Diversion	**Handling/Collection**	**Processing**	**Disposal**
Public Information	Curb Side	Materials Recovery	Landfill
Reduction	Direct Haul	Shredding	Export
Re-Use	Depot(s)	Bailing/Compacting	Incineration
Recycling	Transfer Station(s)		Energy from Waste
On-site Composting	Source Separation		
Central Composting			
Special Wastes			

All of the reduction/diversion programs complied with all of the criteria considered during the screening exercise including: is the program proven, locally manageable, area appropriate and does it comply with Regulations and Policies.

6.0 Evaluation of Waste Management Plan Programs

The Waste management Plan programs identified and described in Section 5.0 were screened to confirm their general suitability and applicability for potential implementation in Blind River. Programs that satisfied the screening criteria were identified as requiring further consideration for possible inclusion in the Waste Management Plan.

"Alternatives to" (i.e. alternative programs) were evaluated relative to each other considering their potential impact to the environment, technical suitability and economics. Key advantages and disadvantages of each program were also identified and considered.

Through this process, the preferred alternative Waste Management Plan ("alternative to") incorporates 13 programs under the 4 components, many of which make-up part of the Town's existing waste management system. The preferred program under the waste disposal component of the Waste Management Plan was determined to be "Landfill".

Table B: Programs for Inclusion in the Waste Management Plan			
Reduction/Diversion	**Handling/Collection**	**Processing**	**Disposal**
Public Information	Curb Side	Materials Recovery	Landfill
Reduction	Direct Haul		
Re-Use	Depot(s)		
Recycling	Source Separation		
On-site Composting			
Central Composting			
Special Wastes			

7.0 Alternative Methods

Of the programs making-up the preferred Waste Management Plan, disposal by landfilling (new or expanded site) requires EA Act approval and was carried forward for further evaluation. The next steps in the EA planning process were to identify and evaluate alternative methods of carrying out this portion of the Waste Management Plan. The alternative methods considered were to expand the existing landfill site or establish a new or "green field" site, at one of a number of potential locations. A total of 6 suitable candidate locations within the Study Area were identified.

8.0 Phase 1 Evaluation of Alternative Methods

Alternative methods were evaluated following the 2 Phase comparative evaluation process established in the ToR. The process considers, in increasing detail from Phase 1 to Phase 2, relative impacts, mitigating measures, net effects as well as key advantages and disadvantages.

Phase 1 of the evaluation assesses each location considering the criteria outlined in Table C.

Table C: Alternative Methods Evaluation Criteria – Phase 1

Criteria Group	Evaluation Criteria
A - Natural Environment	1. Potential for loss or disruption of terrestrial features on and off site. 2. Potential for loss or disruption of wildlife on and off site. 3. Potential for loss or disruption of aquatic features on and off site. 4. Potential for loss or removal of agriculture resources on and off site. 5. Potential for impairment of groundwater resources. 6. Potential for impairment of surface water resources. 7. Potential for impairment of air quality (e.g. dust and odour).
B - Social Environment	1. Potential for displacement or disruption to residents. 2. Potential for displacement or disruption to institutional, community and recreational features. 3. Potential to impact Indigenous Communities. 4. Potential for effects on future planned land uses. 5. Potential effects of noise (generated on and off site). 6. Transportation related considerations.
C - Economic Environment	1. Potential for displacement or disruption to existing businesses and their employees. 2. Potential for displacement or disruption of forestry and aggregate industries. 3. Potential cost of implementing alternative. 4. Transportation related considerations.
D - Cultural Environment	1. Potential for displacement or disruption of built heritage resources and/or cultural heritage landscapes by removal and/or demolition and/or disruption by isolation. 2. Disturbance or destruction of archaeological resources. 3. Impacts to registered and unregistered cemeteries that have been identified and documented.
E - Technical Considerations	1. Potential for addressing the stated problem or opportunity.

The Phase 1 evaluation reveals a strong preference to provide additional landfilling capacity by expanding the existing landfill site (Location 1).

9.0 Phase 2 Evaluation of Alternative Methods

As described in the ToR, only the "*…alternative methods identified for further consideration under Phase 1*" were subject to the Phase 2 evaluation. In this case, the provision of additional disposal capacity by expanding the existing disposal site was considered under Phase 2.

Consistent with the ToR, the criteria groups established for the Phase 1 evaluation are used during the Phase 2 evaluation with criteria expanded to include consideration of impacts along likely haul and access routes in addition to those expected on and off-site. Additional criteria are also introduced under each criteria group. Phase 2 of the evaluation considers the criteria outlined in Table D.

Table D: Alternative Methods Evaluation Criteria – Phase 2

Criteria Group	Evaluation Criteria
A - Natural Environment	1. Potential for loss or disruption of terrestrial features along access/haul routes. 2. Potential for loss or disruption of wildlife along access/haul routes. 3. Potential for loss or disruption of aquatic features along access/haul routes. 4. Potential for loss or removal of agriculture resources along access/haul routes. 5. Characteristics of site-specific geology. 6. Potential for predicting groundwater migration pathways. 7. Potential for impacting or disruption of groundwater resources. 8. Potential for impairment of surface water resources and associated impacts. 9. Potential for flood hazard. 10. Potential for impairment to air quality (e.g. dust and odour).
B - Social Environment	1. Potential for displacement or disruption to residents along access/haul routes. 2. Potential for displacement or disruption to institutional, community and recreational features along access/haul routes. 3. Potential for disruption to Indigenous communities along access/haul routes. 4. Potential noise impacts on nearby sensitive receptors (generated on and off site). 5. Potential to integrate end-use with surrounding community. 6. Potential for removal of future planned land uses on and off site.

Table D: Alternative Methods Evaluation Criteria – Phase 2	
Criteria Group	**Evaluation Criteria**
C - Economic Environment	1. Potential displacement or disruption to existing businesses and their employees along access/haul routes. 2. Potential cost of implementing alternative including capital, operating and closure/post closure costs. 3. Potential impacts to property values.
D - Cultural Environment	1. Potential for impact to archaeological resources or areas of archaeological potential. 2. Potential for removal of built heritage resources and cultural heritage landscapes.
E - Technical Considerations	1. Potential reliability and flexibility. 2. Potential operational constraints and opportunities.

At completion of the Phase 2 evaluation, expanding the existing waste disposal site was confirmed to be the preferred alternative method for incorporation into the Waste Management Plan.

10.0 Landfill Expansion – Conceptual Design

The final step in the EA process was to develop a conceptual design for the preferred alternative method. The conceptual design comprises a 2.0 hectare horizontal, 1m vertical expansion of the existing fill area as well as landfilling via trenching to a 1.5m depth beneath the expansion footprint. A contaminant attenuation zone of 27.5 hectares was also delineated to ensure that the expanded site is capable of meeting Provincial groundwater protection requirements.

The current waste disposal site will be expanded to accommodate 201,203m^3 of municipal solid waste and daily/interim cover material (20% allowance) and an additional 7,041m^3 (dry volume) of biosolids.

The existing entrance road, accessed via the gated entrance off of Highway 17, will undergo minor improvements to the alignment to accommodate a new waste drop off area. The attendant's shelter will be located near the relocated waste drop off area. The existing groundwater monitoring network consisting of thirteen (13) monitoring wells is in-place at the current landfill site will be retained and expanded as may be required from time to time. Surface water management control is provided through the ongoing day-to-day fill area grading activities in addition to perimeter infiltration channels designed to capture and detain surface water runoff to allow it to infiltrate into the shallow groundwater system.

11.0 Impact Management and Monitoring

Potential impacts associated with expansion of the existing landfill site that were identified from the net environmental effects analysis are summarized in Table E along with the corresponding mitigating measures.

Table E: Summary of Effects		
Criteria Group	**Potential Impact**	**Mitigating Measures**
A – Natural Environment	Minimal potential for loss or disruption of terrestrial features due to clearing.	- Establish limits to minimize grubbing and stripping organics. - Progressively revegetate site.
	Low potential for disruption to wildlife due to clearing.	- Minimize disturbance beyond cleared area. - Revegetate site following closure.
	Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts.	- Do not deposit fill in area of surface water pooling. - Monitor surface water runoff within the fill area. - Establish surface water management controls to reduce off site impacts.
	Low potential to impact downgradient groundwater resources.	- Expand monitoring network to confirm groundwater direction and identify potential contamination. - Develop contaminant attenuation zone. - Appropriate grading and progressive capping to limit leachate production.
	Moderate potential for surface water contamination due to proximity of expressed groundwater.	- Proper grading of site to control the discharge of surface water originating from the fill area. - If appropriate, cover standing water with clean fill. - Reconfigure area of surface water pooling to be part of surface water management design for site.
	Low potential for air quality impairment due to odour and dust.	- Progressive capping of waste material to control odour and dust. - Onsite road dust control.
B – Social Environment	Low potential or disruption of residents due to noise, odour and dust.	- Progressive capping, dust control and appropriate hours of operation.
	Low potential or disruption of institutional, community and recreational features.	- Progressive capping, dust control and appropriate hours of operation.
	Low potential to impact Indigenous communities/uses in the location vicinity.	- Progressive capping, dust control and appropriate hours of operation. - Provide stormwater management at site to minimize offsite impacts. - Continue to consult with Indigenous communities with respect to any concerns or comments received regarding the site. - Continue the established monitoring program for the existing site.
	Low potential to impact future planned land uses.	- Standard operational procedures such as dust, odour, noise and litter control.
	Low potential for impacts of noise generated on and off site.	- Establish appropriate hours of operation to limit time periods where noise due to operations is generated.
	Low potential for impacts related to transportation.	- Enforcement of Highway Traffic Act. - Maintain existing haul routes.
C – Economic Environment	Low potential to disrupt existing businesses and employees.	- Maintain appropriate hours of operation. - Maintain existing haul routes.
	Low potential to disrupt forestry and aggregate industries.	- Maintain development to within existing site limits.
	Low cost to implement alternative.	- Establish minimum required limits of grubbing and stripping organics.

Table E: Summary of Effects		
Criteria Group	**Potential Impact**	**Mitigating Measures**
	No impact to current transportation related costs.	- Maintain existing haul routes.
D – Cultural Environment	Low potential for displacement of Built Heritage Resources and/or Cultural Heritage Landscapes.	Complete a CHER, if required.
	Low potential for disturbance or destruction of archaeological resources.	Complete and archaeological assessment.
	Low potential for impact to cemeteries.	Continued consideration for potential.
E – Technical Consideration	Mitigated impact to the environment by developing and operating an expanded landfill site.	- Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices. - Obtain ECA amendment from MECP.

The effects of the preferred alternative of expanding the currently operating site on climate change are mitigated given the relatively small quantities of waste expected to be received at the expanded site, sub-soil and cover characteristics, its relative size and there being no on-site buildings with basements.

Considering that more than 200% "freeboard volume" is provided by the site's stormwater management facilities and that a potential increase of up to 10% in runoff volume may occur due to climate change effects, it is anticipated that no additional works would be required to manage potential flows. Additional effort may be required to maintain the site access and interior roads in addition to erosion and sediment control on the surface water management works due to potentially more severe rainfall events.

12.0 Consultation

The Consultation program played a critical role during the EA process and was intended to provide opportunity for input from the public, stakeholders, Indigenous Communities, and agencies at key points in the process. The program was designed to be flexible to meet the needs of a variety of stakeholders and included: issuing a Notice of Commencement; public information centres or open houses; meetings and teleconferences; and, consultations with Indigenous Communities.

Three (3) "Task Reports" were prepared during completion of the EA process to document the results of various EA steps for compilation into the EA Report.

- Task 1 Report – Description of the Problem/Opportunity
- Task 2 Report – Alternative Waste Management Systems and Diversion – Part A: "Alternatives to"
- Task 3 Report – Part B: Identification and Assessment of Alternative Methods

The consultation program is documented in more detail in the companion Consultation Report document.

1.0 INTRODUCTION AND PURPOSE

In response to the identified decline in available municipal waste disposal capacity, The Town of Blind River (Town) initiated the Environmental Assessment (EA) process to develop a solid Waste Management Plan.

To commence the EA planning process under the Environmental Assessment Act (EAA), an EA Terms of Reference (ToR) was prepared by the Town and approved by the Minister of the Environment, Conservation and Parks (MECP) in July of 2008. Prior to submitting the ToR for Ministerial approval, it underwent the required agency and public review. The ToR sets out the Town's framework and work plan for addressing the requirements of the EAA including: a description of the proposed undertaking; characterization of the study area; identification and assessment of "alternatives to" the undertaking and alternative implementation methods; as well as public consultation activities.

Although waste diversion activities do not require EA Act approval, they were considered during the EA Planning Process as an integral component to a Waste Management Plan.

1.1 Background

The Blind River municipal waste disposal site has been serving residents of the Town and area since the 1970s. The 2-hectare waste disposal site (approved area), located 5.5 kilometres east of Town on Highway 17, currently accepts disposal of domestic, commercial, and non-hazardous solid industrial wastes, scrap wood and brush, and iron sludge generated from the potable water treatment facility located at Cameco Corporation in Blind River. These wastes are being received in accordance with Environmental Compliance Approval (ECA) No. A713870, including amendments made since the certificate was issued in November 1980.

Studies completed for the Town's current waste disposal site and inspection reports conducted by the Ministry of the Environment, Conservation and Parks (MECP) have identified concerns regarding the operation and decreasing capacity of the municipal landfill site. The Town initiated the EA planning process in response to the decreasing disposal capacity. As of November 2022, the remaining waste disposal volume at the existing landfill is 4,891m^3 and estimated to be consumed by December 2023.

The MECP has identified litter generation as well as surface water ponding and leachate seepage along the west side of the site due to the absence of a stormwater or leachate collection system as ongoing operational issues. The Town and municipal landfill site operator have taken steps to address these issues, including cleaning-up litter and developing a stormwater management plan.

1.2 The Environmental Assessment Planning Process

The EA Planning Process is governed by the EAA. As noted under Section 2 of the EAA, the purpose of the Act is to provide for *"the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment."*

Section 3 of the Act states that the EAA is applicable to, among others:

> *(a) enterprises or activities or proposals, plans or programs in respect of enterprises or activities by or on behalf of Her Majesty in right of Ontario or by a public body or public bodies or by a municipality or municipalities;*

The Town's proposed development of a Waste Management Plan, specifically the disposal component, is subject to EAA approval.

1.2.1 EA Work Plan

Following the MECP approval of the ToR, a Notice of Commencement was published and an Open House was held to inform government agencies and the public of the proposed undertaking. A phased EA work plan was developed as described below. Consultation with Indigenous communities, government agencies and the public was carried out throughout the project. The Consultation program is discussed further in Section 11.0

Task 1: The Problem or Opportunity

Task 1 involved the development of a Problem or Opportunity statement and descriptions of the project Study Area, including an environmental inventory (natural, social/cultural, economic and transportation environments) and the existing waste management system. The planning period, population projections and anticipated waste quantities to be considered were also established.

Task 1 outcomes are described greater detail in Sections 2.0, 3.0 and 4.0 of this document.

Task 2: Identification and Assessment of "Alternatives to"

"Alternatives to" were identified and assessed under Task 2. The purpose of Task 2 was to ensure that all reasonable "alternatives to" meeting the stated purpose of the undertaking are identified, compared and evaluated in order to establish the preferred programs under the following Waste Management Plan components:

1. Reduction and Diversion: methods used to reduce the amount of waste generated or to divert wastes from the disposal stream.
2. Handling and Collection: methods used to gather and transport waste materials to the processing and/or disposal streams.
3. Processing: methods of transforming, storing or otherwise using waste materials in conjunction with diversion programs or prior to disposal.
4. Disposal: methods used to dispose of waste materials deemed to be at the end of their useful lifecycle.

Waste Management Plan components and programs are described in Section 5.0 and "alternatives to" and their evaluation are described in Section 6.0 of this document.

Task 3: Identification and Assessment of Alternative Methods

The disposal method identified as the preferred "alternative to", to provide additional landfill capacity, requires EAA approval. To satisfy this requirement, the Town considered establishing a new site (5 alternative new sites were considered) as well as expanding the current site.

Alternative methods are described in Section 7.0 and their 2-Phase evaluation in Sections 8.0 and 9.0 of this document.

Task 4: Landfill Site Conceptual Design

An extension of the assessment of alternative methods involved the development of a conceptual design for the proposed landfill site expansion. The concept includes expansion to the east, south and west of the current fill area above areas that had historically been landfilled.

Section 10.0 of this document describes the proposed conceptual design.

Task 5: Prepare EA Documentation.
Throughout the EA planning process a series of documents were developed and made available to the public, agencies and Indigenous communities through the project web page, via direct emailing and during public information sessions (Open Houses). A companion "Consultation Report" has also been prepared to document consultation activities, as described in Section 11.0 of this document.

This document will be issued as a draft document for the required review period prior to its finalization and submission the MECP for formal approval.

1.3 Terms of Reference Requirements

A tabular summary of the requirements of the approved ToR and where in the EA Report they are discussed is provided in Table 1.1.

Table 1.1: Terms of Reference Requirements

ToR Requirement		EA Report Section
Section	**Description**	
3.0	The proposed undertaking will address the non-hazardous residential, industrial, commercial and institutional (IC&I), construction and demolition (C&D), biosolid and iron sludge wastes generated in Blind River.	Section 3.0
3.1	A proposed 25 to 40 year planning period will be considered.	Section 2.0
4.1	Regardless of the preferred "alternative to", improvements to the diversion program currently in-place will be assessed during the EA Planning process.	Section 5.0
5.0	The EA will identify and assess the environment that might reasonably be expected to be affected, directly or indirectly, by the proposed alternatives and preferred undertaking.	Section 4.0
6.0	"Alternatives to" and alternative methods will be evaluated for their net environmental effects and their advantages and disadvantages.	Sections 6.0 and 7.0
6.1	"Alternative to" will be evaluated considering criteria presented in ToR Table 6.1.	Sections 6.0 and 7.0
6.2	Alternative methods will be comparatively evaluated in 2 Phases.	Sections 8.0 and 9.0
6.2.1	Phase 1 alternative methods evaluation will be based on a comparative evaluation of criteria presented in Table ToR 6.2.	Section 8.0
6.2.1	The need to weigh criteria will be assessed during review of input from the public and participating agencies.	Sections 8.1 and 9.1
6.2.2	Phase 2 alternative methods evaluation will be based on a comparative evaluation of criteria presented in ToR Table 6.3.	Section 9.0
6.3	Results of net environmental effects assessment will facilitate the development of a recommended impact management strategy.	Summarized on Tables 9.1 to 9.8. and Section 11.0

Table 1.1: Terms of Reference Requirements		
ToR Requirement		EA Report Section
Section	Description	
6.4	A monitoring program and schedule will be developed to provide for post-EA monitoring.	Section 11.0
6.5	An EA Report will be prepared in accordance with the requirements of the EA Act and the ToR.	EA Report (this document)
6.6	Following compilation, a draft EA Report will be provided to agencies and the public for review and comment prior to finalizing.	EA Report (this document)
7.0	Prior to submission of the EA Report, a consultation report will be compiled to provide a record of consultation activities undertaken and input/comments received.	Section 12.0 and Consultation Report (companion to this EA Report)

2.0 DESCRIPTION OF THE PROBLEM/OPPORTUNITY

Studies completed by the Town and inspections conducted by the MECP have documented the decreasing capacity of the existing municipal landfill site.

The Town initiated the EA planning process under the EAA for the purpose of developing a solid Waste Management Plan to address the declining capacity at the Town's municipal waste disposal site and accommodate the waste stream generated by the approximately 3,500 residents as well as the industrial, commercial and institutional users in the Town of Blind River.

2.1 Service and Study Areas

The Waste Management Plan Service Area coincides with the limits of the Town of Blind River.

The Study Area consists of several geographical townships that make up the incorporated Town of Blind River and covers approximately 82,400 hectares. The western limits include the Townships of Cobden, Scarfe and Juillette; the north limits include Kamichisitit and Jogues Townships and the east limits include Timmermans, Mack and Striker Townships. The North Channel of Lake Huron bounds the south limits of the Study Area. A map of the Study Area is provided in Figure 2.1.

Depending on the preferred alternative identified through the EA Planning Process, the declining capacity at the Town's municipal waste disposal site may be addressed by alternatives that include expansion of the existing site and/or establishment of a new or "green field" site. Study Area limits were established to coincide with the Town boundaries.

2.2 Planning Period

The proposed planning period ranges from 25 years (including an expansion of the existing site) to 40 years (including a greenfield site) and depends on the preferred alternative identified through the EA Planning Process.

NOUVEL TWP.
KAMICHISITIT TWP.
JOGUES TWP.
MONTGOMERY TWP.
JUILLETTE TWP.
TIMMERMANS TWP.
CHIBLOW LAKE
MATINENDA LAKE
LEAR LAKE
PLUMP LAKE
PATTON TWP.
SCARFE TWP.
MACK TWP.
HIGH LAKE
EMERALD LAKE
PEAK LAKE
EMERALD LAKE
DON LAKE
LITTLE DUCK LAKE
RYAN LAKE
CANOE LAKE
LAKE HOPE
GRANARY LAKE
LILY LAKE
UPPER CRANBERRY LAKE
LOWER CRANBERRY LAKE
CATARACK LAKE
LAKE DUBORNE
HOBBEN TWP.
ALLEN LAKE
LAKE LAUZON
BASS LAKE
THOMPSON TWP.
STRIKER TWP.
RED LAKE
BLIND RIVER
HWY 17
LOCATION OF
CURRENT MUNICIPAL
LANDFILL SITE
LAKE HURON
TOWN OF BLIND RIVER

LEGEND

STUDY AREA
(MUNICIPAL BOUNDARY)

MISSISSAUGA FIRST
NATION LANDS

N

KRESIN
Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

DESIGN	KEC
DRAWN	KEC 01/2021
CHECKED	C.KRESIN
PROJECT	0508.08
FILENAME	0508.08 FIG 2.1 study area
SCALE	1:125,000

WASTE MANAGEMENT PLAN EA
TOWN OF BLIND RIVER

STUDY AREA

2.1

Rev 0

2.3 Current Waste Management Program

The Town's current waste management program incorporates diversion and landfill disposal for a population of approximately 3,500 permanent residents along with the industrial, commercial and institutional (ICI) sectors. Under the current ECA, the site is approved to receive domestic, commercial, non-hazardous solid industrial waste, scrap wood and brush, and iron sludge waste generated from the potable water treatment facility located at Cameco Corporation in Blind River.

A curb side waste collection program is in place and provides weekly refuse pick-up. A private company, under contract with the Town, collects waste from residential households and from the IC&I sector. Dumpsters are located throughout the municipality (located in rural areas) and are also collected on a regular basis. Pickup of bulk items occur on pre-selected days each month. Residents and businesses requiring disposal at times other than scheduled pickup days can dispose of wastes at the waste disposal site (i.e. direct haul) during days that the site is operational.

Household hazardous wastes are not accepted at the site but are collected during Household Special Waste Days that are held on a regular basis.

The existing waste management system and facilities are summarized below:

1. Residential curb-side pick-up of materials for disposal with a 2 bag limit (weekly);
2. Curb-side pick-up of bulk materials (e.g. white goods) once per month;
3. Institutional, commercial, IC&I and rural residential waste dumpster collection;
4. Weekly curb-side recyclables pick-up (alternating weeks for paper/corrugated cardboard/boxboard and glass/metal/plastic containers);
5. Diversion of Household Hazardous Waste (HHW) through a regulatory scheduled hazardous waste disposal day (every two years);
6. Direct haul to waste disposal site;
7. Landfill disposal of solid non-hazardous waste;
8. Stock-piling of clean brush/wood wastes for future grinding and burning;
9. Separation of rubber tires, white goods and electronics; and,
10. Exporting water pollution control plant biosolids for disposal.

The Town has been operating a blue box recycling program since 1998. The program includes the curb-side collection of comingled recyclable products that include the following:

1. Newspaper;
2. Catalogues;
3. Magazines;
4. Household fine paper;
5. Telephone books;
6. Corrugated cardboard;
7. Boxboard;
8. Glass bottles and jars;
9. Steel and aluminium food and beverage containers;
10. Aluminium foil trays; and,
11. Plastic containers marked 1 through 6.

2.3.1 Waste Disposal Site

Material that is not diverted from the waste stream is disposed of at the existing municipal waste disposal site located approximately 2 kilometres east of the built-up section of the Town of Blind River on the north side of Highway 17 (Figure 2.2). The site legal description is the south ½ of Lot 7, Concession 1 of Striker Township in the District of Algoma. The site has been receiving wastes since the early 1970's and operates under authority of the original Certificate of Approval Number A7138701, issued November 26, 1980.

Entry to the site is from the south and fill activities have more recently taken place in the raised section of the landfill site as well as in various diversion areas around the perimeter of the raised section, as shown on Figure 2.3. An attendant's shelter is also present.

The site is situated in an area of relatively flat topography sloping gradually to the south toward Lake Huron. The terrain to the east and northeast of the landfill site is of higher elevations and groundwater has been interpreted to flow south-westerly, eventually discharging into Lake Huron approximately 1.2km south of the landfill site.

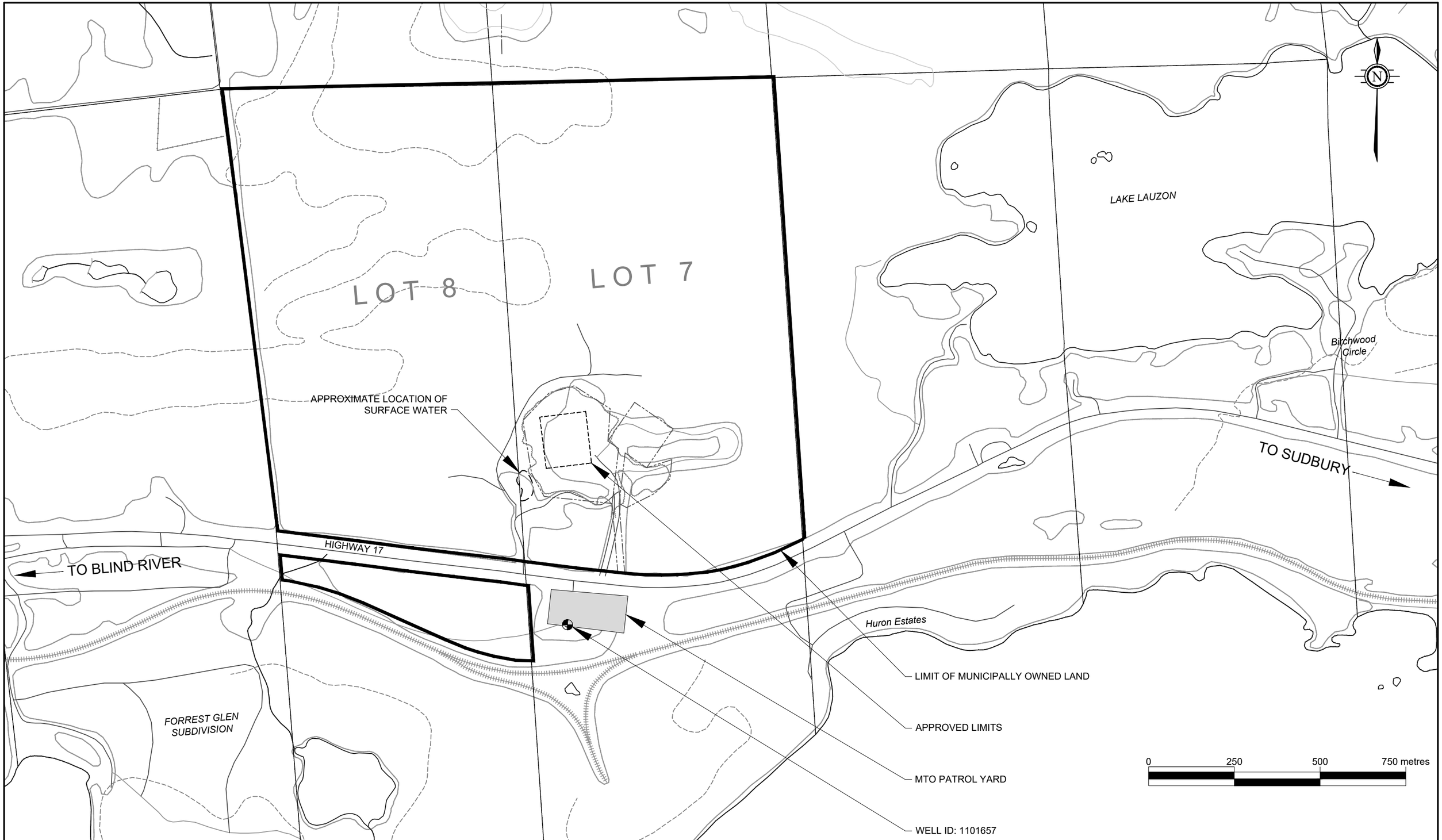
The site operates as a natural attenuation site, relying on naturally occurring physical, chemical and biological processes to reduce concentrations of contaminants below MECP Reasonable Use limits prior to reaching the property boundary. The Town has used the trench and, most recently, area method of landfilling at the site, gradually increasing the height of the site throughout its operating life. Based on annual estimates of the volume of waste and cover material placed at the site, the approved fill volume is close to being attained.

As stated in a 2002 hydrogeological assessment report:

> *"The 8.68 hecatare (2.14 acre) landfill is located in a former gravel pit in the Precambrian Shield on the north shore of Lake Huron (north channel). The site is characterized by undulating terrain with relatively thig overburden and occasional rock outcrops. Lakes and poorly drained wetlands are common. Lakes and poorly drained wetlands are common. Leachate is observed to collect in the shallow topographic depressions on the south and east sides of the site."*

Also:

> *"According to the Northern Ontario Engineering Geology Terrain Study (VanDine 1979; Blind River Sheet NTS 41J/SE), local terrain conditions are described as till with round moraine as the dominant landform (outwash plain is the subordinate landform). Bedrock underlies a drift veneer, local relief is moderate, and terrain is undulating to rolling."*



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

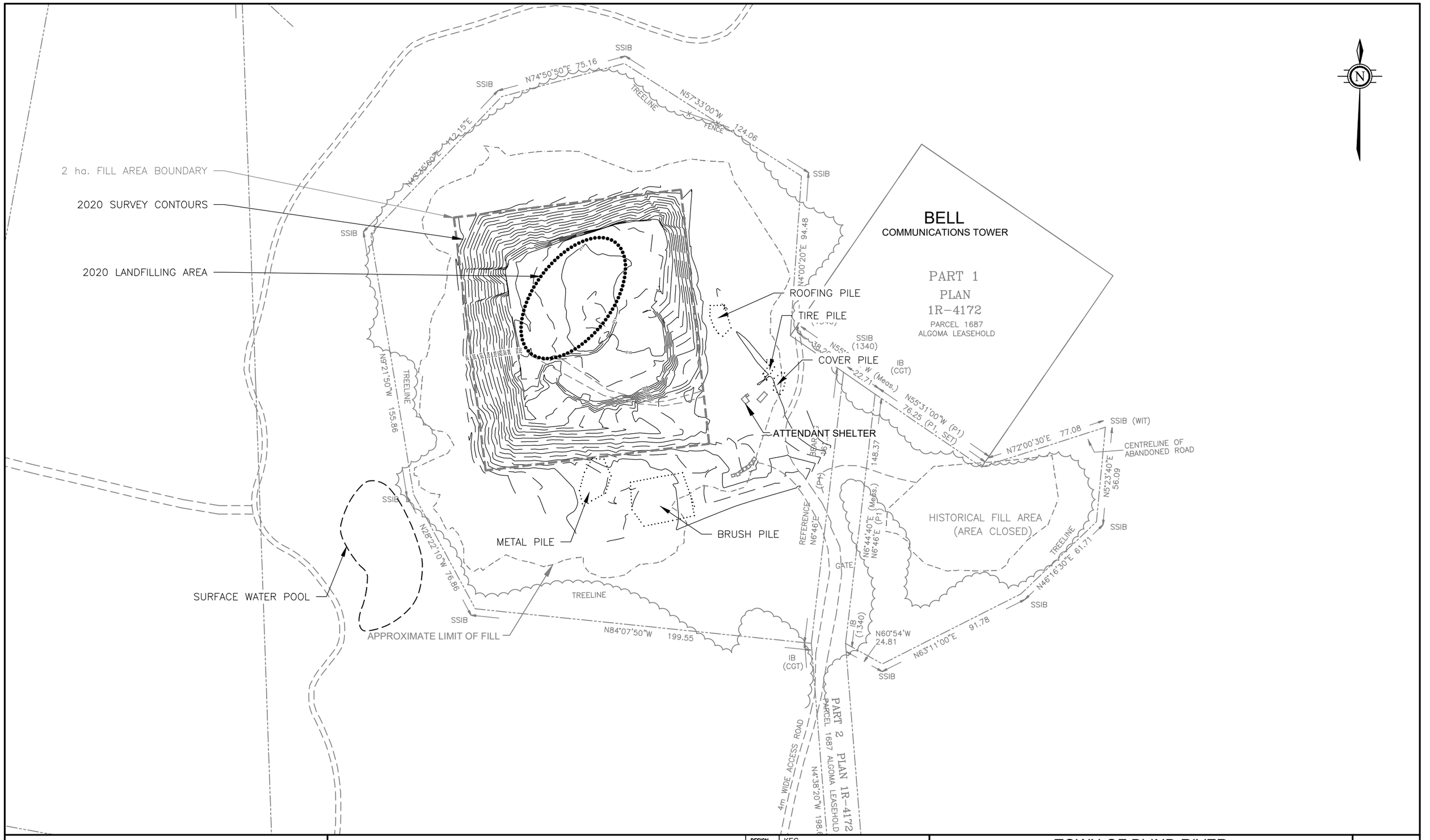
DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.08	
FILENAME	0508.08 location plan	
SCALE	1:1000	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

LOCATION PLAN

2.2

Rev 0



KRESIN Engineering Corporation	Sault Ste. Marie, Ontario (705) 949-4900

NOTES

DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.08	
FILENAME	0508.08 site plan	
SCALE	1:2000	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

SITE PLAN

2.3

Rev 0

2.3.2 Waste Diversion

In addition to the curb side waste collection program, a weekly curb side recyclables program (alternating weeks for paper/corrugated cardboard/boxboard and glass/metal/plastic containers) is maintained by the Town. Annual recyclables diversion rates in the range of 10% of the total waste and recyclables volume have been reported in the Town's annual monitoring reports. This is a typical rate for communities located remote from markets.

Tires, wood waste, scrap metals and white goods are also accepted at the landfill site for diversion and are stockpiled in designated areas pending shipment for recycling or disposal by other means (e.g. burning clean wood waste).

Household hazardous wastes including corrosive, toxic, reactive and flammable wastes are collected and disposed of by a qualified contractor on Household Special Waste Days (HSWD) scheduled by the Town (typically once every 2 years). During HSWD, wastes from the IC&I sectors is not accepted. It is the responsibility of businesses to dispose of their own hazardous waste in accordance with MECP requirements.

To prolong the life of the current and proposed waste disposal sites, the Town will continue to implement diversion programs, keeping unnecessary wastes from landfill.

2.3.3 Biosolids and Residuals

Biosolids, commonly referred to as sewage sludge, are generated at the Town's sewage treatment plant and are currently hauled by a private contractor for disposal at a composting facility.

Residual iron sludge from the water treatment plant at Cameco Corporation is hauled to and disposed of at the municipal landfill site.

2.3.4 Waste Recycling Strategy

A Waste Recycling Strategy (see Appendix A) was developed by the Town in 2012 to identify opportunities to increase the efficiency and effectiveness of its recycling program and maximize the amount of blue box material diverted from landfill. The steps involved in the development of the waste recycling strategy included: characterizing the waste stream; describing the Town's current recycling program; discussing and developing waste recycling strategy goals and initiatives; identifying potential improvements to the recycling program; assessing the feasibility of possible improvements or additions to the program; consulting with the public; identifying contingencies; and, developing plans for implementation, monitoring and reporting.

Through completion of the Waste Recycling Strategy, the Town committed to a process of continuous improvement, as budget allows, in order to maximize the volume of material diverted from disposal.

3.0 WASTE COMPOSITION AND QUANTITY

3.1 Waste Composition

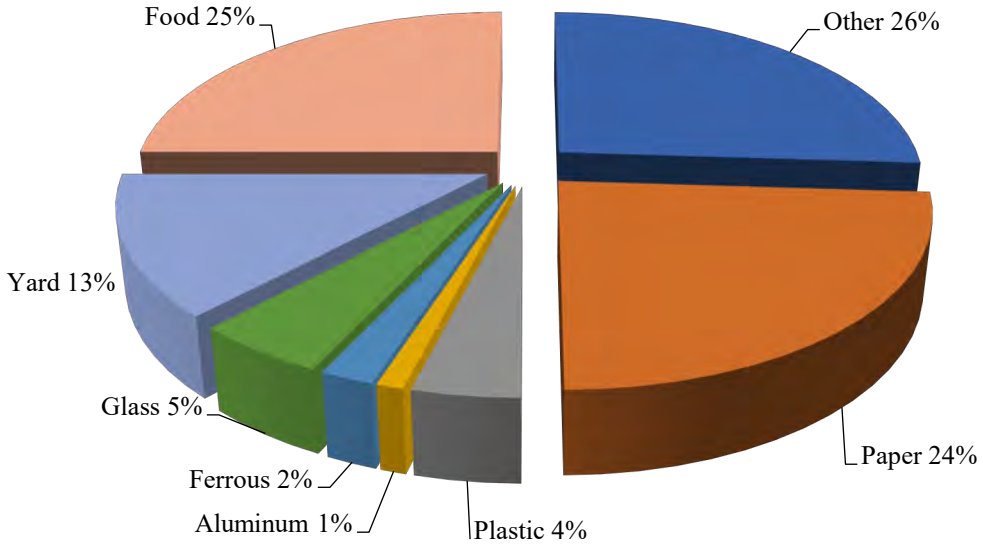
A waste composition study has not been conducted in Blind River. However, the composition of wastes generated in the Town has been characterized using information from other Ontario municipalities and is presented in the following Figures[1]:

Figure 3.1 - composition of household non-hazardous wastes. "Other" includes materials such as wood products, tires, furniture and clothing.

Figure 3.2 - composition of industrial, commercial and institutional (IC&I) waste. "Other" includes such materials as leather, rubber and primary textiles.

Figure 3.3 - composition of construction and demolition (C&D) wastes. "Other" includes materials such as tires, ceiling tiles and rubber.

Figure 3.1
Household Waste Composition



[1] Ontario Ministry of the Environment. June 2004. Ontario's 60% Waste Diversion Goal, A Discussion Paper.

Figure 3.2
IC&I Waste Composition

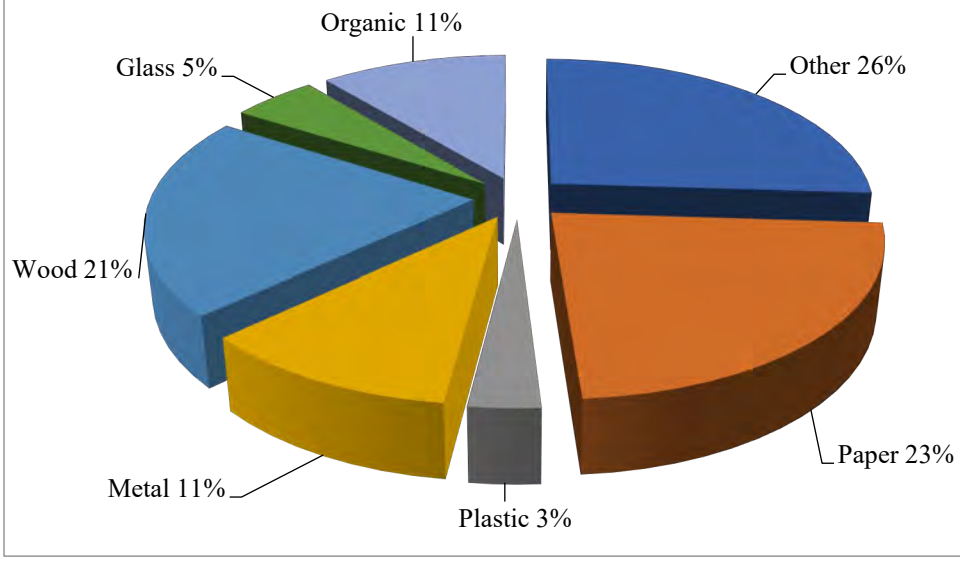
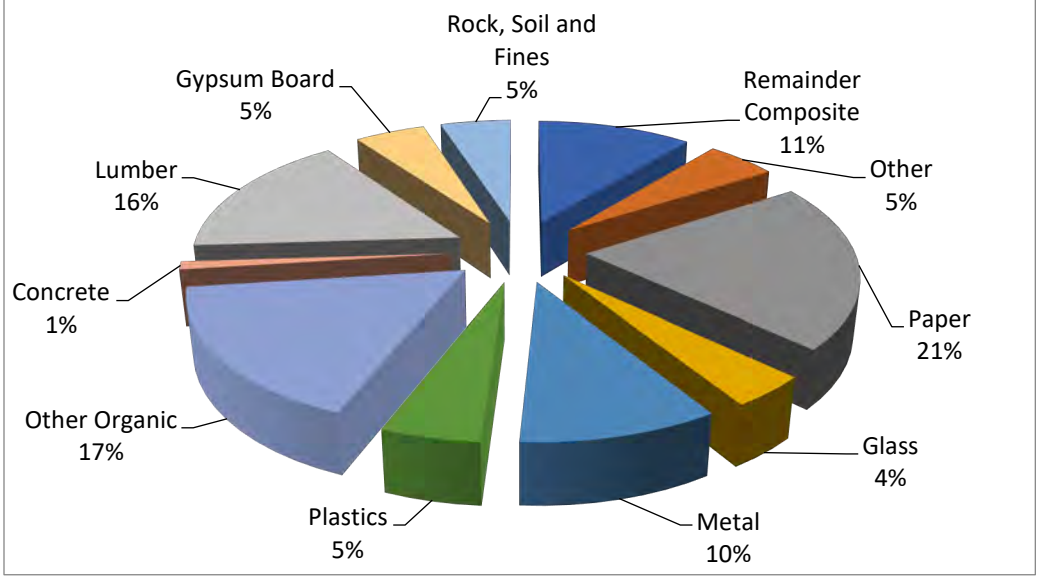


Figure 3.3
Construction and Demolition Waste

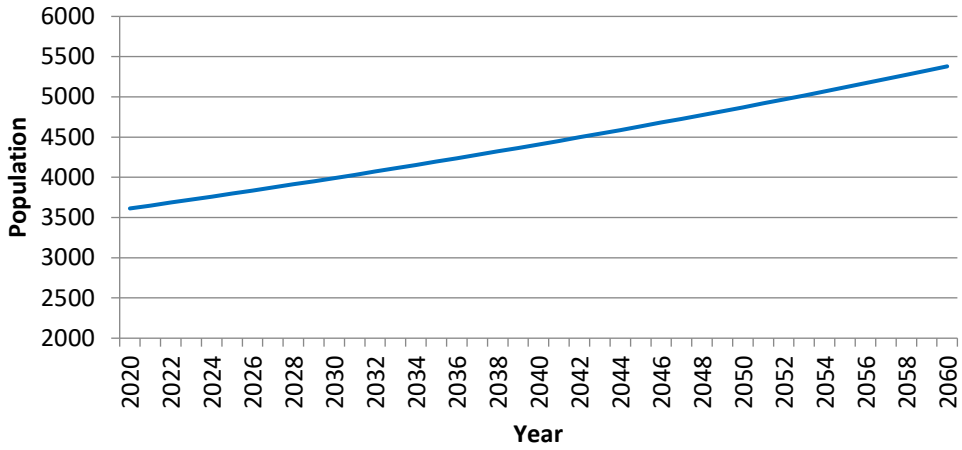


3.2 Population Projection

The Town's population has remained relatively stable over the last several decades, the most recent increases having occurred through annexation of once abutting rural townships. For this study, a population growth rate of 1% per annum has been used to estimate waste volumes for the 25 to 40 year planning period (Figure 3.4).

The projected 25-year population is 4,633 (in the year 2045) and 40 year population is 5,379 (in 2060).

Figure 3.4
Town of Blind River
Population Projection



3.3 Waste Disposal and Generation Rates

There are approximately 2,417 households within the Study Area generating domestic solid waste in Blind River. Domestic wastes are also produced by an estimated 477 IC&I sector waste generators including retail stores, offices, schools, medical clinics, refineries, building contractors and automotive garages.

With an increased awareness of the need to reduce wastes, it is anticipated that future waste generation rates may be somewhat less than current rates. However, for the purpose of ensuring that the future waste management system and facilities are capable of meeting the needs of the community, no decrease in waste generation rate has been applied. A per capita waste disposal rate was established by determining the average annual fill rate, as reported in the Town's annual landfill monitoring reports, and dividing that by the Town's population reported by Stats Canada (3,472 in 2016).

At the end of 2022, the average annual deposit rate of waste and cover material was determined to be 5,075 cubic metres per year over the last 10 years. This results in a domestic waste generation rate of 1.97m^3/person/year, and includes residential as well as ICI wastes. As of November 2022, the remaining waste disposal volume at the existing landfill is 4,891m^3. When applying the average annual deposit rate of 5,075 m^3/year, the site should operate until December 2023.

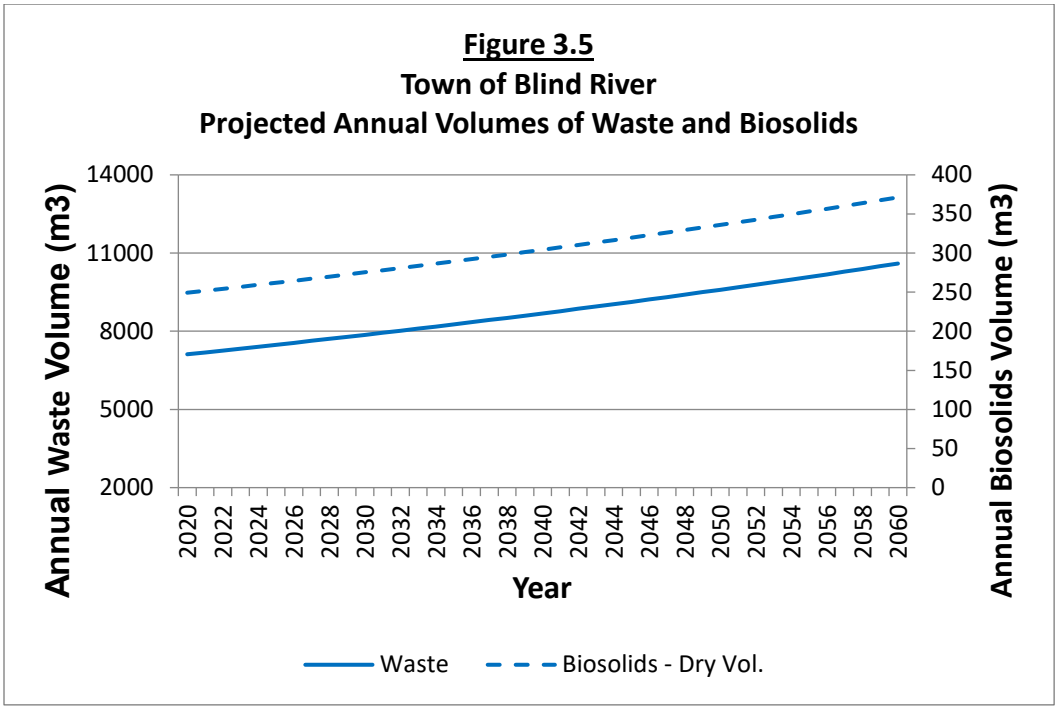
3.3.1 Biosolids and Residuals

The Town's contracted sewage treatment plant operator reports that the annual average volume of biosolids removed from the plant for disposal is 2,400m^3, or 0.69 m^3/person/year. Biosolids are currently hauled to a private processing operation for composting. If biosolids were to be disposed of by landfilling, the equivalent dry volume, or volume required in a landfill, is estimated to be 240m^3.

Residuals from the Town's water treatment plant are pumped to the sanitary sewer for treatment and volumes are ultimately included with the sewage treatment plant biosolids. The dry volume of Cameco Corporation water treatment plant residuals is included in the per capita waste disposal rate developed in Section 3.2 and, therefore, also included in the waste volume projections.

3.4 Annual Waste Volumes

Figure 3.5 depicts the estimated annual waste and biosolids volumes anticipated during the 25- and 40-year planning periods.



A summary of the estimated volumes of waste requiring disposal is presented in Table 3.1.

Table 3.1: Summary of Projected Waste Volumes (m^3)

Waste Type	25 Years	40 Years
Domestic Waste	201,023	347,952
Biosolids Waste	7,041	12,187

4.0 DESCRIPTION OF THE ENVIRONMENT

General descriptions of the Study Area environment are presented in the following subsections.

4.1 Natural Environment

The Town's Official Plan, Schedule A (Land Use) and the Northshore Forest Management Plan mapping identify several sensitive areas and habitats. Including:

- Wetlands and lakes distributed across the Study Area;
- Deer Wintering Areas located along the northwest boundary of the Study Area;
- Moose aquatic feeding areas scattered across the northern portion and eastern boundary of the Study Area;
- Heron nesting sites located along the Blind River and Matinenda Lake;
- Forest research areas located within the lower half of the Study Area;
- Raptor nesting sites located adjacent to the Mississagi River, Lake Huron and Pear Lake;
- A waterfowl nesting site located adjacent to a tributary of Red Lake;
- Bald Eagle feeding areas identified along the Mississagi River and Lake Huron;
- Matinedna Lake and Lake Duborne are classified as Lake Trout Lakes;
- Walleye migration routes identified along the Blind River, Cataract Lake and Lake Duborne;
- Matinenda Provincial Park is located within the central portion of the Study Area; and,
- North Channel Inshore Provincial Park (Waterway Class) and Mississagi Delta Provincial Park (Nature Reserve Class) are located along the southern boundary of the Study Area.

4.1.1 Climate

Study Area climate is somewhat moderated, as it is located along the North Channel of Lake Huron, and is situated in a region that experiences short, warm and sometimes hot summers and a long winter season. The winter months are accompanied by cold temperatures and lake-effect snow. Historical climate data for the Study Area is located in Table 4.1.

Table 4.1 Historical Climate Data

Description	Value
Average Annual Temperature	4.86 ºC
Average Maximum July Daily Temperature	24.1 ºC
Average Minimum January Daily Temperature	-17.2 ºC
Average Maximum January Daily Temperature	-6.4 ºC
Average Minimum Annual Temperature	-0.34 ºC
Average Maximum Annual Temperature	10.07 ºC
Average Annual Rainfall	680 mm
Average Annual Snowfall	275 cm

Weather statistics from Elliot Lake Airport weather station.

4.1.2 Geology/Hydrogeology

The topography within the Study Area is typical of the Canadian Shield with undulating terrain and visible bedrock outcrops and ridges throughout. Soil cover is generally thin and it is underlain by Precambrian Shield bedrock.

Overburden in the Study Area is predominantly morainal, glaciofluvial and glaciolacustrine sediments, generally grading from gravels to sand and fine sand, silt and clay at depth. Overburden thickness varies depending upon the configuration of the bedrock surface and reaches depths exceeding 30 m in depressed areas. Glaciofluvial outwash deposits along the Blind River are typical of most river valley deposits primarily composed of gravelly sand and having low relief.

Agricultural potential within the Study Area is limited due to unfavourable soils conditions which include low fertility, low capacity to hold water, and stony composition in some areas which interferes with tillage, planting, and harvesting. Tillage is also inhibited as a result of the undulating to hilly topography with limited soil depth in many areas.

Area water table is generally high and the coarse-grained (sand and gravel) overburden enables the downward flow of water and contaminants and consequently provides limited protection to overburden aquifers from surface sources of contamination. The Town's groundwater supply is obtained from a well field located along the east shoreline of the Blind River, approximately 5 kilometers west of the current waste disposal site within the built-up section of Town. The existing site is not a source of contamination to the municipal drinking water supply.

4.1.3 Surface Water Resources

The Town is located within the Great Lakes Watershed, on the north shore of Lake Huron at the mouth of the Blind River and is largely bound by surface water bodies/courses.

The Blind River is located to the west and north of the Town, running south from numerous tributaries and a group of lakes including Lake Duborne, Cataract Lake, Canoe Lake, High Lake, Chiblow Lake and Matinenda Lake. The River discharges into the North Channel of Lake Huron. Allen Lake and Bass Lake are located northeast of the Town and drain into Lauzon Lake, which itself drains into the North Channel of Lake Huron. Several smaller lakes and streams are also located throughout the Study Area.

Numerous permanent and seasonal homes as well as cottages and lodges are located on all of these larger bodies of water within the Study Area. These dwellings draw surface water and/or groundwater for domestic use and utilize the surface water resources for recreational purposes. In addition to supporting prolific aquatic communities, these waterbodies are also home to many species of fish including: lake trout, speckled trout, rainbow, northern pike, bass, whitefish, perch, walleye and muskellunge. Smelt and salmon can be found in the area lakes during the spring and fall respectively.

4.1.4 Vegetation

Vegetation within the Study Area is classified as a subsection of the Great Lakes St. Lawrence Forest Region. This vegetation type is characterized by hardy pioneering tree species such as oaks, maple, yellow and white birch. Also prevalent in sandy flat areas and coarser-textured soils are maple, red pine, white pine, eastern hemlock, jackpine, beech, basswood and balsam fir. Black spruce occur scattered in more saturated organic soils.

Extensive and relatively recent disturbance in this region has resulted in the removal of much of the natural vegetation leaving a landscape dominated by pioneer and colonizing species.

4.1.5 Terrestrial Biology

The area surrounding the built-up community is generally sparsely developed and supports large game such as black bear, moose and deer, as well as smaller species such as otters, racoons, rabbits, etc.

The Study Area is inhabited by a number of bird species. These include the black capped chickadee, northern flicker, grouse, bald eagle, broad-winged hawk, ruby throated hummingbird and osprey.

Reptiles and amphibians are also common within the Study Area. Such species include the leopard frog, the yellow spotted salamander, the common snapping turtle, the midland painted turtle, the eastern garter snake and the milk snake.

4.1.6 Aquatic Animal Life and Fisheries

Numerous lakes are located within the Study Area that support a variety of sport fish species. These species include lake trout, whitefish, yellow perch, brook trout, rock bass, walleye, and brown bullhead. Several lakes within the Study Area have also been designated as lake trout lakes by the Ministry of Natural Resources and Forestry (MNRF).

4.1.7 Species at Risk

There are several species within the Study Area that have been placed on the Ontario Species at Risk List. These species are at risk due to habitat loss, land use and resource management activities, the spread of invasive species, and other considerations. The Study Area includes species that have been classified as endangered, threatened or species of special concern.

A species is classified as endangered if it lives in the wild in Ontario but is facing imminent extinction or extirpation. Within the Study Area, the wood turtle and Lake Sturgeon (Great Lakes – Upper St. Lawrence populations) are identified as endangered and the mountain lion is an endangered species possibly located within the area.

A species that is classified as threatened is one that is native to the area and that is at risk of becoming endangered in Ontario if limiting factors are not reversed. Threatened species found within the Study Area include the following:

1. Bobolink;
2. Bank Swallow;
3. Eastern Whip-poor-will;
4. Least Bittern; and,
5. Blanding's Turtle.

A species of special concern is one that is sensitive to human activities or natural events which may cause it to become endangered or threatened. Species of special concern located within the Study Area include:

1. Canada Warbler;
2. Olive-sided Flycatcher;
3. Peregrine Falcon;
4. Common Nighthawk;
5. Evening Grosbeak;
6. Monarch Butterfly;
7. Wood Thrush;
8. Easter Wood-pewee;
9. Black Tern; and,
10. Snapping Turtle.

The Natural Heritage Information Centre (NHIC) has identified species classified as imperiled (S2 species rank), *vulnerable* (S3 species rank) and *apparently secure breeding populations* (S4B species rank) within the vicinity of the Study Area. S2 species are those that have a restricted range with very few populations (20 or fewer), with steep declines or other factors making it very vulnerable to extirpation. S3 species are those that are vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation. S4B species are those breeding populations that are apparently secure and are uncommon but not rare, with some cause for long-term concern due to declines or other factors.

Species that have been classified as imperiled (S2) within or in close proximity to the Study Area include the lake sturgeon. Vulnerable species (S3) include the Greene's rush, the Blanding's turtle and the snapping turtle. Species that have been classified as apparently secure breeding populations (S4B) include the bobolink, eastern wood-pewee, bank swallow and the wood thrush.

4.1.8 Provincial Parks and Preserve Areas

Matinenda Provincial Park, regulated in 2003, is approximately 29,417 hectares in size and is located approximately 15 kilometers north of the built-up community. Restrictions on permitted uses within the park area have been applied as the park includes the Matinenda Jack Pine Barrens and Matinenda Pine-Hemlock natural heritage areas. The park supports traditional uses such as fishing and hunting.

The Mississagi Delta Provincial Nature Reserve is approximately 2,400 hectares in size and is located in the North Channel of Georgian Bay, approximately 10 kilometres southwest of the Study Area. The park was established in 1985 and is abundant in geological, archaeological and historical features. The reserve consists of a number of habitats including upland coniferous, mixed and deciduous forests, thickets, rock barrens, coniferous and deciduous swamps, bogs, fens and marshes and much of the park can only be accessed by water.

The North Channel Inshore Provincial Park consists of five parcels of Crown land (approximately 3,800 hectares in total) located along the North Channel of Lake Huron. Regulated as a waterway class park in 2002, the Provincial Park protects the largest remaining undeveloped section of the North Channel of Lake Huron shoreline in Thessalon Ecodistrict, providing an ideal migratory and breeding habitat for bird species.

A wetland is classified by the MNRF using the Ontario Wetland Evaluation System and is recognized as having ecological significance. The Marsh Bay-Island Wetland is located within the southwest portion of the Study Area and is approximately 300 hectares in size.

4.2 Social/Cultural Environment

According to the 2016 census, the population of the Town of Blind River is 3,472. This is a population decrease of approximately 2.2% since 2011. The majority of the population is represented by individuals between the age of 15 – 64 years, with a median of approximately 52 years of age.

4.2.1 Land Use

The Town of Blind River is primarily a residential community with a small industrial component and commercial and institutional components that provide basic services to the permanent residents and visitors to the community. The principle future development areas are lands to the north and east of the existing built-up urban service and settlement area.

Residential development consists mainly of single detached housing. Semi-detached and social-assisted housing have been developed in the area and a small number of residential apartment buildings are found in the community. Many of the area lakes also support residential and cottage developments.

The majority of commercial development is located along Highway 17 and a section of Woodward Avenue. Institutional lands are dispersed throughout and consist of churches, schools and community services (e.g. Hospital, Algoma Public Health).

Though scattered throughout, industrial zones are concentrated at the east end of Town along Highway 17. The principle industry in the area is Cameco, a uranium refinery, which is located west of the community, outside of the communal water and sewer service area.

Recreational zones include multi-functional park areas and numerous hiking, skiing and snowmobile trails. Various environmental protection zones are found along the shores of Lake Huron and Bay of Blind River and a large wetland area is located west of the community.

4.2.2 Indigenous Communities

The Study Area is within the Robinson-Huron Treaty land. The area surrounding the Study Area includes lands of the Mississauga First Nation, the Serpent River First Nation and the Sagamok Anishnawbek First Nation. These are Anishinaabe-speaking First Nations that have long inhabited the north shore of Lake Huron. The Mississauga First Nation is located adjacent to the Study Area some 5 km west of the built-up area of the community, along Highway 17 and adjacent to the Blind River and Mississagi River.

An established Metis community also claims historic use in the Study Area and is represented by the Metis Nation of Ontario.

4.2.3 Utilities

Properties within the built-up portion of the Study Area are serviced by communal water and sewage facilities and those in the Forrest Glen and Huron Shores subdivisions are serviced by the municipal water supply and on-site sewage disposal systems. Throughout the Study Area outlying (rural) areas are serviced by private water supplies and on-site sewage systems.

The following utility authorities have facilities within the Study Area:

1. Hydro One;
2. Enbridge Gas Inc.;
3. Bell Canada; and
4. Shaw – Eastlink.

4.2.4 Cultural Heritage Resources

Cultural heritage resources include archaeological resources, built heritage resources, and cultural heritage landscapes.

4.2.4.1 *Archaeological Resources*

The Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Archaeological Potential* (screening checklist) was completed for six landfill locations identified for consideration. The completed checklists identified the candidate locations 3, 4, 5, and 6 all have archaeological potential. Candidate Location 2 was

identified as having low archaeological potential because it has been recently intensively and extensively disturbed.

A Stage 1-2 archaeological assessment (under Project Information Form (PIF) number P094-0244-2017) was undertaken for Location 1 (the preferred alternative) on August 21, 2017 by Archaeological Services Inc. and is included in Appendix D. The report has been entered into the Ontario Public Register of Archaeological Reports. The archaeological assessment found that the study area does not retain archaeological potential and does not require further assessment.

4.2.4.2 *Built Heritage Resources and Cultural Heritage Landscapes*

The Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (screening checklist) was completed for six landfill locations identified for consideration (including the preferred alternative, Location 1). Through the completion of the checklist, it was determined that the six candidate locations have low potential for built heritage resources and cultural heritage landscapes, therefore, no further technical studies (e.g., Cultural Heritage Evaluation Report) have been undertaken.

4.2.5 Recreation

There are numerous recreational opportunities in the Study Area. Popular spring and summer activities include boating, swimming, canoeing, fishing, camping and hiking. Popular fall and winter activities include hunting, ice fishing, skiing and snowmobiling. There are numerous municipal parks and public beaches located within the Study Area limits.

4.2.6 Official Plans and Policy Documents

The Study Area consists of several geographical townships that make up the incorporated Town of Blind River including the Townships of Cobden, Scarfe, Juillette, Kamichisitit, Jogues, Timmermans, Mack and Striker. The Town of Blind River has adopted an Official Plan.

The Town's Official Plan was updated in February of 2015. The purpose of the Official Plan is to serve as a basis for managing change over an approximately 20-year period using policies based on an integrated view of economy, environment and community.

Existing waste management facilities are permitted within areas designated as Rural and Resource Areas. The Rural and Resource Area designation described in the Official Plan includes lands within Town limits that are outside the urban service area boundary and not within one of the other major land use designations.

The Food and Organic Waste Policy Statement (Statement) issued April 30, 2018 under section 11 of *Resource recovery and Circular Economy Act, 2016* provides direction to provincial ministries, municipalities, industrial, commercial and institutional establishments, and the waste management sector to increase waste reduction and resource recovery of food and organic waste. Section 6.8 of the Statement includes "Proponents of new or expanded waste management systems for disposal should consider resource recovery opportunities for food and organic waste". Referencing the table included in Section 2.1 of the Statement, the Town of Blind River falls under "Municipalities in Northern Ontario" and is therefore subject to policy 4.3. Policy 4.3 of the Statement calls for Municipalities in Northern Ontario to provide curbside collection of food and organic waste to single-family dwellings in an urban settlement area within a local municipality. The policy goes on to define a local municipality in this case as "greater than 50,000

and the population density of the local municipality is greater than or equal to 300 persons per square kilometre". Due to the Town of Blind River having a population less than 50,000, policy 4.3 does not apply. However, Section 4.6 of the Policy states that "Where collection of food and organic waste is not provided subject to policies 4.1 to 4.5, municipalities shall provide for the resource recovery of food and organic waste through means such as home composting, community composting and local event days.". The Town's existing Waste Management Plan incorporates public information and waste reduction programs discussed further in Section 5 of this report. Currently, on-site composting occurs to an unknown and assumed minimal extent within the municipality. Both on-site composting and central composting will be considered for incorporation into the Town's preferred Waste Management Plan. The Town will also consider other waste diversion initiatives that align with Provincial policies. Currently, Algoma Bio-Septic Technologies Inc. (ABT) diverts biosolids generated at Blind River's sewage treatment plant into organic material for reuse. This process appears to align with Section 6.16 of the Statement which encourages municipalities to plan for management and beneficial use of biosolids.

4.3 Economic Environment

The Study Area was originally settled by Algonquin cultures. By 1500-1600 the area formed part of the Ojibway Territory. A fur trading post was established by the Northwest Company in 1789 at the mouth of the Missisagi River and by the early 1800's, a small water-based settlement was established near the mouth of the Blind River. When fur trade began to decline, the Hudson Bay Company purchased the Northwest Company and many of the trappers settled along the rivers flowing into Lake Huron. By 1850, logging became a prominent industry and in 1887 the Canadian Pacific Railway (CPR) reached Algoma. The logging and saw mill industry was largely responsible for the establishment and growth of the community of Blind River. These activities continued to be prominent until about 1968 when the Domtar mill closed.

Uranium was discovered near Blind River in 1955 which led to the development of the first uranium mine located in Algoma Mills. The uranium mine was only operational for a short time but lead to the discovery of the Blind River-Elliot Lake uranium mining camp. A uranium refinery was developed in 1983 just west of the community and is currently owned and operated by Cameco Corporation.

Presently the principle economic activities include commercial service, tourism, the Cameco uranium refinery, and public-sector services. Some mineral resources, limited to aggregate deposits (sand and gravel), are located within the Study Area.

4.3.1 Municipal Services

In addition to providing waste management services, the Town of Blind River also provides drinking water and waste water treatment services as well as recreational and social services.

Municipal Drinking Water System

The municipal drinking water facility is owned by the Town and is located at 11 Hudson Street. The facility is rated for a maximum capacity of 6,000 m^3/day. Five GUDI (groundwater under the direct influence of surface water) wells located along the east shoreline of the Blind River provide water for the Town's treatment plant where it is then treated and pumped to the Town's standpipe and distribution system.

Waste Water Treatment Plant

The Blind River Waste Water Treatment Plant is located at 21 Martin Street, just south of Highway 17 and approximately 100m east of the Blind River. The waste water treatment plant has a rated capacity of 3,500m^3/day and a peak design of 7,689m^3/day. Following treatment at the plant, the waste water flows

through an outfall pipe to a diffuser where it is discharged approximately 100m west of the plant, into the Blind River.

4.4 Transportation Environment

The Town is located on the Trans-Canada Highway (King's Highway No. 17), approximately halfway between Sault Ste. Marie and Sudbury. Numerous local roadways, urban and rural, have been established in the built-up community and rural areas which are maintained by the Town. Access to the current landfill site is provided from the Trans-Canada Highway.

The Huron Central Railway (HCR) right-of-way is located adjacent to and south of Highway 17 through the Study Area.

5.0 WASTE MANAGEMENT PLAN COMPONENTS AND PROGRAMS ("ALTERNATIVES TO")

A municipal Waste Management Plan is comprised of several key components, categorized as follows:

1. Reduction and Diversion: methods used to reduce the amount of waste generated or to divert wastes from the disposal stream.
2. Handling and Collection: methods used to gather and transport waste materials to the processing and/or disposal streams.
3. Processing: methods of transforming, storing or otherwise using waste materials in conjunction with diversion programs or prior to disposal.
4. Disposal: methods used to dispose of waste materials deemed under the Waste Management Plan to be at the end of their useful lifecycle.

Several programs exist within each component. Which programs are eventually adopted by a specific community depends on considerations including net environmental impacts as well as the community's ability to operate, maintain and manage programs with varying complexities. A long-list of alterative Waste Management Plan programs was developed by referring to past similar projects and the EA ToR. The long-listed programs identified in Figure 5.1 and are described in more detail in the following subsections.

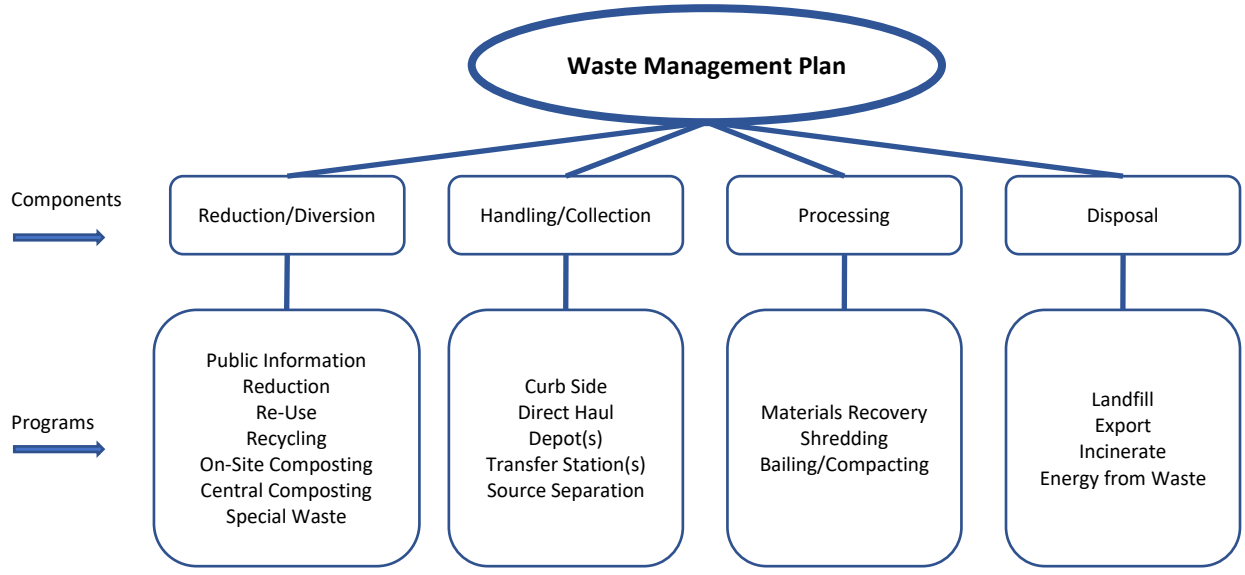


Figure 5.1: Long-list of Waste Management Plan Components and Programs Considered

5.1 Component 1: Reduction and Diversion

Recognizing the potential to reduce the requirement for disposal of waste material, approaches to increase waste reduction and diversion efforts were considered for inclusion in the Waste Management Plan. The programs considered are described in the subsections below.

5.1.1 Public information

Successful reduction and diversion programs incorporate public information programs that plainly and accurately describe the Waste Management Plan, encourage public participation, and emphasize the public's role of the public in ensuring successful Waste Management Plan implementation. Pubic information programs should be geared toward all municipal sectors and should:

1. Use a broad range of techniques to relay information.
2. Be adaptable to allow strategy changes or to suit particular sector/area needs.
3. Outline waste management issues affecting the Town and their consequences should the issues not be addressed.
4. Describe the objectives of the Waste Management Plan and encourage public participation in its formulation and implementation.
5. Clearly identify the benefits of the Waste Management Plan, advise how the public can participate, maintain a flow of information, and promote long-term behavioural change.
6. Describe the components of the Waste Management Plan as well as their interconnectedness.

Public information programs may be applied and are considered useful regardless of the quantity of waste being accommodated by the Waste Management Plan and a successful program can result in a better operating Waste Management Plan. The program would need to reflect the urban/rural and ICI mix of the community and would need to address previous waste management habits where changes are proposed. In order to maintain momentum and relevance, the program must be reviewed and renewed regularly. Public information programs may be run year-round.

Although there are costs associated with the development and implementation of a public information program, the expenditure should cause other, more costly components of the Waste Management Plan to function in more cost-effective manners. Focus on particular components of the Waste Management Plan that would result in the greatest efficiencies (thus greatest reduction in operating costs) could be incorporated into a program to help improve its cost effectiveness.

5.1.2 Waste Reduction

Waste reduction programs are designed to reduce the generation or use of products that possess the potential to increase materials accommodated by the Waste Management Plan and are typically incorporated into public information programs. An example of such an initiative is the recent movement away from the use of plastic grocery store bags which, by instituting a monetary charge per bag, has shown to be effective in reducing the use of this form of packaging. Other waste reduction initiatives include: avoiding products with excess packaging; purchasing materials with longer service lives or multiple uses; junk mail reduction campaigns; and, avoiding hazardous materials. By reducing the waste generated, the load and reliance on other Waste Management Plan components is also reduced.

The success of waste reduction programs relies on the degree to which residents and ICI sectors practice the particular initiative(s). To help ensure success, a program must:

1. Be targeted to a specific initiative and/or socio-economic group.
2. Reflect the urban/rural population mix.
3. Be developed, maintained and monitored to allow modification as may be required.

Waste reduction programs are also useful in that they help develop and maintain a mind-set among all sectors to reduce waste volumes wherever possible. In order to be productive, the program should develop and/or target specific waste reduction initiatives and its effectiveness must be monitored so that modifications can be made to help ensure its success. Although a waste reduction program can be implemented regardless of the quantities of waste generated or reduced, there may be a greater potential for program success if initiatives that would result in the highest reduction rates are implemented initially.

The costs to develop and implement waste reduction programs are specific to the particular initiatives targeted and vary. Similarly to a public information program, the expenditure should improve the cost effectiveness of other, more costly Waste Management Plan components. As noted, targeting specific waste generators can help maximize savings to on-going Waste Management Plan operating costs. Funding opportunities may be available from time to time.

5.1.3 Re-Use

Waste re-use programs are developed to delay or circumvent the introduction of certain materials into the Waste Management Plan components and include initiatives that encourage the continued or other use of materials at the site of waste generation or at other locations. Materials can either be used in their original or modified form. Re-use programs are linked to public information programs, are considered secondary to waste reduction programs and must:

1. Identify the benefits of material re-use.
2. Reinforce that certain waste materials may be resources and that re-use is acceptable.
3. Be structured to support the development of a re-use ethic in all sectors.
4. Provide a variety of options to help ensure success.
5. Reflect needs of the urban/rural mix.

Depending on the structure of a waste material re-use program, the majority of costs are typically borne by the material generator or the resource user. Costs to the municipality are associated with incorporating the program into a public information program and, should a central depot be established (eg. “share shed”), with constructing and operating such a facility. The cost effectiveness of a re-use program will ultimately be based on its structure and the initiatives implemented under it.

5.1.4 Recycling

A waste recycling program is designed to remove marketable materials from the disposal stream so that they can be reconstituted into new products by manufacturers. Considering that recycling programs typically require additional cost and energy requirements to implement, they are thought of as third priority following reduction and re-use programs. Requiring some source separation by waste generators, recycling programs are most commonly operated at a municipal scale (private company or municipal service) to address the needs of entire communities. To help ensure their success, recycling programs must:

1. Rely on stable, cost-effective markets for recyclable materials.
2. Produce quantities of materials that make the program cost-effective (this may need to be done by networking with other jurisdictions).

3. Be flexible enough to accommodate increases in material quantities and additional materials.
4. Incorporate a public information component to describe and encourage participation.

Recycling programs can be implemented in rural and urban areas, target all sectors and divert a wide range of materials from disposal. Effort is required to separate materials at the source and pick-up materials at the curb-side; however, employment opportunities result from the need for material collection, handling and processing. Perhaps the greatest threat to the success of recycling programs is the availability of markets, variable value of recyclable materials, and costs to ship materials to markets. The cost of implementing recycling programs is dependent on the level of service, the requirements for depots, bins and other facilities, as well as operational costs.

5.1.5 On-Site Composting

An on-site composting programs remove material from the disposal stream at the source by allowing waste generators to separate compostable organic household and yard waste and produce an environmentally acceptable soil conditioning material. Composting can be done at an outdoor location with adequate capacity and orientation (facing the sun) or indoor vermiculture. Although not required to aid the process, composting vessels may be purchased or constructed by residents. On-site composting programs:

1. Employ processes that occur naturally and require little manipulation/intervention.
2. Are capable of accommodating a majority of household organic wastes, leaf and yard waste, and organic wastes from other sectors.
3. Must include a public information program to describe how to establish and operate a composting system, and to identify acceptable compostable materials.

On-site composting programs can be implemented in all sectors, but are most common in the residential sector, and are not limited by minimum waste quantity requirements. The end product is dependent on the organic wastes that had been introduced to the process. Implementation of on-site composting programs is typically supported by municipalities or other organizations through assistance with obtaining composting vessels, and producing and providing informative publications to assist in establishing and trouble-shooting systems. Although on-site composting can be utilized year-round, the efficiency decreases during periods of cooler temperatures and the process can cease during winter months. Insulating composting vessels or composting indoors can alleviate this.

With the possible exception of financial assistance with purchasing composting vessels and public information programs, costs associated with on-site composting programs are borne by individuals who establish such systems.

5.1.6 Central Composting

A central composting program typically involves composting of residential leaf and yard waste on a municipal scale. Other organic wastes from all sectors are excluded from leaf and yard waste composting programs for end product quality concerns. Central composting programs that include all organic wastes are also beginning to be implemented in Ontario. Leaf and yard waste composting may be implemented at a central approved location such as a landfill site and requires minimal effort to operate. In contrast, programs that include all organic wastes, require designated and approved facilities with supervision and operational support. The end use of the compost is determined in-part by the quality of the material in comparison to regulated limits.

Leaf and yard waste, and other organics, make-up large components of the municipal waste stream. As a result, the operational life of disposal sites would be increased should these materials be removed from the waste stream. A central composting program can be implemented in both urban and rural areas and applied to all sectors, though leaf and yard waste programs are most typically residential. Program success is not dependent on minimum waste quantities; however, the process will not function efficiently if the capacity is exceeded or if contaminants are introduced into the system. As with other programs, to help ensure its success, a central composting program must incorporate a public information component. Efficiency of the program would be affected by type of program (leaf and yard or all organics) and temperature.

Costs associated with establishing a central leaf and yard waste composing program include site preparatory costs and operation costs (minimal and consist of periodic turning and moving of material). Curb-side collection is not required for a leaf and yard waste composting program but may increase participation rates. A program to compost all organic materials is significantly more costly and requires the establishment and operation of a composting facility capable of operating year-round as well as curb-side collection.

5.1.7 Household Special Waste

Household special (or hazardous) waste programs are designed to remove and divert materials that require special consideration from a health and safety and/or environmental contamination perspective. Such programs may be implemented through the establishment of a permanent depot (year-round or seasonal) or by periodically collecting these wastes at a pre-determined frequency. Minimum or maximum waste quantities do not affect the success of the program and it can be implemented in all sectors and in urban and rural areas. A household hazardous waste program:

1. Requires a method to safely and properly collect, store, transport and dispose of materials/products.
2. Should incorporate a public information component to encourage a reduction in the use of hazardous products.
3. Can be operated in conjunction with other area municipalities.

Household special waste programs rely on source separation, as well as direct haul of materials to a central collection location, by waste generators. Curb side collection is not used when implementing household special waste programs due to the potential to cause violent reactions between products if/when they mix. The establishment of a permanent depot (with storage capacity) requires environmental approvals and licensing whereas periodic collection does not (an appropriately licensed contractor must receive the waste for disposal in these cases), the construction and maintenance of appropriate facilities, and specialized staff training.

5.2 Component 2: Handling and Collection

Waste handling and collection methods impact the volumes of materials directed to either the recycling and diversion or disposal streams as they are impacted by considerations such as accessibility and ease of use. Implementation cost is also an important consideration. The programs under this Waste Management Plan component that were considered are described in the following subsections.

5.2.1 Curb Side Collection

Curb side collection programs are designed to gather waste materials from the locations where they are generated and transport them to processing and/or disposal facilities (for disposal, recycling or composting). Curb side programs most typically refer to residential collection; however, they can also include container collection from multi-residential units and/or other sectors. Implementation of curb side collection programs requires a vehicle or vehicles capable of accommodating the materials being collected and sized depending upon the service required. Compartmentalized trucks, or a number of trucks, can be used for same day service for all materials.

Minimum waste quantities are required to improve the cost effectiveness of curb side collection programs; thus, they may not be practical in low density (i.e. rural) or low waste generation situations. Because of this, it may be required to vary the level of service throughout a municipality. Maximum waste quantities capable of being accommodated by these programs are limited by the capacity of the collection vehicles and frequency of collection. Curb side collection programs may operate throughout the year.

Depending on level of service and materials collected, capital expenditures are required to purchase vehicles and storage containers as well as for their operation and maintenance. These costs can be either incurred directly by a municipality or by private company operating the collection program(s) under contract.

5.2.2 Direct Haul

Designed to enable individual waste generators to transport waste materials to processing and/or disposal facilities, direct haul programs are required where curb side programs have not been implemented and/or where waste requires disposal between curb side pick-up times. Direct haul programs are not limited by minimum waste quantities; however, maximum waste quantities are limited by the capacity of receiving facilities. The programs can operate in all sectors and in urban or rural areas. Most of the required labour effort associated with these programs is provided by the individual waste generator. The receiving site(s) must be supervised to verify the nature of waste materials transported to them.

Transportation costs associated with direct haul programs are borne by waste generators. Capital and operation and maintenance costs associated with receiving facilities are borne by the Municipality and depend on the number of facilities and operating hours.

5.2.3 Depot(s)

Depot programs are designed to provide strategically located facilities where waste materials can be deposited by individual waste generators. Materials are then collected and transported from depots to processing and/or disposal facilities. Depots can be established to accept recyclable, re-usable, compostable and disposable materials and are typically most effective when waste quantities are low. Frequency of collection from depots depends on the type(s) of waste material, proximity to other land uses and temperature. Although not limited by minimum waste quantities, facility capacity dictates the maximum waste quantities that can be accommodated by depot programs.

Facilities used in depot programs do not typically require site attendants but this is ultimately determined, in-part, by the nature of materials accepted at the depot and by the cost recovery method. Depot programs are suitable for use where curb side collection would be cost prohibitive or not possible, to supplement curb side collection or where the type of waste material is not suitable for collection programs (e.g. household special waste). These programs can operate year-round and are best suited for the residential sector.

Costs associated with implementing depot programs are related to establishing the depot location (land and development costs), purchasing appropriate containers/structures, and operation and maintenance of the facility. The magnitude of the cost is dependent upon the number of depots required, materials accepted, the need for an attendant and whether operated under contract.

5.2.4 Transfer Station(s)

Transfer station programs are established to provide facilities to where individual waste generators or small collectors can transport waste materials. Materials from transfer stations are then collected on a regular basis and transported to separate facilities for processing and/or disposal. In many cases, transfer station facilities comprise a number of waste storage bins situated in an open-air environment. Facilities can be enclosed and some on-site waste processing can be conducted (e.g. shredding, compaction, bailing). Transfer station programs:

1. Allow for the use of larger, more cost-effective haul vehicles in areas with low waste generator density.
2. May be operated year-round.
3. Are most typically used in rural areas where haul distances to processing and/or disposal facilities are great.

A transfer station program requires a minimum waste quantity to make the program economical and/or feasible and the maximum waste quantity capable of being accommodated is dependent upon the size/capacity of the facility or individual facilities.

Capital costs associated with transfer station programs include land acquisition, facility development, processing facilities, and purchase of transfer vehicles. Operations and maintenance costs are dependent on the type of facility, waste materials accepted, the need for an attendant, and hauling costs. Transfer stations can be operated by municipalities directly or under contract.

5.2.5 Source Separation

Source separation programs require that individual waste generators segregate waste materials into categories for subsequent collection and/or transportation. The programs, generally used to segregate recyclable, re-usable, compostable, disposable and hazardous materials, can be used year-round in all municipal sectors. Source separation is often an essential Waste Management Plan component and maximum and minimum waste quantities do not apply to these programs. Effectiveness of the program is affected by the attitudes, receptiveness and willingness of waste generators to participate as well as the degree of source separation required.

As a majority of the effort to implement source separation programs is provided by individual waste generators, costs are also borne by the generators. It is expected that material collection and handling costs may increase; however, processing and/or disposal costs should decrease.

5.3 Component 3: Processing

Alternative waste processing programs considered are described in the following subsections.

5.3.1 Materials Recovery

Materials recovery programs are designed to receive waste materials for sorting, segregating and direction to the appropriate stream. A wide range of materials, generally co-mingled, may be received at a material

recovery facility (MRF) and may be handled using manual and/or automatic processes. MRFs may be designed to accommodate a wide range of material types and quantities; however, due to their nature, the cost effectiveness of MRFs decreases when accommodating smaller quantities. Suitable for use year-round and by all sectors, MRFs:

1. Require special siting considerations for convenience, costs and to mitigate potentially disruptive effects.
2. Require varying degrees of labour input based on material volume and type, degree of segregation required, and type of processes (i.e. manual or automated).

Costs associated with implementing a materials recovery program are dependent upon the degrees of mechanization and segregation required, as well as the volume of material handled. Capital costs include those associated with land acquisition, site development, construction of structures, and purchasing equipment. Operations and maintenance costs would vary based on facility size and equipment used and may be reduced by combining with other Waste Management Plan facilities.

A private company owns and operates a recyclables MRF in the Town of Blind River and collects materials from numerous area municipalities for recovery and, ultimately, bringing to market.

5.3.2 Shredding

A shredding program is designed to reduce waste materials to a homogeneous size and is typically used to reduce bulky materials in association with their recycling, composting or disposal. Shredding programs are:

1. Generally implemented at disposal sites, transfer stations, MRFs or recycling facilities.
2. Capable of reducing material volume by factors of between 4 to 8.
3. Capable of speeding up composting processes.

Shredding programs may be implemented year-round, and are neither limited by waste material volume or municipal sector. When used prior to transportation of waste materials, larger volumes of material may be accommodated thereby potentially reducing transportation costs. Either fixed or portable equipment may be incorporated into a shredding program.

Capital costs include the purchase of equipment and, potentially, facility development and depend on the volumes and types of waste materials accommodated. Operation and maintenance costs are dependent on the program developed and are associated with labour, equipment and facility operation, and transportation.

5.3.3 Bailing and Compacting

Bailing and compaction programs provide reductions in volume of waste materials and the formation of units of waste material that are easier to handle, store, ship, and/or dispose. Densities of the waste units are generally greater than that provided by typical landfill compaction methods and, as a result, could result in increased landfill life spans. Bailing and compaction programs may be used to:

1. Increase landfill density and lifespan.
2. Reduce leachate production by slowing the decomposition process.
3. Reduce the occurrence of vermin and litter at waste handling or disposal sites.

Program implementation is not limited by waste quantities and can be used year-round by all sectors and equipment may either be fixed or portable. Labour requirements are dependent on the system implemented.

Capital costs are related to the acquisition of bailing and compaction equipment and facility development (e.g. storage structures) and are dependent on the waste materials accommodated and their destination. Operation and maintenance costs would be incurred in association with the required labour, binding supplies, equipment transportation and operation.

5.4 Component 4: Disposal

Waste Management Plans ultimately include a disposal program(s) to accommodate the residual waste stream. Disposal programs considered are described in the following subsections.

5.4.1 Landfilling

A landfilling program involves the controlled disposal, by burying, of waste materials. Material is typically placed in layers, compacted and covered with acceptable material (e.g. granular fill). Landfills can accept a wide range of waste materials but most commonly receive domestic household and ICI waste generated by all municipal sectors, urban and rural, on a year-round basis. Although a minimum waste quantity would not generally apply, maximum quantities are established by site characteristics and regulating documents (e.g. site Environmental Compliance Approval). Landfilling programs require Environmental Assessment Act and Environmental Protection Act approval prior to development and operation.

A landfilling program requires the use of a site attendant to monitor disposal activities, receive tipping fees and generally supervise operations at a landfill site. Staff requirements depend on the level of service provided at the site or sites. Methods to monitor and document the volume and type of waste materials accepted for disposal are also needed.

Capital costs associated with implementing a landfilling program include: planning and engineering; land acquisition; site development; leachate management facilities; groundwater monitoring facilities; access and security fencing; structures; and, equipment. Operation and maintenance costs include: site attendant; environmental monitoring; machinery operating costs; cover material costs; and, closure costs. Costs are dependent upon capacity requirements, hydrogeological conditions, landfilling method, and cost recovery method.

5.4.2 Export

A waste material export program permanently removes waste materials from the area in which they were generated and may accommodate different waste types (e.g. household special waste). In theory, these programs can be used to address all or some of the Waste Management Plan needs; however, transporting waste material for disposal to different jurisdictions is not well accepted and there is a trend toward legislating against this practice. Export programs are not limited by minimum or maximum waste quantities except for economical concerns. A significant risk exists should a receiving site cease to accept waste materials, leaving users without a disposal option.

Capital costs associated with export programs include vehicle and equipment acquisition (or contracted services), as well as development of transfer facilities. Operation and maintenance costs are related to the loading and transportation of waste materials, receiving of waste materials, and maintaining equipment.

5.4.3 Incineration

Incineration is also referred to as thermal processing due to the number of alternative technologies available to thermally process waste. Incineration programs reduce the volume of waste material by controlled burning. Incineration employs processes that monitor and regulate temperature, scrub exhaust, and monitor for compliance with emissions standards. Unless captured, energy produced during the process is released to the atmosphere. There are minimum waste requirements for an incineration program to be feasible and, in Northern Ontario would require a centralized incinerator location to accept waste materials from a large geographic area. Incineration programs are capable of being operated on a year-round basis and can service all municipal sectors. Incineration of municipal solid waste is not common in Northern Ontario; however, the burning of clean wood waste is practiced at certain disposal sites Northern Ontario to reduce the volume of landfill space that it would otherwise consume. Incineration does produce residual waste that requires disposal at a landfill site, possibly licensed to accept hazardous wastes.

Capital costs associated with an incineration program are high and include those associated with combustion facility design, approval and construction and acquisition of appropriate ancillary equipment. Operation and maintenance costs are also higher than for other disposal programs.

5.4.4 Energy from Waste

Energy from waste programs are typically designed to utilize thermal energy recovered from the incineration of waste materials. Heat from controlled incineration processes is typically used to produce steam to drive turbines or to heat buildings or districts. Minimum waste quantities apply from a cost effectiveness perspective and the systems are limited by the capacity of the facility and/or available end-use/market. There are also seasonal limitations associated with heating applications. Energy from waste programs have been established in Southern Ontario where waste volumes are sufficient to keep the programs feasible.

Capital, operational and maintenance costs would be similar to an incineration program with the addition of energy recovery equipment/technology. Also similar to incineration, an energy from waste program would produce residual waste requiring disposal at a landfill site, possibly licensed to accept hazardous wastes.

6.0 EVALUATION OF WASTE MANAGEMENT PLAN PROGRAMS

The Waste Management Plan programs identified and described in Section 5.0, and summarized in Table 6.1, are the "alternatives to" the undertaking that were evaluated during the EA process.

Table 6.1: Long List of Waste Management Plan Components and Programs

Reduction/Diversion	Handling/Collection	Processing	Disposal
Public Information	Curb Side	Materials Recovery	Landfill
Reduction	Direct Haul	Shredding	Export
Re-Use	Depot(s)	Bailing/Compacting	Incineration
Recycling	Transfer Station(s)		Energy from Waste
On-site Composting	Source Separation		
Central Composting			
Special Wastes			

6.1 Short List of Alternative Programs

The long-list of alternative Waste Management Plan programs was screened to confirm the general suitability and applicability of each program for potential implementation in Blind River prior to conducting the evaluation described in the ToR. Programs were screened considering the following criteria:

1. Program Proven – has the program been successful in other areas of the Province;
2. Locally Manageable – can the program be effectively managed with local capabilities;
3. Area Appropriate – is the program is suitable/applicable to the Study Area; and,
4. Compliance with Regulations and Policies – does the program comply with regulations and policies.

Programs that satisfied the screening criteria are summarized in Table 6.2 and are identified as requiring further consideration for possible inclusion in the Waste Management Plan. Results from the screening exercise are summarized in Tables 6.3-6.6.

Table 6.2: Short List of Waste Management Plan Components and Programs

Reduction/Diversion	Handling/Collection	Processing	Disposal
Public Information*	Curb Side*	Materials Recovery*	Landfill*
Reduction*	Direct Haul*	Shredding	
Re-Use	Depot(s)*	Baling/Compacting	
Recycling*	Transfer Station(s)		
On-site Composting	Source Separation*		
Central Composting			
Special Wastes*			

The Town's existing Waste Management Plan incorporates the programs denoted with an asterisk (*). Re-Use and On-site Composting also occurs to an unknown and assumed minimal extent.

Table 6.3: Screening of Waste Reduction and Diversion Programs							
Criteria	**Public Education**	**Waste Reduction**	**Re-Use**	**Recycling**	**On-Site Composting**	**Central Composting**	**HH Special Waste**
Program Proven	- successfully demonstrated in various jurisdictions - demonstrated throughout the Study Area with source separation/Blue Box program	- successfully demonstrated in various jurisdictions - results are immediate, identifiable and attributable	- product re-use is demonstrated in various jurisdictions - re-use centres demonstrated municipally, volunteer organizations and commercial ventures	- demonstrated in other jurisdictions and locally with the Town's Blue Box Program	- demonstrated in other jurisdictions	- demonstrated in other jurisdictions	- demonstrated in other jurisdictions and used locally
Locally Manageable	-can be delivered and managed locally - program driven by local needs	- can be delivered and managed locally under existing political structure - compliments municipal/provincial/national programs	- can be delivered and managed locally - may be suitable as a commercial venture	- can be delivered and managed locally	-could be delivered and managed locally depending on the level of program	- manageable locally - possible to form network of communities with neighbouring municipalities or development of commercial venture	- manageable locally - opportunities to network with IC&I sector locally and with nearby municipalities
Area Appropriate	- must be area specific to address rural/local needs - must address language/culture needs - can be conducted all year	- may have to target specific groups within area - can be practiced all year	- may require distinct delivery strategy dependent upon area serviced - may be developed for use all year	- may require distinct delivery strategy dependent upon area serviced - may be developed for use all year	- addresses demonstrated area need	- appropriate for area use - may require special facilities or structures to accomplish year-round operation	- appropriate for area use - may require special facilities - may require specialized training or certification for delivery
Compliance with Regulations and Policies	- consistent with regulations and policies	- allows achievement of provincial/municipal targets	- allows achievement of provincial/municipal targets	- may require approval for facilities	- consistent with regulation and policies - consistent with waste reduction and legislation targets	- consistent with waste reduction and legislation targets	- consistent with Regulations
Warrants Further Consideration?	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration

Table 6.4: Screening of Waste Collection and Handling Programs					
Criteria	**Curbside Collection**	**Direct Haul**	**Depot(s)**	**Transfer Station(s)**	**Source Separation**
Program Proven	- successfully demonstrated in various jurisdictions - currently in use within the Town for household and IC&I wastes and Blue Box program	- successfully demonstrated in various jurisdictions - currently in use throughout the study area for rural and urban household waste, IC&I wastes and Blue Box material	- successfully demonstrated in various jurisdictions - currently in use for Blue Box material in Town of Blind River	- successfully demonstrated in various jurisdictions	- successfully demonstrated in various jurisdictions - in use locally for Blue Box program
Locally Manageable	- manageable locally - networking opportunities for Blue Box program with MRF operator	- manageable locally - is the responsibility of the waste generator	- manageable locally - may serve rural/small urban needs adequately	- manageable locally - may serve rural/small urban needs adequately	- manageable locally - would have to be coupled with public education component to be effective
Area Appropriate	- appropriate for urban area - appropriate for some rural areas	- appropriate for both urban and rural areas	- appropriate for both urban and rural areas	- appropriate for rural areas - may not be appropriate for urban areas	- appropriate for urban and rural areas
Compliance with Regulations and Policies	- complies with regulations and policies - service encourages waste reduction	- complies with regulations and policies	- complies with regulations and policies - could combine diversion/disposal	- complies with regulations and policies - requires approvals for operation - could combine diversion/disposal	- complies with regulations and policies
Warrants Further Consideration?	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration

Table 6.5: Screening of Waste Processing Programs			
Criteria	**Materials Recovery Facility**	**Shredding**	**Bailing/Compaction**
Program Proven	- successfully demonstrated in various jurisdictions - demonstrated locally by MRF facility in the Town of Blind river	- successfully demonstrated in various jurisdictions	- successfully demonstrated in various jurisdictions
Locally Manageable	- locally manageable - networking opportunities i.e. MWRC	- locally manageable - networking opportunities possible i.e. shared machinery or contracted services	- locally manageable - networking opportunities possible i.e. shared machinery
Area Appropriate	- appropriate for study area	- appropriate for study area, dependent on quantity	- appropriate for study area, dependent on quantity
Compliance with Regulations and Policies	- complies with regulations and policies -requires approvals	- complies with regulations and policies	- complies with regulations and policies
Warrants Further Consideration?	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration	**YES**- complies with all criteria and warrants further consideration

Table 6.6: Screening of Waste Disposal Programs								
Criteria	**Landfill**	**Export**	**Incinerate**	**Energy from Waste**	**Wet Oxidation**	**Plasma Torch**	**Hydrolysis**	**Pyrolysis**
Program Proven	- successfully demonstrated in various jurisdictions - demonstrated successfully in the Town of Blind River	- component proven in various jurisdictions	- component proven in various jurisdictions	- component proven in various jurisdictions	- not directly used to treat municipal solid waste	- new technology - not proven	- new technology - not proven	- new technology - not proven
Locally Manageable	- locally manageable	- locally manageable	- not locally manageable	- not locally manageable	- not locally manageable	- not locally manageable	- not locally manageable	- not locally manageable
Area Appropriate	- appropriate for study area	- appropriate for study area	- limited application to study area due to waste quantity requirements	- limited application to study area due to waste quantity requirements	- limited application to study area due to waste quantity requirements	- limited application to study area due to waste quantity requirements	- limited application to study area due to waste quantity requirements	- limited application to study area due to waste quantity requirements
Compliance with Regulations and Policies	- complies with regulations and policies - requires approvals for development and operations	- consistent with existing regulations but not with MECP policy - not specifically regulated	- would require complex approvals	- would require complex approvals	- would require complex approvals	- would require complex approvals	- would require complex approvals	- would require complex approvals
Warrants Further Consideration?	**YES**- complies with all criteria and warrants further consideration	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria	**NO**- component does not comply with all criteria

6.2 Alternative Programs Identified in the ToR

The alternative programs identified in the ToR are:

1. Do Nothing;
2. Increased diversion;
3. Landfill (new or expand);
4. Thermal Processing; and,
5. Exporting Waste.

Items 4 and 5 were removed from consideration during the screening exercise (subsection 6.1 herein) and Items 2 and 3 are included in the short list of alternative programs (Table 6.2). Item 1, the "do nothing" alternative, is described in Sub-section 6.2.1.

6.2.1 Do Nothing

The "do nothing" alternative considers the premise that remaining waste capacity at the existing waste disposal site would be utilized and waste management services provided by the Town would not be expanded or improved. This alternative considers the resulting circumstances should steps to address the decreasing landfill capacity and need for a long-term Waste Management Plan not be taken and is used as a benchmark when considering the suitability of other "alternatives to" the undertaking.

The "do nothing" alternative is considered a non-feasible approach to addressing the Town's waste management needs. Should the current waste disposal site be operated until capacity and closure, residents and businesses would be left without an appropriate waste disposal option. This may result in the development of unregulated dump sites, possibly leading to negative environmental effects relating to air, land and water contamination. This approach does not require action from the Town to implement; however, following closure the Town would be required to care for the site to ensure its compliance with applicable MECP regulations and standards. This approach does not address the Town's projected waste streams or volumes and therefore does not address the stated problem or opportunity.

6.3 Evaluation Criteria

The evaluation of "alternatives to" (i.e. alternative programs) considered the characteristics of the specific programs, their applicability and suitability, as well as their environmental effects and impact management measures. Environmental, technical and economic evaluation criteria, as proposed in the EA ToR, are presented in Table 6.7.

Table 6.7: "Alternatives to" Evaluation Criteria	
Criteria Group	**Criteria**
Environment	Relative general impacts (positive and negative) to the: 1. Natural environment (what components of the natural environment may be affected by the alternative (i.e. air/water/land); 2. Social environment (incl. transportation considerations); 3. Cultural environment; and, 4. Economic environment (incl. transportation considerations).
Technical Considerations	1. Does the alternative address the stated problem or opportunity and meet all applicable regulations and policies affecting the alternative? 2. Can the alternative respond to changes such as increased diversion, or fluctuations in waste quantities? 3. Has the alternative been proven through approval of similar facilities and successful operating experience in Northern Ontario?
Economic Considerations	1. Relative cost of alternatives. 2. Town's ability to implement the alternative.

6.3.1 Environment

This criterion compared the programs based on their potential effects on the natural, social/cultural and economic environment, including, for example, evaluations of impact on: surface/groundwater, land, air, wildlife communities, heritage and cultural resources, and residential/Indigenous/industrial communities.

6.3.2 Technical Considerations

This criterion compared the suitability of each program to address the Town's needs and comply with applicable regulations and policies. Programs were also compared considering their flexibility with respect to waste volumes and compositions and their expected effectiveness.

6.3.3 Economic Considerations

This criterion considers costs associated with each program and the Town's ability to implement each program.

6.4 Scoring of Alternative Programs

Relative impact scores of low, medium and high were assigned based on qualitative and quantitative indicators, including: information available in existing reports and studies; and, public/agency input/comments. Impact scores were assigned, relatively, as follows:

Low (1): The implementation of the alternative has minimal to no impact on the criterion being considered.

Medium (2): The implementation of the alternative has moderate impact on the criterion being considered.

High (3): The implementation of the alternative has significant/direct impact on the criterion being considered.

Individual criteria scores as well as advantages and disadvantages associated with implementing each program are summarized in Tables 6.9 to 6.16 and described in the following subsections.

6.4.1 Reduction/Diversion Programs (Tables 6.9 and 6.10)

All 7 of the reduction/diversion programs considered are expected to reduce the volume of waste that ultimately enters the disposal stream. The 4 programs with the lowest total impact rankings were determined to be: public information; reduction; re-use; and, on-site composting. These 4 programs have similar expected impacts on the environment, technical and economic considerations and are currently practiced to varying degrees/formalities in the Town of Blind River. All reduction/diversion programs should be monitored for effectiveness and enhanced as part of the Waste Management Plan as opportunities arise. Of the 3 programs with similarly higher scores, blue box recycling and special waste diversion programs (contracted biennial special waste collection days) are included in the current Waste Management Plan. These programs have the greatest potential to reduce the volumes of waste and environmental contaminants directed to the disposal stream. Central composting of leaf and yard waste can be conducted within a designated area at the landfill site; however, significant capital and operational outlay would be required to develop an organics composting program.

Due to the potential for reduction/diversion programs to reduce waste volume entering the disposal stream, reduce contaminant loads, and involve residents and ICI sectors in reduction and diversion practices they are all considered for inclusion in the Waste Management Plan. Notable caveats are that central composting would be best undertaken only for leaf and yard waste and special waste diversion on a contracted basis at a frequency determined by the Town.
The effectiveness of programs that are included in the current Waste Management Plan would be monitored and improvements made as required and feasible. For example, waste diversion and recycling programs were evaluated as part of the "*Waste Recycling Strategy*" prepared for the Town in May of 2012 (a copy is provided in Appendix A) considering a series of criteria that included:

1. Percentage of waste diverted from landfill (will the component decrease the current volume to waste directed to landfill?);
2. Proven results (is the component a best practice recognized by Waste Diversion Ontario?);
3. Reliable market/end use (will the component capture materials that have an established end market?);
4. Economically feasible (will the component be cost-effective?);
5. Accessible to the public (will the component be accepted/understood by the public?); and,
6. Ease of implementation (will the component be easily implemented with existing programs?).

Results of the evaluation, summarized in Table 6.8, identified a number of priority and future initiatives.

Table 6.8: Priority and Future WRS Initiatives

	Priority Initiatives	*Corresponding Reduction/Diversion WMP*
1.	Public Education and Promotion Program	Public Education
2.	Training of Key Program Staff	Recycling
3.	Bag Limits/Increase Materials Diverted	Reduction
4.	Provision of Free Blue Boxes	Recycling
5.	Assess Tools and Methods to Maximize Diversion	n/a
6.	Follow Generally Accepted Principles for Effective Procurement and Contract Management	n/a
	Future Initiatives	
A.	Optimization of Collection Operations	Recycling
B.	Enhancement of Recycling Depots	Recycling
C.	Multi-municipal Collection and Processing of Recyclables	n/a
D	Standardized Service Levels and Collaborative Recyclables	n/a

n/a – not applicable as initiative does not correspond with a specific reduction/diversion WMP.

6.4.2 Handling/Collection Programs (Tables 6.11 and 6.12)

The handling/collection alternative programs curb side collection, direct haul and source separation were scored as having the least overall impact for the criteria considered. These programs can be undertaken in a manner that would allow residents and businesses to dispose of their wastes with convenience. These programs can be practiced in combination with other waste management programs and can lead to an increase in the amount of waste diverted from landfill. The cost to direct haul waste is borne by the waste generator and, while source separation is largely dependent on market reliability, this program can reduce the costs of other Waste Management Plan components (e.g. increase waste disposal site life). Establishing depots was given an overall score of neither best nor worst for the criteria evaluated and, as they are part of the Town's existing Waste Management Plan, would remain in-place with consideration given to their enhancement. Transfer stations were scored highest (i.e. least desirable).

6.4.3 Processing Programs (Table 6.12 and 6.14)

The materials recovery program was the preferred option for the processing component of the Town's Waste Management Plan. It was evaluated as having less of an overall negative effect on the environment as it helps to minimize the impacts to air, land and water by reducing the amount of waste being sent to landfill. This program supports and fosters community involvement and is expected to not have significant impact on the economic environment as a materials recovery facility (MRF) currently operates within the Town of Blind River. This program assists in achieving waste diversion targets set by the Town and is a suitable option for the waste stream produced throughout the service area. The cost to execute this program was found to be similar to the other processing programs evaluated; however, enhancement may be possible as the cost of operation and services may be reduced by increased participation of neighbouring municipalities. This program will continue to be practiced as part of the

Town's Waste Management Plan. Shredding and bailing/compacting programs were less desirable and scored higher.

6.4.4 Disposal Programs (Tables 6.15 and 6.16)

Landfill was the only disposal program that warranted further consideration following the development of the short-list of alternative Waste Management Plan programs. Although negative impacts to air, land and water are possible as a result of landfilling operations, these effects can be mitigated through proper management and the application of appropriate control methods. Depending on site location, this option may result in minimal impacts to the social and economic environments with respect to visual impacts and adjacent property values. This program provides a solution to the Town's waste management needs while being easily implemented as the Town has experience with the operation and maintenance of a waste disposal site. The landfilling option has flexibility with respect to waste volumes and composition and is expected to be capable of handling the Town's current and projected waste disposal stream. It is anticipated that costs associated with the landfilling option can be optimized through effective site selection and operations as well as the implementation of other waste management programs (e.g. recycling program).

Table 6.9: Alternative WMP Reduction and Diversion Programs

Criterion \ Program	Public Information	Reduction	Re-Use	Recycling	On-Site Composting	Central Composting	Special Waste
ENVIRONMENT							
Effect on Natural Environment	- can reduce land/water contamination from landfill with less waste produced when effective	- can reduce negative environmental effects and need for mitigation with reduced waste volumes - reduces the impact on natural resources	- can reduce negative environmental effects and need for mitigation with reduced waste volumes - reduces the impact on natural resources	- decreased depletion of natural resources and energy demand	- reduces methane generation component and reduces source of organic acids at landfill site	- reduces methane generation component and reduces source of organic acids at landfill site - impacts related to noise and odour may result	- prevent natural resource contamination by providing a solution to indiscriminate dumping or landfill disposal - risk of accidental spill - possibility of creating noise/odour impacts to environment during collection/transport/storage
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**2**	**2**
Effect on Social/Cultural Environment	- provides information to local communities and encourages public participation	- supports community commitment to reductions in wastes volumes and awareness of WMP	- supports community commitment to reductions in wastes volumes and awareness of WMP	- supports community commitment to reductions in wastes volumes and awareness of WMP	- supports community commitment to reductions in wastes volumes and awareness of WMP	- supports community commitment to reductions in wastes volumes and awareness of WMP	- supports community commitment to reductions in wastes volumes and awareness of WMP - information/participation opportunity for residents
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Effect on Economic Environment	- cost effective waste management component which can improve effectiveness of other components	- may reduce overall waste management costs (diverts waste) - may reduce mitigation costs	- may reduce overall waste management costs (diverts waste) - may reduce mitigation costs	- may reduce overall waste management costs (diverts waste) - may reduce mitigation costs	- may reduce overall waste management costs (diverts waste) - may reduce mitigation costs	- may reduce overall waste management costs (diverts waste) - may reduce mitigation costs	- increases overall waste management costs - may reduce mitigation costs as diverts waste from landfill
Impact Ranking	**1**	**1**	**1**	**2**	**1**	**2**	**2**
Criterion Group Total	**3**	**3**	**3**	**4**	**3**	**5**	**5**
TECHNICAL							
Addresses Stated Problem/Provides a Viable Solution to the Need	- assists in achievement of waste diversion targets	- assists in achievement of waste diversion targets - reduction in wastes that require disposal	- assists in achievement of waste diversion targets - reduction in wastes that require disposal	- assists in achievement of waste diversion targets - reduction in wastes that require disposal	- reduces waste volumes in the disposal stream - reduces the load on waste collection / handling	- reduces waste volumes in the disposal stream - results in a useful end product	- reduces waste volumes in the disposal stream - removes contaminants from disposal stream
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Flexibility of Alternative	- the scope of the program can be determined by the local needs - can be combined with other components	- the scope of the program can be determined by the local needs - can be combined with other components	- the scope of the program can be determined by the local needs - adaptable by product, level of service and level of convenience - can be combined with other components	- the scope of the program can be determined by the local needs and markets - can be combined with other components	- the scope of the program can be determined by an individual's needs - can be combined with other components	- the scope of the program can vary - can be combined with other components	- year round or seasonal approach is somewhat adaptable technology but highly regulated - periodic "special waste days" are adaptable and less onerous to the Town - can be combined with other components
Impact Ranking	**1**	**1**	**1**	**2**	**1**	**2**	**2**
Compliance with Regulation and Policies	- consistent with regulations and policies	- consistent with regulations and policies	- consistent with regulations and policies	- consistent with regulations and policies - there is an existing MRF in Blind River	- consistent with regulations and policies	- if more than leaf and yard wastes, requires approved facilities with supervision and operational support	- if centralized year-round or seasonal system is adopted, requires approved facilities with supervision and operational support
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**2**	**2**
Appropriate for Study Area Waste Quantity/Mix	- appropriate for area quantity and mix of wastes as there is no max/min quantity considerations - must address language/culture needs - can be conducted all year	- appropriate for area quantity and mix of wastes - most significant opportunities when per capita waste generation rates high - may need to target specific groups within area - can be conducted all year	- appropriate for area quantity and mix of wastes - may be most suitable component for waste types such as building materials, clothing, furniture, etc. - can be conducted all year	- appropriate for area quantity and mix of wastes - can be conducted all year	- difficult to use all year without appropriate technologies, vermiculture	- appropriate for area quantity and mix of wastes - may need special consideration for wood wastes difficult to use all year without appropriate facility	- can be customized to suit the local needs and combined with other components - difficult to use all year without appropriate facility
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**1**	**1 – periodic program**
Alternative Proven	- successfully demonstrated in various jurisdictions - demonstrated throughout the Study Area with source separation/Blue Box program	- successfully demonstrated in various jurisdictions - results are immediate, identifiable and attributable	- is demonstrated in various jurisdictions - re-use centres demonstrated municipally, volunteer organizations and commercial ventures	- demonstrated in other jurisdictions and locally with the Town's Blue Box Program	- demonstrated in other jurisdictions and in Town of Blind River historically	- demonstrated in other jurisdictions	- centralized approach demonstrated in other jurisdictions - periodic approach demonstrated in Town of Blind River historically
Impact Ranking	**1**	**1**	**1**	**1**	**1**	**1**	**1 – periodic program**
Criterion Group Total	**5**	**5**	**5**	**6**	**5**	**7**	**7**
ECONOMIC							
Ability of the Town to Implement the Alternative	- can be developed to a level that is affordable as required - program driven by local needs	- can be developed to a level that is affordable as required	- program currently in-place, though opportunity exists to expand	- program currently in-place and opportunities to expand are market driven	- a program had historically been offered in Town, opportunity exists to re-engage	- possible to form network of communities with neighbouring municipalities or development of commercial venture	- the Town currently practices a biennial household special waste day - programs other than contractor operated "hazardous waste days" have high operational, storage, collection and transportation costs
Impact Ranking	**1**	**2**	**2**	**2**	**1**	**2**	**2**
Alternative Financially Realistic/Economically Viable	- cost of development/implementation of program should cause other, more costly components of the WMP to be more cost effective (focus on components of the WMP that would result in the greatest efficiencies (thus greatest reduction in operating costs))	- if developed to a level that is affordable	- if developed to a level that is affordable	- if developed to a level that is affordable	- costs associated with the purchase of a composter - cost effective way of handling certain organic household and yard waste materials - may require program support costs	- if more than leaf and yard wastes, requires approved facilities with supervision and operational support - potential for cost offset through sale of compost	- a centralized year round or seasonal facility is not viable without grouping together area municipalities - periodic "household special waste days" are costly but viable considering waste types removed from disposal and messaging to residents
Impact Ranking	**1**	**1**	**1**	**3**	**2**	**2**	**3**
Criterion Group Total	**3**	**3**	**3**	**5**	**3**	**4**	**5**
TOTALS	**10**	**11**	**11**	**15**	**11**	**16**	**17**

Table 6.10: Alternative WMP Reduction and Diversion Programs – Advantages and Disadvantages

Criterion \ Program	Public Information	Reduction	Re-Use	Recycling	On-Site Composting	Central Composting	Special Waste
ENVIRONMENT							
Advantages and Disadvantages	**Advantages**: -can increase effective waste management awareness and practices throughout the community **Disadvantages**: may single out non-compliance issues that may lead to social/cultural criticism	**Advantages**: - reduces potential environmental contamination - saves resources - diverts waste from landfill - creates community involvement **Disadvantages**: none	**Advantages**: - reduces potential environmental contamination - saves resources - diverts waste from landfill - creates community involvement **Disadvantages**: none	**Advantages**: - conserves resources - potential to reduce environmental contamination **Disadvantages**: if facilities are not managed properly, could create negative environmental effects - requires input of energy	**Advantages**: - diverts wastes from landfill - produces useable resource as and end result - saves natural resources - community awareness **Disadvantages**: can be difficult to enforce	**Advantages**: increases environmental protection - diverts wastes from landfill **Disadvantages**: can create negative impacts to the environment if not operated/managed properly	**Advantages**: increases environmental protection - diverts hazardous wastes from landfill **Disadvantages**: can create negative impacts to the environment if not operated/managed properly
TECHNICAL							
Advantages and Disadvantages	**Advantages**: - effective waste management awareness and practices are increased throughout the community **Disadvantages**: none	**Advantages**: - helps to achieve waste management objectives - reduces dependency on operating systems to address needs **Disadvantages**: - effectiveness relies largely on community participation	**Advantages**: - helps to achieve waste management objectives **Disadvantages**: sorting of reusable materials can be inconvenient - effectiveness relies largely on community participation	**Advantages**: helps to achieve waste management objectives **Disadvantages**: number of materials may be limited to market availability - effectiveness relies largely on community participation	**Advantages**: assists in achieving diversion targets - requirements for waste handling and collection may be reduced **Disadvantages**: not everyone can compost - system relies on community participation	**Advantages**: addresses a portion of the disposal needs for which other reasonable solutions do not exist **Disadvantages**: requires awareness/participation of the community to be successful	**Advantages**: addresses a portion of the disposal needs for which other reasonable solutions do not exist **Disadvantages**: requires awareness/participation of the community to be successful
ECONOMIC							
Advantages and Disadvantages	**Advantages**: overall cost of other components are reduces - through success, public education program cost should decrease **Disadvantages**: staff may be required to initiate public education program - there are immediate required costs needed to implement the program	**Advantages**: - may reduce other waste management costs **Disadvantages**: may be dependent on market availability	**Advantages**: - may reduce other waste management costs **Disadvantages**: may require facility development	**Advantages**: - cost recovery opportunities **Disadvantages**: facility and operating costs - program success dependent on market	**Advantages**: - minimal costs to waste management systems - requires little support **Disadvantages**: results are dependent on community participation	**Advantages**: - creates networking opportunities **Disadvantage**: higher overall costs	**Advantages**: - creates networking opportunities **Disadvantage**: higher overall costs

Table 6.11: Alternative WMP Handling and Collection Programs

Criterion \ Program	Curb Side	Direct Haul	Depot(s)	Transfer Stations	Source Separation
ENVIRONMENT					
Effect on Natural Environment	- Ensures waste removal and helps in controlling the waste stream flow and designation - May lead to a decrease in the level of littering - May lead to an increase in the level of greenhouse gases with respect to vehicle emissions - Could result in potential noise impacts associated with vehicle operations	- May increase the amount of wastes receiving proper management by allowing generators to take wastes to the appropriate facilities - Improper transport of wastes may result in an increased amount of roadside litter - Improper disposal may lead to negative effects to land and water - Potential negative effects with respect to an increase in noise, odour and dust emissions are possible as a result of multiple vehicles transporting wastes to disposal facilities	- Can reduce the improper dumping of waste material - Land may be required for facility construction (loss of vegetation/habitat) - If properly constructed/operated, facilities can have minimal impacts to land and water - Facility operations may lead to negative effects with respect to an increase in noise, dust, odour, litter and vehicle traffic - May create negative visual impacts	- Can reduce the improper dumping of waste material - Land may be required for facility construction (loss of vegetation/habitat) - If not properly managed, could lead to potential negative effects to air/water/land as a result of facility operations - Land may be required for facility construction (loss of vegetation/habitat) - Waste may attract scavenging wildlife to the area	- Alternative may reduce impact on natural resources as it can reduce to amount of waste being sent to landfill - Reduces environmental impacts to air/land/water as materials would be diverted from landfill/disposal
Impact Ranking	**2**	**2**	**3**	**3**	**1**
Effect on Social/Cultural Environment	- Provides a convenient method of disposal for residents and the IC&I sector - Requires a high level of community participation to be effective	- Provides an option for residents and business to dispose of wastes when required - May not be desirable for waste generators to transport their own wastes - May cause an increased number of traffic conflicts	- Convenient for waste generators that are not located in an area serviced by curb side collection programs - Relies on community participation - Provides an option for residents and business to dispose of wastes when required - May not be desirable for waste generators to transport their own wastes	- Increase of traffic may affect those living in the vicinity of the facility - Haul distances may be increased depending on the location of the facility - The construction of a transfer facility may negatively impact adjacent properties with respect to odours, dust, noise, nuisance animals and visual impacts - May be appropriate for rural areas where haul distances to processing and/or disposal facilities are great	- Requires community participation to be effective - May be an inconvenience for residence to separate materials
Impact Ranking	**2**	**2**	**2**	**2**	**2**
Effect on Economic Environment	- The convenience of curb side collection may help to enhance business performance and maintain corporate social responsibility - Has to opportunity to create local employment - cost to the Town to operate	- Cost of transportation and disposal of wastes is the responsibility of the waste generator	- Property values may decrease for those located in close vicinity to the facility - Businesses may be required to transport wastes a greater distance depending on the location of the facility - cost to the Town to operate	- Property values may decrease for those located in close vicinity to the facility - Businesses may be required to transport wastes a greater distance depending on the location of the facility - cost to the Town to operate	- Program may be beneficial to other waste management programs (e.g. increase landfill life by diverting waste to their appropriate waste streams)
Impact Ranking	**2**	**1**	**2**	**2**	**1**
Criterion Group Total	**6**	**6**	**7**	**7**	**4**
TECHNICAL					
Addresses Stated Problem/Provides a Viable Solution to the Need	- Assists in providing a solution to the Town's waste management needs	- Assists in providing a solution to the Town's waste management needs	- Depending on the level of service provided, this WMP program could assist in providing a solution to the Town's waste management needs	- Depending on the level of service provided, this WMP program could assist in providing a solution to the Town's waste management needs if haul distance to landfill warrants	- Depending on the level of service provided, this WMP program could assist in providing a solution to the Town's waste management needs
Impact Ranking	**1**	**1**	**1**	**1**	**1**
Flexibility of Alternative	- Adaptable with respect to the level of service, frequency of service, type of equipment use and labour requirements - May be limited by the capacity of the collection vehicles - The level of service may be affected by haul distance - Can be combined with other waste management programs	- Adaptable with respect to delivery method and waste type (e.g. landfill waste, recyclables, etc.) - As residents and business haul their own wastes, specialized waste collection vehicles are not required by the Town - Appropriate for urban and rural areas - Can be combined with other waste management programs	- Requires more individual effort but could allow for a greater opportunity for the disposal of a variety of materials (e.g. recyclables, hazardous waste, etc.) - Appropriate for urban and rural areas - Can be combined with other waste management programs	- flexible with respect to type, size and location of the facility - Appropriate for rural areas - May not be appropriate for urban areas	- Program is flexible with respect to the material separated and the degree of comingling permitted; however relies on market availability to be effective - no minimum or maximum waste quantities - Appropriate for urban or rural areas
Impact Ranking	**2**	**1**	**2**	**3**	**2**
Compliance with Regulation and Policies	- Can be operated to comply with applicable regulations and policies	- Complies with regulations and policies - The receiving site requires the appropriate approvals prior to receiving incoming wastes	- Complies with regulations and policies - Program assists in waste reduction targets - Approvals would be required for the construction and operation of a depot facility	- Complies with regulations and policies - Program has the possibility to incorporate diversion programs, helping to achieve waste diversion targets - May require approvals prior to construction and/or operation	- Complies with regulations and policies - Program assists in waste reduction targets and directs wastes to the appropriate waste streams
Impact Ranking	**1**	**1**	**1**	**1**	**1**
Appropriate for Study Area Waste Quantity/Mix	- Capable of handling the Town's current and projected waste stream - Can provide the collection of multiple waste streams	- Capable of handling the Town's current and projected waste stream - Appropriate for the waste quantity/mix produced throughout the study area	- Capable of handling the Town's current and projected waste generation - Can provide the collection of multiple waste streams	- Appropriate for the waste quantity/mix produced throughout the study area - Can provide the collection of multiple waste streams	- Appropriate for the waste quantity/mix produced throughout the study area
Impact Ranking	**1**	**1**	**1**	**1**	**1**
Alternative Proven	- This WMP program has been successfully demonstrated in various jurisdictions and is currently practiced by the Town	- This WMP program has be successfully demonstrated in various jurisdiction and is use throughout the study area	- This WMP program has been successfully demonstrated in various jurisdictions and is currently practiced	- This WMP program has been successfully demonstrated in various jurisdictions	- This WMP program has been successfully demonstrated in various jurisdictions and is currently practiced as part of the Town's Blue Box recycling program
Impact Ranking	**1**	**1**	**2**	**2**	**1**
Criterion Group Total	**6**	**5**	**7**	**8**	**6**
ECONOMIC					
Ability of the Town to Implement the Alternative	- curb side collection is practiced as part of current waste management plan	- direct hauling is practiced as part of current waste management plan	- Blue Box program is implemented as part of current waste management plan	- The Town is capable of implementing this alternative	- The Town is capable of implementing this alternative, Blue Box materials are currently separated for collection
Impact Ranking	**1**	**1**	**1**	**1**	**1**
Alternative Financially Realistic/Economically Viable	- This program is financially suitable for urban and some rural areas - Minimum waste quantities are required to improve cost effectiveness - May be less costly to residents than other WMP programs (e.g. direct haul)	- Costs associated with the collection of wastes are incurred by the waste generator - costs associated with a site attendant and/or facility to receive wastes - Costs associated with the receiving facilities are borne by the municipality and are dependent on the number of facilities and operating hours	- Costs are dependent upon frequency/density served, the hours of operation; the services provided, the extent of the facilities required and the materials accepted	- Costs are dependent on land required, facility development, the services provided and operation and maintenance costs - Costs to transport materials from the transfer facility to a waste management or diversion facility - Minimum waste quantities are required to make the program cost effective	- The cost of source separation is minimal to the waste generator - Costs to collect and transport materials to depots, markets or other waste management facilities
Impact Ranking	**2**	**1**	**2**	**2**	**2**
Criterion Group Total	**3**	**2**	**3**	**3**	**3**
TOTALS	**15**	**13**	**17**	**18**	**13**

Table 6.12: Alternative WMP Handling and Collection Programs – Advantages and Disadvantages					
Program / Criterion	**Curb Side**	**Direct Haul**	**Depot(s)**	**Transfer Stations**	**Source Separation**
ENVIRONMENT					
Advantages and Disadvantages	**Advantages**: Provides a high level of service - Allows for a high level of community participation - Increases the volume of waste materials properly handled - Decreases the need for direct haul and associated littering **Disadvantages**: - Collection vehicles may create effects related to traffic congestion/flow	**Advantages**: - Waste generators dispose of wastes when required **Disadvantages**: Can result in waste accumulation at the source, possibly leading to contamination of land/water - May not be desirable for waste generator to transport own wastes	**Advantages**: - Reduction of uncontrolled disposal **Disadvantages**: Potential negative environmental impacts may result (i.e. visual impacts, noise, odour) - May lead to litter accumulation in close vicinity to the facility	**Advantages**: - Reduction of uncontrolled disposal **Disadvantages**: Can have negative impacts to surrounding area - Increased dust, odour, litter near site is possible	**Advantages**: - encourages responsible waste handling throughout the community **Disadvantages**: none
TECHNICAL					
Advantages and Disadvantages	**Advantages**: Allows for a combination of waste materials to be collected simultaneously - Can be used with other waste diversion components - Assists in diverting wastes from landfill (recyclables) **Disadvantages**: Program may have limitations due to vehicle capacities, collection frequencies, type of waste material - Relies on the compliance of residents for source separation - Not as suitable for rural areas as urban	**Advantages**: - can lead to increased use of diversion components at landfill - can be combined with other waste management components - relies on waste generator for source separation and proper transport/disposal of wastes **Disadvantages**: May lead to an increase in traffic to the landfill	**Advantages**: - can accept a variety of materials at one location - provides increase level of service to rural areas - Waste can be directed to the appropriate waste stream **Disadvantages**: Increases waste handling	**Advantages**: - provides increase level of service to rural areas -reduces traffic to landfill as well as haul distances **Disadvantages**: requires additional handling of wastes	**Advantages**: - assists in achieving waste diversion target - can lead to a decrease in waste disposal quantities **Disadvantages**: relies largely on the participation of the community to be effective
ECONOMIC					
Advantages and Disadvantages	**Advantages**: Collection services can be combined to increase cost effectiveness **Disadvantages**: Requires a minimum waste quantity to be cost effective - Costs may increase for rural waste generators	**Advantages**: - low cost waste management program **Disadvantages**: there may be increased costs associated with the level of service at facilities receiving wastes	**Advantages**: Cost effective service - Flexible design opportunities - Can be operated at low cost and low maintenance **Disadvantages**: Can have negative effects on land use values - Depending on the services provided at the facility, operation costs may be increased	**Advantages**: - cost effective for rural areas - cost associated with collection of wastes may be decreased **Disadvantages**: may create negative impacts on adjacent land values	**Advantages**: Costs may be minimal as they are mainly borne by the generator - Costs of other waste management components may be decreased **Disadvantages**: dependent on market availability and material prices

Table 6.13: Alternative WMP Processing Programs

Criterion \ Program	Materials Recovery	Shredding	Bailing/Compacting
ENVIRONMENT			
Effect on Natural Environment	- Diverts material from landfill helping to minimize effects to the natural environment - May lead to an increase in dust, odour and noise due to facility operations	- Can assist in decreasing facility size and land requirements - May result in air quality impacts due to dust/exhaust from shredding equipment - May lead to noise impacts as a result of shredding operations - Waste build up prior to shredding may lead to an increase in odours - May produce leachate at a greater rate	- Can reduce the amount of land required for facilities - Potentially reduced leachate and methane gas generation by slowing the decomposition process - Can lead to noise, dust and odour impacts from collection and facility operations - Can help to reduce occurrence of vermin and other nuisance wildlife at waste handling or disposal site - Can reduce wind blown litter
Impact Ranking	**1**	**2**	**2**
Effect on Social/Cultural Environment	- Fosters community involvement	- A decrease in disposal facility size and/or land required for a facility	- A decrease in disposal facility size and/or land required for a facility
Impact Ranking	**1**	**1**	**1**
Effect on Economic Environment	- Depending on the location of a materials recovery facility, adjacent properties may experience a decrease in value - Can provide local employment for the handling/processing of materials	- Depending on the need and/or location of a potential facility, adjacent properties may experience a decrease in value	- Depending on the need and/or location of a potential facility, adjacent properties may experience a decrease in value
Impact Ranking	**1**	**2**	**2**
Criterion Group Total	**3**	**5**	**5**
TECHNICAL			
Addresses Stated Problem/Provides a Viable Solution to the Need	- Assists in providing a solution to the Town's waste management needs - Helps to achieve waste diversion targets - Requires disposal of residual wastes - diverts waste from landfill	- Program requires the disposal or reuse of wastes following shredding - Can be implemented to assist in the operation of other waste management plans (e.g. help to increase landfill life) - Does not directly assist in achieving waste diversion targets	- Program requires the disposal or reuse of wastes following bailing/compaction - Can be implemented to assist in the operation of other waste management plans (e.g. help to increase landfill life) - Does not directly assist in achieving waste diversion targets
Impact Ranking	**1**	**2**	**2**
Flexibility of Alternative	- Can be designed to accommodate a wide range of material and quantities - Would require a varying degree of labour input based on material volume and type, degree of segregation required and type of process used in the facility	- Can be used to accommodate a variety of materials prior to reuse or disposal - Can be operated throughout the year - May not be practical for small quantities of wastes	- Machinery can be portable or stationary and can very in size depending upon need - Not limited by waste quantities - Can be used to accommodate a variety of material
Impact Ranking	**1**	**2**	**1**
Compliance with Regulation and Policies	- Complies with regulations and policies - MRF is currently operational in Blind River	- Complies with regulations and policies	- Complies with regulations and policies
Impact Ranking	**1**	**1**	**1**
Appropriate for Study Area Waste Quantity/Mix	- Capable of handling the Town's current and projected waste stream - Appropriate for the waste quantity/mix produced throughout the study area	- Appropriate for the waste quantity/mix produced throughout the study area	- Appropriate for the waste quantity/mix produced throughout the study area
Impact Ranking	**1**	**2**	**2**
Alternative Proven	- Has been successfully demonstrated in various jurisdictions - Demonstrated locally by MRF operating in the Town of Blind River	- Has been successfully demonstrated in various jurisdictions in combination with other waste management programs	- This WMP program has been successfully demonstrated in various jurisdictions and is currently practiced at the MRF
Impact Ranking	**1**	**1**	**1**
Criterion Group Total	**5**	**8**	**7**
ECONOMIC			
Ability of the Town to Implement the Alternative	- Town is capable of this WMP program as an MRF is located in Town	- The Town is capable of implementing this waste management program	- The Town is capable of implementing this waste management program
Impact Ranking	**1**	**1**	**1**
Alternative Financially Realistic/Economically Viable	- a privately owned and operated site is currently situated in the Town of Blind River	- Costs associated with equipment, operations and potential facility development (dependent on waste volumes and types of materials accommodated) - Shared cost of equipment or contracted service (i.e. networking with neighbouring communities) may make the program viable	- Costs are associated with the purchase of equipment and potential facility cost - Operation and maintenance costs relating to labour, binding supplies, equipment transportation and operation - Volume of waste may not warrant expense of program
Impact Ranking	**1**	**3**	**3**
Criterion Group Total	**2**	**4**	**4**
TOTALS	**10**	**17**	**16**

Table 6.14: Alternative WMP Processing Programs – Advantages and Disadvantages

Criterion \ Program	Materials Recovery	Shredding	Bailing/Compacting
ENVIRONMENT			
Advantages and Disadvantages	**Advantages**: Decreases negative impacts to environment by diverting wastes from landfill - Supports community involvement with waste management system **Disadvantages**: None, MRF is currently operating	**Advantages**: - Reduces land requirements for landfill site **Disadvantages**: May increase rate of leachate production	**Advantages**: - can reduce rate of leachate production - Can reduce vector concerns by reducing litter propagation **Disadvantages**: increases contaminating lifespan - Can result in impacts related to dust/odour/noise
TECHNICAL			
Advantages and Disadvantages	**Advantages**: Helps to achieve waste management objectives - Use of facility is not limited by the time of year **Disadvantages**: Number of materials may be limited to market availability - Effectiveness relies largely on community participation - May require additional handling/processing of waste material	**Advantages**: - Can be used for a variety of materials **Disadvantages**: Does not assist in waste diversion	**Advantages**: - Increases landfill life - Can be combined with other waste management components - Not limited by waste quantities **Disadvantages**: May lead to increase in handling/processing times - does not improve waste diversion
ECONOMIC			
Advantages and Disadvantages	**Advantages**: - Cost recovery/offset opportunities - Costs can be reduced by sharing operations/services with other municipalities **Disadvantages**: Costs are dependent on the volume of waste quantities received - Costs may be high for handling/storage prior to materials being marketable	**Advantages**: May reduce costs related to the operation of other waste management components - Can be operated in conjunction with other components - Operation/services can be shared/contracted out to reduce costs **Disadvantages**: - Costs effectiveness is dependent on waste volumes and types of wastes accommodated	**Advantages**: - Can reduce costs of other waste management components **Disadvantages**: - high initial equipment costs

Table 6.15: Alternative WMP Disposal Programs

Criterion \ Program	Landfill
ENVIRONMENT	
Effect on Natural Environment	- Environmentally acceptable as site would be required to operate in compliance with applicable regulations and policies - May lead to negative impacts to land, surface water and groundwater - Potential for negative impacts related to air, noise and odour as a result landfill operations - Negative impacts to flora and fauna can be expected as a result of an expansion or establishment of a new site - Can lead to vector/vermin problems and the attraction of nuisance wildlife - Wastes may attract scavenging wildlife to the area
Impact Ranking	**3**
Effect on Social/Cultural Environment	- Sufficient buffer areas would create minimal visual impacts - Traffic going to and from the site may negatively affect those residents closest to the site
Impact Ranking	**2**
Effect on Economic Environment	- Can decrease property values adjacent to the site - Can provide local employment (e.g. site attendant, landfill contractor)
Impact Ranking	**2**
Criterion Group Total	**7**
TECHNICAL	
Addresses Stated Problem/Provides a Viable Solution to the Need	- Program provides a solution to the Town's waste management needs
Impact Ranking	**1**
Flexibility of Alternative	- High flexibility as the program can respond to changes in waste quantities and government policies and regulations
Impact Ranking	**1**
Compliance with Regulation and Policies	- Can be constructed and operated to meet applicable regulations and policies
Impact Ranking	**1**
Appropriate for Study Area Waste Quantity/Mix	- Capable of handling the Town's current and projected waste stream - Special wastes must still be managed at a separate disposal facility
Impact Ranking	**1**
Alternative Proven	- This program has been proven in various jurisdictions and is currently practiced by the Town
Impact Ranking	**1**
Criterion Group Total	**5**
ECONOMIC	
Ability of the Town to Implement the Alternative	- The Town is capable of this waste management program as landfilling is practiced as part of the current waste management system
Impact Ranking	**1**
Alternative Financially Realistic/Economically Viable	- Program is financially suitable - Costs associated with design, land acquisition, development, leachate treatment, monitoring and operations - Costs dependent on capacity requirements, methods of landfilling, environmental conditions and cost recovery method
Impact Ranking	**2**
Criterion Group Total	**3**
TOTALS	**15**

Table 6.16: Alternative WMP Disposal Programs – Advantages and Disadvantages

Criterion \ Program	Landfill
ENVIRONMENT	
Advantages and Disadvantages	**Advantages**: - Potential negative effects can be reduced through application of contamination control methods (i.e. leachate treatment, attenuation, landfill liner, etc.) **Disadvantages**: Environmental impacts to land/water/air - Can attract nuisance wildlife - Requires monitoring to ensure compliance
TECHNICAL	
Advantages and Disadvantages	**Advantages**: - Provides disposal area for those materials that cannot be diverted or otherwise used **Disadvantages**: Does not assist in waste diversion - Requires significant land area for operation - Requires monitoring over long period of time
ECONOMIC	
Advantages and Disadvantages	**Advantages**: - Costs can be reduced by effective site selection and proper disposal methods - Tipping fees may create revenue at site **Disadvantages**: Reduces adjacent land use values - Costs may increase with mitigation measures

6.5 Summary of Evaluation Results

From the evaluation described in the preceding Sections, the Town's preferred Waste Management Plan comprises the components and programs presented in Table 6.17.

Table 6.17: Programs for Inclusion in the Waste Management Plan

Reduction/Diversion	Handling/Collection	Processing	Disposal
Public Information*	Curb Side*	Materials Recovery*	Landfill*
Reduction*	Direct Haul*		
Re-Use	Depot(s)*		
Recycling*	Source Separation*		
On-site Composting			
Central Composting			
Special Wastes*			

The Town's existing Waste Management Plan incorporates the programs denoted with an asterisk (*).

Only the materials recovery program would be undertaken by other than waste generators as an MRF is established and operated in the Town of Blind River by a private waste management company.

6.5.1 Programs Subject to EA Act Approval

The Town is committed to improving the effectiveness of reduction/diversion programs as and when possible in conjunction with the preferred disposal program (landfill) to maximize disposal site lifespan.

Of the programs identified in Table 6.17, disposal by landfilling (new/expanded) requires EA Act approval and is subject to the evaluation of alternative methods described in the following Sections.

7.0 ALTERNATIVE METHODS

As the preferred "alternative to" includes waste disposal by landfilling, the next steps in the EA planning process were to identify and evaluate alternative methods of carrying out this portion of the Waste Management Plan. The alternative methods considered were to expand the existing landfill site or establish a new or "green field" site, at one of a number of potential locations. Suitable candidate locations situated within the Study Area were identified following the process described in Section 7.1.

7.1 Identification of Alternative Landfill Locations

To identify alternative landfill site locations within the Study Area, a screening exercise was undertaken by applying criteria considering location accessibility, various environmental considerations, terrain and geology. Candidate locations were identified for consideration by applying the following criteria:

1. 200m buffer around lakes, streams, rivers, wetland areas, parks and conservation areas;
2. 500m buffer around built-up areas of the community;
3. 50m buffer along roadways;
4. Terrain should be relatively flat; and,
5. Geology (e.g. soil type and expected conditions) should be appropriate for waste disposal site development and operation.

A key consideration when identifying possible site locations was the proximity to where the majority of waste is being produced. This resulted in screening out lands beyond five kilometres to the north of Highway 17, establishing a candidate location search area within the Study Area. If an inadequate number of sites were identified within this search area the offset from Highway 17 would have been expanded. Once the search area was established, the buffers identified above (points 1, 2 and 3) were applied.

To identify areas with morainal, glaciofacluvial and/or glaciolacustrine landforms, the "*Ontario Geological Survey Data Base Map*" for the Blind River area was referenced. These geological landforms are preferred because of their tendency to assist with drainage and contain favourable granular material for waste disposal site development and operation. Other landforms such as organic and bedrock were excluded as being unsatisfactory for a waste disposal site. It was also anticipated land area required to service Blind River would be in the range of 30 hectares (fill area, buffers and contaminant attenuation zone), locations with areas under 30 hectares were therefore not included in the process.

As shown on Figure 7.1, six (6) candidate location were identified as being situated beyond the applied buffers, within the 5km search area and in areas with morainal, glaciofacluvial and/or glaciolacustrine landforms. The next step involved identifying the locations on satellite imagery and to consider the Town's Official Plan to identify any potential land use conflicts. A summary of the 6 candidate locations and their resulting analysis are presented in Table 7.1.

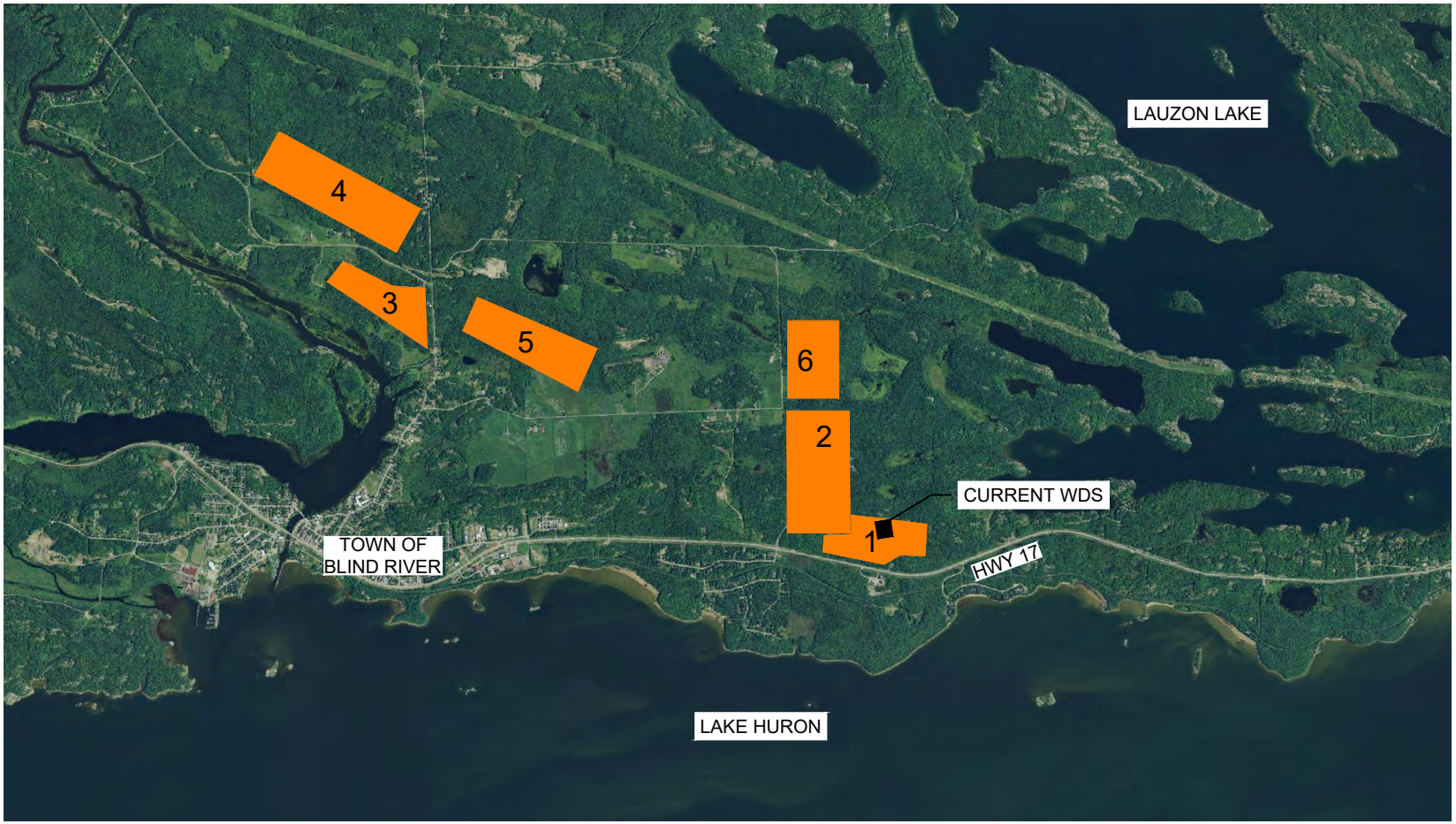
As a result of the screening exercise described above, location number 1 is identified as being the preliminary preferred location for development of additional waste disposal capacity.

The screening process is described in more detail in Appendix B.

Table 7.1: Summary of Potential WDS Locations

Location No.	Location Name	Distance from Centroid (km)[1]	Available Area (ha)	Comments
1	Existing Waste Disposal Site	5.8	30	• Location includes the current WDS. • Access is from Highway 17. • Downgradient lands include Highway 17, on MTO maintenance compound, municipal land, HCR right-off-way and a portion of the North Channel Inshore Provincial Park. • Official Plan designates lands as "Waste Management Assessment", "Employment Area" and "Rural and Resource Area". • Downgradient lands designated as "Rural Resource Area" and "Open Space" in the Official Plan.
2	Industrial Lands and North of Industrial Lands	4.8	67	• Review of satellite imagery identifies that development exists in this industrial area just north of the highway. Site is therefore removed from further consideration. • Solar Farm – part identified as "Employment Area" in the Official Plan.
3	N. of Town Core, W. of Woodward Avenue (Highway 557)	3.0	31	• Includes parcels of private property and residences. • Residences are located near the boundaries of this area. • Suspected bedrock outcrops within this area. • Limited downgradient land. • Official Plan identifies land as "Aggregate Resource Area".
4	N. of Town Core, N. of Highway 557, W. of Granary Lake Road	3.4	70	• Several homes downgradient of this area. • Parcels of private property extend into the area. • Part identifies as "Aggregate Resource Area" and part as "rural and Resource Area" in the Official Plan.
5	N. of Town Core, E. of Woodward Avenue	3.0	47	• Area includes parcels of privately owned land. • Downgradient lands include private residential properties. • Official Plan identifies land as "Aggregate Resource Area".
6	N. of Highway 17, E. of Robb Road	5.3	34	• Downgradient lands include private residential properties. • Part identified as "Aggregate Resource Area" and part as "Rural and Resource Area" in the Official Plan.

Notes: 1. The "Distance from Centroid" is the approximate travel distance from the intersection of Highway 17 and Woodward Avenue to the potential WDS location.



LEGEND

CANDIDATE LOCATION

KRESIN Engineering Corporation

DESIGN		
DRAWN	JS	Dec 2018
CHECKED		
PROJECT	0508.08	
FILENAME	0508.08 candidate locations	
SCALE	1:62,500	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

CANDIDATE LOCATIONS

7.1

Rev 0

7.2 Descriptions of Alternative Locations

The 6 candidate locations identified for consideration are described in further detail in the following subsections.

7.2.1 Location 1 – Existing Waste Disposal Site

Location 1 is situated on municipally owned land at the location of the existing municipal waste disposal site. Approximately 30 hectares in size, the site is located approximately 5.5 kilometres east of the Town's core. The area surrounding the site is dominated by maple, birch and poplar species.

The site has been previously cleared for landfill operations and includes an access road, drop-off location and an area for the storage of metals, clean brush and other divertables. The Town's Official Plan describes the location as being a "Waste Management Assessment Area" within a "Rural and Resource Area". The Town's Zoning By-law has zoned this location for waste disposal. Undeveloped land is located north and east of the site and a solar farm has been developed on the property west of the site. Highway 17 is located to the south, beyond which is a large parcel of Town-owned land.

There are no defined agricultural resources within the boundaries of this location.

The dominant landform within the area is described as ground moraine with a coarse-grained overburden (sand and gravel). Location 1 is situated in an area of relatively flat topography, sloping gradually to the south toward Lake Huron.

An area of surface water pooling, previously described as a local expression of groundwater, is situated approximately 55m west of the active fill area at Location 1. This surface water location is currently included in the monitoring program for the existing waste disposal site. The area is suspected to have a high-water table and the overburden in the area can be, but is typically not, a local source of drinking water. There are no known downgradient drinking water supply wells in the vicinity of this location.

7.2.2 Location 2 – Industrial Lands and North of Industrial Lands

Location 2 is situated approximately 4.7 kilometres from the Town's core and includes approximately 67 hectares of land. A mix of oak, maple, poplar and birch trees surround the site. Undeveloped land is located to the north and west of the site. A portion of the land to the east includes the existing waste disposal site as well as undeveloped land. Highway 17 is located to the south.

The majority of Location 2 has been cleared, developed and is identified as "Employment Area" in the Township's Official Plan. In addition to some light industrial uses, a solar development has been constructed in sections across a large portion of the property. Land within the northern portion of Location 2 has been identified as an "Agricultural Area" in the Town's Official Plan. Agricultural land also extends north of the location.

Location 2 is situated in an area of ground moraine, consisting of till and sand overburden over bedrock. The topography is described as undulating to rolling with mainly moderate local relief.

There are no known aquatic features within the boundaries of Location 2. An unevaluated wetland and small surface water body are located approximately 45m and 225m west, respectively, of the limits of

Location 2. Undefined wetlands are also located approximately 200m south and 275m and 320m east of this location. There are no known downgradient water supply wells located in the vicinity of this location.

7.2.3 Location 3 – N. of Town Core, W. of Woodward Avenue (Highway 557)

Location 3 includes approximately 31 hectares of land located about 2.5 kilometres from the Town's core. Highway 557 is located north and east of the site, the Blind River is located to the south and developed land is located to the west. Poplar and birch species appear to dominate the site with spruce and pine scattered across the central portion of the site.

Location 3 is situated in a glaciofluvial outwash plain characterised by sand and gravel overburden and bedrock outcrops. The topography of this location is described as undulating to rolling topography with mainly low local relief, gradually sloping south towards the Blind River.

An unevaluated wetland is located within and adjacent to the southeast portion of this location while another is located approximately 70m to the east. A tributary of Blind River lies approximately 195m to the west and the Blind River is approximately 250m southwest of Location 3. A water supply well is located within the location boundary, near the southeast corner and a second well is located approximately 295m downgradient of this location.

Location 3 has been designated a "Rural and Resource Area" in the Town's Official Plan. The area includes parcels of private property that have been cleared, however, the remainder of the location appears to be undeveloped, containing large portions of forest covered areas. The downgradient shoreline adjacent to the Blind River is designated as an "Environmental Protection Area" and this the section of the Blind River is considered a walleye migration route.

7.2.4 Location 4 – N. of Town Core, N. of Highway 557, W. of Granary Lake Road

Location 4, approximately 3.2 kilometres north of the Town's core, includes approximately 70 hectares of land. The majority of land within this location appears to be undeveloped and forested, being occupied largely by maple and poplar species with pine and spruce species scattered across the site. Private properties and Highway 557 are located to the south of this location and developed properties and Granary Lake Road are located to the east. The majority of land to the north is undeveloped.

Location 4 is designated under the Town's Official Plan as a rural and resource area. An area zoned for mineral extraction is located within the boundaries of this location and the downgradient shoreline adjacent to the Blind River is designated as an Environmental Protection Area. The Blind River located in this area has been designated as a walleye migration route. No agricultural resources were identified at this location.

Location 4 is situated in an area dominated by ground moraine till overburden overlying bedrock. Topography across the location is described as undulating to rolling with mainly moderate local relief.

Unevaluated wetlands are located onsite and 45m downgradient of the south boundary of Location 4. Additional wetlands are situated approximately 115m east and 190m north and the Blind River is located approximately 900m south. Drainage from the wetland area east of this location appears to flow through the southeast portion of Location 4. There are seven records of domestic water supply wells located in the vicinity of this location. Two wells are located approximately 675m, and 775m downgradient of the west

half of the site and a single well is located approximately 115m downgradient of the east half of this location. A water supply well is also located approximately 100m to the east while three additional wells are located approximately 90m, 350m and 420m north of the location's northeast corner.

7.2.5 Location 5 – N. of Town Core, E. of Woodward Avenue

Location 5 is situated approximately 3 kilometres north-northeast of the built-up area of the Town of Blind River and is approximately 47 hectares in size. This location appears to be undeveloped and forest covered (pine, poplar and maple species) with private properties to the west on Highway 557 and south on Robb Road.

Location 5 is situated in a "Rural and Resource Area". Agricultural resources were identified at the southeast corner of this location as well as south of the east half of the location. A designated "Mineral Extraction Area" is located approximately 140 meters to the east and lands zoned for "Future Development" are located within the location limits.

Location 5 is situated on a glaciolacustrine plain comprised of sand and silt overburden. The topography of this location is undulating to rolling having mainly low local relief and the area is anticipated to have a high water table.

There are no known aquatic features located within the boundaries of this location, however, unnamed wetlands lie adjacent to the location in all directions varying in distance from 85m to 580m. A watercourse is also located approximately 155m south of the location. A downgradient water supply well is located approximately 135m south of the southeast corner of this location

7.2.6 Location 6 – N. of Highway 17, E. of Robb Road

Location 6 is approximately 5.3 kilometres from the Town's core and includes approximately 34 hectares of land. The site appears to be dominated by maple and poplar species. The property to the west includes Robb Road as well as private land while the properties to the north, south and east have not been developed.

The northern portion of the location has been designated as a "Rural and Resource Area" while the southern portion is identified as an "Agricultural Area" in the Town's Official Plan. Agricultural land extends to the west and south of this location.

A large portion of this location is situated in an area of ground moraine comprised of a till overburden over bedrock. The remainder of the site is described as a glaciolacustrine plain having a sand and silty overburden. The topography of Location 6 is described as undulating to rolling having mainly moderate local relief.

There are no known aquatic features located within the boundaries of Location 6. Unevaluated wetlands are located approximately 350m west, 290m north and 75m northeast of the site. A surface water location is located approximately 240m to the east and a tributary of Red Lake is located approximately 120m northeast at its closest point. A tributary of Blind River is located approximately 85m west of the location boundary. A water supply well is located approximately 415m west of the northern limits of this location.

8.0 PHASE 1 EVALUATION OF ALTERNATIVE METHODS

Following the approach described in the EA ToR, alternative methods were evaluated in 2 Phases, Phase 2 involving assessment in greater detail of alternative methods identified for further consideration under Phase 1. The purpose of the Phase 1 and Phase 2 comparative evaluation was to identify a single preferred location ("method") from the six identified candidate landfill locations.

During completion of the EA, Location 2 has become nearly fully developed as a solar farm and industrial park and has therefore been removed from consideration. However, as the location was originally identified as an alternative, and evaluations had been completed prior to the location being fully developed, it is included in the Phase 1 evaluation.

8.1 Comparative Evaluation – Phase 1

Phase 1 of the evaluation assesses each location considering the criteria outlined in Table 8.1, and described in Sub Section 8.1.2. The Town and stakeholders were consulted on the evaluation criteria, scoring and the need for criteria weighting throughout the EA process. Consultation involved presentation and discussion of the criteria, why and how they were considered and scored, along with the result of the evaluation at a Public Open house.

In addition to the modifications made where needed to address comments received, it was determined through consultation with stakeholders during Open House sessions and with the Town that criteria weighting was not required.

Table 8.1: Alternative Methods Evaluation Criteria – Phase 1			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
A - Natural Environment	1. Potential for loss or disruption of terrestrial features on and off site.	• Terrestrial features on-site that would be displaced • Terrestrial features off-site that may be disrupted during operation	• Aerial photography • Field Assessment
	2. Potential for loss or disruption of wildlife on and off site.	• Wildlife on-site that would be displaced • Wildlife off-site that may be disrupted during operation	• Aerial photography • Field Assessment • Ministry records and mapping
	3. Potential for loss or disruption of aquatic features on and off site.	• Aquatic features on-site that would be displaced • Aquatic features off-site that may be disrupted during operation	• Aerial photography • Field Assessment • Ministry records and mapping • Fisheries data
	4. Potential for loss or removal of agriculture resources on and off site.	• Agriculture resources on-site that would be displaced • Agriculture resources downgradient that may be disrupted during operation	• Aerial photography • Field Assessment • Town of Blind River Official Plan
	5. Potential for impairment of groundwater resources.	• Overburden composition and depth • Proximity to surface water resources • Prescence of downgradient drinking water wells	• Borehole records • Available hydrogeological and topographic maps • Aerial photography • Ministry well records
	6. Potential for impairment of surface water resources.	• Surface water resource on-site that may be impaired • Surface water resource off-site that may be impaired during operation • Site drainage direction • Area flood elevation	• Aerial photography • Field assessment • Topographic maps • Ministry flood mapping
	7. Potential for impairment of air quality (e.g. dust and odour).	• Access road surface type	• Aerial photography • Field assessment

Table 8.1: Alternative Methods Evaluation Criteria – Phase 1			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
B - Social Environment	1. Potential for displacement or disruption to residents.	• Residences on-site who would be displaced • Residences off-site who may experience disruption effects (e.g. noise, dust, odour) during operation	• Aerial photography • Field assessment • Town of Blind River Official Plan • Town of Blind River Zoning By-Law
	2. Potential for displacement or disruption to institutional, community and recreational features.	• Institutional, community and recreational features on-site who would be displaced • Institutional, community and recreational features off-site that may experience disruption effects (e.g. noise, dust, odour) during operation	• Aerial photography • Field assessment • Town of Blind River Official Plan • Town of Blind River Zoning By-Law
	3. Potential to impact Indigenous Communities.	• Indigenous Communities off-site that may be impacted during operation	• Aerial photography • Environmental Assessment consultation
	4. Potential for effects on future planned land uses.	• Current land zoning • Adjacent land zoning	• Town of Blind River Official Plan • Town of Blind River Zoning By-Law
	5. Potential effects of noise (generated on and off site).	• Proximity to residential properties • Current land zoning • Adjacent land zoning • Proximity to cycling trail and Hillside Cemetery	• Aerial photography • Town of Blind River Official Plan • Town of Blind River Zoning By-Law
	6. Transportation related considerations.	• Land zoning along haul route • Haul route road type • Number of major intersections • Proximity to aggregate pit on High Road	• Aerial photography • Town of Blind River Official Plan • Town of Blind River Zoning By-Law
C - Economic Environment	1. Potential for displacement or disruption to existing businesses and their employees.	• Businesses on-site who would be displaced • Businesses off-site that may be disrupted during operation	• Aerial photography • Town of Blind River Official Plan • Town of Blind River Zoning By-Law

Table 8.1: Alternative Methods Evaluation Criteria – Phase 1			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
	2. Potential for displacement or disruption of forestry and aggregate industries.	• Forestry and aggregate industries on-site that would be displaced • Forestry and aggregate industries off-site who may be disrupted during operation	• Aerial photography • Town of Blind River Official Plan • Town of Blind River Zoning By-Law • Ministry mapping
	3. Potential cost of implementing alternative.	• Cost to develop site for waste disposal operations	• Aerial photography • Historical operating costs • Conceptual site designs
	4. Transportation related considerations.	• Distance of haul route from Town's core • Length of access road from haul route	• Aerial photography
D - Cultural Environment	1. Potential for displacement or disruption of built heritage resources and/or cultural heritage landscapes by removal and/or demolition and/or disruption by isolation.	• Built heritage resources and/or cultural heritage landscapes on-site that would be displaced • Built heritage resources and/or cultural heritage landscapes off-site that may be disrupted	• Ministry of Citizenship and Multiculturalism (MCM) Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes • Historical records • Discussions with Town staff • Community consultation
	2. Disturbance or destruction of archaeological resources.	• Areas of archaeological potential within the study area • Archaeological resources off-site that may be disrupted • Prescence of known archaeological resources on or within vicinity of the location	• MCM Criteria for Evaluating Archaeological Potential • Historical records • Discussion with Town staff
	3. Impacts to registered and unregistered cemeteries that have been identified and documented.	• Registered or unregistered cemeteries on-site that would be displaced • Registered or unregistered cemeteries off-site that may be disrupted	• Hillside Cemetery • Historical records • Discussions with Town staff • Community consultation

Table 8.1: Alternative Methods Evaluation Criteria – Phase 1			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
E - Technical Considerations	1. Potential for addressing the stated problem or opportunity.	• Does the development address the Town's waste disposal needs • Current land zoning • Adjacent land zoning	• Aerial photography • Town of Blind River Official Plan • Town of Blind River Zoning By-Law

8.1.1 Data Sources

As described in the approved ToR, Phase 1 of the comparative evaluation of alternative methods involves the collection/confirmation of available data related to the preferred alternative method and an evaluation of associated advantages and disadvantage, net environmental effects and impact management measures. Data was sourced by reviewing existing reports, documents, aerial photography, mapping and obtaining input through consultation activities with government agencies, Indigenous communities and the public. Data sources are also included in Table 8.1.

Potential impacts associated with each candidate location are assessed relative to the remaining candidate locations. In this case, impacts relating to the development of a green site were considered to be inherently "worse" than impacts relating to expansion of the existing landfill site. This is supported by there being no history of public noise, dust or odour complaints associated with the existing site and considering that the local social, economic and natural environments have been impacted by historical operations. As a result, the number of technical studies conducted was minimized. Should it have been found that expansion of the existing site would not be considered following the Phase 1 comparative evaluation, additional technical studies may have been completed.

8.1.2 Criteria Groups and Criteria

Criteria Group A: Natural Environment
The comparative evaluation was completed under this criteria group by considering the potential loss of or disruption to the natural environment. This evaluation was performed by assessing seven criteria related to the natural environment.

Criteria 1: Potential for Loss/Disruption of Terrestrial Features
Outside of the built-up community, land uses within the Study Area include rural and resource areas, Crown land and Provincial Parks and Reserves. Predominant landforms are morainal, glaciofluvial and glaciolacustrine in nature. Lakes, rivers, wetlands and bedrock outcrops are frequent and overburden depths vary.

The Study Area is dominated by hardy pioneering tree species such as maples and yellow and white birch. Also prevalent in sandy flat areas and coarser-textured soils are maple, red pine, white pine, eastern hemlock, jackpine, beech, basswood and balsam fir. Black spruce is found scattered in more saturated organic soils. Extensive and relatively recent disturbance in this region has resulted in the removal of much of the natural vegetation leaving a landscape dominated by pioneer and colonizing species.

The purpose of this criteria was to assess the relative potential for loss or disruption to terrestrial features within each candidate location using aerial photography and a field assessment. Those locations where development would require no clearing and thus having minimal to no impact on terrestrial features were assigned a low ranking; locations where development would require partial clearing and potential for moderate impacts were assigned a medium ranking; and, locations which were undeveloped and require significant clearing with the potential for a significant or direct impact were assigned a high ranking.

Criteria 2: Potential for Loss/Disruption of Wildlife On and Off Site
The area surrounding the built-up portion of the Town is generally sparsely developed and supports large game such as black bear, moose and deer, as well as small animals such as porcupines, racoons, rabbits, etc. The Study Area is also inhabited by a number of bird species, reptiles and amphibians.

The Town's Official Plan identifies moose aquatic feeding areas, deer wintering areas, bald eagle feeding areas and colonial waterbird nesting areas within the limits of the Study Area. It is encouraged that these areas be protected and maintained to support healthy wildlife populations.

There are several species within the Study Area that have been placed on the Ontario Species at Risk List. These species are at risk due to habitat loss, land use and resource management activities, the spread of invasive species, etc. The Study Area includes species that have been classified as endangered, threatened or species of special concern.

The purpose of this criteria is to assess the relative potential for loss of or disruption to wildlife populations and habitat within each candidate location using aerial photography, field assessment and available Ministry records and mapping. Those locations where development would require no clearing and thus having minimal to no impact on wildlife were assigned a low ranking; locations where development would require partial clearing and potential for moderate impact were assigned a medium ranking; and, locations which were undeveloped and require significant clearing as well as having a wetland either on or adjacent to the site with the potential for a significant or direct impact were assigned a high ranking.

Criteria 3: Potential for Loss/Disruption of Aquatic Features On and Off Site
Water bodies/courses that lie within the Study Area support a variety of sport fish species, including: lake trout, small-mouth bass, pike, musky and speckled trout. Lake Huron also supports commercial fishing activities.

Several lakes within the Study Area have been designated as lake trout lakes by the MNRF. Lake trout lakes are particularly vulnerable to the impacts of human activities, including exploitation, acidification, species introductions and habitat destruction, aquatic animal life and fisheries activities.

The Town's Official Plan also identifies a walleye migration route within the Study Area along the Blind River, in Cataract Lake and Lake Duborne.

The purpose of this criteria is to assess the relative potential for loss of or disruption to aquatic features within each candidate location using aerial photography, field assessment, available Ministry records and mapping and Fisheries data. Those locations having no aquatic features on-site or adjacent to the site and thus having minimal to no impact were assigned a low ranking; locations having no aquatic features on-site but a feature within approximately 100m of the site and potential for moderate impact were assigned a medium ranking; and, locations with an aquatic feature(s) on-site and potential for significant or direct impact were assigned a high ranking.

Criteria 4: Potential for Loss/Removal of Agriculture Resources On and Off site
As identified on the Town's Official Plan, agricultural areas are limited within the Study Area as result of topography and unfavourable soil conditions (eg. bedrock outcrops).

The purpose of this criteria is to assess the relative potential for loss of or disruption to agricultural lands within each candidate location using aerial photography, field assessment and the Town of Blind River Official Plan. Those locations having no agricultural resources on or downgradient of the site and thus having minimal to no impact on agricultural lands were assigned a low ranking; locations with agricultural resources located downgradient from the site and potential for moderate impact were assigned a medium ranking; and, locations with agricultural resources on-site as per the Town of Blind River Official Plan and potential for significant or direct impact were assigned a high ranking.

Criteria 5: Potential for Impairment of Groundwater Resources.
This criterion considers the relative potential for impacts to groundwater resources. The hydrogeological setting of the location is important in determining the ability to minimize off site impacts to groundwater through natural attenuation processes. As an expanded or greenfield landfill site would operate as a natural attenuation site, it would rely on the natural hydrogeological setting to control the migration of leachate impacted waters to within acceptable regulatory standards.

The purpose of this criteria is to assess the attenuation potential of the candidate locations and associated relative potential for groundwater impairment while considering their proximity to groundwater sources using available hydrogeological and topographic mapping, aerial photography and Ministry drinking well records. Those locations having no downgradient drinking water wells and expected adequate contaminant attenuation thus having minimal to no impact on groundwater resources were assigned a low ranking; locations having no downgradient drinking water wells but an aquatic feature in close proximity to the site with potential for moderate impact were assigned a medium ranking; and, locations with downgradient drinking water wells, aquatic features on or adjacent to site and bedrock outcrops with potential for significant or direct impact were assigned a high ranking.

Criteria 6: Potential for Impairment of Surface Water Resources
This criterion considers the relative potential of a landfill development to cause adverse impact on the water quality of downstream surface watercourses and water bodies. Provincial regulations and policies establish allowable water quality impacts to protect and conserve surface water resources.
Impairment of surface water quality as a result of erosion, sedimentation, flooding and contamination can have a significant impact on the use of surface water resources for human consumption/use, recreation, agriculture, sustaining aquatic life, and other water uses. The potential for impairment of surface water quality is minimized by the degree of protection (natural and/or engineered) offered by a waste disposal site, the location of the site with respect to surface water courses as well as the catchment areas up and downstream of the site.

The purpose of this criteria is to assess the relative potential for impairment of surface water resources at each location using aerial photography, field assessment, topographic mapping and Ministry flood mapping. Candidate locations above the area flood elevation with no surface water features on or adjacent to site and thus expected to have minimal to no impact on surface water resources were assigned a low ranking; locations above the area flood elevation with surface water resources either adjacent to or downgradient of the site with potential for moderate impact were assigned a medium ranking; and, locations with surface water resources on-site with potential for a significant or direct impact were assigned a high ranking.

Criteria 7: Potential for Impairment to Air Quality
Site characteristics and operational activities at a waste disposal site have the potential to lead to greenhouse gas, odour and dust emissions resulting in negative air impacts. As the service area and characteristics and volume of waste is expected to be the same for all candidate locations, the quantity of greenhouse gases, odours and dust produced are also expected to be similar at all candidate locations. All of the locations are within 6 km of the Town's core, however, offsite impacts may vary depending on the conditions of the roadways utilized to access the site (e.g. paved or gravel surface) and other operational considerations.

The purpose of this criteria is to assess the relative potential for air quality impacts resulting from development at each alternative location using aerial photography and field assessment. Locations with

potential access from a road with a paved surface and thus are that are expected to cause minimal to no impact on air quality a low ranking was assigned; locations with potential access from a partially paved road(s) with the potential for moderate impact were assigned a medium ranking; and, locations with potential access from a gravel road with potential for a significant or direct impact were assigned a high ranking.

Criteria Group B: Social Environment

The social environment criteria group consisted of six evaluation criteria which consider potential impacts including disruptions to residents, disruptions to community and recreational features as well as Indigenous communities, effects on future planned land uses, potential effects of noise on and off site and impacts to the transportation environment.

Criteria 1: Potential for Displacement or Disruption to Residents

Construction of a landfill site has the possibility to displace or disrupt existing and future residents in the vicinity of the landfill site. The landfill site may require a significant amount of area to accommodate the required volume of waste as well as the downgradient area required to attenuate potentially contaminated groundwater. Daily operations can cause negative impacts to those properties in the vicinity of the site with respect to associated noises, air quality and traffic.

The purpose of this criteria is to assess the relative potential that residents within the vicinity of any of the candidate locations may be displaced or disrupted using aerial photography, field assessment as well as the Town of Blind River Official Plan and Zoning By-law. Development at those locations with no residential properties within 200m and expected to have minimal to no impact on residents were assigned a low ranking; locations with residential properties within 100-200m with the potential for moderate impact were assigned a medium ranking; and, locations with residential properties on-site or within 100m with the potential for a significant or direct impact were assigned a high ranking.

Criteria 2: Potential for Displacement or Disruption to Institutional, Community and Recreational Features

The construction and operation of a landfill site/expansion has the potential to impact existing and future institutional, community and recreational features in its vicinity. The land required and potential impacts to the social environment may affect the use of onsite or adjacent properties.

The purpose of this criteria is to assess the relative potential that any institutional, community or recreational features/potential would be displaced or disrupted on or within the vicinity of any of the candidate locations using aerial photography, field assessment as well as the Town of Blind River Official Plan and Zoning By-law. Those locations with no zoning for and/or institutional, community or recreational features on-site with the potential for minimal to no impact were assigned a low ranking; locations with no zoning for and/or institutional, community or recreational features on-site but with a designated cycling trail or Hillside Cemetery within 100m with the potential for moderate impact were assigned a medium ranking; and, locations with zoning for and/or institutional, community or recreational features on-site with the potential for a significant or direct impact were assigned a high ranking.

Criteria 3: Potential to Impact Indigenous Communities

The construction and operation of a landfill site/expansion may impact Indigenous communities. To assess whether the project may have an adverse impact on Aboriginal and Treaty rights, Indigenous and Northern Affairs Canada (INAC) as well as Indigenous communities in the Study Area vicinity were contacted throughout completion of the EA to obtain input into the definition of the problems/opportunity, identification and evaluation of alternative solutions. The alternative landfill locations and their

corresponding evaluation were presented in a Public Open House in February 2016 as well as a Task 3 Report (dated May 2019) which was circulated to the identified communities. No comments were received from Indigenous communities following the Public Open House and distribution of the Task 3 Report.

Consultation was conducted with the identified communities and meetings were held between the Town and the Mississauga First Nation (MFN) as well as the Metis Nation of Ontario (MNO). Each meeting included a general discussion of the proposed project, potential impacts and mitigating measures and environmental compliance monitoring. Both MFN and MNO requested that they be kept informed throughout the planning process.

The purpose of this criteria is to assess the relative potential for adverse impacts of development at the candidate locations on lands, resources, traditional activities or other interests of Indigenous communities. Those locations with an adequate distance from Indigenous lands, resources, traditional activities or other interests and expected to have minimal to no impact were assigned a low ranking; locations with features such as a tributary of Blind River located within 200m which may impact traditional uses and the potential for moderate impact were assigned a medium ranking; and, locations with MFN lands within 1km as well as containing water/watercourses draining towards the Blind River and the potential for a significant or direct impact were assigned a high ranking.

Criteria 4: Potential for Effects on Future Planned Land Uses
Land use planning addresses the type, distribution and arrangement of land uses within the municipality as well as the policies affecting these land uses.

The purpose of this criteria is to assess the relative potential that development of the candidate locations would affect the planned land uses on and within the vicinity of each candidate location using the Town of Blind River Official Plan and Zoning By-law. Those locations currently zoned for waste disposal and no additional planned land uses expected to have minimal to no impact on future planned land uses were assigned a low ranking; locations with planned land uses on-site with the potential for moderate impact were assigned a medium ranking; and, locations with lands designated in the Town's Official Plan and Zoning By-law for uses other than waste disposal with the potential for a significant or direct impact were assigned a high ranking.

Criteria 5: Potential Effects of Noise (Generated On and Off Site)
The construction and operation of a landfill site may cause noise emissions as a result of the use of on-site equipment to manage incoming wastes and divertables. Traffic generated by the waste collection vehicles and residents direct hauling their wastes to the site may also create negative impacts due to noise emissions.

The purpose of this criteria is to assess the relative potential for noise impacts on nearby receptors using aerial photography as well as the Town of Blind River Official Plan and Zoning By-law. Those locations surrounded by lands zoned conducive to a waste disposal site (commercial, industrial) and expected to have minimal to no impact on nearby receptors were assigned a low ranking; locations with features such as a cycling trail and Hillside Cemetery located and residential properties within 500m of the site with the potential for moderate impact were assigned a medium ranking; and, locations with residential properties and/or private parcels of land on or adjacent to the site with the potential for a significant or direct impact were assigned a high ranking.

Criteria 6: Transportation Related Considerations
Potential effects to the transportation environment include impacts related to traffic safety and operations along the haul routes to the candidate locations.

The purpose of this criteria is to assess the relative potential for transportation related impacts using aerial photography as well as the Town of Blind River Official Plan and Zoning By-law. Those locations with haul routes expected to remain along Highway 17, similar to the existing landfill site and minimal to no impact on traffic safety and operations were assigned a low ranking; locations with haul routes including Highway 557 along with land uses such as residential, institutional and commercials with the potential for moderate impact were assigned a medium ranking; and, locations with non-paved haul routes through numerous major intersections with the potential for a significant or direct impact were assigned a high ranking.

Criteria Group C: Economic Environment
The economic environment criteria group consisted of 4 evaluation criteria which consider potential impacts to the economic environment including: displacement or disruptions to existing businesses and employees; displacement or disruptions to forestry and aggregate industries; the cost of implementing the alternative; and, transportation related considerations.

Criteria 1: Potential for Displacement or Disruption to Existing Businesses and their Employees
The construction and operation of a landfill will require sufficient land area to accommodate waste and provide the proper attenuation of landfill contaminants. This may affect local businesses (present and future) and their employees on or within the vicinity of a waste disposal site.

The purpose of this criteria is to assess the relative potential that businesses would be disrupted or displaced as a result of developing a landfill at a candidate location using aerial photography as well as the Town of Blind River Official Plan and Zoning By-law. Those locations with no existing businesses within their boundaries and expected to have minimal to no impact on businesses and their employees were assigned a low ranking; locations with existing businesses or commercially zoned lands within 100m of the sites with potential for moderate impact were assigned a medium ranking; and, locations with existing businesses within the site boundaries and the potential for significant or direct impact were assigned a high ranking.

Criteria 2: Potential for Displacement or Disruption of Forestry and Aggregate Industries
The purpose of this criteria is to assess the relative potential that forestry and/or aggregate operations would be displaced or disrupted as a result of the establishment of a landfill site at one of the candidate locations using aerial photography, available Ministry mapping as well as the Town of Blind River Official Plan and Zoning By-law. Those locations with no forestry or aggregate industries within their boundaries and expected to have minimal to no impact on forestry and aggregate operations were assigned a low ranking; locations with forestry or aggregate industries within 100m of the sites with potential for moderate impact were assigned a medium ranking; and, locations with forestry or aggregate industries within the site boundaries and the potential for significant or direct impact were assigned a high ranking.

Criteria 3: Potential Cost for Implementing Alternative
Costs related to the establishment of a landfill site include those associated with the initial development of the site, ongoing development and operating costs, closure and post-closure costs and can vary depending on the location.

The purpose of this criteria is to assess the relative costs that would be incurred with the development and operation of a landfill site at the candidate locations using aerial photography, historical operating costs and conceptual site designs. Those locations expected to result in lower construction and /or operational costs due to the site having already been established as a waste disposal site were assigned a low ranking; potential sites expected to have moderated associated costs due to previous clearing being completed and/or necessary features for waste disposal operations already established (access road, fire break) were assigned a medium ranking; and sites expected to have high construction and/or operational costs due to requiring clearing and the construction of necessary features for waste disposal operations were assigned a high ranking.

Criteria 4: Transportation Related Considerations
Similar to current operations, the Town will continue to provide waste management pick up for the residents of the Town of Blind River. Hauling costs will vary depending on the travel distance to the landfill site. Similarly, costs associated with access road construction and maintenance requirements will also vary based on location specific considerations but are expected to be similar for all candidate locations.

The purpose of this criteria is to assess relative transportation related costs using aerial photography. Those locations with hauling distances expected to remain similar to or less than the distance to access the existing landfill site with minimal to no impact on transportation related costs were assigned a low ranking; locations with marginally longer hauling distances and/or additional maintenance costs along the hauling route with the potential for moderate impact to transportation related costs were assigned a medium ranking; and, locations with substantially longer hauling distances including additional expected maintenance costs along the route with the potential for significant impacts were assigned a high ranking.

Criteria Group D: Cultural Environment
The cultural environment criteria group consisted of 3 evaluation criteria which considered the relative potential for displacement or disruption of archaeological and cultural resources associated with locating a landfill at each candidate location. Potential was assessed through the completion of the following Ministry of Citizenship and Multiculturalism (MCM) evaluation checklists:

1. “Criteria for Evaluating Archaeological Potential”; and,
2. “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes”.

Copies of completed checklists are presented in Appendix E.

In addition to Provincial requirements, built heritage resources, cultural heritage landscapes and archaeological resources (together cultural heritage resources) are identified in the Town’s Official Plan as features that should be considered and conserved where required in all land-use planning decisions.

Criteria 1: Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes
The purpose of this criterion is to assess the relative potential for displacement of built heritage resources and/or cultural heritage landscapes by removal and/or demolition and/or disruption by isolation.

Following the completion of the MCM’s “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes” checklist, locations with low potential for the existence of these resources were assigned a low ranking therefore no further technical cultural heritage studies (e.g., Cultural Heritage Evaluation Report) were undertaken.

Criteria 2: Potential for Disturbance or Destruction of Archaeological Resources
The potential to disturb or destroy identified or documented archaeological resources by development at each candidate location is assessed under Criteria 2.

Following the completion of the MCM "Criteria for Evaluating Archaeological Potential" checklist, locations with low potential for the existence of these resources were assigned a low ranking; and, locations determined to require an archaeological assessment be completed were assigned a high ranking.

Criteria 3: Potential for Impacts to Registered and Unregistered Cemeteries
Criteria 3 considers the potential impact to registered and unregistered cemeteries that have been identified and documented.

MECP publication "D-4 Land Use On or Near Landfills and Dumps" states that the most significant contaminant discharges and visual problems are considered to normally occur within 500m of the perimeter of a fill area at a landfill. Since cemeteries are listed as a sensitive land use in D-4, those locations further than 500m from of a registered or unregistered cemetery were assigned a low ranking; and, locations within 500m of a registered or unregistered cemetery were assigned a high ranking.

Criteria Group E: Technical Considerations
The technical considerations criteria group consisted of 1 evaluation criterion which compared the suitability of each candidate location to address the Town's waste disposal needs for the next 25-40 years while minimizing environmental impacts to the adjacent areas.

Criteria 1: Potential for Addressing the Stated Problem or Opportunity
The purpose of this criteria is to compare the relative suitability of each candidate location to address the Town's future waste management needs using aerial photography as well as the Town of Blind River Official Plan and Zoning By-law. Candidate locations were assigned a low ranking if the development at the location addressed the stated problem while minimizing environmental impacts to on and offsite receptors; medium rankings were assigned to candidate locations that address the stated problem but may result in negative environmental impacts to on and offsite receptors; and, high rankings were assigned to candidate locations do not address the stated problem or result in negative environmental impacts to on and offsite receptors.

8.1.3 Criteria Ranking: Net Environmental Effects

The establishment of a waste disposal site has the potential to create both negative and positive environmental effects. To comply with the requirements of the Environmental Assessment Act, the EA must provide a description of methods to "prevent, change, mitigate or remedy" the potential environmental effects. Mitigation measures are ways of reducing or avoiding negative effects or improving positive effects. Net environmental effects are residual positive or negative effects that may occur following application of the mitigation measures.

A net environmental effects assessment was completed to assign expected impact rankings considering the potential for impairment and effect of mitigating measures. Considering the relative net environmental effects anticipated, each location was assigned an impact ranking of "*low*", "*medium*", or "*high*".

The ranking of each component was based on qualitative assessments of relative levels of concern and/or potential for adverse impact resulting from development at each candidate location. Relative rankings of

"*low*", "*medium*" or "*high*" potential impact were assigned to individual criterion under each criteria group for each candidate site. The impact rankings were as follows:

Low (1): The establishment of a waste disposal site would have minimal potential for impact on the component of the environment being considered.

Medium (2): The establishment of a waste disposal site would have moderate potential for impact on the component of the environment being considered.

High (3): The establishment of a waste disposal site would have significant/direct potential for impact on the component of the environment being considered.

The combined ranking for all criteria groups were integrated and each candidate site was subsequently ranked as having an overall potential for impact of either "*Low*", "*Medium*", or "*High*".

Criteria Group A: Natural Environment

The net environmental effects assessment for Criteria Group A is summarized in Table 8.2 and the assignment of rankings discussed below.

Criteria 1: Potential for Loss/Disruption of Terrestrial Features

Candidate locations 1 and 2 received rankings of low as all or portions of the locations have been cleared and additional clearing is expected to have a lower potential to impact terrestrial systems. The remainder of the sites received high relative rankings as the locations are undeveloped and would require comparably greater extents of clearing for the establishment of a waste disposal site.

Criteria 2: Potential for Loss/Disruption of Wildlife On and Off Site

Locations 1 received a low ranking as the site has been cleared for some time to allow operation of the existing landfill site and the disruption to wildlife was expected to be minimal. Location 2 received a medium ranking as wildlife would likely be displaced to nearby areas of similar habitat that have not been developed. High rankings were assigned to locations 3, 4, 5 and 6 as they are bounded by development or natural features (e.g. rivers, wetlands, etc.), potentially limiting the opportunity for wildlife displacement.

Criteria 3: Potential for Loss/Disruption of Aquatic Features On and Off Site

Candidate locations 1, 2, 5 and 6 received medium rankings as wetland areas or surface water bodies were located within 100m of the locations. Locations 3 and 4 received high rankings as wetland areas/surface water sources are within their boundaries.

Criteria 4: Potential for Loss/Removal of Agriculture Resources On and Off site

Locations 1, 3 and 4 received low impact rankings as there are no agricultural lands located within or downgradient from their boundaries. Locations 2, 5 and 6 received high rankings due to the existence of agricultural lands within their boundaries.

Criteria 5: Potential for Impairment of Groundwater Resources.

Location 1 received a low ranking as it is situated within an area of favourable overburden with no identified downgradient groundwater resources and a degree of impact established from operation of the existing landfill site. Candidate location 2 received a medium impact ranking as it is within an area of favourable overburden but is located in close vicinity to an unevaluated wetland to the west. Although

within areas of favourable overburden, locations 3, 4, 5 and 6 received high impact rankings as a result of having groundwater sources (i.e. wells) located within or in close vicinity to their boundaries.

Criteria 6: Potential for Impairment of Surface Water Resources
Locations 1, 2, 5 and 6 received medium rankings, as wetland/surface water sources are situated in close vicinity whereas locations 3 and 4 received high rankings as wetland areas are located within their boundaries.

Criteria 7: Potential for Impairment to Air Quality
All locations received a low ranking as the impairment to air is expected to be similar at each location.

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for loss or disruption of terrestrial features on and off site.	Location 1	• Location has been cleared. • Cleared area currently used for waste disposal. • Adjacent to wetland.	• Loss or disruption of terrestrial features due to need for grubbing and stripping organics.	• Establish limits to minimize grubbing and stripping organics . • Progressively revegetate site.	• Minimal potential for short and long term loss or disruption of terrestrial features.	1
	Location 2	• Majority of location has been cleared and is currently used for solar farm and commercial businesses. • Adjacent to wetland.	• Loss or disruption of terrestrial features due to need for additional clearing.	• Establish limits to minimize clearing. • Progressively revegetate site.	• Minimal potential for short and long term loss or disruption of terrestrial features.	1
	Location 3	• Majority of site appears to be undeveloped. • Would require significant clearing. • Wetland located on site.	• Loss or disruption of terrestrial features due to need for significant clearing and on-site wetland.	• Establish limits to minimize clearing. • Salvage usable timber during site development. • Progressively revegetate site.	• High potential for short and long term loss or disruption of terrestrial features.	3
	Location 4	• Majority of site appears to be undeveloped. • Would require significant clearing. • Contains mineral extraction area.	• Loss or disruption of terrestrial features due to need for significant clearing.	• Establish limits to minimize clearing. • Savage usable timber during site development. • Progressively revegetate site.	• High potential for short and long term loss or disruption of terrestrial features.	3
	Location 5	• Location appears to be undeveloped. • Would require significant clearing. • Adjacent to wetland areas.	• Loss or disruption of terrestrial features due to need for significant clearing.	• Establish limits to minimize clearing. • Savage usable timber during site development. • Progressively revegetate site.	• High potential for short and long term loss or disruption of terrestrial features.	3
	Location 6	• Majority of the location appears to be undeveloped. Would require significant clearing. • Adjacent to wetland.	• Loss or disruption of terrestrial features due to need for significant clearing.	• Establish limits to minimize clearing. • Salvage usable timber during site development. • Progressively revegetate site.	• High potential for short and long term loss or disruption of terrestrial features.	3
2. Potential for loss or disruption to wildlife on and off site.	Location 1	• Location has been cleared in the area of the proposed expansion. • Location is current operating landfill.	• Disruption to wildlife due to need for grubbing and stripping organics.	• Minimize disturbance beyond cleared area. • Revegetate site following closure.	• Wildlife may be displaced to area of similar habitat adjacent to location. • Low potential for disruption to wildlife.	1
	Location 2	• Majority of the location has been cleared. • Location utilized as a solar yard and industrial park.	• Disruption to wildlife due to need for additional clearing and new site operations.	• Minimize disturbance beyond cleared area. • Revegetate site following closure.	• Wildlife may be displaced to area of similar habitat adjacent to location. • Moderate potential for disruption to wildlife.	2
	Location 3	• Majority of location appears to be undeveloped. • Would require significant clearing. • Wetland located on site. • Development has occurred around the location.	• Disruption to wildlife due to need for additional clearing and new site operations.	• Minimize disturbance beyond cleared area. • Fill not to be deposited in area of surface water. • Revegetate site following closure.	• Wildlife may be displaced to area of similar habitat adjacent to location. • High potential for disruption to wildlife.	3
	Location 4	• Majority of location appears to be undeveloped. • Would require significant clearing. • Wetland located on site.	• Disruption to wildlife due to need for additional clearing and presence of onsite wetland and new site operations.	• Fill not to be deposited in area of surface water. • Minimize disturbance beyond cleared area. • Revegetate site following closure.	• Wildlife may be displaced to area of similar habitat adjacent to location. • High potential for disruption or displacement of terrestrial systems.	3
	Location 5	• Location appears to be undeveloped. • Would require significant clearing.	• Disruption to wildlife due to need for additional clearing and new site operations.	• Fill not to be deposited near wetland area.	• Wildlife may be displaced to area of similar habitat adjacent to location.	3

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
		• Adjacent to wetland areas. • Development in vicinity of location.	• Close to wetland area.	• Minimize disturbance beyond cleared area. • Revegetate site following closure.	• High potential for disruption or displacement of wildlife.	
	Location 6	• Majority of the location appears to be undeveloped. Would require significant clearing. • Adjacent to wetland. • Undeveloped land located east of the location.	• Disruption to wildlife due to need for additional clearing and new site operations. • Close to wetland area.	• Fill not to be deposited in area of surface water. • Minimize disturbance beyond cleared area. • Revegetate site following closure.	• Wildlife may be displaced to area surrounding site as there is a significant amount of land to the north and northwest that have not been developed. • High potential for disruption or displacement of wildlife.	3
3. Potential or loss or disruption of aquatic features on and off site.	Location 1	• Existing location is located adjacent to an area of surface water pooling that appears to be expression of groundwater. This location is currently included in the monitoring program. • No aquatic features located within 200m of location.	• No changed loss or disruption of aquatic features.	• Fill not to be deposited in area of surface water pooling. • Monitor surface water runoff within the fill area. • Establish surface water management controls to reduce off site impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	2
	Location 2	• No aquatic features onsite. • Location is approximately 45m west of an unevaluated wetland. • Unevaluated wetlands are also located 270m east and 180m south.	• Due to proximity of unevaluated wetlands, development at the location has the potential to disrupt aquatic features off site.	• Monitor surface water runoff within the fill area. • Eliminate surface water ponding on fill area. • Establish surface water management and monitoring program to assess possible offsite impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	2
	Location 3	• Unevaluated wetland/surface water body located in southeast corner. • Unevaluated wetland located approximately 70m east. • Watercourse located approximately 195m west of location. • The Blind River is located 250m downgradient. • Environmental Protection Area designated along shoreline of Blind River.	• Due to proximity of unevaluated wetlands and surface water features, development at the location has the potential to disrupt aquatic features off site.	• Monitor surface water runoff within the fill area. • Eliminate surface water ponding on fill area. • Establish surface water management and monitoring program to assess possible offsite impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	3
	Location 4	• Unevaluated wetland located approximately 150m east of location. • Unevaluated wetlands located to the north and south. • A watercourse appears to flow through the south-eastern portion of the location (from wetland to the east).	• Due to proximity of unevaluated wetlands and surface water features, development at the location has the potential to disrupt aquatic features on and off site.	• Monitor surface water runoff within the fill area. • Eliminate surface water ponding on fill area. • Establish surface water management and monitoring program to assess possible offsite impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	3

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
	Location 5	• No known aquatic features on location. • Unevaluated wetlands surround the location, the closest being approximately 100m northeast.	• Due to proximity of unevaluated wetlands, development at the location has the potential to disrupt aquatic features off site.	• Monitor surface water runoff within the fill area. • Eliminate surface water ponding on fill area. • Establish surface water management and monitoring program to assess possible offsite impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	2
	Location 6	• No known aquatic features on location. • Unevaluated wetlands surround the location, the closest being approximately 100m northeast.	• Due to proximity of unevaluated wetlands, development at the location has the potential to disrupt aquatic features off site.	• Monitor surface water runoff within the fill area. • Eliminate surface water ponding on fill area. • Establish surface water management and monitoring program to assess possible offsite impacts.	• Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts. • No physical disruption.	2
4. Potential for loss or removal of agriculture resources on and off site.	Location 1	• No known agricultural resources identified on location. • No known agricultural resources downgradient.	• None expected.	• None expected.	• No effects anticipated – low potential.	1
	Location 2	• Portion of location is identified in Town's Official Plan as an "Agricultural Area".	• Potential for loss or removal of agricultural lands should agricultural lands be impacted by development.	• Place fill footprint in least productive portion of land.	• High potential of loss of agricultural lands.	3
	Location 3	• No known agricultural resources identified on location. • No known agricultural resources downgradient.	• None expected.	• None expected.	• No effects anticipated – low potential.	1
	Location 4	• No known agricultural resources identified on location. • No known agricultural resources downgradient.	• None expected.	• None expected.	• No effects anticipated – low potential.	1
	Location 5	• Agricultural resources located in southeast corner of location. • Agricultural area located south of east portion of site.	• Potential for loss or removal of agricultural lands should agricultural lands be impacted by development. • Potential impact to off-site agricultural lands.	• Place fill footprint in area furthest from agricultural lands and situate to minimize off-site impacts	• High potential of loss of agricultural lands onsite and impact to off-site lands.	3
	Location 6	• Approximately half the location is identified in the Town's Official Plan as an "Agricultural Area".	• Potential for loss or removal of agricultural lands should agricultural lands be impacted by development. • Potential impact to off-site agricultural lands.	• Place fill footprint in least productive portion of land.	• High potential of loss of agricultural lands.	3
5. Potential for Impairment of Groundwater Resources.	Location 1	• Morainal overburden. • No known downgradient drinking water wells.	• Groundwater impacts similar to those associated with existing site, requiring attenuation. • Continued leachate generation expected.	• Expand monitoring network to confirm groundwater direction and identify potential contamination. • Develop contaminant attenuation zone. • Appropriate grading and progressive capping to limit leachate production.	• Lower potential to impact downgradient sources. • Adequate attenuation expected.	1
	Location 2	• Morainal overburden. • No known downgradient drinking water wells.	• Leachate generation expected as a result of landfill operations.	• Establish a groundwater monitoring network to confirm groundwater	• Moderate potential for impacts to groundwater resources in the vicinity of the site.	2

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
		• Wetland area located to the east and to the south.	• Groundwater impacts similar to those associated with existing site, requiring attenuation. • Moderate potential that wetlands adjacent to the site could become contaminated.	direction and identify potential contamination. • Develop contaminant attenuation zone. • Appropriate grading and progressive capping to limit leachate production.	• Dependant on orientation of development.	
	Location 3	• Glaciofluvial overburden. • Suspected bedrock outcrops within this area. • Drinking water well located at southeast corner of location. • Unevaluated wetland/surface water body located in southeast corner.	• Leachate generation expected as a result of landfill operations. • Groundwater impacts similar to those associated with existing site, requiring attenuation. • Higher potential to impact groundwater supplies/resources. • Limited downgradient land for attenuation.	• Establish a groundwater monitoring network to confirm groundwater direction and identify potential contamination. • Develop contaminant attenuation zone. • Additional leachate protection may be required if downgradient land is not sufficient. • Appropriate grading and progressive capping to limit leachate production.	• Difficulty with respect to site development as a result of bedrock outcrops and limited downgradient land. • High potential to impact groundwater resources/supplies (without leachate collection system) due to proximity to well.	3
	Location 4	• Morainal overburden. • Drinking water wells located downgradient and adjacent to location. • Surface water course located within site.	• Groundwater impacts similar to those associated with existing site, requiring attenuation. • Higher potential to impact groundwater supplies/resources.	• Establish a groundwater monitoring network to confirm groundwater direction and identify potential contamination. • Develop contaminant attenuation zone. • Appropriate grading and progressive capping to limit leachate production.	• Higher potential to impact groundwater resources/supplies due to proximity to wells.	3
	Location 5	• Glaciolacustrine overburden. • Drinking water well located downgradient of southeast corner. • Surface water course located downgradient of location.	• Groundwater impacts similar to those associated with existing site, requiring attenuation. • Higher potential to impact groundwater supplies/resources.	• Establish a groundwater monitoring network to confirm groundwater direction and identify potential contamination. • Develop contaminant attenuation zone. • Appropriate grading and progressive capping to limit leachate production.	• Higher potential to impact groundwater resources/supplies due to proximity to wells.	3
	Location 6	• Glaciofluvial overburden. • No known downgradient drinking water wells. • Drinking water well located to the west - appears to be upgradient. • Surface elevations suggest surface water runoff is mainly to the west.	• Groundwater impacts similar to those associated with existing site, requiring attenuation. • Higher potential to impact groundwater supplies/resources due to close proximity to developed properties.	• Establish a groundwater monitoring network to confirm groundwater direction and identify potential contamination. • Appropriate grading and progressive capping to limit leachate production. • Additional leachate protection may be required if downgradient land isn't sufficient.	• Higher potential to impact groundwater resources/supplies (without leachate collection system) due to proximity to wells.	3
6. Potential for Impairment of Surface Water Resources.	Location 1	• Surface water pooling located within site – likely expression of groundwater. Currently included in monitoring program. • Location above flood elevation for area.	• No additional impact expected.	• Proper grading of the site to control the discharge of surface water originating from the fill area. • If appropriate, cover standing surface water with clean fill. • Reconfigure area of surface water pooling to be part of surface water management design for site.	• Moderate potential for surface water contamination due to proximity and expressed groundwater.	2

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
	Location 2	• Unevaluated wetland approximately 45m west. • Unevaluated wetland approximately 270m east and 180m south. • Drainage has been altered at location for solar yard. • Location above flood elevation for area.	• Potential for impairment due to discharge of leachate impacted groundwater, dependent on orientation of development.	• Development of surface water management system. • Proper grading of the site to control the discharge of surface water originating from the fill area. • Establish CAZ.	• Moderate potential impairment of surface water quality.	2
	Location 3	• Surface water/unevaluated wetland located on location. • Drainage appears to be southwest towards the Blind River. • Location above flood elevation for area.	• Potential to impact downgradient surface water course due to discharge of leachate impacted groundwater.	• Development of surface water management system. • Proper grading of the site to control the discharge of surface water originating from the fill area. • Establish CAZ	• Higher potential impairment of surface water quality on and offsite.	3
	Location 4	• Unevaluated wetlands located on location and directly adjacent to south boundary. • Unevaluated wetlands located approximately 115m east and 210m north. • Surface water course located on east side of location and appears to drain to a tributary of Blind River. • Location above flood elevation for area.	• Potential to impact surface water/wetland area on site due to discharge of leachate impacted groundwater. • Potential to impact downgradient surface water course due to leachate impacted groundwater.	• Development of surface water management system. • Proper grading of the site to control the discharge of surface water originating from the fill area. • Establish CAZ.	• Higher potential impairment of surface water quality on and offsite.	3
	Location 5	• No known onsite surface water sources. • Unevaluated wetlands located downgradient and adjacent to the location. • Location above flood elevation for area.	• Potential to impact adjacent wetlands due to close proximity and discharge of leachate impacted groundwater.	• Development of surface water management system. • Proper grading of the site to control the discharge of surface water originating from the fill area. • Establish CAZ.	• Moderate potential impairment of surface water quality (surface water/wetland area).	2
	Location 6	• No known onsite surface water sources. • Downgradient surface water sources located approximately 75m west. • Mapping suggest west surface water drainage from location. • Location above flood elevation for area.	• Potential to impact adjacent surface water sources due to close proximity and discharge of leachate impacted groundwater.	• Development of surface water management system. • Proper grading of the site to control the discharge of surface water originating from the fill area. • Establish CAZ.	• Moderate potential impairment of surface water quality.	2
7. Potential for Impairment to Air Quality.	Location 1	• Location accessed from Highway 17 (paved).	• No change to the current potential is expected.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for changed impairment to air quality due to existing site operations at this location.	1

TABLE 8.2: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
	Location 2	• Potential location access from Development Drive (paved) off Highway 17 (paved)	• Potential air quality impacts at location 2 are similar to those associated with the existing operation at location 1. No appreciable change is expected in area air quality.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for impairment to air quality (dust, odour, greenhouse gas).	1
	Location 3	• Potential location access from Highway 557 (paved)	• Potential air quality impacts from waste and equipment operations similar to those associated with existing operation but in new area of Town.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for impairment to air quality (dust, odour, greenhouse gas).	1
	Location 4	• Potential location access from Highway 557 (paved).	• Potential air quality impacts from waste and equipment operations similar to those associated with existing operation but in new area of Town.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for impairment to air quality (dust, odour, greenhouse gas).	1
	Location 5	• Potential access from Highway 557 (paved), or from Robb Road (paved)	• Potential air quality impacts from waste and equipment operations similar to those associated with existing operation but in new area of Town.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for impairment to air quality (dust, odour, greenhouse gas).	1
	Location 6	• Potential access using Highway 557 (paved) and Robb Road (paved).	• Potential air quality impacts from waste and equipment operations similar to those associated with existing operation but in new area of Town.	• Progressive capping of waste material to control odour and dust. • Onsite road dust control.	• Low potential for impairment to air quality (dust, odour, greenhouse gas).	1

Criteria Group B: Social Environment

The net environmental effects assessment for Criteria Group B is summarized in Table 8.3 and the assignment of rankings discussed below.

Criteria 1: Potential for Displacement or Disruption to Residents

Candidate locations 1 and 2 received low rankings as they are respectively situated approximately 400m and 230m from residential properties and, as a result, minimal impacts to these properties are expected. Candidate location 5 received a medium ranking at the nearest residential property appears to be situated approximately 190m south of the site. Locations 3, 4 and 6 received high rankings as residential properties were either onsite or within 100m location boundaries.

Criteria 2: Potential for Displacement or Disruption to Institutional, Community and Recreational Features

Candidate locations 1 and 4 received low rankings as institutional, community or recreational features are not present at either location. Low potential for negative impacts is also expected as the nearest feature, Hillside Cemetery, is located approximately 115m southeast of location 4. A designated cycling trail is also located approximately 450m south of location 1 and 360m southeast of location 4. Medium rankings were assigned to candidate locations 2, 3 and 6 as a designated cycling trail is within 100m of each location. A small area within location 3 is designated as "Open Space" along its east boundary. It is stated in the Town's Official Plan, that it is the Town's preference to retain "Open Space" areas for recreational purposes. Location 5 received a high ranking as this location contains lands zoned for "Future Development", not including *waste management* as a permitted use.

Criteria 3: Potential to Impact Indigenous Communities

Concerns expressed by MNO were similar to those expressed by MFN with no distinguishable preference between candidate locations, with the exception that expansion of the existing landfill site (location 1) was generally preferable to establishing a new site.

Candidate locations 1, 2 and 6 received low rankings as they are located at a distance anticipated to result in minimal impacts on Indigenous lands, resources, traditional activities or other interests. Location 5 received a medium ranking as a tributary of the Blind River is located approximately 125m to the south, potentially impacting traditional uses. Locations 3 and 4 received high rankings as each contains surface water/watercourse draining towards the Blind River, resulting in a higher potential to impact traditional uses as well as the MFN lands directly, being located approximately 530m southwest of location 3 and 1km southwest of location 4.

Criteria 4: Potential for Effects on Future Planned Land Uses

Candidate location 1 received a low ranking as it is currently zoned for waste disposal and no additional planned land uses have been identified within the property. Locations 2, 3, 4, 5 and 6 received high rankings as each contains lands designated in the Town's Official Plan and Zoning By-law for uses other than waste disposal.

Criteria 5: Potential Effects of Noise (Generated On and Off Site)

Candidate locations 1 and 2 received low rankings as they are surrounded by lands zoned for commercial, industrial or waste disposal purposes. A medium ranking was assigned to locations 4, 5 and 6 as only moderate impacts are anticipated depending on the chosen orientation of a landfill within each location. Candidate location 3 received a high rank as parcels of private property are located within location boundaries as well as adjacent to the site boundaries.

Criteria 6: Transportation Related Considerations

Candidate locations 1 and 2 received low rankings as the haul route for each is expected to remain along Highway 17, similar to the existing landfill site. Locations 3, 4, 5 and 6 received medium rankings as the haul route includes Highway 557, a route not currently used to haul waste. Moderate potential for impact(s) to safety along the haul route exists for these locations as residential, institutional and commercial establishments are situated adjacent to Highway 557.

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for displacement or disruption to residents.	Location 1	• No residents within location boundary. • Site is located approximately 450m northwest and 400m northeast of residential properties. • No residential properties located downgradient of site. • Impacts similar to current operations.	• Potential for disruption to residents with respect to noise, dust and odour.	• Operational measures including progressive capping, dust control, appropriate hours of operation.	• Low potential for disruption due to the established landfill site operating at this location. • No displacement expected.	1
	Location 2	• No residents within location boundary. • Residential properties border land downgradient of site – approximately 230m southwest.	• Potential for disruption to residents with respect to noise, dust and dour. • Depending on location of fill area on site, residential properties may be within CAZ for the site. • Potential to impact Lake Lauzon cottage access road.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Fill area should be positioned at the greatest distance possible from residential properties.	• Low potential for disruption to residents due to the established site operating nearby and current Location 2 industrial use. • No displacement expected.	1
	Location 3	• Residential properties located within boundary. • Parcels of private property located adjacent to each boundary of site. • Residential properties located within 500m of site.	• Potential for displacement dependent on orientation of development and/or disruption to residents with respect to noise, dust and odour.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Acquire property required for waste disposal and attenuation.	• High potential for disruption due to operation and potential impact of landfill on green field location. • Displacement possible.	3
	Location 4	• Residential properties located within boundary. • Residential properties located approximately 160m downgradient of the site.	• Potential for displacement dependent on orientation of development and/or disruption to residents with respect to noise, dust and odour.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Acquire property required for waste disposal and attenuation.	• High potential for disruption due to operation and potential impact of landfill on green field location. • Displacement possible.	3
	Location 5	• Portion of site is zoned for future development. • Residential properties located approximately 190m south of the site.	• Potential for disruption to residents with respect to noise, dust and odour. • Minimal downgradient land for attenuation between site and residential properties, may be required for CAZ.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Position fill area at location furthest upgradient from residential properties. • Acquire land required for attenuation.	• Moderate potential for disruption due to operation and potential impact of landfill on green field location. • Displacement possible.	2
	Location 6	• Residential properties located approximately 95m west of the site.	• Potential for disruption to properties adjacent to site with respect to noise, dust and odour. • Minimal downgradient land for attenuation between site and residential properties, may be required for CAZ.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Acquire land required for attenuation.	• High potential for disruption due to operation and potential impact of landfill on green field location. • Displacement possible.	3
2. Potential for displacement or disruption to institutional, community and recreational features.	1	• There are no institutional, community or recreational features located onsite. • A cycling trail is located approximately 450m south of the location.	• No changes to the existing condition are expected.	• Operational measures including progressive capping, dust control, appropriate hours of operation.	• Low potential for displacement or disruption to institutional, community and recreational features.	1
	2	• There are no institutional, community or recreational features located onsite.	• Potential for disruption to recreational trail with respect to noise, dust and odour.	• Operational measures including progressive capping, dust control, appropriate hours of operation.	• Moderate potential for displacement or disruption to recreational features.	2

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
		• Cycling trail is located directly adjacent to northwest corner of location.				
	3	• The Hillside Cemetery is located approximately 80m north of the location. • Cycling trail is located approximately 65m east of the location. • The site includes land zoned as Open Space – permitted uses include institutional, community or recreational uses. • Adjacent to lands zoned for Future Development use.	• Potential for disruption to institutional, recreation and community features with respect to noise, dust and odour and waste hauling.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Place fill away from designated areas.	• Moderate potential for displacement or disruption to recreational features.	2
	4	• The Hillside Cemetery is located approximately 115m southeast of the location. • Cycling trail located approximately 350m southeast of location.	• Potential for disruption to institutional and recreational facilities with respect to noise, dust and odour and waste hauling.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Place fill area away from institutional property located southeast of the site.	• Low potential for displacement or disruption to institutional, community or recreational features.	1
	5	• Site includes area zoned for “Future Development”. • Site located approximately 240m upgradient of cycling trail. • Site located approximately 230m southeast from Hillside Cemetery.	• Potential for disruption or displacement to “future development” area depending on orientation of development. • Potential for disruption to institutional and recreational facilities with respect to noise, dust and odour and waste hauling.	• Operational measures including progressive capping, dust control, appropriate hours of operation.	• High potential for displacement or disruption to future onsite institutional, community and recreational features.	3
	6	• Designated cycling trail is located approximately 25m west of the location and runs the length of the west boundary.	• Potential for disruption to recreational facilities with respect to noise, dust and odour and waste hauling. • Potential for displacement dependent upon orientation of development.	• Operational measures including progressive capping, dust control, appropriate hours of operation.	• Moderate potential for displacement or disruption to institutional, community and recreational features.	2
3. Potential to Impact Indigenous communities.	1	• Serpent River No. 7 First Nation Reserve is located approximately 13km east (downstream) of the location. • Mississagi River No. 8 First Nation Reserve is located approximately 5km west (upstream). • Location within traditional Metis lands. • Archaeological assessment completed for the existing landfill site states the area did not retain archaeological potential and that no registered archaeological sites were located within 10km of the location.	• No changes to the existing condition are expected.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Provide storm water management at site to minimize offsite impacts. • Continue to consult with Indigenous communities with respect to any concerns or comments received regarding the site. • Continue with monitoring program for the existing site.	• Low potential to impacts Indigenous communities/uses in the vicinity of the location as no changes are expected.	1

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
	2	• The site is located approximately 4km east of the Mississagi River No. 8 First Nation Reserve. • Serpent River No. 7 First Nation Reserve is located approximately 14km east of the site. • Location within traditional Metis lands.	• As a large portion of the site is cleared, additional impact would be limited to a small portion of undeveloped land situated in the north of the parcel.	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Provide storm water management at site to minimize offsite impacts. • Continue to consult with Indigenous communities with respect to any concerns or comments. • Establish monitoring program for site to identify offsite impacts.	• Low potential to impacts Indigenous communities/uses in the vicinity of the site.	1
	3	• Site is located approximately 530m northeast of the Mississagi River No. 8 First Nation Reserve. • Serpent River No. 7 First Nation Reserve is located approximately 18km east of the site. • Location within traditional Metis lands.	• Leachate generation expected as a result of landfill operations. • Potential to impact groundwater resources. • Limited downgradient land for attenuation.	• Establish a groundwater monitoring network to confirm groundwater direction to identify potential contamination. • Establish contaminant attenuation zone. • Provide storm water management at site to minimize offsite impacts. • Continue to consult with Indigenous communities with respect to any concerns or comments.	• Attenuation may be difficult as a result of limited downgradient land. • Possible impact to surface water resources adjacent to MRFN. • High potential to impact Indigenous communities/uses.	3
	4	• Site located approximately 1km northeast of Mississagi River No. 8 First Nation Reserve. • Serpent River No. 7 First Nation Reserve located approximately 19km east of site. • Location within traditional Metis lands. • Drainage course located onsite.	• Leachate generation expected as a result of landfill operations. • Potential to impact groundwater and surface water resources.	• Establish a groundwater monitoring network to identify potential contamination. • Provide storm water management at site to minimize offsite impacts. • Establish contaminant attenuation zone. • Continue to consult with Indigenous communities with respect to any concerns or comments.	• Possible impact to surface water resources adjacent to MRFN • High potential to impact Indigenous communities/uses.	3
	5	• Mississagi River No. 8 First Nation Reserve located approximately 975m west of site. • Site located approximately 17km west of Serpent River No. 7 First Nation Reserve. • Location within traditional Metis lands.	• Leachate generation expected as a result of landfill operations. • Potential to impact groundwater and surface water resources as tributary is located approximately 125m south of location.	• Establish a monitoring network to identify potential contamination. • Provide storm water management at site to minimize offsite impacts. • Establish contaminant attenuation zone. • Continue to consult with Indigenous communities with respect to any concerns or comments.	• Possible impact to surface water resources adjacent to MRFN • Moderate potential to impact Indigenous communities/uses.	2
	6	• Site approximately 3.8km east of Mississagi First Nation No. 8 Reserve. • Serpent River No. 7 First Nation Reserve located approximately 14km east of site. • Location within traditional Metis lands.	• Leachate generation expected as a result of landfill operations. • Potential to impact groundwater and surface water resources.	• Establish a monitoring network to identify potential contamination. • Provide storm water management at site to minimize offsite impacts. • Establish contaminant attenuation zone. • Continue to consult with Indigenous communities with respect to any concerns or comments.	• Possible impact to groundwater and surface water resources. • Low potential to impact Indigenous communities/uses.	1

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
4. Potential for effects on future planned land uses.	1	• Location is currently zoned for waste disposal. • No planned land uses identified.	• No changes to current situation expected.	• Standard operational procedures with respect to operations, such as dust, odour, noise and litter control.	• Future land use of existing site will remain unaffected from current effects. • Low potential to impact future planned land uses.	1
	2	• Part of the location is identified as an "Employment Area" in the Town's Official Plan – solar farm. • Lands identified as "Agricultural Area" and "Mineral Aggregate Resource Area".	• Potential to impact future planned land uses as a result of displacement (site development) of "Employment Area", "Agricultural Area" and "Mineral Aggregate Resources Area".	• Develop areas exhausted of aggregate resources. • Standard operational procedures with respect to operations, such as dust, odour, noise and litter control.	• Use of the location as a solar farm would be removed. • High potential to impact future planned land uses.	3
	3	• Includes parcels of residential property. • Part of the location is identified as a "Living Area" in the Town's Official Plan. • "Future Development Area" as identified in the Town's Zoning By-Law is located approximately 130m east of the location.	• Potential to impact future planned land uses due to displacement (site development) and disruption (operational impacts) of established residences and areas designated "Living Area" and "Future Development Area".	• Standard operational procedures with respect to operations, such as dust, odour, noise and litter control. • Situate development to limit interference with other uses and potential uses.	• "Future Development" and "Living" Areas will be potentially removed/reduced from land inventory. • High potential to impact future planned land uses.	3
	4	• Parcels of residential property extend onto the location. • Part of location is identified as a "Mineral Aggregate Resource Extraction Area" as well as "Rural and Resource Area" in the Town's Official Plan.	• Potential to impact future planned land uses due to displacement (site development) and disruption (operational impacts) of established nearby residences.	• Standard operational procedures with respect to operations, such as dust, odour, noise and litter control. • Place fill in area exhausted of aggregate resources. • Situate development to limit interference with other uses and potential uses.	• "Mineral Aggregate Extraction" and "Rural and Resource" Areas will be potentially removed/reduced from land inventory. • High potential to impact future land uses.	3
	5	• Part of location is located within a "Future Development" designated area. • Part of location is identified as "Rural and Resource Area" and "Agriculture" area in the Town's Official Plan.	• Potential to impact future planned land uses due to displacement (site development) and disruption (operational impacts) of areas designated as "Future Development Area", "Rural Resource Area" and "Agricultural Area".	• Standard operational procedures with respect to operations, such as dust, odour, noise and litter control. • Place fill in area exhausted of aggregate resources. • Situate development to limit interference with other uses and potential uses.	• "Future Development", "Rural Resources" and "Agricultural" Areas will be potentially removed/reduced from land inventory. • High potential to impact future land uses.	3
	6	• Part of the location is identified as "Agricultural" and "Rural and Resource Area" in the Town's Official Plan.	• Potential to impact future planned land uses due to displacement (site development) and disruption (operational impacts) of areas designated as "Rural Resource Area" and "Agricultural Area".	• Standard operational procedures with respect to operations, such as dust, odour, noise and litter control. • Situate development to limit interference with other uses and potential uses.	• "Agricultural" and "Rural Resource" Areas will be potentially removed/reduced from land inventory. • High potential to impact future land uses.	3

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
5. Potential effects of noise (generated on and offsite)	1	• Nearest residential property located approximately 400m southwest of location. • Adjacent lands zoned for waste disposal, highway commercial and general industrial purposes. • No known noise complaints. • No change in haul route anticipated.	• Noise effects along current haul routes and due to day-to-day operations. • No changes to the current effects are anticipated.	• Establish appropriate hours of operation to limit time periods where noise due to operations is generated.	• No changed effects. • Low potential for noise impacts.	1
	2	• No residents situated on location. • Nearest residential property appears to be situated approximately 230m southwest of the location. • Adjacent lands zoned for rural, highway commercial and waste disposal purposes.	• Noise effects along the same haul routes as currently and due to day-to-day operations, also similar to current.	• Fill area should be positioned at the greatest distance possible from residential properties. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated.	• No appreciably changed effects. • Low potential for noise impacts	1
	3	• Includes parcels of private property. • Private property lies adjacent to each boundary of the location. • The Hillside Cemetery is located approximately 80m north of the location. • Cycling trail is located approximately 65m east of the location.	• Noise effects to nearby residences due to day-to-day operations as well as to all land uses along waste haul routes established to access green field site location.	• Fill area should be positioned at the greatest distance possible from residential properties. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated.	• Day-to-day impacts near to site and along new haul routes resulting from noise associated with site operation and waste hauling. • High potential for noise impacts.	3
	4	• Parcels of privately owned land extends into the location. • Residential properties located approximately 160m south of location. • The Hillside Cemetery is located approximately 120m southeast of the location. • Cycling trail located approximately 370m southeast of location.	• Noise effects to nearby residences due to day-to-day operations as well as to all land uses along waste haul routes established to access green field site location.	• Fill area should be positioned at the greatest distance possible from residential properties. • Position fill area at greatest distance from developed properties. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated.	• Day-to-day impacts near to site and along new haul routes resulting from noise associated with site operation and waste hauling. • Moderate potential for noise impacts.	2
	5	• Parcels of privately owned land located approximately 190m south of the location. • Residential properties located within 500m of location. • Location approximately 240m north of cycling trail. • Location approximately 200m southeast from Hillside Cemetery.	• Noise effects to nearby residences due to day-to-day operations as well as to all land uses along waste haul routes established to access green field site location.	• Fill area should be positioned at the greatest distance possible from residential properties. • Position fill area at location furthest upgradient from residential properties. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated.	• Day-to-day impacts near to site and along new haul routes resulting from noise associated with site operation and waste hauling. • Moderate potential for noise impacts.	2

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
	6	• Cycling trail located approximately 65m west of the location. • Residential property located approximately 95m west.	• Noise effects to nearby residences due to day-to-day operations as well as to all land uses along waste haul routes established to access green field site location.	• Fill area should be positioned at the greatest distance possible from residential properties. • Position fill area at location furthest from residential and recreational features. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated.	• Day-to-day impacts near to site and along new haul routes resulting from noise associated with site operation and waste hauling. • Moderate potential for noise impacts.	2
6. Transportation Related Considerations	1	• It is expected that the existing haul route along Highway 17 will be used. • Highway is paved. • No major intersections between Town and site.	• No changes to the current conditions are expected.	• Enforcement of Highway Traffic Act. • Existing haul route maintained by the Province.	• No changes to current effects are expected. • Low potential for negative impacts related to transportation.	1
	2	• The location would be likely be accessed from Highway 17. • Highway is paved. • No major intersections between Town and location.	• No changes to the current conditions are expected.	• Enforcement of Highway Traffic Act. • Haul route maintained by the Province.	• No changes to current effects are expected. • Low potential for negative impacts related to transportation.	1
	3	• The location would likely be accessed from Highway 557. • Highway is paved. • Close proximity to aggregate pit on High Road – may encounter larger commercial vehicles along haul route. • Residential properties/school located along haul route. • School bus route along haul route.	• Although accessed from a Provincial Highway, increased risk of operational conflicts with large commercial vehicles accessing the location. • New waste haul routes would be established through residential and commercial areas.	• Enforcement of Highway Traffic Act. • Potential establishment of Community Safety Zones. • Haul route maintained by the Province and portions by the Town.	• Increased traffic and potential for conflicts along new access routes. • Moderate potential for negative impacts.	2
	4	• The location would likely be accessed from Highway 557. • Highway is paved. • Close proximity to aggregate pit on High Road – may encounter larger commercial vehicles along haul route. • Residential properties/school located along haul route. • School bus route along haul route.	• Although accessed from a Provincial Highway, increased risk of operational conflicts with large commercial vehicles accessing the location. • New waste haul routes would be established through residential and commercial areas.	• Enforcement of Highway Traffic Act. • Potential establishment of Community Safety Zones. • Haul route maintained by the Province and portions by the Town.	• Increased traffic and potential for conflicts along new access routes. • Moderate potential for negative impacts.	2
	5	• The location would likely be accessed from Highway 557. • Highway is paved. • Close proximity to aggregate pit on High Road – may encounter larger commercial vehicles along haul route.	• West portion of Robb Road includes significant curve in alignment, potentially impacting traffic safety along Robb Road • Possibly accessed from a Provincial Highway or municipal urban roadway, increased risk of operational conflicts with large commercial vehicles accessing the location.	• Enforcement of Highway Traffic Act. • Potential establishment of Community Safety Zones. • Haul route maintained by the Province and portions by the Town.	• Increased traffic and potential for conflicts along new access routes. • Moderate potential for negative impacts.	2

TABLE 8.3: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
		• Residential properties/school located along haul route. • School bus route along haul route.	• New waste haul routes would be established through residential and commercial areas.			
	6	• Location could be accessed from Highway 557/Robb Road – paved roads. • Possible extension of Industrial Park Road could provide access to Robb Road. • Intersection of Robb Road and Highway 557 is within residential area. • School bus route along haul route.	• West portion of Robb Road includes significant curve in alignment, potentially impacting traffic safety along Robb Road. • Accessed from a municipal urban roadway, increased risk of operational conflicts with large commercial vehicles accessing the location. • New waste haul routes would be established through residential and commercial areas.	• Enforcement of Highway Traffic Act. • Haul route maintained by the Province and portions by the Town. • Potential establishment of Community Safety Zones. • Possibly extend Industrial Park Road north to intersect with Robb Road and provide haul route access vis Highway 17.	• Increased traffic and potential for conflicts along new access routes. • Moderate potential for negative impacts.	2

Criteria Group C: Economic Environment

The net environmental effects assessment for this Criteria Group is summarized in Table 8.4 and the assignment of rankings discussed below.

Criteria 1: Potential for Displacement or Disruption to Existing Businesses and their Employees

Candidate locations 1, 4, 5 and 6 received low rankings as no businesses are present within their boundaries. Candidate location 3 received a medium ranking as it is located within 100m of commercially zoned lands. Candidate location 2 received a high ranking as businesses are located within the boundaries which may be displaced with the establishment of a waste disposal site.

Criteria 2: Potential for Displacement or Disruption of Forestry and Aggregate Industries

Locations 1, 3, 5, and 6 received low rankings as there are no forestry or aggregate industries within 100m of their boundaries. Candidate locations 2 and 4 received high rankings as identified aggregate resource/extraction areas are located within their boundaries.

Criteria 3: Potential Cost for Implementing Alternative

Location 1 received a low ranking as it has been established as a waste disposal site including many of the necessary features required for operations (eg. monitoring wells, access road, fire break) and would require minimal grubbing and stripping organics. Location 2 received a high ranking as, although a majority of the area has been cleared and an access road has been constructed, cost associated with relocating existing businesses is expected to be high. Locations 3, 4, 5 and 6 received high rankings as they have not been developed and would require clearing and the construction of the necessary features for waste disposal operations.

Criteria 4: Transportation Related Considerations

All candidate locations received low rankings as hauling distances are expected to remain similar to or less than the distance to access the existing landfill site. It is expected that each haul route would require standard road maintenance on an ongoing basis with no measurable impact attributed specifically to increases in landfill related traffic. Maintenance of site access roads at each candidate location is expected to be similar in scope and cost.

TABLE 8.4: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP C: ECONOMIC ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for displacement or disruption to existing businesses and their employees.	Location 1	• Location is currently zoned for waste disposal and highway commercial. • Adjacent businesses include Leroy Construction and North Shore Power Group Inc. • Location approximately 5.5km from Town's core.	• Impacts similar to current conditions expected.	• Maintain appropriate hours of operation. • Maintain existing haul routes.	• No changes to current effects are expected. • Low potential to disrupt existing businesses and employees.	1
	Location 2	• Site zoned as General Industrial, Highway Commercial, Mineral Extraction, and Agriculture. • Solar farm located on location. • Businesses located in southern portion of the location.	• Displacement of existing businesses required to develop location.	• Establish fill area in a location farthest from developed portion of location.	• May require the establishment of a CAZ beneath business properties. • High potential to displace existing businesses.	3
	Location 3	• Location approximately 55m west of a Highway Commercial and Future Development Zone.	• Existing businesses may be disrupted by site operational activities, noise, odour, dust.	• Establish fill area in a location farthest from businesses. • Establish appropriate hours of operation to limit time periods where noise due to operations is generated.	• Impact from day-to-day site operations. • Moderate potential to disrupt existing businesses and employees.	2
	Location 4	• No known businesses situated within the 500m of location.	• No nearby businesses anticipated to be impacted.	• None proposed.	• Low potential to disrupt existing businesses.	1
	Location 5	• Approximately 180m east of Highway Commercial zone.	• Existing businesses may be disrupted by site operational activities, noise, odour, dust.	• Establish fill area in a location farthest distance from businesses. • Establish appropriate hours of operation to limit time periods where noise due to operations is generated.	• Impact from day-to-day site operations. • Low potential to disrupt existing businesses.	1
	Location 6	• No businesses located onsite. • Solar farm located approximately 545m south of the location.	• No nearby businesses anticipated to be impacted.	• None proposed. • Establish appropriate hours of operation to limit time periods where noise due to operations is generated.	• Impact from day-to-day site operations. • Low potential to disrupt existing businesses.	1
2. Potential for displacement or disruption of forestry and aggregate industries.	Location 1	• Location has already been established and cleared. • Lands zoned for Mineral Extraction location approximately 390m north and 275m south. • No harvest areas are within the location.	• Appreciable changes to current effects not anticipated. • Aggregate resources largely depleted and no appreciable merchantable timber at location.	• Expand fill area waste adjacent to existing fill area. • Maintain development to within existing site limits.	• Appreciable changes to current effects not anticipated. • Low potential to displace or disrupt aggregate industries.	1
	Location 2	• Large portion of location previously cleared. • No harvest areas within the location. • Mineral extraction area within the location. • Mineral extraction area located approximately 410m west.	• Resources extraction potential largely lost due to current level of development. • Historical location clearing has disrupted forestry potential.	• Place fill in area exhausted of aggregate and forestry resources.	• No change to historical impact is expected. • High potential to disrupt forestry and aggregate industries.	3

TABLE 8.4: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP C: ECONOMIC ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
	Location 3	• No harvest areas within the location. • No aggregate extraction areas located onsite. • Located within 280m of mineral extraction area and 270m northeast of mineral aggregate resource area.	• None anticipated.	• Establish fill area in a location farthest distance from mineral extraction and aggregate resource areas.	• None anticipated. • Low potential to disrupt forestry and aggregate industries.	1
	Location 4	• No harvest areas within the location. • Mineral extraction area within location at southwest and southeast corners.	• Restriction to the mineral extraction potential.	• Establish fill area in a location farthest distance from mineral extraction areas.	• Potential to remove/loose mineral extraction potential. • High potential to disrupt forestry and aggregate industries.	3
	Location 5	• No harvest areas within the location. • Aggregate resource area approximately 150m north and east of location.	• None anticipated.	• Establish fill area in a location farthest distance from aggregate resources.	• None anticipated. • Low potential to disrupt forestry and aggregate industries.	1
	Location 6	• No harvest areas within the location. • Aggregate resource areas within 500m of the location.	• None anticipated.	• Establish fill area in a location farthest distance from aggregate resources.	• None anticipated. • Low potential to disrupt forestry and aggregate industries.	1
3. Potential cost of implementing alternative.	Location 1	• Previously cleared in areas of potential expansion. • A groundwater monitoring network has been established at the location. • Storm water management plan will be required. • Existing access road to be used.	• No appreciable change in costs associated with operating and maintaining the existing landfill. • Minimal cost associated with clearing of an expansion area.	• Clearly establish the minimum required area requiring clearing.	• Cost to clear land would be incurred. • Lowest potential costs.	1
	Location 2	• Location has been largely cleared. • Majority of the location is in use – solar farm.	• Moderate costs expected for additional clearing, establishment of site and monitoring network. • Expected high cost to relocate existing business(es).	• Clearly establish the minimum required area requiring clearing. • Provide alternative industrial zoned lands for business relocations from Town inventory.	• Cost to clear land, develop site and relocate businesses would be incurred. • Land acquisition costs. • High potential costs.	3
	Location 3	• Majority of the location is undeveloped. • Significant forest cover.	• Significant costs expected for clearing, establishment of site and monitoring network.	• Clearly establish the minimum required area requiring clearing. • Situate fill area to maximize the use of Crown and/or Town-owned land. • Retain contractors following competitive bidding processes.	• Cost to clear land and develop site would be incurred. • Land acquisition costs. • High potential costs.	3
	Location 4	• Majority of the location is undeveloped. • Significant forest cover.	• Significant costs expected for clearing, establishment of site and monitoring network.	• Clearly establish the minimum required area requiring clearing. • Situate fill area to maximize the use of Crown and/or Town-owned land. • Retain contractors following competitive bidding processes.	• Cost to clear land and develop site would be incurred. • Land acquisition costs. • High potential costs.	3
	Location 5	• The location has not been developed. • Significant forest cover. • Furthest location from an established road.	• Significant costs expected for the clearing, establishment of site and monitoring network.	• Clearly establish the minimum required area requiring clearing. • Situate fill area to maximize the use of Crown and/or Town-owned land. • Retain contractors following competitive bidding processes.	• Cost to clear land and develop site would be incurred. • Land acquisition costs. • High potential costs.	3

TABLE 8.4: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP C: ECONOMIC ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
	Location 6	• The location has not been developed. • Significant forest cover.	• Significant costs expected for the clearing, establishment of site and monitoring network.	• Clearly establish the minimum required area requiring clearing. • Situate fill area to maximize the use of Crown and/or Town-owned land. • Retain contractors following competitive bidding processes.	• Cost to clear land and develop site would be incurred. • Land acquisition costs. • High potential costs.	3
4. Transportation related considerations.	Location 1	• No changes in existing haul route expected. • Location access road is approximately 5.5km from Town's core.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1
	Location 2	• Anticipated access road for the location is approximately 4.7km from Town's core.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1
	Location 3	• Anticipated access road for the location is approximately 3.3km from Town's core.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1
	Location 4	• Anticipated access road for the location is approximately 5.4km from the Town's core.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1
	Location 5	• Anticipated access road for the location is approximately 2.7km from Town's core.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1
	Location 6	• Anticipated access road via Highway 557, Robb Road is approximately 5.5km from Town's core. • Anticipated access road from extension of Industrial Park Road to Robb Road is approximately 6.4km.	• No appreciable changes to transportation related costs expected.	• None proposed.	• None anticipated.	1

Criteria Group D: Cultural Environment

The net environmental effects assessment for Criteria Group D is summarized in Table 8.5 and the assignment of rankings discussed below.

All of the candidate locations are situated in an area of known historical Indigenous activity and development at any location will require the completion of an archaeological assessment and perhaps a cultural heritage evaluation report (CHER).

Criteria 1: Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes

This criteria was evaluated through completion of the checklist "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" (see Appendix E) for each candidate location. All of the candidate locations were determined to have low potential to cause displacement by removal and/or demolition and/or disruption by isolation of built heritage resources and/or cultural heritage landscapes, therefore no technical studies (e.g., a Cultural Heritage Evaluation Report) were undertaken.

Criteria 2: Potential for Disturbance or Destruction of Archaeological Resources

To assess the potential to disturb or destroy archaeological resources that have been identified and documented, the checklist "Criteria for Evaluating Archaeological Potential" was completed for each candidate location (see Appendix E).

Candidate locations 1 and 2 received low relative rankings as they have been previously developed and do not contain known archaeological sites. Although no known archaeological sites have been identified on candidate locations 3, 5 and 6, archaeological potential exists at each due to their proximity to water (i.e. either within 300m or water features situated with location boundaries) and considering that little previous development has occurred within their boundaries. Archaeological potential also exists at Location 4 due to evidence of elevated topography and pockets of well-drained soil. As a result, candidate locations 3, 4, 5 and 6 received medium relative rankings.

Criteria 3: Potential for Impacts to Registered and Unregistered Cemeteries

Candidate locations 1, 2 and 6 received low rankings as they are located beyond 500m from the Hillside Cemetery. Locations 3 is located approximately 80m southwest of the Hillside Cemetery and is assigned a moderate ranking. Locations 4 is located approximately 120m northwest of the Hillside Cemetery and is assigned a moderate ranking. Locations 5 is located approximately 200m southeast of the Hillside Cemetery and is assigned a moderate ranking.

TABLE 8.5: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP D: CULTURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes	All Locations	• Through completion of the "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist and community consultations, low potential for the existence of these resources and/or landscapes was identified.	• Potential displacement and/or disruption of resources and/or landscapes.	• Complete a cultural heritage evaluation report (CHER), if required, prior to confirmation of the preferred alternative (Phase 2 evaluation).	• None anticipated but to be confirmed during Phase 2 evaluation if required. • Low potential for displacement and/or disruption is anticipated.	1
2. Potential for Disturbance or Destruction of Archaeological Resources	Location 1	• Location has been previously developed. • Archaeological assessment completed for the existing location states that the area does not retain archaeological potential and that no registered archaeological sites are within 10km of the location.	• Potential to encounter archaeological resources during expansion of the fill area.	• Complete an archaeological assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• None anticipated. • Low potential for disturbance or destruction of archaeological resources.	1
	Location 2	• No known archaeological sites located on or within the vicinity of the site. • Location has been previously developed.	• Potential to encounter archaeological resources during development and excavation of the fill area.	• Complete an archaeological and assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• None anticipated. • Low potential for disturbance or destruction of archaeological resources.	1
	Location 3	• No known archaeological sites located on or within the vicinity of the location. • Located within 300m of Blind River	• As the location in close proximity to a water source, potential exists for disturbance or destruction of archaeological resources.	• Complete an archaeological and assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• Possible archaeological potential. • Moderate potential for disturbance or destruction of archaeological resources.	2
	Location 4	• No known archaeological sites located on or within the vicinity of the location. • Evidence of elevated topography and pockets of well-drained soil within limits.	• Considering evidence of elevated topography and pockets of well-drained soil, potential exists for disturbance or destruction of archaeological resources.	• Complete an archaeological and assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• Possible archaeological potential. • Moderate potential for disturbance or destruction of archaeological resources.	2
	Location 5	• No known archaeological sites located on or within the vicinity of the location. • Wetlands are located within 100m of the location.	• As the location in close proximity to a water source, potential exists for disturbance or destruction of archaeological resources.	• Complete an archaeological and assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• Possible archaeological potential. • Moderate potential for disturbance or destruction of archaeological resources.	2
	Location 6	• No known archaeological sites located on or within the vicinity of the location. • Wetlands are located within 100m of the location.	• As the location in close proximity to a water source, potential exists for disturbance or destruction of archaeological resources.	• Complete an archaeological and assessment prior to confirmation of the preferred alternative (Phase 2 evaluation).	• Possible archaeological potential. • Moderate potential for disturbance or destruction of archaeological resources.	2
3. Potential for Impacts to Registered and Unregistered Cemeteries	Location 1	• Hillside Cemetery located beyond 500m from the location.	• None anticipated.	• Continued consideration as more information becomes available during the EA (e.g. Phase 2 evaluation) and development processes.	• None anticipated. • Low potential for impact to registered and unregistered cemeteries.	1
	Location 2	• Hillside Cemetery located beyond 500m from the location.	• None anticipated.	• Continued consideration as more information becomes available during the EA (e.g. Phase 2 evaluation) and development processes.	• None anticipated. • Low potential for impact to registered and unregistered cemeteries.	1
	Location 3	• The Hillside Cemetery is located approximately 80m northeast of the location.	• Potential for impacts to Hillside Cemetery	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Establish fill area in a location farthest distance from cemetery.	• Moderate potential for impacts to Hillside Cemetery.	2

TABLE 8.5: PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP D: CULTURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
	Location 4	• The Hillside Cemetery is located approximately 120m southeast of the location.	• Potential for impacts to Hillside Cemetery	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Establish fill area in a location farthest distance from cemetery.	• Moderate potential for impacts to Hillside Cemetery.	2
	Location 5	• Location approximately 200m southeast from Hillside Cemetery.	• Potential for impacts to Hillside Cemetery	• Operational measures including progressive capping, dust control, appropriate hours of operation. • Establish fill area in a location farthest distance from cemetery.	• Moderate potential for impacts to Hillside Cemetery.	2
	Location 6	• Hillside Cemetery located beyond 500m from the location.	• None anticipated.	• Continued consideration as more information becomes available during the EA (e.g. Phase 2 evaluation) and development processes.	• None anticipated. • Low potential for impact to registered and unregistered cemeteries.	1

Criteria Group E: Technical Considerations

The net environmental effects assessment for Criteria Group E is summarized in Table 8.6 and the assignment of rankings discussed below.

Criteria 1: Potential for Addressing the Stated Problem or Opportunity

Candidate location 1 received a low ranking as the land has been previously designated for and is currently used as a municipal waste disposal site, demonstrating the capability to address the problem or opportunity. Candidate locations 2, 3, 4, 5 and 6 each received a high ranking for this criterion due to the need or likely need to provide engineered facilities to manage the leachate generated from a landfill site as it is expected that natural attenuation process may not be adequate. Although the locations are anticipated to provide sufficient land area to establish a waste disposal site, it is expected that the onsite and adjacent land use designations would also be impacted as a result.

TABLE 8.6 – PHASE 1 COMPARATIVE EVALUATION – CRITERIA GROUP E: TECHNICAL CONSIDERATIONS

Criterion	Potential Location	Comments	Potential Environmental Effects	Mitigation	Net Environmental Effects	Impact Ranking
1. Potential for addressing the stated problem or opportunity.	Location 1	• The establishment of a waste disposal site at this location will address the Town's waste disposal needs. • Land is zoned for waste disposal purposes. • Adjacent lands zoned commercial and industrial.	• Impacts similar to existing site expected, e.g. groundwater quality impact. • CAZ lands available (Crown and Town owned). • Lands included in the currently delineated expanded CAZ include a portion of the solar farm to the west (Municipal), Highway 17 right-of-way, Crown land (including MTO Patrol Yard and vacant land) and vacant municipal land.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECA amendment from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • Low negative impact.	1
	Location 2	• The establishment of a waste disposal site at this location will address the Town's waste disposal needs. • Site has been previously developed. • Site has been zoned for industrial, commercial, agricultural and aggregate extraction purposes.	• Likely to impact onsite businesses and uses of designated lands within the site. • Contamination of groundwater expected and need to establish CAZ required. • Potential lands that may be included in a CAZ include a solar farm and industrial businesses along Development Drive.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECAs from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • High negative impact potential.	3
	Location 3	• The establishment of a waste disposal site at this location will address the Town's waste disposal needs. • Privately own parcels of property are located onsite.	• Potential to negatively impact current onsite/nearby land uses. • Contamination of groundwater expected and need to establish CAZ required. • Limited space available for a CAZ downgradient of the site including private residential properties.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECAs from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • High negative impact potential.	3
	Location 4	• The establishment of a waste disposal site at this location will address the Town's waste disposal needs. • Site contains privately own parcels of property and lands zoned for aggregate extraction. • Aggregate extraction area located downgradient of site.	• Potential to negatively impact current onsite/nearby land uses. • Contamination of groundwater expected and need to establish CAZ required. • Potential to impact onsite surface water course. • Potential lands that may be included in a CAZ include several private residential properties and the Highway 557 right-of-way.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECAs from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • High negative impact potential.	3
	Location 5	• The establishment of a waste disposal site will address the Town's waste disposal needs. • Land zoned for "Future Development" and "Agriculture" are located within and downgradient of the site.	• Potential to negatively impact current nearby land uses. • Contamination of groundwater expected and need to establish CAZ required. • Potential lands that may be included in a CAZ include several private residential properties and the Robb Road right-of-way.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECAs from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • High negative impact potential.	3
	Location 6	• The establishment of a waste disposal site will address the Town's waste disposal needs. • Parcels of privately- owned land are located adjacent to the site. • Site contains lands zoned for agricultural purposes.	• Potential to negatively impact current nearby land uses. • Contamination of groundwater expected and need to establish CAZ required. • Potential lands that may be included in a CAZ include several private residential properties and the Robb Road right-of-way.	• Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices for the specific location. • Obtain ECAs from MECP.	• Mitigated impact to the environment. • Waste disposal needs met. • High negative impact potential.	3

8.1.4 Advantages and Disadvantages

From the net environmental effects assessment, a summary of key advantages and disadvantages associated with each alternative location was prepared and is presented in Table 8.7. Referencing Table 8.7:

1. Location 1 “expansion of the current landfill site” provides the highest ratio of advantages to disadvantages (9.5);
2. Location 2 “industrial lands and north of industrial lands” provides the second highest ratio of advantages to disadvantages (0.9);
3. Location 6 “North of Highway 17, East of Robb Road” provides an advantage to disadvantages ratios of 0.4;
4. Location 3 “North of Town core, West of Highway 557” provides an advantage to disadvantages ration of 0.3; and,
5. Location 3 “North of Town core, West of Highway 557” and Location 5 “North of Town core, East of Woodward Avenue” both provide advantages to disadvantages rations of 0.2.

A significant advantage associated with expansion of the existing landfill site is related to the need for ongoing monitoring and maintenance of the existing site should it be closed to develop a green field site (i.e. locations other than Location 1). Should the existing landfill site be expanded, monitoring and maintenance activities would be focused at a single location, environmental impact would be consolidated at a single location, and construction and annual operation costs as well as exposure to environmental liability would be reduced.

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
Natural Environment						
1. Potential impact to terrestrial features on and off-site.	(A) Location cleared less loss or disruption to terrestrial features.	(A) Location largely cleared less loss or disruption to terrestrial features.	(D) Clearing required, greater loss or disruption of terrestrial features.	(D) Clearing required, greater loss or disruption of terrestrial features.	(D) Clearing required, greater loss or disruption of terrestrial features.	(D) Clearing required, greater loss or disruption of terrestrial features.
2. Potential impact to wildlife on and off-site.	(A) Location cleared less loss or disruption to Wildlife.	(A) Location largely cleared less loss or disruption to wildlife.	(D) Clearing required, greater loss or disruption to wildlife.	(D) Clearing required, greater loss or disruption to wildlife.	(D) Clearing required, greater loss or disruption to wildlife.	(D) Clearing required, greater loss or disruption to wildlife.
3. Potential impact to aquatic features on and off-site.	(D) Surface water adjacent to location.	(D) Wetland adjacent to location.	(D) Wetland/ surface water body onsite and adjacent to location.	(D) Watercourse onsite.	(D) Wetland downgradient of location.	(D) Watercourse adjacent to location.
4. Potential impact to agricultural features on and off-site.	(A) No agricultural features on or downgradient of location.	(D) Agricultural lands within location.	(A) No agricultural features on or downgradient of location.	(D) Agricultural lands on and downgradient of location.	(D) Agricultural lands on and downgradient of location.	(D) Agricultural lands within location.
5. Potential impact to groundwater on and off-site.	(A) No groundwater sources/wells nearby.	(A) No groundwater sources/wells located nearby.	(D) Drinking water well in southeast corner of location.	(D) Drinking water wells south and east of location.	(D) Drinking water well downgradient of location.	(D) Groundwater sources in close proximity to location.

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
6. Potential impact to surface water on and off-site.	(D) Area of surface water pooling on location.	(D) Wetlands located adjacent to location.	(D) Wetland located onsite.	(D) Wetland located onsite; drainage course onsite.	(D) Wetland adjacent to location.	(D) Watercourse adjacent to location.
7. Potential impact to Air quality.	(A) Impacts from operations of existing site.	(D) Additional and new impacts from operation and maintenance of a new landfill.	(D) Additional and new impacts from operation and maintenance of a new landfill.	(D) Additional and new impacts from operation and maintenance of a new landfill.	(D) Additional and new impacts from operation and maintenance of a new landfill.	(D) Additional and new impacts from operation and maintenance of a new landfill.
Social Environment						
1. Potential impact to residents on and off-site.	(A) No residents on or downgradient of location.	(D) No residents onsite; residential properties downgradient of location.	(D) Residential properties within location.	(D) Residential properties within location.	(D) Residential properties downgradient of the location.	(D) Residential properties adjacent to location.
2. Potential impact to institutional, community and recreational features on and off-site.	(A) No onsite or nearby features	(D) Recreational features adjacent to location	(D) Location includes lands designated for open space; recreational and institutional facilities are	(A) No features nearby or on location.	(D) Includes lands designated for future development.	(D) Recreational features adjacent to location.

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
			in close vicinity.			
3. Potential to impact Indigenous Communities.	(A) No Indigenous communities located on or within immediate vicinity of the location.	(A) No Indigenous communities located on or within immediate vicinity of the location.	(D) Indigenous community in close proximity to location	(D) Indigenous community in close proximity to location	(D) Indigenous community in close proximity to location	(A) No Indigenous communities located on or within immediate vicinity of the location.
4. Potential impact to future planned land uses on and off-site	(A) Location is zoned for waste disposal.	(D) Location is zoned for agriculture, industrial and commercial uses.	(D) Location is zoned as a living area; adjacent to future development area.	(D) Location includes land zoned for mineral extraction; includes parcels of private property.	(D) Location includes land zoned for agriculture and future development.	(D) Location includes land zoned for agriculture.
5. Potential impact to noise on and off-site	(A) Adjacent lands zoned for industrial and commercial uses; no nearby residents.	(A) No nearby residents.	(D) Residential, institutional, recreational features in close proximity.	(D) Residential properties located adjacent.	(D) Residential properties located downgradient.	(D) Residential properties and recreational features adjacent to location.
6. Potential transportation impacts	(A) Provincial highway to site.	(A) Provincial highway to site.	(D) Secondary highway through	(D) Secondary highway through	(D) Secondary highway through	(D) Secondary highway/municipal road though

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
			residentially zoned area.	residentially zoned area.	residentially zone area.	residentially zoned area.
Economic Environment						
1. Potential impact to businesses and employees.	(A) No onsite businesses; adjacent property includes commercial and industrial zoned land.	(D) Businesses located onsite.	(D) Commercial property in close proximity to location.	(A) No businesses one or in close proximity to the location.	(A) No businesses one or in close proximity to the location.	(A) No businesses one or in close proximity to the location.
2. Potential impact to forestry and aggregate industries.	(A) No forestry or aggregate industries on or within vicinity of location.	(D) Mineral extraction area onsite.	(A) No forestry or aggregate industries on or within vicinity of location.	(D) Mineral extraction area onsite.	(A) No forestry or aggregate industries on or within vicinity of location.	(A) No forestry or aggregate industries on or within vicinity of location.
3. Potential impact to cost.	(A) Location previously cleared and is established.	(D) Costs required establish landfill and long-term monitoring.	(D) Costs required for clearing, site preparation and long-term monitoring.	(D) Costs required for clearing, site preparation and long-term monitoring.	(D) Costs required for clearing, site preparation and long-term monitoring.	(D) Costs required for clearing, site preparation and long-term monitoring.
4. Potential impact to	(A) No change in haul route is expected.	(A) Transportation related costs	(A) Transportation related costs	(A) Transportation related costs expected to be	(A) Transportation related costs	(A) Transportation related costs expected to be

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
transportation cost.		expected to be similar to current site.	expected to be similar to current site.	similar to current site.	expected to be similar to current site.	similar to current site.
Cultural Environment						
1. Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes	(A) Low potential for displacement and/or disruption of resources and/or landscapes.	(A) Low potential for displacement and/or disruption of resources and/or landscapes.	(A) Low potential for displacement and/or disruption of resources and/or landscapes.	(A) Low potential for displacement and/or disruption of resources and/or landscapes.	(A) Low potential for displacement and/or disruption of resources and/or landscapes.	(A) Low potential for displacement and/or disruption of resources and/or landscapes.
2. Disturbance or Destruction of Archaeological Resources	(A) Archaeological assessment has been completed – location does not contain archaeological potential.	(A) No known archaeological sites within vicinity of location; majority of the location has been developed.	(D) No known archaeological sites within vicinity of location; distance from water creates potential and requires that an assessment be completed.	(D) No known archaeological sites within vicinity of location; topography and soil type creates potential and requires that an assessment be completed.	(D) No known archaeological sites within vicinity of location; distance from water creates potential and requires that an assessment be completed.	(D) No known archaeological sites within vicinity of location; distance from water creates potential and requires that an assessment be completed.
3. Impacts to Registered and Unregistered Cemeteries	(A) Located beyond 500m from cemetery.	(A) Located beyond 500m from cemetery.	(D) Located within 500m of cemetery.	(D) Located within 500m of cemetery.	(D) Located within 500m of cemetery.	(A) Located beyond 500m from cemetery.

Table 8.7: Phase 1 Advantages and Disadvantages of Candidate Locations						
Criteria Group/Criterion	**Candidate Location**					
	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
Technical						
1. Potential to address problem.	(A) Will address Town's future waste disposal needs; land has been designated for waste disposal.	(D) Will address future waste disposal needs; designated land uses are expected to be impacted.	(D) Will address future waste disposal needs; designated land uses are expected to be impacted.	(D) Will address future waste disposal needs; designated land uses are expected to be impacted.	(D) Will address future waste disposal needs; designated land uses are expected to be impacted.	(D) Will address future waste disposal needs; designated land uses are expected to be impacted.
Overall Impact	(A) = 19 (D) = 2 Ratio A:D = 9.5	(A) = 10 (D) = 11 Ratio A:D = 0.9	(A) = 4 (D) = 17 Ratio A:D = 0.2	(A) = 5 (D) = 16 Ratio A:D = 0.3	(A) = 4 (D) = 17 Ratio A:D = 0.2	(A) = 6 (D) = 15 Ratio A:D = 0.4

(A) Advantage; (D) Disadvantage

8.1.5 Phase 1 Evaluation Results

Table 8.8, compiles the individual criteria rankings into an overall relative ranking, or score, for each location. For each location, individual criteria scores of either 1, 2 or 3 were assigned where impact potential was determined to be either low, medium or high (respectively). The lowest possible cumulative score any location could therefore receive corresponds to the number of criteria considered, 21. Locations were then assigned an overall ranking or score, relative to the lowest possible score, by adding the scores for each criteria and dividing by 21. The location having the lowest score is most preferred as its impact potential was determined to be lowest.

Referencing Table 8.8, the Phase 1 evaluation identifies the locations with the 3 lowest impact rankings in the following order:

1. Location 1 “expansion of the current landfill site” as the location with the lowest impact ranking (i.e. preferred – Score of 1.1);
2. Location 2 “industrial lands and north of industrial lands” as the location with the second lowest impact ranking (Score of 1.8); and,
3. Location 6 “North of Highway 17, East of Robb Road” (Score of 2.0).

Since the initiation of the EA, Location 2 has been nearly fully developed as a solar farm. As a result, Location 2 is not considered past the Phase 1 evaluation stage.

With reference to the rankings presented in Table 8.8, the Phase 1 evaluation reveals a strong preference to provide additional landfilling capacity by expanding the existing landfill site (Location 1). Considering the strong preference for expansion, and the advantages associated with maintaining landfilling operations at a single location, developing additional waste disposal capacity at Location 1 was carried forward alone for further consideration under the Phase 2 evaluation stage. Should it have been found that implementing an expansion of the existing landfill site would not be acceptable, the Phase 2 evaluation would have been expanded to include the establishment of a green field site at Location 6.

Table 8.8: Alternative Methods – Phase 1 Summary of Impact Rankings						
Criteria Group & Criteria	**Location 1**	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
NATURAL ENVIRONMENT						
1. Potential for loss or disruption of terrestrial features on and off site.	Low Ranking.	Low Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.
2. Potential for loss or disruption of wildlife on and off site.	Low Ranking.	Medium Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.
3. Potential for loss or disruption of aquatic features on and off site.	Medium Ranking.	Medium Ranking.	High Ranking.	High Ranking.	Medium Ranking.	Medium Ranking.
4. Potential for loss or removal of agriculture resources on and off site.	Low Ranking.	High Ranking.	Low Ranking.	Low Ranking.	High Ranking.	High Ranking.
5. Potential for impairment of groundwater resources.	Low Ranking.	Medium Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.
6. Potential for impairment of surface water resources.	Medium Ranking.	Medium Ranking.	High Ranking.	High Ranking.	Medium Ranking.	Medium Ranking.
7. Potential for impairment of air quality (e.g. dust and odour).	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.
SOCIAL ENVIRONMENT						
1. Potential for displacement or disruption to residents.	Low Ranking.	Low Ranking.	High Ranking.	High Ranking.	Medium Ranking.	High Ranking.

Table 8.8: Alternative Methods – Phase 1 Summary of Impact Rankings						
Criteria Group & Criteria	**Location 1**	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
2. Potential for displacement or disruption to institutional, community and recreational features.	Low Ranking.	Medium Ranking.	Medium Ranking.	Low Ranking.	High Ranking.	Medium Ranking.
3. Potential to impact Indigenous Communities.	Low Ranking.	Low Ranking.	High Ranking.	High Ranking.	Medium Ranking.	Low Ranking.
4. Potential for effects on future planned land uses.	Low Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.
5. Potential effects of noise (generated on and off site).	Low Ranking.	Low Ranking.	High Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.
6. Transportation related considerations.	Low Ranking.	Low Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.
ECONOMIC ENVIRONMENT						
1. Potential for displacement or disruption to existing businesses and their employees.	Low Ranking.	High Ranking.	Medium Ranking.	Low Ranking.	Low Ranking.	Low Ranking.
2. Potential for displacement or disruption of forestry and aggregate industries.	Low Ranking.	High Ranking.	Low Ranking.	High Ranking.	Low Ranking.	Low Ranking.
3. Potential cost of implementing alternative.	Low Ranking.	Medium Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.

Table 8.8: Alternative Methods – Phase 1 Summary of Impact Rankings						
Criteria Group & Criteria	**Location 1**	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**
4. Transportation related considerations.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.
CULTURAL ENVIRONMENT						
1. Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.	Low Ranking.
2. Disturbance or Destruction of Archaeological Resources.	Low Ranking.	Low Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.
3. Impacts to Registered and Unregistered Cemeteries	Low Ranking.	Low Ranking.	Medium Ranking.	Medium Ranking.	Medium Ranking.	Low Ranking.
TECHNICAL CONSIDERATIONS						
1. Potential for addressing the stated problem or opportunity.	Low Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.	High Ranking.
OVERALL RANKINGS/SCORES						
	19L, 2M **Score 1.1**	10L, 6M, 5H **Score 1.8**	8L, 5M, 11H **Score 2.4**	6L, 4M, 11H **Score 2.2**	5L, 8M, 8H **Score 2.1**	7L, 7M, 7H **Score 2.0**

9.0 PHASE 2 EVALUATION OF ALTERNATIVE METHODS

Phase 2 of the comparative evaluation is described in the ToR as an evaluation in greater detail of "*…alternative methods identified for further consideration under Phase 1*". Accordingly, the Phase 2 evaluation described in this Section further assesses the suitability of Location 1 "expansion of the existing landfill site" as the preferred method to provide additional waste disposal capacity. As noted in Section 8.0, should the Phase 2 evaluation have found that an expansion of the existing landfill site would be unacceptable, the Phase 2 evaluation would be expanded to included consideration of Location 6 (green field site).

9.1 Comparative Evaluation – Phase 2

Consistent with the ToR, the criteria groups established for the Phase 1 evaluation are used during the Phase 2 evaluation with criteria expanded to include consideration of impacts along likely haul and access routes in addition to those expected on and off-site. Additional criteria are also introduced under each criteria group. The Town and stakeholders were consulted on the evaluation criteria, scoring and the need for criteria weighting throughout the EA process. Modifications were made where needed to address comments received and criteria weighting was not incorporated.

Phase 2 of the evaluation considers the criteria outlined in Table 9.1, and described in Sub-Section 9.1.2.

Table 9.1: Alternative Methods Evaluation Criteria – Phase 2			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
A - Natural Environment	1. Potential for loss or disruption of terrestrial features along access/haul routes.	• Terrestrial features along existing Highway 17 haul route that may be displaced or disrupted • Terrestrial features along existing access road that may be displaced or disrupted • Change in traffic volumes	• Aerial photography • KEC field assessment • Blue Heron Environmental Impact Study
	2. Potential for loss or disruption of wildlife along access/haul routes.	• Wildlife along existing Highway 17 haul route that may be displaced or disrupted • Wildlife along existing access road that that may be displaced or disrupted • Change in traffic volumes	• KEC field assessment • Blue Heron Environmental Impact Study • Ministry records and mapping
	3. Potential for loss or disruption of aquatic features along access/haul routes.	• Aquatic features along existing Highway 17 haul route that may be displaced or disrupted • Aquatic features along existing access road that may be displaced or disrupted • Change in traffic volumes	• Aerial photography • KEC field assessment • Blue Heron Environmental Impact Study
	4. Potential for loss or removal of agriculture resources along access/haul routes.	• Agricultural resources along existing Highway 17 haul route that may be displaced or disrupted • Agricultural resources along existing access road that may be displaced or disrupted • Change in traffic volumes	• Aerial photography • KEC field assessment • Town of Blind River Official Plan
	5. Characteristics of site-specific geology.	• Overburden composition and depth	• Borehole records
	6. Potential for predicting groundwater migration pathways.	• Overburden composition and depth • Bedrock profiling • Observed water table configurations	• Blind River Municipal Waste Disposal Site Hydrogeological and Surface Water Assessment (Existing and Proposed Expanded)

Table 9.1: Alternative Methods Evaluation Criteria – Phase 2			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
			• Bedrock probe tests • Annual operations and monitoring reports (existing landfill)
	7. Potential for impacting or disruption of groundwater resources.	• Ongoing annual monitoring of groundwater resources	• Blind River Municipal Waste Disposal Site Hydrogeological and Surface Water Assessment (Existing and Proposed Expanded) • Annual operations and monitoring reports (existing landfill)
	8. Potential for impairment of surface water resources and associated impacts.	• Ongoing annual monitoring of surface water resources	• Blind River Municipal Waste Disposal Site Hydrogeological and Surface Water Assessment (Existing and Proposed Expanded) • Annual operations and monitoring reports (existing landfill)
	9. Potential for flood hazard.	• Lake Huron high water mark	• Fisheries and Oceans Canada data
	10. Potential for impairment to air quality (e.g. noise, dust and odour)	• Number and frequency of any complaints received relating to air quality impacts • Change in operations at the site including equipment deployed at the landfill • Operating hours of expanded landfill site • Change in daily waste received • Speed of vehicular traffic along unpaved access road. Change in traffic volumes • Extent of exposed waste material • Surface water flow/ponding in fill area • Size of the working area • Number of temporary or long-term storage piles • Cleanliness of public drop-off bins and waste receiving area	• Noise Impact Assessment & Odour and Dust Management Plan • MECP's recommended FIDOL (Frequency, Intensity, Duration, Offensiveness and Location) approach • Public complaint records. • Annual Monitoring and Operations Report. • MECP Inspection Reports. • Town and/or Operator daily observations.

Table 9.1: Alternative Methods Evaluation Criteria – Phase 2			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
B - Social Environment	1. Potential for displacement or disruption to residents along access/haul routes.	• Residents along existing access road that may be displaced or disrupted • Residents along existing Highway 17 haul route that may be displaced or disrupted • Change in traffic volumes	• Aerial photography • KEC field assessment • Noise Impact Assessment & Odour and Dust Management Plan
	2. Potential for displacement or disruption to institutional, community and recreational features along access/haul routes.	• Institutional, community and recreational features along existing Highway 17 haul route that may be displaced or disrupted • Institutional, community and recreational features along existing access road that may be displaced or disrupted • Change in traffic volumes	• Aerial photography • KEC field assessment • EA Consultation with the public, stakeholders and agencies
	3. Potential for disruption to Indigenous communities along access/haul routes.	• Indigenous communities disrupted along Highway 17 between the Town and existing site • Indigenous communities disrupted along existing access road off Highway 17 • Change in traffic volumes	• EA Consultation with Indigenous Communities
	4. Potential noise impacts on nearby sensitive receptors (generated on and off site).	• Sensitive receptors near the existing site • Historical noise complaints at existing site	• Noise Impact Assessment & Odour and Dust Management Plan • Discussions with Town staff
	5. Potential to integrate end-use with surrounding community.	• Is end-use of existing compatible with surrounding community	• Town of Blind River Official Plan • Town of Blind River Zoning By-Law
	6. Potential for removal of future planned land uses on and off site.	• Future land use planning on-site • Future land use planning off-site	• Town of Blind River Official Plan • Town of Blind River Zoning By-Law
C - Economic Environment	1. Potential displacement or disruption to existing businesses and their employees along access/haul routes.	• Existing businesses along existing Highway 17 haul route that may be displaced or disrupted • Existing businesses along existing access	• EA Consultation with the public, stakeholders and agencies

Table 9.1: Alternative Methods Evaluation Criteria – Phase 2			
Criteria Group	**Evaluation Criteria**	**Indicators**	**Data Sources**
		road that may be displaced or disrupted • Change in traffic volumes	
	2. Potential cost of implementing alternative including capital, operating and closure/post closure costs.	• Area of grubbing and stripping organics required • Construction of a public drop off area for waste, recyclables and divertables • Construction/relocation of an attendant's shelter • Additional groundwater monitoring wells	• Design and Operations report • Conceptual site design • Historical operating and well installation costs
	3. Potential impacts to property values.	• Changes in operations at the existing site • Historical impacts on adjacent land uses	• Design and Operations report • Discussions with Town staff
D - Cultural Environment	1. Potential for impact to known archaeological resources or areas of archaeological potential.	• Potential presence of archaeological resources or areas of archaeological potential at existing site	• ASI Stage 1 and 2 Archaeological Assessment report
	2. Potential for removal of built heritage resources and cultural heritage landscapes.	• Potential presence of built heritage and cultural heritage landscapes at existing site	• Ministry of Citizenship and Multiculturalism Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes checklist
E - Technical Considerations	1. Potential reliability and flexibility.	• Environmental performance of existing site • Ability to potentially implement other waste management diversion, processing or disposal options	• Design and Operations report • Discussions with Town staff
	2. Potential operational constraints and opportunities.	• Additional or changed operational constraints at existing site	• Design and Operations report • Discussions with Town staff

9.1.1 Data Sources

As described in the ToR, data considered during the Phase 2 evaluation was developed following in-depth review of published information and, as required, intrusive site work. This includes:

1. Annual Monitoring and Operations and Reports (existing landfill);
2. Hydrogeological and Surface Water Assessment Municipal Waste Disposal Site (Existing and Proposed Expanded);
3. Records from the advancement of numerous boreholes;
4. Ground and Surface Water Monitoring, Trigger Mechanisms and Contingency Plan;
5. Bedrock profiling;
6. Archaeological Services Inc. (AIS) Stage 1 and 2 Archaeological Assessment;
7. Noise Impact Assessment & Odour and Dust Management Plan
8. Surface water drainage review;
9. Blue Heron Environmental Impact Study
10. Surface Water Management Plan and System Design
11. Detailed topographic surveys; and,
12. On-site reconnaissance.

Data sources are also included in Table 9.1.

Due to the preferred alternative being expansion of the currently operating site, and with the exception of the studies listed above, additional technical studies were not completed. This is supported by there being no history of public noise, dust or odour complaints associated with the existing site and considering that the local social, economic and natural environments have been impacted by historical operations. Should it have been found that expansion of the existing site would not be considered following the Phase 1 comparative evaluation, additional technical studies may have been completed.

9.1.2 Criteria Groups, Criteria and Criteria Ranking

The criteria ranking method applied during the Phase 2 included qualitative and quantitative assessments and ranking of expected impacts following the implementation of potential mitigation measures to assess the expected net environmental effects. The assessment considers potential on and off-site effects associated with the construction, operation and closure /post closure of developing Location 1, providing waste disposal capacity through an expansion to the current landfill site.

Criteria Group A: Natural Environment

A summary of the Phase 2 assessment is presented in Table 9.2.

Criteria 1: Potential for loss or disruption of terrestrial features along access/haul routes

Criteria 1 was expanded from the Phase 1 evaluation to include potential impacts along anticipated access and haul routes.

The haul route to Location 1 is the long-established King's Highway Number 17 with the majority of waste being hauled easterly along the highway from the built-up community. Smaller amounts of waste are also hauled along Highway 17 from locations east of Location 1. Similarly, the access road to Location 1 is long established and no realignment or change in use is expected. With an expansion of the waste disposal capacity at Location 1, related traffic volumes on both the haul route and access road are not expected to change as a result of a site expansion.

No loss or additional disruption of terrestrial features along either the haul routes or the access road will occur by the provision of additional waste disposal capacity at Location 1. Mitigation measures are not required in this regard.

An Environmental Impact Study (EIS) was undertaken by Blue Heron Environmental (Blue Heron) for Location 1 to identify potential ecological sensitivities and recommend mitigation in support of the expansion of the existing landfill site. A copy of the report is provided in Appendix G. The study area for the EIS was defined as the existing landfill site plus 120 metres (m) of adjacent lands to account for wildlife movement. Blue Heron stated that there is moderate and high potential for eighteen (18) Species at Risk (SAR) to inhabit the study area, based on the information and habitat available. Blue Heron noted that of these 18 SAR, eleven (11) are protected SAR which means they are provincially designated as threatened or endangered under the Endangered Species Act (ESA). Blue Heron presumed the presence of several types of Significant Wildlife Habiat but stated that the habitat the supports these features is not limited on the landscape and even though expansion of the existing landfill site may have a small, local effect, the ability of the species to persevere as self-sustaining populations in the region is anticipated. Blue Heron specifically noted the presence of habitat to support endangered bats, Bank Swallow and Blanding's Turtle in the study area. Blue Heron stated that once the recommended mitigation measures described in the EIS are implemented, no effects to these featured from expansion of the existing landfill site are expected.

This criteria is assigned rank of low (score of 1), minimal potential for loss or disruption.

Criteria 2: Potential for loss or disruption of wildlife along access/haul routes
Criteria 2 was expanded from the Phase 1 evaluation to include potential impacts along anticipated access and haul routes.

Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from expanding capacity at Location 1. Loss or disruption of wildlife will not occur as a result of the need to establish and operate haul and access routes.

The potential for loss or disruption of wildlife exists in the event that a waste hauling vehicle is involved in a traffic accident or leaves the road resulting in a fuel spill, or strikes wildlife, for example. This potential is mitigated in the case of Location 1 by the high degree of Highway maintenance, specifically winter maintenance, employed by the Province, frequent patrols by law enforcement to control speed and driver behavior, and frequent patrols by Highway maintenance/management personnel to identify potential road safety issues and to respond to accidents requiring environmental cleanup. No additional mitigation measures are required in this regard.

As stated in Criteria 1, Blue Heron stated that there is moderate and high potential for eighteen (18) Species at Risk (SAR) to inhabit the study area, eleven (11) of which are protected SAR. Blue Heron presumed the presence of several types of Significant Wildlife Habiat but stated that the habitat the supports these features is not limited on the landscape and even though expansion of the existing landfill site may have a small, local effect, the ability of the species to persevere as self-sustaining populations in the region is anticipated. Blue Heron specifically noted the presence of habitat to support endangered bats, Bank Swallow and Blanding's Turtle in the study area. Blue Heron stated that once the recommended mitigation measures described in the EIS are implemented, no effects to these featured

from expansion of the existing landfill site are expected.

This criteria is assigned rank of low (score of 1), minimal potential for loss or disruption.

Criteria 3: Potential for loss or disruption of aquatic features along access/haul routes
Criteria 3 was expanded from the Phase 1 evaluation to include potential impacts along anticipated access and haul routes.

Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1. Loss or disruption of aquatic features will not occur as a result of the need to establish and operate haul and access routes.

The potential for loss or disruption of aquatic features exists in the event that a waste hauling vehicle is involved in a traffic accident or leaves the road resulting in a fuel spill, for example. This potential is mitigated in the case of Location 1 by the high degree of Highway maintenance, specifically winter maintenance, employed by the Province, more frequent patrols by law enforcement to control speed and driver behavior, and more frequent patrols by Highway maintenance/management personnel to identify potential road safety issues and to respond to accidents requiring environmental cleanup. No additional mitigation measures are required in this regard.

Additionally, the Blue Heron EIS described in Criteria 1 did not identify any aquatic features within the study area.

This criteria is assigned rank of low (score of 1), minimal potential for loss or disruption.

Criteria 4: Potential for loss or removal of agriculture resources along access/haul routes
Criteria 4 was expanded from the Phase 1 evaluation to include potential impacts along anticipated access and haul routes.

Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1.

There are no agricultural resources located along the established haul and access routes to Location 1 and no loss or removal of agricultural resources will occur. No mitigation measures are expected to be required. This criteria is assigned rank of low (score of 1), minimal potential for loss or removal.

Criteria 5: Characteristics of site specific geology
Site specific geology at Location 1 has been investigated in detail through the advancement of boreholes and bedrock probes as well as the installation of monitoring wells.

Location 1 is located near the contact of the Elliot Lake, Hough Lake and Quirke Lake Groups (conglomerate, greywacke, arkose, orthoquartzite, argillite, limestone, dolomite, rhyolite, basalt) on the south; and the Cobalt Group (conglomerate, greywacke, arkose, orthoquartzite, siltstone, argillite) on the north, all of Late Precambrian Huronian period (OGS, 1977).

According to the Northern Ontario Engineering Geology Terrain Study (VanDine, 1979; Blind River Sheet NTS 41J/SE), local terrain conditions are described as till with ground moraine as the dominant landform (outwash plain is the subordinate landform). Bedrock underlies a drift veneer and is of relatively low permeability and effectively forms the base of the local groundwater flow system. Local relief is moderate, and terrain is undulating to rolling[2].

Auger drilling completed in association with the construction of 12 groundwater monitoring wells reveals up to 7 metres of sand and gravel deposits over bedrock. The soils encountered throughout Location 1 consisted primarily of a thin layer of topsoil over mixed sand and gravel layers. The sand and gravel layer overlays a silty sand and gravel till layer to the north (MW-1). At remaining locations, the sand and gravel layers were found to overlay medium to coarse grained sand layers to a silt layer in MW-2. An exception was noted where a medium grained sand layer was overlying a sand and gravel layer at MW-6. All of the soils were reported as being wet during the drilling program. MW-2/02, which is located within the limits of the existing waste fill area, encountered waste material from 0.3 to 3.7 metres below grade and terminated at a depth of 6.6m in a silty clay layer.

The geologic conditions are acceptable for the development/expansion of a municipal landfill site at Location 1 and this criteria is assigned a rank of medium (score of 2), as although there is a low negative impact/restriction to expansion, an increased volume of overburden material will be leachate impacted.

Criteria 6: Potential for predicting groundwater migration pathways
The undulating, poorly-drained terrain, the relatively thin overburden layer, and the Precambrian rock combine to produce shallow local flow systems from topographic highs into adjacent lakes, wetlands or streams. Groundwater flow systems are most active in the relatively permeable sand and gravel deposits.

Groundwater migration pathways have been established and assessed at Location 1 for a period of time approaching 20 years, beginning in 2002, and are monitored and reported on annually. The current groundwater monitoring program relies on information collected from 11 functioning monitoring wells situated on Location 1 and a 12th monitoring well located south of Highway 17. Figure 9.1 depicts the arrangement of the monitoring well network. Monitoring at Location 1 shows that the water table is generally between 1.6 and 0.4 metres below grade and that the sand and gravel deposits are partially saturated. Interpretations of observed water table configurations reveal that the flow direction (migration pathway) from the existing fill area is generally to the west and south. In 2020, a series of 9 bedrock probes were advanced along a trail north of the existing fill area confirming the existence of an apparent bedrock ridge. This bedrock ridge is interpreted to restrict the groundwater migration pathway (i.e. acts as a northerly flow boundary).

The water-table configuration at Location 1 extends within the waste and flow is outward to the west and south. Flow to the north, east northeast is considered unlikely due to higher terrain along the north and east boundaries and the existence of the bedrock ridge. Leachate originating in the waste moves from the current fill area within the shallow groundwater flow system and eventually discharges into Lake Huron. The bedrock effectively forms the base and boundaries of the local groundwater flow system.

Considering the work completed in connection with the existing landfill operation, groundwater

[2] Hydrogeological Investigation. Town of Blind River Landfill. Goffco Limited, September 30, 2002.

migration pathways at Location 1 are well understood. This criteria is assigned a rank of low (score of 1) due to a low negative restriction to expansion.

Criteria 7: Potential for impacting or disruption of groundwater resources
As Location 1 includes the existing waste disposal site, groundwater movement through and from the location and impacts to groundwater quality have been monitored annually since 2002. An assessment of the potential impact to or disruption of groundwater resources is also included in the 2021 Hydrogeological and Surface Water Assessment Report (copy presented in Appendix C).

Groundwater flow pathways at Location 1 are understood as is the likely leachate plume migration pathway, and this information has been used to delineate a contaminant attenuation zone (CAZ), as shown on Figure 9.2. Lands downgradient of Location 1 and within the delineated CAZ are owned by the Town of Blind River and the Crown (Ministry of Transportation – Highway 17 right-of-way). These lands are not developed, nor are they developable, to accommodate uses relying on or requiring groundwater resources. No potable water wells are located within or downgradient from the CAZ as the area is situated within the boundary of the municipal drinking water service area.

While groundwater resources will be impacted from a water quality perspective, their disruption is not expected as it is anticipated that expansion of waste disposal capacity at Location 1 would rely on the natural attenuation of contaminants within the CAZ. This is consistent with the leachate management approach at the existing landfill and the incorporation of engineered leachate management systems (e.g. pump and treat), which may disrupt the groundwater system, is not expected to be required.

As a result of the existing landfill site operation, groundwater resources at Location 1 have historically been impacted. Impacts are mitigated by ensuring waste material is compacted and covered, and that final cover is placed, progressively, over fill areas and side slopes that have reached their final contour elevations to limit the surface water available to infiltrate the waste mass and produce leachate. These mitigating measures would continue with an expanded landfill site at Location 1 and surface water management facilities would be improved. Compared to the existing impact/disruption to groundwater resources, no remarkable changes are expected as a result of providing additional waste disposal capacity at Location 1. This criteria is assigned a rank of medium (score of 2) as a larger CAZ will be required to attenuate the larger volume of leachate produced from an expanded fill area.

Criteria 8: Potential for impairment of surface water resources and associated impacts
Similar to Criteria 7, the potential for impairment of surface water resources and associated impacts is understood at Location 1 as a result of the ongoing annual monitoring of the existing landfill operations since 2002. An assessment of this potential is also included in the Hydrogeological and Surface Water Assessment Report.

Surface water has historically been observed to pool to the southwest of the existing waste fill area and this has been characterised as a collection of expressed groundwater, likely having been impacted by landfill leachate. Under certain conditions and seasons (e.g. spring), overland flow of water from this location has been observed to occur. The Town proposed to improve surface water management at Location 1 to address this as well as to redirect a contribution to surface water flows originating from the adjacent solar development. An application for approval of this work was submitted to the Ministry of the Environment, Conservation and Parks (MECP) in June 2021 with an approval being issued in October 2022. Construction of the surface water management works at the site is ongoing.

The CAZ associated with the existing and an expanded landfilling operation at Location 1 will adequately attenuate contaminates prior the eventual discharge of groundwater into Lake Huron. This criteria is assigned a rank of low (score of 1) as no appreciable change to the current condition is expected.

Criteria 9: Potential for flood hazard
This criteria assesses the potential that flood waters may impact the operation and/or performance of an expanded landfill site at Location 1. The existing fill area and available expansion area are located beyond the Lake Huron high water mark. Considering this, as well as the favourable local topography and drainage pathways at Location 1 as well as along its main haul route (Highway 17) and access road, impacts relating to flooding (i.e. flood hazards) are not expected. This criteria is assigned a rank low (score of 1) potential for flood hazard.

Criteria 10: Potential for Impairment to Air Quality (e.g. dust and odour)
A Noise Impact Assessment & Odour and Dust Management Plan was completed for Location 1 to provide "an assessment of potential noise impacts due to operations at the site and to local trucking related to operations at the site, including an evaluation of any proposed noise control measures". The report also identified potential sources and receptors of odour and dust associated with the Location 1 expansion and presents best management practices to mitigate potential impacts. A copy of the report is provided in Appendix F.

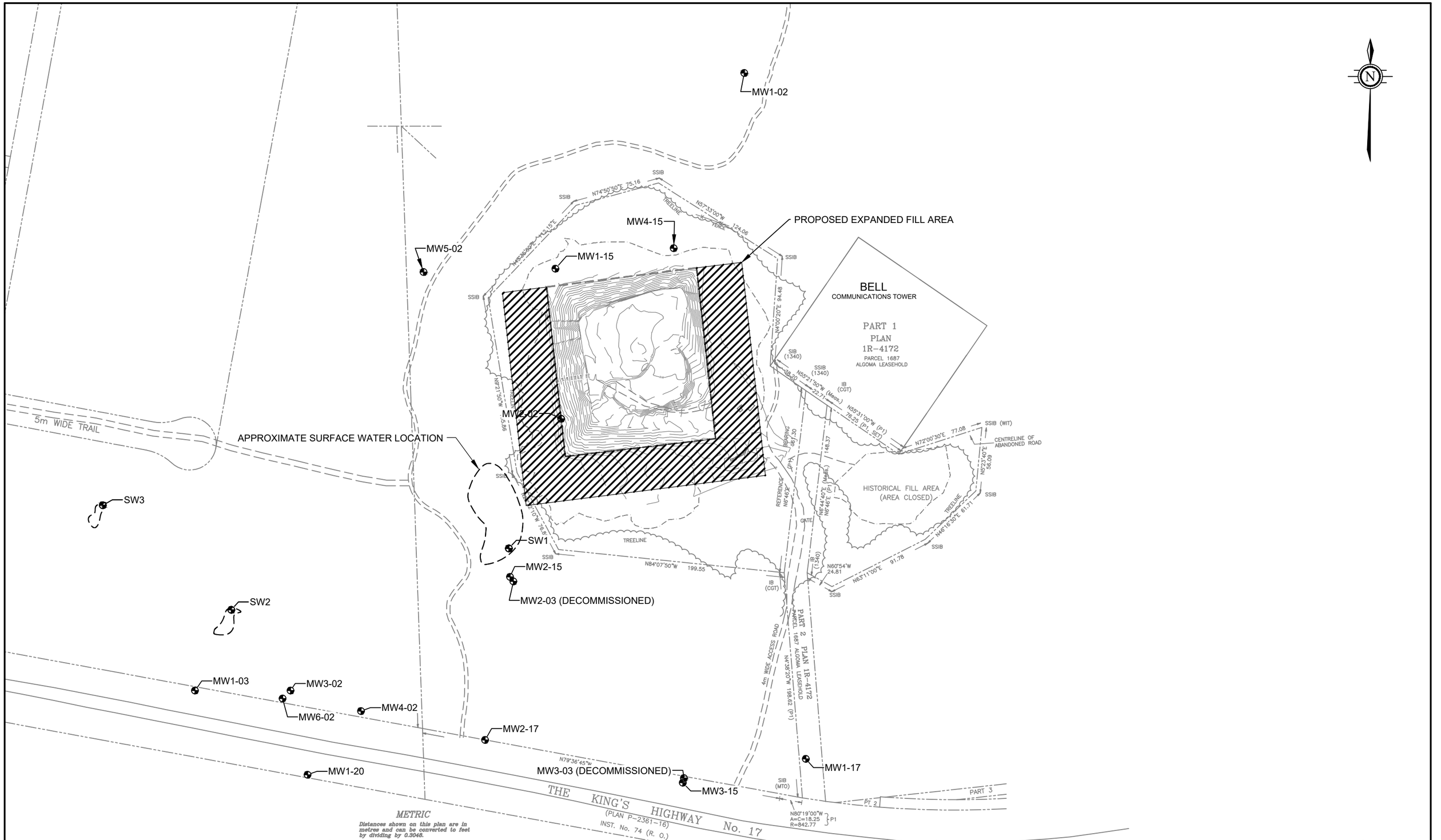
With respect to odour, the need for landfill gas mitigation is not anticipated at Location 1 owing to the expected volume of waste to be received, its sub-soil characteristics (course-grained sand and gravel), its relative size and there being no on-site buildings with basements. Odours from waste material will be addressed through the application of cover material and directing surface water flow to surface water management works surrounding the expanded fill area. It is expected that odour associated with Location 1 will be shielded by the treed buffer and surrounding forested areas. Given the remoteness of Location 1, and considering the historical record of no odour complaints, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded site. Should odour emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

Dust is not expected to be an issue at Location 1 owing to its remoteness and the controlled number of vehicles expected to be travelling to the working area during construction and operation of the expanded site. Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. A minimal change in traffic volumes and vehicle type/use will result from constructing the expanded site with no notable changes expected during operation of future expanded site. Considering the historical record of no dust complaints at Location 1, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded site. It is expected that any dust associated with Location 1 will be mitigated by the treed buffer and surrounding forested areas. Should dust emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

This criteria is assigned a rank low (score of 1) potential for impairment to air quality (e.g. dust and odour).

TABLE 9.2: PHASE 2 EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for loss or disruption of terrestrial features along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required.	• Possible loss or disruption resulting from vehicular accident (eg. spill or fire). • No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road).	• No change expected.	1
2. Potential for loss or disruption to wildlife along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required.	• Possible loss or disruption from vehicular accident (eg. spill, fire or animal strike). • No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
3. Potential or loss or disruption of aquatic features along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required.	• Possible loss or disruption resulting from vehicular accident (eg. spill or fire). • No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
4. Potential for loss or removal of agriculture resources along access/haul routes.	Location 1	• No known agricultural resources identified on site. • No known agricultural resources downgradient.	• No agricultural land is situated along haul and access routes to Location 1. • No change from the current condition is expected.	• None proposed.	• No change expected.	1
5. Characteristics of site specific geology.	Location 1	• Morainal overburden, 1m to 4m and up to 10m thickness. • Gravels, sands and silts. • Moderate topographic relief.	• Contamination of overburden within fill area and along the leachate migration pathway.	• Progressive capping of the fill area and proper surface water management to reduce leachate formation potential.	• Increased volume/area of leachate contaminated overburden.	2
6. Potential for predicting groundwater migration pathways.	Location 1	• Horizontal and vertical flow boundaries identified (i.e. bedrock base and ridge). • Water table elevation and potentiometric surface established and well understood. • Migration pathway to the south west from Location 1, toward Lake Huron.	• Groundwater flow system and migration pathways are well defined in conjunction with the existing site.	• Expand monitoring network to confirm groundwater direction and identify potential contamination. • Develop contaminant attenuation zone. • Continue monitoring water table elevations and interpreting plume migration.	• No change expected. • Low negative impact to expansion.	1
7. Potential for impacting or disruption of groundwater resources.	Location 1	• Leachate will impact groundwater quality. • No known downgradient drinking water wells. • Downgradient CAZ lands available.	• Groundwater impacts similar to existing site but larger volume of leachate produced with expanded site. • Larger CAZ area required to attenuate contaminants.	• Establish appropriate CAZ boundaries. • Proper compaction and daily cover during site operations. • Progressive capping of the fill area and proper surface water management to reduce leachate formation potential.	• Increased volume of leachate contaminated groundwater. • Larger CAZ area required.	2
8. Potential for impairment of surface water resources and associated impacts.	Location 1	• Surface water pooling south-west of active fill area, likely an expression of groundwater. • Currently included in monitoring program. • No other remarkable surface water features.	• Expressed groundwater pooled shown to be leachate impacted. • No change from the current potential for impact is expected.	• Progressive capping of the fill area and proper surface water management to reduce leachate formation potential. • Proper grading and drainage of the site to control the discharge of surface water originating from the fill area and adjacent development.	• No change in potential is expected. • Impact limited to on-site surface water.	1
9. Potential for flood hazard.	Location 1	• Location 1 is above flood elevation for area. • Local topography and drainage pathways protect against flooding.	• No change from the current condition is expected.	• Maintain onsite surface water management. • None proposed.	• No change expected.	1
10. Potential for impairment of air quality (e.g. noise, dust and odour).	Location 1	• No complaints relating to air quality impacts received by the Town over the past 20 years.	• Potential for noise impacts during construction and operation of expanded site.	• Surrounding forested areas including treed buffer.	• Low negative impact to expansion.	1

TABLE 9.2: PHASE 2 EVALUATION – CRITERIA GROUP A: NATURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
		• Site is located in a remote area approximately 6 km from centre of Blind River. • Proposed expansion areas have previously been cleared; therefore, the surrounding forested areas and treed buffer will continue to mitigate noise, odour and dust. • Haul and access routes are already established for operation of the existing landfill site and no new routes will be constructed. • No change in operations of the site are anticipated following expansion with the operator continuing to deploy 1 loader and 1 sheepsfoot compactor. • The amount of daily waste received at the site is not expected to increase following expansion (i.e. the service area remains unchanged). • No change to traffic volumes or vehicle type/use expected. • Expansion areas contain sub-soil characteristics (coarse-grained sand gravel) that allows the site to passively ventilate odour causing LFG through waste mass and cover material.	• Potential dust impacts during construction of expansion areas and stockpiling of excavated materials. • Potential dust impacts from vehicular traffic on non-paved access road. • Potential odour impacts from public drop-off bins or any waste with a particularly strong odour. • Potential for odour impacts from formation of leachate and LFG.	• Limit work hours and ensuring vehicles are equipped with proper and functioning muffling devices. • Excavated materials will remain on-site for use as cover or other site features (e.g. berms and roads) • Minimizing the speed of descent and drop height during unloading of excavated materials. • Loading and unloading at downwind side of storage piles. • Minimize the height and slope of all temporary or long-term stockpiles. • Speed limit of 30 km/h posted along access road. • Apply water along with chemical additives (i.e. calcium chloride) during construction and operation of expanded site. • Immediately cover any waste with a particularly strong odour. • Maintain the size of the working area to a minimum. • Cover waste following daily operations. • Frequently empty waste from public drop-off bins and cleaning the bins when required. • Progressively cap the fill area once it reaches its final contours. • Application of cover material and construction of small berms, as required, to direct surface water flow away from and around active disposal operations.		



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NOTES

DESIGN		
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.08	
FILENAME	0508.08 monitoring well networks	
SCALE	1:3000	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

MONITORING WELL NETWORK

9.1

Rev 0

LEGEND

INTERPRETED DIRECTION OF FLOW

MW4-15 EXISTING MONITORING WELL

EXISTING WETLANDS

INTERPRETED GROUNDWATER CONTOURS

ATTENUATION ZONE WITHIN MTO ROW

MW5-02

MW1-15

MW4-15

PROPOSED EXPANDED FILL AREA

FILL AREA

BELL
COMMUNICATIONS TOWER

MW2-02

CONSTRUCTION
DEBRIS

MW2-15

TOWN

MW1-03

MW3-02

MW6-02

MW4-02

200m

MW2-17

MW1-20

MW3-03 (DECOMMISSIONED)

MW3-15

MW1-17

TOWN

CROWN-HIGHWAY 17 RIGHT OF WAY

CONTAMINANT ATTENUATION ZONE
(10.2ha)

CANADIAN PACIFIC RAILWAY

TOWN

CROWN

CROWN

TOWN

CROWN

CROWN

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NOTES

DESIGN		
DRAWN	K.SHERLOCK	01/2021
CHECKED		
PROJECT	0508.08	
FILENAME	0508.08 CAZ	
SCALE	1:3000	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

CAZ - ACTIVE FILL AREA

9.2

Rev 0

Criteria Group B: Social Environment

A summary of the Criteria Group B Phase 2 assessment is presented in Table 9.3.

Criteria 1: Potential for displacement or disruption to residents along access/haul routes

Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1. The potential for disruption or displacement to residents is low as it relates to negative impacts to air quality as well as the need to establish and operate haul and access routes.

These will continue to be mitigated through the application of best management practices, appropriate transportation infrastructure planning, maintenance and enforcement processes.

The Noise Impact Assessment & Odour and Dust Management Plan report identified sources of noise at Location 1 during daily operations as dominated by the use of heavy equipment including a rubber-tire front-end loader and sheepsfoot landfill compactor as well as waste haul traffic along the lone access road. Thirteen (13) noise receptors were identified within the study area, which was set at 1 kilometre within the proposed expanded fill area. All 13 receptors were reportedly permanent residences. The results indicate that for the worst-case modelling scenario, predicted sounds levels at the noise receptors are below the daytime limit of 55 dBA. Therefore, no mitigation measures are required for the construction of the site expansion.

Given the remoteness of Location 1, and considering the historical record of no noise complaints, no additional mitigation measures are anticipated for the future operation of the expanded site due to the treed buffer remaining in place. Equipment noise will continue to be of minimal concern owing to the anticipated minimal handling required at the Site as well as regular inspection of equipment muffling devices. It is expected that noise from operations that does occur will be shielded by the surrounding forested areas. Should noise emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts shall be initiated (if required).

The report also identified potential sources and receptors of odour and dust associated with expansion of Location 1 and presents best management practices to mitigate potential impacts. Given the remoteness of Location 1, and considering the historical record of no odour complaints, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded site. The generation of landfill leachate will be addressed through the application of cover material and directing surface water flow to surface water management works surrounding the expanded fill area. It is expected that odour associated with Location 1 will be shielded by the treed buffer and surrounding forested areas. Should odour emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

Dust is not expected to be an issue at Location 1 owing to its remoteness and the controlled number of vehicles expected to be travelling to the working area. Considering the historical record of no dust complaints at Location 1, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded site. It is expected that any dust associated with Location 1 will be mitigated by the treed buffer and surrounding forested areas. Should dust emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

Criteria 2: Potential for displacement or disruption to institutional, community and recreational features along access/haul routes
Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1. The potential for disruption or displacement to institutional, community and recreational features is low as it relates to the need to establish and operate haul and access routes and will continue to be mitigated through the application of appropriate transportation infrastructure planning, maintenance and enforcement processes.

Criteria 3: Potential for disruption to Indigenous communities along access/haul routes
Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1. The potential for disruption or displacement to Indigenous communities, resources or traditional uses, as a result of the need to establish and operate haul and access routes, is low. Mitigation will continue through the application of appropriate transportation infrastructure planning, maintenance and enforcement processes.

Criteria 4: Potential for noise impacts on nearby sensitive receptors (generated on and off site)
As described in Criteria 1, sensitive receptors were identified as thirteen (13) reportedly permanent residences located within 1km of Location 1. The Noise Impact Assessment & Odour and Dust Management Plan determined that given the remoteness of Location 1, and considering the historical record of no noise or odour complaints as well as the controlled number of vehicles expected to be travelling to the working area, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded site. Should noise, odour or dust emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts shall be initiated (if required).

The existing landfill site is situated at Location 1 and waste hauling and access routes are established for the operation and maintenance of a landfill site at Location 1. With the provision of additional waste disposal capacity at Location 1, no change to the level or nature of noise generated by site operations or hauling waste to Location 1 is expected. The potential for changes to noise impacts on nearby sensitive receptors is low and will continue to be mitigated through the use of appropriate equipment muffling devices and hours of operation.

Criteria 5: Potential to integrate end-use with surrounding community
The existing landfill site is situated at Location 1 and its end-use as green space is currently integrated into the Official Plan and Zoning Bylaw. Expansion of the existing landfill site will not change this and the potential that this use does not integrate with the surrounding community is low.

Criteria 6: Potential for removal of future planned land uses on and off site
The existing landfill site is situated at Location 1 and land-use planning on and off-site has considered and incorporated this use historically and on an ongoing basis. Accordingly, the potential for removal/change of future planned land uses on and off site is low.

TABLE 9.3: PHASE 2 EVALUATION – CRITIERIA GROUP B: SOCIAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation Measures**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for displacement or disruption to residents along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required. • No change to traffic volumes or vehicle type/use expected.	• No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
2. Potential for displacement or disruption to institutional, community and recreational features along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required. • No change to traffic volumes or vehicle type/use expected.	• No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
3. Potential for displacement or disruption to Indigenous communities along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required. • No change to traffic volumes or vehicle type/use expected.	• No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
4. Potential noise impacts on nearby sensitive receptors (generated on and off site).	Location 1	• Nearest residential property located approximately 925m southeast of site. • Adjacent lands zoned for waste disposal, highway commercial and general industrial purposes. • No known noise complaints. • No changes in haul route or site operations anticipated.	• No change from the current condition is expected.	• Establishing appropriate hours of operation to limit time periods where noise due to operations is generated. • Ensure equipment is fitted with appropriate muffling devices.	• No change expected.	1
5. Potential to integrate end-use with surrounding community.	Location 1	• Existing Official Plan and Zoning Bylaw designations for Location 1 and surrounding areas are established to allow and be compatible with use as a landfill site.	• No change from the current condition is expected.	• None proposed.	• Low negative potential to integrate end-use with the surrounding community.	1
6. Potential for removal of future planned land uses on and off site.	Location 1	• Existing Official Plan and Zoning Bylaw designations for Location 1 and surrounding areas are established to allow and be compatible with use as a landfill site.	• No change from the current condition is expected.	• Continue operating and maintaining site per the Design and Operations report and MECP regulations/requirements.	• No change expected.	1

Criteria Group C: Economic Environment

Table 9.4 presents a summary of the Criteria Group C Phase 2 assessment.

Criteria 1: Potential displacement or disruption to existing businesses and their employees along access/haul routes

Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. No notable change in traffic volumes or vehicle type/use will result from developing Location 1. The potential for disruption or displacement to existing businesses and their employees as it relates to the need to establish and operate haul and access routes is low and will continue to be mitigated through the application of appropriate transportation infrastructure planning, maintenance and enforcement processes.

Criteria 2: Potential cost of implementing alternative including capital, operating and closure/post closure costs

Capital costs associated with developing additional disposal capacity at Location 1 include: grubbing, stripping organics and grading of the disposal buffer areas; construction of a public drop off area for waste, recyclables and divertables; and, construction/relocation of an attendant's shelter. Procurement of a weigh scale would likely not be needed as quantity estimates would continue to be developed by comparing annual topographic surveys. To mitigate capital cost, expansion areas will be arranged to minimize the required grubbing, stripping organics and grading as well as any expansion of the existing monitoring well network.

Once constructed, the effort required on an annual basis to operate and maintain an expanded landfill site at Location 1 and the cost to do so will not increase from current levels. The Town currently contracts-out operation and maintenance of the landfill site (competitive tendering process), a practice that effectively mitigates cost, and it is anticipated that this will continue to occur in the future.

Similar to the expected operation and maintenance effort and costs, those associated with closure and post-closure activities will also not increase appreciably from the current condition, with the exception that increased effort for final grading and increased volumes of final cover material would be required. Costs associated with post-closure ground and surface water quality monitoring as well as inspections and maintenance of the integrity of the final cover would not increase from requirements related to the existing landfill site.

A budget cost estimate of capital costs to construct an expansion of the landfill site at Location 1, summarized in Table 9.5, has been developed referencing costs from a recently constructed northern Ontario, natural attenuation landfill site. As annual costs to operate and maintain the site are routinely revised through a competitive tendering process and are not expected to change from the current condition, these costs are not considered here. Table 9.6 presents a summary of budget cost estimates for closure and post-closure costs, also developed referencing recently tendered natural attenuation landfill closure costs. Expansion of the existing location is the alternative with the lowest overall cost.

Criteria 3: Potential impact to property values

Landfilling operations have occurred on an ongoing basis for several decades at Location 1 and haul and access routes are also long established. Existing land uses are not notably restricted by these operations and no notable change is expected to result from expanding waste disposal capacity at Location 1. As a result, the potential to impact property values is assigned a rank of 1 (low).

TABLE 9.4: PHASE 2 EVALUATION – CRITERIA GROUP C: ECONOMIC ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for displacement or disruption to existing businesses and their employees along access/haul routes.	Location 1	• Highway 17 and the existing access road are both long established and no modifications are required. • No change to traffic volumes or vehicle type/use expected.	• No change from the current condition is expected.	• Routine maintenance by the Province (Highway 17) and Town (access road). • Policing of Highway traffic speed and driver behaviour (OPP).	• No change expected.	1
2. Potential cost of implementing alternative including capital, operating and closure/post closure costs.	Location 1	• Site has been previously cleared, minimal grubbing and stripping of organics is required. • A groundwater monitoring network has been established at the site. • Storm water management works are proposed for the existing site and can accommodate site expansion. • Existing access road to be used. • Re-orientation of waste receiving areas is required.	• No change to operation and maintenance costs is expected. • No appreciable change to closure and post-closure costs is expected. • Lowest cost alternative is development of additional disposal capacity at Location 1.	• Minimize the scope of changes to existing site features during design of required expansion area. • Employ competitive bidding processes where possible.	• Minimized potential cost.	1
3. Potential impact to property values.	Location 1	• Landfilling operations have been long established at Location 1. • Adjacent land uses are not impacted by landfill operations. • Highway 17 and the existing access road are both long established and no modifications are required.	• No change from the current condition is expected.	• Continue operating and maintaining site per the Design and Operations report and MECP regulations/requirements. • Establishing appropriate hours of operation to limit time periods where noise due to operations is generated. • Ensure equipment is fitted with appropriate muffling devices.	• No change expected.	1

Table 9.5: Capital Cost – Budget Cost Estimate (2023 – HST Extra)				
Item	**Unit**	**Unit Cost**	**Quantity**	**Cost**
1) Closure Plan	L.S.	$60,000	1	$60,000
2) Grubbing and Stripping Organics	m2	$10.00	22,500	$225,000
3) Earth Excavation	m^3	$17.00	20,000	$340,000
4) Ditching	m	$475.00	750	$356,250
5) Site roads	m	$35.00	300	$10,500
3) Attendant shelter	L.S.	$6,500	1	$6,500
			Sub-Total:	$998,250
			Contingency (15%):	$149,737.50
			Total:	**$1,147,987.50**

Table 9.6: Closure and Post-Closure Cost – Budget Cost Estimate (2023 – HST Extra)				
Item	**Unit**	**Unit Cost**	**Quantity**	**Cost**
1) General Requirements	L.S.	$45,000	1	$45,000
2) Final Cover				
- Clay	m^3	$45.00	20,520	$923,400
- Topsoil	m^3	$58.00	5,130	$297,540
- Seed	m^2	$2.25	34,200	$76,950
3) Perimeter Fencing	m	$8,5.00	1,070	$90,950
4) Entrance Gate	L.S.	$10,000	1	$10,000
			Total:	**$1,443,840**

Annual Post-Closure Costs				
4) GW and SW Monitoring	L.S.	$14,000	1	$14,000
5) Maintenance				
- Monitoring wells	L.S.	$900.00	1	$900.00
- General site	L.S.	$1,500	1	$1,500
6) Annual Report	L.S.	$10,000	1	$10,000
			Total (annual):	**$26,400**

Criteria Group D: Cultural Environment

Table 9.7 presents a summary of the Criteria Group D Phase 2 assessment.

Criteria 1: Potential for impact to known archaeological resources or areas with moderate to high archaeological potential

A "Stage 1 and 2 Archaeological Assessment", under PIF number P094-0244-2017, was undertaken by Archaeological Services Inc. (ASI) at Location 1 in 2017 (a copy is provided in Appendix D). The assessment study area was approximately 5.5 hectares around the existing landfill site. The Stage 1 background study determined that no previously registered archaeological sites are located within ten kilometres of the assessment study area, but that the area could retain archaeological potential, thus requiring completion of a Stage 2 assessment. Following completion of the required Stage 2 property survey it was determined that study area does not retain archaeological potential and does not require further assessment (i.e. a Stage 2 test pit survey).

Considering the results from the archaeological assessment, the potential for impact to known archaeological resources or areas of archaeological potential is low. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Services Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological alterations which would be a contravention of the *Ontario Heritage Act*.

Criteria 2: Potential for removal of built heritage resources and cultural heritage landscapes on and off site and along access/haul routes

The completion of the checklist "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" for Location 1 (see Appendix E), determined that the Location has low potential for built heritage resources and cultural heritage landscapes and therefore does not require the completion of a Cultural Heritage Evaluation Report (CHER). Similarly, a CHER is not required for potential off-site impacts as no changes to existing haul and access routes will be implemented.

TABLE 9.7: PHASE 2 EVALUATION – CRITERIA GROUP D: CULTURAL ENVIRONMENT						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
1. Potential for impact to known archaeological resources or areas with moderate to high archaeological potential.	Location 1	• Stage 1 and Stage 2 archaeological assessment completed for the Location 1 concludes that the area did not retain archaeological potential and that no registered archaeological sites were located within 10km of the site.	• None anticipated.	• Monitor during site development work for indication of potential items of archaeological interest and, if encountered, stop work and notify MCM and archaeologists (ASI).	• None anticipated.	1
2. Potential for removal of built heritage resources and/or cultural heritage landscapes.	Location 1	• MHTSC checklist "Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes" completed and completion of CHER not required.	• None anticipated.	• To the extent possible, design and construct works to retain and maintain landscapes and visual settings. • Monitor during site development work for indication of potential items of cultural heritage significance and, if encountered, stop work and notify MCM and archaeologists (ASI).	• None anticipated.	1

Criteria Group E: Technical Considerations

A summary of the Criteria Group E Phase 2 assessment is presented in Table 9.8 presents

Criteria 1: Potential reliability and flexibility

An expansion of the existing landfill operations at Location 1 would represent a continuation of landfilling operations established at the location in the 1970's. Overviews of available area for landfilling as well as environmental performance of the existing operation (eg. adequate undeveloped downgradient lands available for contaminant attenuation) reveal that establishing and operating an expansion would provide an ongoing reliable solution.

An expansion of the existing landfill site at Location 1 will not introduce new impacts to current and potential land uses at the existing location and surrounding area. Similarly, land uses would not change and/or be restricted at an alternative location and its surrounding area. This maintains flexibility with respect to the potential for development within the Town of Blind River by not introducing constraints to other developable properties and areas. Operational flexibility would also be maintained as expansion at Location 1 does not prevent the Town from potentially implementing other waste management diversion, processing or disposal options in the future.

The potential to impact reliability and flexibility considerations is deemed to be low.

Criteria 2: Potential operational constraints and opportunities

No additional or changed operational constraints would be introduced as a result of expanding landfilling operations at Location 1. An opportunity exists to minimize landfill operational costs by expanding the existing site as this would avoid the need for ongoing annual monitoring and reporting at 2 sites as, if the existing site was closed and an alternative location developed as a landfill, there would be a requirement to monitor and maintain the closed site as well as the new site. Similarly, impact to groundwater and surface water quality and to other natural environment considerations would be limited to Location 1.

The potential for impacts introducing operational constraints or limiting opportunities is deemed to be low.

TABLE 9.8 – PHASE 2 EVALUATION – CRITERIA GROUP E: TECHNICAL CONSIDERATIONS						
Criterion	**Potential Location**	**Comments**	**Potential Environmental Effects**	**Mitigation**	**Net Environmental Effects**	**Impact Ranking**
1. Potential reliability and flexibility.	Location 1	• Landfilling operations have occurred at Location 1 since the early 1970s. • Adequate land area is available for fill area and CAZ expansion at Location 1. • No changes to land uses near Location 1 or alternative location are required. • Adequate land area is available to implement other waste management programs at Location 1 in the future, if needed.	• No change from the current condition is expected.	• Continue operating and maintaining site per the Design and Operations report and MECP regulations/requirements.	• No change expected.	1
2. Potential operational constraints and opportunities.	Location 1	• No constraints anticipated. • Opportunity to minimize overall landfill operation and maintenance costs as only 1 waste disposal site will been established (no separate closed and operating sites). • Environmental impacts limited to 1 location.	• No change from the current condition is anticipated.	• Continue operating and maintaining site per the Design and Operations report and MECP regulations/requirements.	• No change expected. • Limits impacts to 1 location.	1

9.1.3 Advantages and Disadvantages

From the Phase 2 assessment described in subsection 9.1.2, a summary of advantages and disadvantages associated with providing additional waste disposal capacity at Location 1 is presented in Table 9.9. The ratio of key advantages to disadvantages presented in Tabl2 9.9 is 7.7 (23 advantages to 3 disadvantages).

Key advantages associated with expansion of the existing landfill site include:

1. Should the existing landfill site be expanded, monitoring and maintenance activities would be focused at a single location, reducing construction and annual operation costs as well as exposure to environmental liability.
2. No need to change existing haul and access routes thereby maintaining the same level and nature of impacts along existing routes.
3. No need to construct new haul and access routes thereby mitigating impacts to the natural, social, cultural and economic environments.
4. Environmental conditions (eg. groundwater flow direction) and compliance monitoring networks are well understood and established at Location 1.

A disadvantage of expanding landfill capacity at Location 1 is that the lifespan for expansion proposals is limited by MECP to a period of 25 years. However, should the site be shown to be operated and performing in accordance with regulatory requirements and further expansion be technically supported in the future, subsequent expansion may be possible. Also in this regard, new technologies or approaches may be identified for future implementation that would: reduce required disposal capacity (eg. cost effective incineration or other diversion programs); recover disposal capacity (eg. landfill mining); and/or, provide enhanced environmental control (eg. cost effective leachate collection and treatment).

TABLE 9.9 – LOCATION 1 – ADVANTAGES AND DISADVANTAGES	
Criteria Group/Criterion	***Advantage/Disadvantage***
Natural Environment	
1. Impact to terrestrial features	(A) Access and haul routes established, no new/changed disruption.
2. Impact to wildlife	(A) Access and haul routes established, no new/changed disruption.
3. Impact to aquatic features	(A) Access and haul routes established, no new/changed disruption.
4. Impact to agricultural resources	(A) Access and haul routes established, no new/changed disruption.
5. Site specific geology	(A) Geological conditions are acceptable for establishing a landfill.
6. Groundwater migration pathways	(A) Pathways are well defined with no impact to downgradient use.
7. Impact to groundwater resources	(D) Groundwater expected to be impacted; (A) no wells downgradient.
8. Impact to surface water resources	(D) Impact expected; (A) impact can be contained onsite.
9. Flood hazard	(A) Located above high water lines.
Social Environment	
1. Impact to residents	(A) Access and haul routes established, no new/changed disruption.
2. Impact to institutional, community and recreational features	(A) Access and haul routes established, no new/changed disruption.
3. Impact to indigenous communities	(A) Access and haul routes established, no new/changed disruption.
4. Noise impacts	(A) Site is remote from sensitive receptors
5. Potential to integrate end-use	(A) Site is long established and considered in municipal planning processes
6. Impact to future planned land use	(A) Site is long established and considered in municipal planning processes
Economic Environment	
1. Impact to businesses and employees	(A) Access and haul routes established, no new/changed disruption.
2. Cost of implementing and operating	(A) Site requires minor improvements to expand capacity, keeps landfilling operations at a single location in the Study Area, reducing monitoring and maintenance costs.
3. Impact to property values	(A) Site has operated as a landfill historically, no new/changed impact.
Cultural Environment	
1. Archaeological resources	(A) Archaeological assessment has been completed for the site – site does no archaeological potential identified.
2. Heritage features/landscapes	(A) MHTCS checklist completed, no need to complete CHER.
Technical	
1. Reliability and flexibility	(A) Maintains flexibility of use at other alternative locations and adjacent properties (D) Limits expansion period to 25 years, pending performance review.
2. Operational constraints and Opportunities	(A) No additional or changed operational constraints. (A) Opportunity to reduce ongoing monitoring and reporting costs by consolidating landfilling operations t Location 1.

9.1.4 Phase 2 Evaluation Results – Preferred Alternative Method

Following completion of the Phase 2 evaluation, the provision of additional waste disposal capacity by expanding the existing landfill site at Location 1 was confirmed to be the preferred alternative method.

10.0 LANDFILL EXPANSION – CONCEPTUAL DESIGN

Expansion of the current waste disposal site is the preferred alternative method to provide additional waste disposal capacity.

10.1 Waste Characteristics and Quantities

10.1.1 Waste Accepted

Waste to be accepted at the expanded Blind River landfill site will include:

1. Domestic, commercial and other waste limited to scrap wood and brush;
2. Non-hazardous solid industrial waste;
3. Iron sludge waste generated from the potable water treatment facility located at Cameco Corporation in Blind River; and,
4. Biosolids waste generated from the Town of Blind River municipal sewage treatment plant.

Household Special wastes will not be accepted at the waste disposal site but it is expected that Household Special Waste Days will continue to take place on a regular basis.

10.1.2 Waste Volume

The current waste disposal site will be expanded to accommodate 201,023m^3 of municipal solid waste and daily/interim cover material and an additional 7,041 m^3 (dry volume) of biosolids.

10.2 Landfill Expansion Design

10.2.1 Landfill Design Criteria

Ontario waste disposal sites are subject to Part V of the Environmental Protection Act (EPA) and regulations made under the Act. Prior to constructing an expansion of the waste disposal site, the Town of Blind River is required to request an amendment of the current ECA from the MECP.

The conceptual design of the waste disposal site expansion has been prepared in accordance with Ontario Regulation 232/98 “Landfill standards: A guideline on the regulatory and approval requirements for new or expanding landfilling sites”, made under the EPA. The guideline outlines the regulatory and approval requirements for the design, operation, closure and post-closure care of new and expanding municipal waste disposal sites. It is proposed that the expanded site will continue to function as a natural attenuation site.

The conceptual design of the expanded site considers the relevant environmental and regulatory requirements as well as the following design considerations:

1. Establish and maintain appropriate buffers for the site;
2. Constraints related to site geology, hydrogeology and surface water;
3. Site operations related to noise, odour, dust, litter and vector/vermin issues;
4. Site monitoring and management (e.g. for annual reporting); and,
5. Development of contingency plans.

10.2.2 Limits of Landfilling

Limits of landfilling are governed by the volume of waste to be landfilled, the site area and shape, and the design criteria. In this case, due to the historical filling of waste outside the delineated 2ha fill area, the footprint of the proposed expansion area will encompass these areas beyond the allowable limits. The proposed expansion would be constructed on the east, south and west sides of the existing fill area, increasing the fill area by 2 hectares to a total of 4 hectares. A small 1 meter vertical expansion, increasing the height of the fill area, and trenching to a depth of 1.5m below grade beneath the expansion area, is also required.

10.2.3 Final Contours

Final contours were developed for the existing site as part of the 2004 "Town of Blind Municipal Operations and Maintenance Plan". It was proposed that the top elevation of the waste disposal site at the time of closure of the existing fill area would reach roughly 222 meters above sea level.

Final waste contours following expansion of the footprint were developed in accordance with O. Reg. 232/98, applying 4:1 side slopes to a geodetic elevation of 223m, followed by 20:1 side slopes to the apex of the pyramidal-shaped fill area. Final cover, comprising 600mm of granular material with low permeability and 150mm of topsoil, will be placed above the final waste contours and then seeded to establish vegetation to aid in erosion control.

10.2.4 Buffer

A 30m buffer will be provided around the fill area to serve as a fire break and to allow vehicle and equipment access for site operation and maintenance. The buffer area will be grubbed of vegetation and surface water management features will also be constructed within the buffer area.

10.2.5 Contaminant Attenuation Zone

In accordance with the contaminant attenuation zone (CAZ) calculations presented in the hydrogeological assessment report, a 27.5 ha CAZ is required downgradient from the expanded fill area to attenuate groundwater contaminants to below Reasonable Use criteria.

10.3 Site Features

This subsection includes descriptions of site operational and access features.

10.3.1 Entrance Road

All access to the Site will be via the existing gated entrance off of Highway 17, east of Town of Blind River. Minor improvements will be made to the alignment of the existing road to accommodate a new waste drop off area. Waste haulers will be required to report to the site attendant on arrival for screening and to receive direction identifying where to deposit waste material.

10.3.2 Attendant's Shelter

Similarly to the existing site, the attendant's shelter will be located near the relocated waste drop off area and situated such that the site attendant can maintain adequate visual surveillance of the site while screening incoming waste. All on-site buildings will be provided with methane gas monitoring devices with alarms (audible and visual) and ventilation by operable windows.

10.3.3 Public Drop-Off Area

Adjacent to the attendant shelter, waste bins will be located at the drop-off area along with a recycling bunker constructed a short distance to the west for metals, brush, recyclables and tires.

10.3.4 Suspect Waste

From time-to-time, there is a possibility that suspect waste (e.g. waste that is suspected by landfill staff to be hazardous waste) would be identified at the site entrance or at the drop off area. In such cases, the hauler will be required to show that the waste is acceptable for receipt at the site prior to disposal. If warranted, the MECP will also be notified.

10.3.5 Leachate Management and Treatment

As established during the Environmental Assessment, the Blind River waste disposal site is designed to function as a natural attenuation site, meaning the site relies on natural processes such as dilution, adsorption and biochemical transformation to maintain compliance with groundwater quality criteria.

During landfilling operations, measures will be implemented to minimize the potential for leachate development. Such measures include: directing surface water flow away from fill areas by maintaining appropriate grading; compacting wastes in-situ; applying daily and interim cover; and, progressively capping the fill area.

The integrity of the final cover will be monitored to ensure its stability and to monitor for the development of leachate springs. Local repair of cover materials may be necessary should cover integrity be degraded and/or leachate springs form.

10.3.6 Surface Water Management

Both the short- and long-term operation and maintenance of the waste disposal site will require that close attention be paid to the surface drainage patterns. It is essential that surface water ponding on the fill area be eliminated wherever possible, and otherwise minimized, so that leachate generation through surface water percolation is minimized.

Drainage of surface water is to be maintained through the provision of areas of positive slope directing runoff to the proposed perimeter drainage ditch. Slopes shall be constructed in such a way that both erosion and sedimentation are minimized. A surface water management plan has been developed for and is currently being implemented at the Site (described in Section 10.4.3).

10.3.7 Soil Stockpiles

Soil from trench excavations will be used for daily, intermediate, and final cover as well as for other on-site development (i.e. berms and roads). Any excavated soil not utilized immediately will be stockpiled in either long-term cover stockpiles or in temporary stockpiles for use as daily cover.

Any topsoil, or soils suitable for revegetation, that is stripped from the fill and other areas will be placed in a designated topsoil stockpile area. The topsoil or overburden will be used to promote the growth of vegetation on final cover as the site develops and at site closure.

If topsoil is not available onsite, it may be necessary to import material for the purpose. This will be monitored closely as the site develops. Over the site's life, the Town will also endeavour to obtain suitable

materials from area construction projects in an effort to minimize premium for potentially importing any cover and/or topsoil materials.

10.3.8 Perimeter Berms

Permanent perimeter berms are not required around the fill area as a result of visual and acoustical barrier effects afforded by the site's remote location and treed buffer at the edge of the 30m fire break area.

10.3.9 Litter Control

In the event that problems with wind-blown debris are encountered, consideration will be given to construction and use of re-locatable litter control fencing.

10.4 Environmental Control Measures

10.4.1 Access Control

During non-operating hours, the landfill gate shall be locked and the site shall be secured against access by unauthorized persons.

Signs will be posted at the site entrance displaying the following information:

1. name of site and site owner;
2. MECP ECA number;
3. applicable municipal by-law numbers;
4. emergency/after hours telephone number(s); and,
5. hours of operation.

Site rules will also be posted, including but are not necessarily limited to:

1. all trucks must be covered to prevent the escape of waste;
2. no trespassing;
3. no scavenging;
4. no illegal dumping; and,
5. maximum speed is 30km/h.

Signage explaining the tipping fee schedule, allowable waste types, providing directions to appropriate disposal areas and warning of potential hazards is also proposed.

Perimeter fencing (post and wire) will be installed around the landfill site at the perimeter of the fire break area.

10.4.2 Waste Control

When the site is operating, all incoming vehicles will report to the attendant shelter before proceeding to the appropriate tipping area.

Incoming waste haulers will be subject to inspection by the site attendant. If a load is considered "unacceptable" (i.e., waste type or materials not identified on the ECA), the attendant will have the authority to reject the load. Any load rejected will be recorded and a Rejection Notice will be provided to the driver, identifying the reason for rejection.

If the operator notices solid, non-hazardous but "unacceptable" waste (a banned material) when a vehicle is unloading, it will be reloaded back into the source vehicle for removal by the hauler. The driver will then be given a Rejection Notice identifying the reason for rejection, the waste hauler, and waste generator. A copy of the Rejection Notice and a summary of action taken will be recorded and kept with the site operating records.

If a waste is suspected to be hazardous, it will not be permitted to be disposed of and the hauler will be instructed to remove the waste from the site pending the hauler's confirmation of its acceptability (i.e., conformance with the ECA). If the waste is confirmed as hazardous, the waste hauler will be required to remove it from the site for proper disposal. If warranted, the MECP will be notified.

Similarly, if the operator uncovers "suspect" waste when moving dumped material in the working area, all work of compacting or covering will cease until the material is removed and stored in a secured area pending its characterization. If the waste is shown to be non-hazardous and "acceptable" it will be landfilled. Waste shown to be unacceptable will be removed and if the hauler or generator can be identified, they will be required to remove the waste and ensure its proper disposal. If warranted, the MECP will be notified.

Any waste soils from site excavations or decommissioning activities will require pre-testing clearance before the material will be accepted for disposal at the proposed facility.

To further discourage attempts at disposal of unacceptable or suspect materials, random checks of incoming waste loads may be made from time to time. Materials not approved for site disposal will be handled as described above.

10.4.3 Surface Water Management

Surface water management control is provided through the ongoing day-to-day fill area grading activities in addition to perimeter infiltration channels designed to capture and detain surface water runoff to allow it to infiltrate into the shallow groundwater system. Construction of infiltration channels will occur north, west and south of the existing landfill site along with grading to direct water runoff towards the channels. If the capacity of the infiltration channels becomes exceeded, they outlet to an infiltration basin situated near the south-west corner of the fill area. Similar to the infiltration channels, the infiltration basin captures and detains surface water runoff for infiltration to the shallow groundwater system. The surface water management works are shown in Figure 10.1.

10.4.4 Groundwater Monitors

The existing groundwater monitoring network consisting of thirteen (13) monitoring wells is in-place at the current landfill site will be retained and expanded as may be required from time to time. The network includes source and background monitors as well as downgradient and boundary monitors.

10.4.5 Landfill Gas Management

The purpose of a landfill gas (LFG) control system is to manage LFG generated within a landfill such that any potential effects on human health and the environment are mitigated to the maximum extent possible. Effects of LFG emissions from landfills are reported to include the following:

1. Explosion hazards;
2. odour nuisance;
3. effects of climate change; and,
4. air quality impacts due to trace constituents.

The specific objectives of a landfill gas management system are to:

1. Minimize subsurface migration of LFG from the fill area to the extent practicable; and,
2. minimize atmospheric LFG emissions (including odour-bearing components) from both uncompleted and completed landfill areas to the extent desirable.

LFG migration is not anticipated to be an issue requiring mitigation at this site owing to its relative size. Monitoring for the presence of methane gas may be carried out periodically at locations in the fill area buffer zone and/or monitoring wells to assess LFG generation at the site.

10.4.6 Odour Control

Landfill gas can have a distinctive odour which is generally regarded as unpleasant and it can, in some instances, cause a nuisance in the vicinity of the site. Depending on weather conditions, these may create an odour problem if the landfill is releasing gas in sufficient quantities.

Landfill odours may originate from:

1. the waste (at the working face);
2. landfill gas; and/or,
3. landfill leachate.

If waste with particularly strong odour is noted it will be placed at the toe of the working face and will be immediately covered with daily soil cover. The proper application of cover material at the close of the day will also control odour.

A copy of the Noise Impact Assessment & Odour and Dust Management Plan is provided in Appendix F.

10.4.7 Litter Control

Litter will be controlled using a variety of measures including minimizing the size of the working face, applying daily cover, covering waste vehicles, landscaping and routine inspection.

Waste haulers will be strongly encouraged to have all vehicles properly covered to prevent the escape of wastes. Although use of tarpaulins cannot be enforced by the site attendant for vehicles on public roads, vehicles entering the site with wastes not properly covered may be refused entry.

Promptly vegetating areas which have received intermediate and/or final cover will result in more extensive vegetative growth, prevent erosion and will also assist in inhibiting wind-blown litter.

As there are no controls that will completely stop blowing litter, the site operator with assistance from other works staff will pick up litter on a regular basis. Monitoring of the effectiveness of this approach will be undertaken during preparation of the annual report and, depending on effectiveness of the program, the site operator may be required to utilize litter control fencing (particularly for above-grade landfilling).
Roads and the adjacent forest surrounding the site will be inspected regularly and any litter noted within the road rights-of-way, including ditches, will be collected and brought to the site for disposal.

10.4.8 Dust Control

Dust is an inherent part of landfilling operations, particularly during long dry spells. The main cause of dust is from vehicles using on-site access roads and from equipment movement around the landfill working area. Dust transmission from a landfill is considered a nuisance to adjacent properties.

Vehicles entering the site will be restricted to a maximum speed of 30 km/h to avoid producing excess amounts of airborne dust or suspended particulate matter. Dust is not anticipated to be an issue at this facility owing to the site's remoteness and the small number of vehicles expected to be travelling to the working area.

A copy of the Noise Impact Assessment & Odour and Dust Management Plan is provided in Appendix F.

10.4.9 Noise Control and Screening

Given the remote location of the existing municipal waste disposal site, and considering the historical record at the site, it is not anticipated that noise mitigation or visual screening will be required.

Equipment noise will be of minimal concern owing to the anticipated minimal handling required at the site. It is expected that noise from operations that does occur will be shielded by the surrounding forested areas. Should noise emissions become excessive, or public complaints be received, the matter will be investigated and remedial efforts initiated if needed.

A copy of the Noise Impact Assessment & Odour and Dust Management Plan is provided in Appendix F.

10.4.10 Fire Control

Accidental fires at landfills are rare. More common is a fire caused by undetected hot loads that are landfilled and generally start within 24 hours of disposal. The method of preventing such fires is to monitor all loads being received at the site and check loads for any hot material. Much less common are subsurface fires resulting from the spontaneous combustion of wastes. Spontaneous combustion occurs when the temperature of combustible materials is elevated to the ignition point as a result of biological decomposition and chemical oxidation.

For safe site operation, the site operator shall be trained in the prevention and detection of fires. Annual firefighting exercises should be undertaken so that the site operator and other responders are familiar with equipment, such as hoses, pumps and extinguishers, and are able to use the equipment effectively.

Appropriate arrangements will be made through consultation with the Town's Fire Department and Public Works Department to ensure that appropriate equipment can be made available in the most effective

manner possible. Considerable reliance will be necessary on maintaining the fire break area in a cleared form (to mineral soil) to maintain isolation of the fill area from the surrounding forested areas.

If conditions allow, the storm water/sedimentation control ponds may provide a supplementary water supply for firefighting purposes but this cannot be relied on.

10.4.11 Burning of Clean Wood Waste

Brush and clean wood waste will be stockpiled for burning in accordance with MECP procedures.

10.4.12 Bird, Pest and Bear Control

Animals may be attracted to a landfill as it potentially offers suitable foraging habitat, and consequently may move onto or into the vicinity of the landfill temporarily or permanently. Animals may also arrive at a landfill by chance as part of the refuse delivered to the site. Animals cannot be completely eliminated from landfill sites, but certain measures can be undertaken to discourage their attendance or control those animals that visit or locate at the site.

Waste compaction makes habitation in the wastes difficult for rodents. Daily cover discourages foraging by birds and rodents and prevents the emergence of flies from larvae. Inactive areas of the site will receive greater depths of soil cover, either 0.3 metres of intermediate cover or 0.75 metres of final cover. In addition, the use of a small working face reduces the size of the foraging opportunity for landfill birds and correspondingly may be expected to affect the carrying capacity of the site for species like gulls. Nuisance rodents near storage containers and buildings can be managed directly by means of a conventional pest control program. Also, grading of areas to prevent ponding of surface water will greatly reduce mosquito numbers.

Bears are a particular nuisance and their presence is best discouraged by the application of daily/interim cover to reduce odours. Should bear problems occur, the frequency and depth of cover will be reviewed and, if required, increased.

Bird Control Measures

The principal concern regarding birds congregating at landfills is the hazard they may create to aircraft. Although specific bird control measures beyond daily operational practices have not been considered necessary at the existing site, the following bird control measures should be adhered to:

1. The active face of the landfill site should be kept small to minimize the area of exposed wastes;
2. the landfill operator should ensure that all waste considered to be a potential source of food is compacted and covered following each day of operation;
3. cover material should be continuously monitored to identify any areas of exposed waste materials;
4. wildlife-proof litter containers should be placed adjacent to the attendant's building to store food waste containers and other potential sources of food prior to disposal;
5. litter fences should be put in place, as required, to assist in preventing wind-blown litter across the site;
6. litter pick-up should be conducted regularly to minimize potential food sources adjacent to the fill area;

7. vegetation within the landfill areas that have received final cover should be allowed to grow to a height that will make it difficult for birds to land;
8. landfill staff should be properly trained in the operation of bird deterrents such as bangers, screamers and flares that can be administered as needed throughout the operating day; and,
9. landfill staff should discourage waste haulers from feeding scavenging birds.

Should the number of scavenging birds frequenting the site or the potential hazard to aircraft increase, the Town may wish to revise the site's control methods to include those beyond operational practices and noise deterrents.

10.5 Site Development and Operation

This subsection includes descriptions of site development and operational features and activities.

10.5.1 Site Equipment

It is anticipated that a rubber-tire loader and landfill compactor will be used to carry out day-to-day operations at the landfill site, including:

1. waste compaction;
2. spreading and covering of waste;
3. site grading;
4. temporary or gravel haul road construction and maintenance; and,
5. snow clearing.

Complete equipment needs should be reviewed by the Town periodically to assess requirements, especially considering the effectiveness of the equipment to attain the assumed minimum compacted waste density of 500kg/m^3.

10.5.2 Landfill Staff

Site staffing requirements include an attendant as well as an equipment operator. It may be possible that these roles are filled by the same individual.

Landfill attendant duties include being responsible for operating the landfill according to the site's detailed design and ECA, including the day-to-day operation of the landfill site. The attendant will also be responsible for directing landfill vehicles in the vicinity of the main entrance, inspecting loads of refuse and issuing violation notices to waste haulers that violate the site operating regulations.

Litter patrol, maintenance and other general labour duties will be shared by the site operator and other Town staff from time to time.

10.5.3 Daily Landfilling Operations

Waste is deposited into the active trench via end dumping from the access road where it is then compacted. The roadway will be extended into/over the trench (by covering previously placed waste) as the trench is filled (from the perimeter to the centre of each half).

Above-grade landfilling would be undertaken in the fill area once the trench capacity has been met. Above grade areas would subsequently receive interim cover to encourage surface water run-off from the filled area to the perimeter ditches.
If spreading and compaction efforts are conducted appropriately, equipment should be capable of achieving an in-place density of 500 kg/m^3. Improved densities could be obtained through the use of larger compaction equipment and thus expand the site's lifespan.

A small working face will be maintained as this typically makes operations more efficient and provides aesthetic and environmental benefits, since it will:

1. reduce the amount of wind-blown litter;
2. give the landfill site operator more control over the working face operations; and,
3. reduce the amount of daily cover required (and consequently increase the capacity of the landfill).

Daily/Interim and Final Cover
At the end of each operating day, the working face will be covered with soil stockpiled from on-site excavation. Any lower permeability soil encountered during excavation would be segregated for use as final cover soil (upon completion of above-grade areas).

During winter and early spring months when the on-site stockpiled soil is snow covered and/or frozen or during adverse weather conditions, it may be difficult to apply cover soil. In such cases, it may be more practical to use alternative, non-soil cover materials (e.g., bark or sawdust). If use of alternative cover materials is required, the Town will correspond with the MECP to ensure proper steps are completed to ensure the use of such material complies with the site's ECA.

Once placed, the horizontal layers of cover soil may interrupt the downward percolation of infiltrating precipitation. If these cover layers redirect the drainage laterally, leachate seeps may occur on the above-ground slopes of the landfill. To minimize the potential for this to occur, the surfaces of the cells will be constructed so they slope inward. The daily and intermediate cover may also be scraped before subsequent landfilling occurs to remove or disturb the cover soils so that a hydraulic connection is established through the entire waste mass. Attention to this detail should reduce the likelihood for leachate seepage from above grade areas.

A suggested procedure for application of cover material is as follows:

i) Daily Cover

At the end of each working day, the entire working face area is graded smooth and compacted. A minimum 150 mm thick layer of soil cover (or approved equivalent) will be placed on all exposed refuse at the working face.

ii) Intermediate Cover

In areas where landfilling will be temporarily discontinued for a period of 1 month or more, a minimum of 300mm of cover will be applied. For placement on above-grade areas, the cover may also be seeded to prevent the erosion and exposure of refuse.

iii) Final Cover

In areas where landfilling has been completed to final contours, a 0.75m thick layer of final cover will be placed, comprised of 0.6m of low permeability native material plus 0.15m of topsoil or other select material to facilitate the growth of vegetation.

Final cover material would be progressively placed as required in conjunction with the completion of above-grade landfilling within each fill area. Alternatively, a decision could be made to defer final cover placement (and place only interim cover) allowing a longer period for settlement to occur within the fill. This decision should be made based on observed conditions during site operation.

10.5.4 Site Inspection and Maintenance

Inspection

The site operator will carry out daily inspection of active areas. Other inactive areas of the landfill site will be inspected weekly. Inspections are intended to identify any immediate or potential site problems, or locations of works needing repair. The site operator, in conjunction with Municipal staff, will be responsible for organizing the appropriate staff, machinery and materials to carry out repairs.
Any significant environmental or operational problem, along with the corrective measures taken to mitigate the problems, will be recorded in an Inspection Log. The Inspection Log will be kept on file as required by the ECA and findings reported annually as part of the annual report.

The site operator will inspect:

i) Conditions of roads (including signs, gates, and fences).

   a. surface condition;
   b. presence of litter; and,
   c. need for ploughing in winter.

ii) Condition of drainage works (ditches, culverts, berms, pond).

   a. erosion;
   b. siltation; and,
   c. clogging.

iii) Condition of final or interim cover.

   a. erosion;
   b. settlement;

c. surface water ponding;
d. state of vegetation; and,
e. leachate seeps.

iv) Condition of working area.

a. presence of litter;
b. sufficient daily cover application; and,
c. presence of vermin.

v) Condition of excavated trench area, above-grade fill area and leachate control.

a. erosion of slopes;
b. ponding of water; and,
c. grading away from fill area.

vi) Condition of fire break area surrounding the fill area. It is imperative this area be maintained clear of trees and vegetation.

Routine Maintenance

A routine maintenance program will be employed to keep the site clean and in working order. The following activities should be included in the routine maintenance schedule.

1. Maintain entrance areas, gates and signs to provide a neat and orderly entrance to the site;
2. the on-site haul road (and access from Highway 17 North) will be graded, with additional granular material being applied as required. This will ensure good all-weather access throughout the site;
3. all equipment will be maintained to ensure its optimal operation. Repairs will be performed as required;
4. all ditches and SWM ponds will be re-excavated and graded and any culverts cleaned, as may be required, to keep them clear of silt, debris, and weeds;
5. areas where landfilling will not be carried out for extended periods of time and where erosion has resulted will be graded and, if required, will receive additional soil cover; and,
6. areas of final cover will be routinely checked for erosion and will be re-graded and vegetated, as necessary.

Inclusion of these activities (on a regular basis) would be subject to available municipal budgets and priorities.

10.5.5 Site Closure Works

Land use following site closure is expected to be passive (limited activity), recreation or open space, which is complementary with the current surrounding land use (i.e., natural environment and solar farm

development). Appropriate grading, landscaping and planting of vegetation and/or natural regeneration will be used to integrate the closed site with the surrounding forest area.

Site buildings and facilities will be removed or modified to suit final use purposes upon closure.

10.5.6 Post-Closure Care

Long-term monitoring and maintenance programs will be implemented for the post-closure care of the site. These programs, to be described in the post closure plan, will be designed to address:

1. ground and surface water quality;
2. site settlement;
3. integrity of cover;
4. erosion of slopes;
5. surface drainage;
6. leachate seeps; and,
7. impact on surrounding environment.

During the post-closure period, site monitoring, maintenance, and repair will be continued for the duration of the estimated contaminating life span of the site. The post-closure period is currently projected to be 30 years.

10.5.7 After-Use

The approach to after-use is based on the following key points:

1. Acknowledgement that the surface of the fill area will need rehabilitation and management to ensure long-term stability;
2. appreciation that the areas beyond the footprint of the fill area will regenerate naturally;
3. recognition that there are educational as well as recreational opportunities associated with rehabilitation initiatives and natural regeneration progress; and,
4. acknowledgement that the components of the After-Use and Rehabilitation Plan must be low-maintenance initiatives with low associated operating costs.

Rehabilitation and Management Initiatives

It will be important to stabilize soil cover following the progressive closure of the fill area. This will be accomplished by establishing vegetation by, for example, hydroseeding. Similarly, vegetation will also be established, at closure, on surfaces which have not been previously progressively closed.

10.6 Conceptual Design

Taking the criteria described into consideration, a conceptual design to expand the Blind River landfill site is shown in Figures 10.1, 10.2 (CAZ) and 10.3 (height of vertical expansion).

PROPOSED NORTH DITCHS: 1.75m WIDE
WITH SIDE SLOPES OF 3:1 AND DEPTH OF 1.0m.
C/W ROCK FLOW CHECK DAMS IN
ACCORDANCE WITH OPSD 291.220.

2 ha. FILL AREA BOUNDARY

2020 SURVEY CONTOURS

REDIRECT EXISTING DITCH

LIMITS OF FUTURE
SITE EXPANSION

APPROXIMATE SURFACE WATER LOCATION.

PROPOSED BERM

PROPOSED TURNING BASIN IN ACCORDANCE
WITH OPSD 500.010

PROPOSED SOUTH DITCHS: 1.75m WIDE
WITH SIDE SLOPES OF 3:1 AND DEPTH OF 1.0m.
C/W ROCK FLOW CHECK DAMS IN
ACCORDANCE WITH OPSD 291.220.

PROPOSED 6.0m ACCESS ROAD

PROPOSED ATTENDANTS SHELTER

PART 1
PLAN
1R-4172
PARCEL 1687
ALGOMA LEASEHOLD

PART 2 PLAN 1R-4172
PARCEL 1687 ALGOMA LEASEHOLD

EX. ROOFING PILE
EX. TIRE PILE
EX. COVER PILE
EX. ATTENDANT SHELTER
EX. METAL PILES
EX. BRUSH PILE
HISTORICAL FILL AREA
(AREA CLOSED)
METAL PILE
BRUSH PILE
ROOFING PILE
TIRE PILE
DROP OFF AREA
GATE
4m WIDE ACCESS ROAD
CENTRELINE OF ABANDONED ROAD
TREELINE
FENCE
SSIB
SSIB (WIT)
IB (CGT)
TOE
TOP

N74°50'50"E 75.16
N57°33'00"W 124.06
N42°15'E
N21°10'W 155.86
N84°07'50"W 199.55
N4°00'20"E 94.48
N55°31'00"W (P1) 76.25 (P1, SET)
N72°00'30"E 77.08
N5°23'40"E 56.09
N6°44'40"E (Meas.) N6°46'E (P1)
N6°46'E REFERENCE
N5°16'30"E 61.71
N60°54'W 24.81
N63°11'00"
N4°38'20"W 198.
148.37
161.
22.71 (Meas.)
(1340)

A 10.3

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
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NOTES

DESIGN	KEC
DRAWN	B. MAAHS 11/2021
CHECKED	C.KRESIN
PROJECT	0508.08
FILENAME	0508.08 Fig 10.1, Fig 10.3
SCALE	1:2000

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

CONCEPTUAL DESIGN

10.1

Rev 1

LEGEND

MW2-15 EXISTING MONITORING WELL

MW FUTURE BOUNDARY WELL

EXISTING WETLANDS

ATTENUATION ZONE WITHIN MTO ROW

MW5-02

MW1-15

MW4-15

PROPOSED EXPANDED FILL AREA

POTENTIAL LOCATION OF FUTURE BOUNDARY WELL

APPROVED FILL AREA

BELL

MW4-02

CONSTRUCTION DEBRIS

MW2-15

TOWN

POTENTIAL LOCATION OF FUTURE HISTORICAL FILL AREA WELL

MW1-03

MW3-02

MW6-02

MW4-02

470m

POTENTIAL LOCATION OF FUTURE WELL SOUTHEAST OF CURRENT FILL AREA

LANDFILL ENTRANCE ROAD

MW2-17

MW1-20

MW3-03 (DECOMMISSIONED)

MW3-15

MW1-17

TOWN

EXISTING RAILWAY

CROWN-HIGHWAY 17 RIGHT OF WAY

POTENTIAL LOCATION OF FUTURE BOUNDARY WELL

CANADIAN PACIFIC RAILWAY

EXISTING WATER MAIN

EXISTING TRAIL

TOWN

CROWN

CROWN

CROWN

TOWN

POTENTIAL LOCATION OF FUTURE BOUNDARY WELL

CONTAMINANT ATTENUATION ZONE (27.6ha)

CROWN

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NOTES

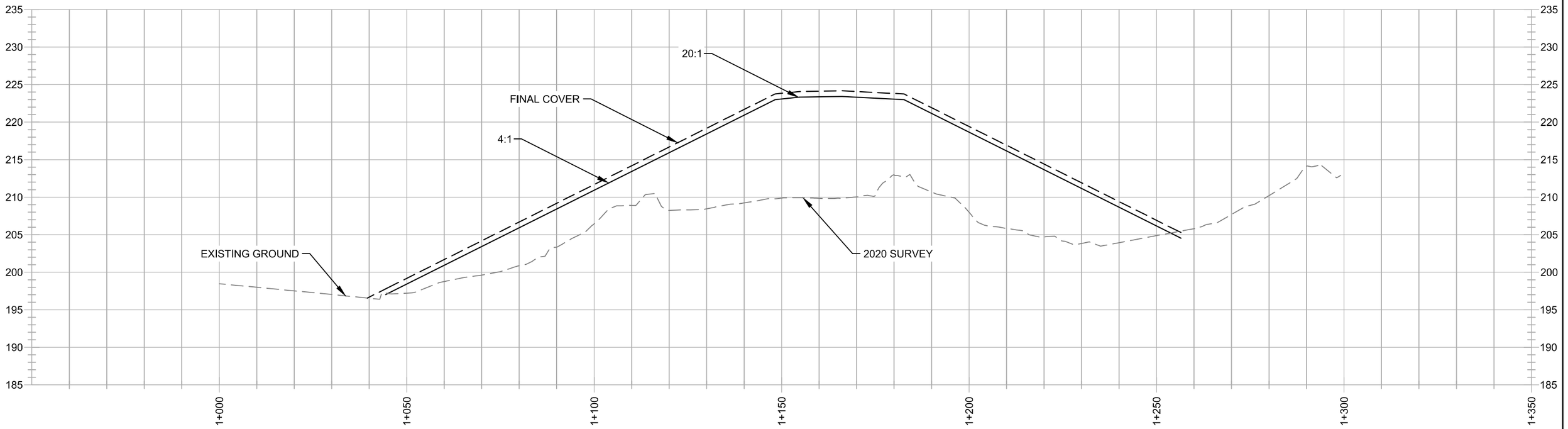
DESIGN	RW	04/24
DRAWN	RW	04/24
CHECKED	CK	04/24
PROJECT	0508.08	
FILENAME	0508.08 Fig 10.2 CAZ plan	
SCALE	1:3000	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

CAZ - PROPOSED EXPANDED AREA

10.2

Rev 2



SECTION A-A
H= 1:1000 V= 1:2000

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NOTES

DESIGN	KEC	
DRAWN	B. MAAHS	11/2021
CHECKED	C.KRESIN	
PROJECT	0508.08	
FILENAME	0508.08 Fig 10.1, Fig 10.3	
SCALE	AS NOTED	

TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

HEIGHT OF VERTICAL EXPANSION

10.3

Rev 0

11.0 IMPACT MANAGEMENT AND MONITORING

Potential impacts associated with expansion of the existing landfill site that were identified in the 2021 Hydrogeological and Surface Water Assessment Report (copy provided in Appendix C) as well as from the net environmental effects analysis undertaken in Sections 8.0 and 9.0.

11.1 Landfill Impact

The existing site operates as a natural attenuation landfill where the gases and leachate produced by the refuse are discharged to the natural environment without the need for engineered control and treatment facilities. It is proposed that the expanded fill area would also operate in this manner.

11.2 Landfill Gases/Odour

The existing and proposed fill areas incorporate below grade disposal and above grade landfilling to a final top of fill elevation of 223m. It is expected that refuse-derived gases should be readily attenuated by natural venting through the refuse capping and within the adjacent 30m buffer zone.

Odours may be an occasional nuisance for distances of a few hundred meters, but should be manageable by adherence to proper landfilling procedures. The nearest residence is located more than 700m from the site and is not expected to be adversely impact by landfill odours.

11.3 Leachate Generation

Leachate is produced when precipitation infiltrates through the landfill cover and underlying waste material causing contaminants to leach into solution. Landfill leachate would most significantly be generated during the seasonal water-surplus periods when precipitation and/or snow melt infiltrate into the landfill. Assuming a recharge of 250mm/yr, approximately 9.5L/min of leachate would be produced through the existing 2ha fill area (5,000m^3 per year). This estimate of leachate produced would double with the proposed 2ha fill area expansion.

11.3.1 Chloride Strength

Chloride strength varies according to several factors, including the method and rate of disposal, infiltration of precipitation, degree of groundwater mounding and the specific refuse composition. Long term quality sampling of moderate-sized Ontario landfills suggests that the chloride concentration may range from about 100 mg/l to over 1000 mg/l, dependent in part on the number of refuse lifts. Over the past several years of groundwater quality monitoring at the existing Blind River waste disposal site, the maximum chloride concentration was determined to be 305mg/L.

Applying a method described by Gehrels and Puumala (2000)[3] to approximate the anticipated chloride concentration in landfill leachate generated at Northern Ontario landfill sites, a concentration of 775mg/L is developed for the existing fill area, increasing to 980mg/L including the expansion area. Calculations are presented in the 2021 Hydrogeological and Surface Water Assessment Report (copy

[3] Gehrels, J. and M. Puumala. 2000. A Method for Predicting Chloride Concentrations in Leachate at Natural Attenuation Landfills in the Precambrian Shield Regions of Ontario, Canada. Groundwater Monitoring and Remediation, Summer 2000. Pp. 169-176.

presented in Appendix C).

The leachate chloride strength used in the attenuation calculations for the existing and proposed fill areas, as described in the following subsections, are 775mg/L and 980mg/L, respectfully.

11.4 Leachate Attenuation

Several processes are locally available to attenuate leachate including:

1. Dilution by groundwater underflow;
2. Dilution by infiltrating precipitation on the adjacent downgradient lands;
3. Adsorption onto the soils beneath and downgradient from the landfill; and,
4. Chemical and biological transformations in the underlying groundwater system.

As adsorption and bio-chemical attenuation cannot be reliably quantified, dilution is relied on as the attenuation mechanism when assessing what water quality impacts may occur within the groundwater system downgradient of the proposed landfill.

Natural attenuation landfill assessments are typically focused on demonstrating that adequate dilution is perennially available to decrease the surrogate landfill contaminant. The assessment described herein considers the fate of chloride as a non-reacting, mobile leachate constituent, it is also assumed that other less mobile and/or more reactive leachate constituents would be attenuated to acceptable levels. Historically, such assessments have been accepted by the Province, provided that routine water quality monitoring is undertaken to promptly detect adverse quality variations resulting from the landfilling operation, and provided that mitigation measures are implemented before unacceptable quality conditions occur at the downgradient property or CAZ boundary.

To comply with MECP requirements, acceptable groundwater quality must be maintained as assessed by applying the Reasonable Use concept. The Reasonable Use concept requires that the concentration of specific constituents at the downgradient site boundary must be less than their maximum permissible Reasonable Use concentration. Reasonable Use concentrations are calculated using the following equation from the MECP's Reasonable Use Guideline B-7.

$$\mathrm{Cm} = \mathrm{Cb} + \mathrm{x}(\mathrm{Cr} - \mathrm{Cb})$$

where: Cm = Reasonable Use concentration (mg/L)
Cb = background concentration (mg/L)
Cr = maximum drinking-water concentration of a particular parameter (mg/L)
x = factor, 0.5 for aesthetic and 0.25 for health-related parameters

At the median background concentration of 0.87mg/L (considering all available groundwater quality data from MW1-02), the maximum allowable chloride concentration is calculated to be about 125.4mg/L at the downgradient boundary of the CAZ.

In accordance with the method described in MECP Procedure B-7-1 "Determination of Contaminant Limits and Attenuation Zones", the maximum concentration of chloride originating from the disposal site that can

be permitted to reach the site boundary and not cause the Reasonable Use concentration to be exceeded is determined applying the following relationship:

$$Cw = Cm - Cp - Co$$

where: Cw = Maximum concentration originating from disposal site (mg/L)
Cm = Reasonable Use concentration (mg/L)
Cp = Background concentration (mg/L)
Co = Potential increase from other sources (mg/L)

As the site is remote from other development, it is assumed that a no additional chloride inputs would occur. The maximum concentration of chloride originating from the disposal site that can be permitted to reach the site boundary is thus estimated to be 124.0mg/L.

The size of the required CAZ was determined to be about 10.4 hectares for the existing fill area and 27.5 hectares for the expanded fill area by applying the equation:

$$CAZ = \frac{A * (C - Cm)}{(Cm - Cb}$$

where: CAZ = Contaminant Attenuation Zone (ha)
A = Fill Area (ha)
Cm = Reasonable Use concentration (mg/L)
Cb = Background concentration (mg/L)

It is estimated that the leachate plume will gradually advance through the CAZ, eventually discharging beyond the CAZ boundary some 115 years from the initiation of site development. It is expected that contaminant attenuation mechanisms will reduce the concentration of critical contaminants to below Reasonable Use concentrations prior to the plume advancing beyond the CAZ boundary.

Although the analysis described herein indicates that acceptable water quality impacts are expected, effective control of surface water so as to not direct surface water onto the fill area and progressive capping of completed portions of the landfill must be incorporated in the Design and Operations Report. The goal of these tasks is to reduce the water available as well as potential groundwater mounding to minimize contact time between the waste and groundwater in an effort to minimize leaching.

11.5 Surface Water Management

As identified in the MECP "Landfill Standards" (June 2010, revised 2012), "surface water control at a landfilling site is required to ensure drainage onto or leaving the site does not adversely affect site operations, on-site surface water or surface water in the vicinity of the site." The overall objective of the surface water management plan is to meet the requirement identified in the Landfill Standards and to maintain the existing surface water and groundwater systems. As the proposed landfill site relies on natural attenuation to comply with MECP requirements, infiltration of all surface water runoff originating from the site is accommodated in the surface water management system design.

All of the surface water management system components will remain within the originating drainage basin so as to not impact the local water budget. The system will incorporate infiltration ditches/swales and infiltration basins to:

1. Collect surface runoff from the landfill area;
2. Intercept surface water runoff from adjacent upgradient areas prior to flowing onto the fill area;
3. Provide storage capacity;
4. Promote infiltration; and
5. Reduce the potential for on-site erosion.

The approach used to develop the surface water management facilities is consistent with the approaches described in the MECP publication "Stormwater Management Planning and Design Manual (March 2003)".

The works proposed in surface water management plan will reduce the potential impact to surface water by improving its management at and in the local area of the site. This includes:

1. Backfilling low lying areas south and west of the fill area where surface waters pond and where leachate seeps are suspected to be occurring. Backfilling areas where potential seeps have been identified will help ensure that leachate impacted groundwater remains within the shallow flow system where effective contaminant attenuation is provided within the CAZ.

2. Constructing intercepting swales that will encourage the infiltration of captured surface water by constructing swales with 0% bottom gradient in a stepped-fashion from segment to segment of the swale. Intercepted surface water will be allowed to infiltrate into the CAZ to improve attenuation of groundwater contaminants.

3. Grading the active fill and buffer areas to ensure only non-contact surface water is directed into the intercepting swale.

4. Constructing an infiltration basin to accommodate surface water flow volumes captured by the intercepting swales during periods of high flow or when the infiltration capacity of the swales is exceeded. Surface water in the basin will be allowed to infiltrate into the CAZ to improve the attenuation of groundwater contaminants.

5. Diverting the drainage ditch originating from the solar development at a location near the northwest corner of the Site and flowing along and adjacent to the westerly boundary of the fill area. This will divert flow away from the toe of the fill area where it potentially contacts historical waste, allow for covering any exposed historical wastes and allow for backfilling up to and against the toe to address potential leachate seeps.

11.6 Potential Impact Summary

Table 11.1 summarizes potential impacts along with the corresponding proposed impact management strategy identified during the Phase 1 comparative evaluation of alternative methods (Section 8.0). Where

the potential exists for impact, it is noted that these impacts are in many cases currently occurring in connection with the operation of the existing landfill site at Location 1.

Table 11.1: Potential Impacts and Proposed Management Strategies

EA Table	Potential Impact	Management Strategy
8.2	Minimal potential for loss or disruption of terrestrial features due to clearing.	- Establish limits to minimize grubbing and stripping organics. - Progressively revegetate site.
8.2	Low potential for disruption to wildlife due to clearing.	- Minimize disturbance beyond cleared area. - Revegetate site following closure.
8.2	Moderate potential for disruption of aquatic features on and off site due to potential leachate and runoff impacts.	- Do not deposit fill in area of surface water pooling. - Monitor surface water runoff within the fill area. - Establish surface water management controls to reduce off site impacts.
8.2	Low potential to impact downgradient groundwater resources.	- Expand monitoring network to confirm groundwater direction and identify potential contamination. - Develop contaminant attenuation zone. - Appropriate grading and progressive capping to limit leachate production.
8.2	Moderate potential for surface water contamination due to proximity of expressed groundwater.	- Proper grading of site to control the discharge of surface water originating from the fill area. - If appropriate, cover standing water with clean fill. - Reconfigure area of surface water pooling to be part of surface water management design for site.
8.2	Low potential for air quality impairment due to odour and dust.	- Progressive capping of waste material to control odour and dust. - Onsite road dust control.
8.3	Low potential or disruption of residents due to noise, odour and dust.	- Progressive capping, dust control and appropriate hours of operation.
8.3	Low potential or disruption of institutional, community and recreational features.	- Progressive capping, dust control and appropriate hours of operation.
8.3	Low potential to impact Indigenous communities/uses in the location vicinity.	- Progressive capping, dust control and appropriate hours of operation. - Provide stormwater management at site to minimize offsite impacts. - Continue to consult with Indigenous communities with respect to any

Table 11.1: Potential Impacts and Proposed Management Strategies		
EA Table	**Potential Impact**	**Management Strategy**
		concerns or comments received regarding the site. - Continue the established monitoring program for the existing site.
8.3	Low potential to impact future planned land uses.	- Standard operational procedures such as dust, odour, noise and litter control.
8.3	Low potential for impacts of noise generated on and off site.	- Establish appropriate hours of operation to limit time periods where noise due to operations is generated.
8.3	Low potential for impacts related to transportation.	- Enforcement of Highway Traffic Act. - Maintain existing haul routes.
8.4	Low potential to disrupt existing businesses and employees.	- Maintain appropriate hours of operation. - Maintain existing haul routes.
8.4	Low potential to disrupt forestry and aggregate industries.	- Maintain development to within existing site limits.
8.4	Low cost to implement alternative.	- Establish minimum required limits of clearing.
8.4	No impact to current transportation related costs.	- Maintain existing haul routes.
8.5	Low potential for displacement of Built Heritage Resources and/or Cultural Heritage Landscapes.	- Complete a CHER, if required.
8.5	Low potential for disturbance or destruction of archaeological resources.	- Complete and archaeological assessment.
8.5	Low potential for impact to cemeteries.	- Continued consideration for potential.
8.6	Mitigated impact to the environment by developing and operating an expanded landfill site.	- Complete design and operations report in accordance with MECP Landfill Standards to ensure site is operated and maintained in accordance with Regulations and best practices. - Obtain ECA amendment from MECP.

Potential impacts were also discussed in more detail during the Phase 2 comparative evaluation of alternative methods (Section 9.0) and summarized in Tables 9.2 to 9.8. For the majority of the criteria considered, no change from current conditions (i.e. do nothing alternative) are expected. Mitigation measures identified during the Phase 2 evaluation, in addition to those identified during Phase 1, are:

1. Routine road and Highway maintenance by the Town and Province to mitigate potential impacts along haul routes;
2. Policing of highway traffic speed and driver behaviour to mitigate potential impacts along haul routes;
3. Establish appropriate CAZ boundaries to mitigate impact to groundwater resources;

4. Ensure operating equipment is fitted with appropriate muffling devices to control noise;
5. Minimize the scope of changes to existing site features during design of expansion area and employ competitive bidding processes to reduce implementation cost.
6. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alterations of the site immediately and engage of licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

   The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Services Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological alterations which would be a contravention of the *Ontario Heritage Act*.

7. To the extent possible, design and construct works to retain and maintain landscapes and visual settings.

11.7 Monitoring

Given complexities of interpreting groundwater systems, once operating, a natural attenuation landfill may function differently than anticipated and/or a constituent other than chloride may be identified as the critical contaminant. Accordingly, it is essential to develop and implement a comprehensive groundwater monitoring program to monitor site performance.

11.7.1 Groundwater Monitoring

Groundwater monitoring comprises an integral component of site operations, with the objectives being to monitor groundwater quality in the overburden aquifer to:

1. Identify and characterize the landfill derived contaminants moving through the overburden aquifer;
2. evaluate the effectiveness of the defined CAZ; and,
3. assess the need for implementation of a contingency plan.

A groundwater monitoring network consisting of fourteen (14) monitoring wells is currently in-place at the landfill site. Following an April 2021 recommendation from MECP, it is proposed to expand the monitoring well network to include a minimum of two (2) CAZ boundary wells adjacent to the Canadian Pacific Rail line as well as a well to the west of MW2-02 at the west CAZ boundary to assess compliance with MECP Reasonable Use Guideline B-7. Following an April 2024 recommendation from MECP, it is proposed to install monitoring wells in the vicinity of the closed historical fill area as well as to the southeast of the active fill area in order to determine groundwater flow direction and groundwater quality. Drawing 6 in Appendix C identifies the location of the monitoring wells currently included as part of the site's groundwater monitoring network as well as the proposed wells discussed above.

Water levels and groundwater samples will be collected from the entire monitoring well network twice per year including during the maximum and minimum water level conditions (spring and fall). The collected samples are required to be analyzed by a licensed laboratory capable of analyzing for the parameters listed in Schedule 5 of the Ontario Landfill Standards to concentrations below the Reasonable Use criteria. Samples collected from the leachate source monitor will be analyzed for parameters listed under Column 1 of Schedule 5. Samples collected from the remaining monitoring locations will be analyzed for parameters in Column 1 of Schedule 5 once annually and for parameters in Column 2 of Schedule 5 for the remaining monitoring event. In addition to the parameters listed in the referenced Schedules, total cyanide, fluoride, organic nitrogen and hardness will also be analyzed for.

During each monitoring event, field pH, temperature, dissolved oxygen and conductivity will be recorded prior to sampling.

11.7.2 Surface Water Monitoring

It is proposed to maintain the existing surface water sampling network (SW1, SW2 and SW3) along with the additions of SW4, SW5 and SW7 as well as a background location (SW6) as shown on Drawing 7 in Appendix C.

Surface water samples will be collected from the entire network four times per year including during the maximum and minimum water level conditions (spring and fall). The collected samples are required to be analyzed by a licensed laboratory capable of analyzing for the parameters listed in Schedule 5 of the Ontario Landfill Standards. Samples collected will be analyzed for parameters identified in Schedule 5, Column 3 of the MECP Landfill Standards. Detection limits for the water quality analysis will be lower than the Provincial Water Quality Objectives (PWQOs) or the Canadian Water Quality Guidelines (CWQG), whichever is more recently published. In addition to the parameters listed in the referenced Schedules, manganese, zinc, hardness and DOC will also be analyzed for.

During each monitoring event, field pH, temperature, dissolved oxygen and conductivity will be recorded prior to sampling.

Surface Ponding Locations

The existing sampling locations, described below, will continue to be monitored:

- SW1 (formerly SW) is sampled approximately 80m southwest of the fill area where surface water pools. As has been interpreted in the past, groundwater may also express at this location.
- SW2 is sampled approximately 330m southwest of the fill area adjacent to the solar farm development from a depression that was excavated to an elevation that is apparently below the water table.
- SW3 is a drainage ditch located approximately 440m southwest of the fill area that collects surface water runoff from locations within the solar farm and contractor's yard and conveys it to a location within the Highway 17 right-of-way, west of the CAZ.

The following new sampling locations will be established:

- SW4 and SW5 are ponding areas at locations approximately 95m south of the southeast corner (SW4) and 110m southwest of the southeast corner (SW5) of the fill area, respectively. Both of these locations may contain surface water potentially impacted by a leachate seep(s).
- SW6 will be established as a background monitor and is located approximately 250m north of the fill area.
- SW7 is ponded water in a low area located southwest of the landfill site and south of the Highway 17 right-of-way.

Characteristics of the locations are described in Table 11.2.

Table 11.2: Surface Water Locations

ID	Zone	Northing	Easting	Location Type	Sample Type
SW1	17T	5116445m	354503m	Permanent/Lentic	Downstream
SW2	17T	5116391m	354259m	Permanent/Lentic	Downstream
SW3	17T	5116483m	354146m	Permanent/Lentic	Downstream
SW4	17T	5116466m	354708m	Permanent/Lentic	Downstream
SW5	17T	5116464m	354559m	Permanent/Lentic	Downstream
SW6	17T	5116918m	354748m	Permanent/Lentic	Upstream
SW7	17T	5116288m	353683m	Permanent/Lentic	Downstream

Additional surface water sampling locations may be required if it is determined that groundwater is flowing to the areas southeast of the active landfilling area and the closed historical fill area.

11.7.3 Monitoring Framework

Monitoring and contingency planning measures have been developed, considering the identified impact management strategies, to assess the performance of the preferred alternative during its construction and operational phases. The proposed monitoring framework includes:

1. Monitoring during construction and operation for nuisances (excessive noise, litter, vectors, dust and odour).
2. Monitoring during construction and operation for traffic impacts (traffic volumes and compatible routes); Monitoring of waste types and quantities disposed of at the site to ensure environmental compliance and assess life expectancy;
3. Monitoring and assessment of ground and surface water quality during site operation to assess performance with respect to the control and attenuation of contaminants originating from the landfill; and,
4. Monitoring of site features during site operation (stormwater management facilities, fill side slopes, roadways, waste receiving areas) to ensure functional operation and environmental compliance.

Monitoring activities proposed during construction will be undertaken for the duration of the construction period. During operation, the proposed monitoring activities will occur at the frequencies shown in Table 11.3 and is similar to that associated with the existing landfill site.

Table 11.3: Monitoring Activities during Site Operation		
Activity	**Frequency**	**Responsible Party**
Nuisance monitoring.	Ongoing. Observations included in weekly reports.	Landfill site operating staff.
Traffic impacts.	Ongoing. Findings summarized in annual reports.	Town staff (considering public input) and collection contractor.
Ground water quality sample collection, analysis and assessment.	Twice annually, spring and fall. Summarized in an annual report.	Qualified consultant.
Surface water quality sample collection, analysis and assessment	Four times per year including during the maximum and minimum water level conditions (spring and fall). Summarized in an annual report.	Qualified consultant.
Assessing site features.	1. Ongoing. Observations included in weekly reports. 2. Twice annually and observations included in annual reports.	1. Landfill site operating staff. 2. Qualified consultant.

Monitoring requirements and a monitoring plan will be formalized during preparation of the Design and Operations Report to be submitted to MECP for review in support of an Application for Approval under the Environmental Protection Act, to establish and operate the expanded landfill site.

11.8 Contingency Plan

The need to implement a contingency plan will be determined through assessment of the monitoring program results and observations. Procedures will be established to support the assessment of monitoring program results to determine whether or not mitigating action is required. For example, with respect to ground and surface water quality monitoring, a trigger mechanisms plan has been developed to identify parameter concentrations at or above which mitigation is needed. This is similar to what is currently practiced relating to the existing landfill site. In the event mitigation is required, a contingency plan would be initiated.

11.8.1 Trigger Mechanisms

Groundwater

In order to develop a list of trigger parameters, median concentrations in leachate and ambient (background) groundwater should be compared. The ratios of concentrations in groundwater from source (leachate) monitor MW2-02 and background monitor MW1-02 will be determined to identify the trigger parameters. This will be completed on an annual basis during preparation of the required annual report. Specific trigger parameters are expected to remain consistent; however, they may change from year to year as the assessment is based on ratios of median values of analytical results that are, by their nature, variable.

Site-specific trigger concentrations, developed based on MECP's Reasonable Use Concept (RUC, Guideline B-7) and described in Procedure B-7-1, will be established for the trigger parameters as determined above. Trigger concentrations will be established as the 75th percentile RUC values, calculated using the 75th percentile background concentration using the 10 most recent sampling results, for each trigger parameter.

Surface Water

To assess compliance with water management policies and to monitor the effectiveness of contingency plans (if implemented), a surface water trigger mechanism plan has been developed. Specifically:

- Policy 1 – In areas which have water quality better than Provincial Water Quality Objectives, water quality shall be maintained at or above the PWQO.

- Policy 2 – Water quality which does not meet PWQOs shall not be degraded further and all practical measures shall be taken to upgrade water quality to the objectives.

Trigger parameters are the leachate indicator parameters identified in Schedule 5, Column 3 of the MECP Landfill Standards and will be assessed on an annual basis.

Trigger concentrations are equivalent to the PWQO and CWQG values, whichever is more recently published.

11.8.2 Trigger Mechanism Plan

The objective of the trigger mechanisms plan is to monitor the potential impact(s) to groundwater and surface water and to establish a structured approach to verifying potential impact(s) and confirming the need to implement the contingency plan to mitigate such impact(s).

The trigger mechanisms plan is comprised of the following 3 tiers:

- Tier I – Annual routine monitoring program;
- Tier II – Intensive monitoring program; and,
- Tier III – Compliance monitoring program.

Tier 1 – Annual Routine (Alert) Monitoring Program

Routine monitoring at the Site will include the collection of samples from the groundwater and surface water monitoring networks. A trend analysis of the groundwater trigger concentration exceedances will be completed as part of the Tier 1 level monitoring. If a trigger parameter exceeds its trigger concentration (including monitoring wells between the fill area and CAZ boundary [ex. MW1-03] and closest to the wetland on the south side of Highway 17 [ex. MW1-20]) on three (3) consecutive sampling events, the MECP shall be informed and an investigation into the cause and the need for implementation or remedial contingency actions shall be carried out. Tier 2 level monitoring will be initiated.

Tier 2 – Intensive (Confirmation) Monitoring Program

Tier 2 is confirmatory monitoring which includes: an increased sampling frequency; a review of supplemental analytical results to confirm the degree and nature of the exceedance; and, discussions with concerned parties.

When Tier 2 is activated, the collection and analysis of samples would be required on a monthly basis, for a period of six (6) months (subject to winter accessibility and ice conditions), from both the background monitoring location and the location where the Tier 1 exceedance(s) occurred. Tier 2 monitoring is conducted to facilitate an assessment of whether an observed exceedance is due solely to landfill impact or is partly or wholly caused by other influences.

If Tier 2 monitoring confirms that the exceedance is related to landfill operations discussions will be held between the Town, the Town's consultant, and the MECP to determine whether implementation of the Contingency Plan is warranted. This discussion should occur 8 months following the implementation of Tier 2 in order to allow for 6 months of intensive (confirmation) sampling plus preparation and submission of an assessment report to MECP. The discussions will define the optimum course of action and review contingency measures available to the Town (e.g. progressive closure and capping). If the MECP confirms that the Tier 2 monitoring indicates an unacceptable impact to the groundwater and/or surface water, the Contingency Plan will be implemented in concert with the Tier 3 monitoring program.

Tier 3 – Compliance Monitoring Program

The Tier 3 compliance monitoring is designed to assess the effectiveness of any contingency measure implemented following the Tier 2 assessment. Specifics of the Tier 3 program details would be determined in conjunction with the development and implementation of the preferred contingency plan. The compliance monitoring trigger parameters, concentrations, locations and monitoring frequency would also be determined at that time.

11.8.3 Mitigating Measures

Contingency plans in this case consist of the application of mitigating measures to address potential environmental effects that exceed or differ from expected net environmental effects. Examples of potential environmental effects and mitigating measures are presented in Table 11.4. Ultimately, mitigating measures would be developed for implementation referencing these examples but tailored, in consultation with MECP, to address specific occurrences.

Table 11.4: Potential Effects and Possible Mitigating Measures	
Potential Environmental Effect	**Possible Mitigating Measures**
Reasonable Use Guidelines exceeded at a site boundary.	1. Grading of site to minimize water available for infiltration. 2. Progressive capping of a landfill site to minimize infiltration of surface water. 3. Develop and conduct an appropriate groundwater monitoring program. 4. Leachate/groundwater collection system, if required.
Exceedance of trigger concentration in surface water	1. Grading of site to minimize water available for infiltration. 2. Progressive capping of a landfill site to minimize infiltration of surface water. 3. Develop and conduct an appropriate surface water monitoring program.
Disruption due to dust and odour created at the site.	1. Progressive capping of a landfill site. 2. Dust and odour control measures, as required.
Disruption due to noise.	1. Specify equipment with appropriate muffling devices. 2. Construct structural noise attenuation barriers if necessary.
Disruption due to vector and vermin.	1. Apply daily cover to a landfill site. 2. Other control strategies, as required.
Litter propagation.	1. Apply daily cover to a landfill site. 2. Use of covered haul trucks. 3. Litter control fencing.

11.9 Consideration of Cumulative Effects

Based on the evaluation of alternative methods carried out for the landfill expansion, negative net environmental effects on the natural, social, economic, cultural or technical environments are anticipated to be mitigated to acceptable levels with implementation of the proposed mitigation measures. There is no other known past, present or foreseeable future activities in the vicinity within a similar timeframe as the proposed landfill expansion. No negative cumulative effects are anticipated.

11.10 Consideration of Climate Change

The effect of the preferred method to provide additional waste disposal capacity on climate change and the effect of climate change on the preferred method to provide additional waste disposal capacity are discussed below with consideration of the MECP guidance document "*Considering Climate Change in the Environmental Assessment Process (2017)"*.

11.10.1 Effects of the Preferred Alternative on Climate Change

Expansion of the currently operating site will impact the generation and emission of LFG, which is comprised primarily of methane and carbon dioxide, both of which are greenhouse gases (GHGs).

The quantity of LFG generated for the currently operating site as well as the preferred alternative of expanding the existing site was estimated using the US EPA "LandGEM – Landfill Gas Emissions Model", version 3.03. LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. LandGEM calculates annual LFG emissions by accounting for the following parameters: annual landfilled waste tonnage, methane generation potential, methane generation rate and methane concentration in LFG.

Waste acceptance rates for the existing landfill site (1972-2023) were based on previous calculations completed in 2001 using MECP's December 1993 Guideline for determining landfill site capacity as well as historical disposal rates based on annual topographic surveys completed at the site since 2002. Waste acceptance rates for 2024 and 2025 (expected closure of existing site) are based on the Town's September 2023 MECP application for emergency interim volume expansion of 10,150m^3, which is equivalent to 2 years of disposal volume at the average annual fill rate over the last 10 years. Estimated waste volumes for the 25-year planning period (2026-2050) are discussed in Sections 3.2 and 3.3 of this report.

Table 11.5 provides the estimated annual emission rate of carbon dioxide (CO_2) and methane (CH_4) from the site using global warming potential (GWP) to estimate the equivalent carbon (CO_2e) emissions for the maximum LFG generation year.

Table 11.5: Maximum Projected GHG Emissions

GHC Species	GWP (kg CO_2e / kg X)	Existing Conditions		Existing Conditions + 25-year Expansion		% Change
		Annual Emissions (Tonne/yr)	Annual Emissions (Tonne CO_2e/yr)	Annual Emissions (Tonne/yr)	Annual Emissions (Tonne CO_2e/yr)	
CO_2	1	1,218	1,218	1,764.4	1,764.4	45
CH_4	28[4]	443.8	12,426.4	642.9	18,001.2	45
Total CO_2e =			**13,644.4**		**19,765.6**	**45**

LFG generation from the existing site is estimated to have peaked in 2016 at 13,644 tonne CO_2e/year and will continue to decline as final cover is applied and the expansion area opens in 2026. LFG generation from the expansion area is estimated to peak in 2051, one year after the proposed closure at approximately 15,963 tonne CO_2e/year. The combined generation from the existing site and expansion area will peak one year after closure of the expansion area in 2051 at 19,766 tonne CO_2e/year.

The effects of the preferred alternative of expanding the currently operating site on climate change are mitigated given the relatively small quantities of waste expected to be received at the expanded site, sub-soil and cover characteristics, its relative size and there being no on-site buildings with basements.

[4]https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/quantification-guidance/global-warming-potentials.html

11.10.2 Effects of Climate Change on the Preferred Alternative

The effects of climate change on the preferred alternative of expanding of the currently operating site are expected to impact surface water management as well as routine site operations due to increasingly severe weather events (rainfall and wind) as well as higher annual mean temperatures resulting in reduced snow cover.

According to the Climate Atlas of Canada, the annual mean precipitation for the period of 1976-2005 in Blind River, ON is 837mm. The Climate Atlas displays projections for two possible climate futures where each one assumes a different level of future GHG emissions. The "high carbon" is the "business as usual" scenario and assumes that world greenhouse gas emissions continue to increase at current rates through the end of the century. This scenario is based on the representative concentration pathways (RCP) 8.5 emissions scenario. The "low carbon" scenario assumes that greenhouse gas emissions increase until about 2050 and then rapidly decline. This scenario is based on the RCP 4.5 emissions scenario. Both RCP emission scenarios are included in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6). According to the Climate Atlas of Canada, the annual mean precipitations under the high carbon scenario for the 2021-2050 and 2051-2080 projected periods are 892mm (+7%) and 921mm (+10%), respectively. The annual mean precipitations under the low carbon scenario for the 2021-2050 and 2051-2080 projected periods are 876mm (+5%) and 907mm (+8%), respectively.

Climate change was considered during the design of the Surface Water Management Plan (SWMP) where the approach used is consistent with the approaches described in Ontario's Stormwater Management Planning and Design Manual and meets requirement identified in the 2012 MECP Landfill Standards. Factors of safety incorporated into the design allow the system to accommodate potential increases to the volume of surface water runoff generated. Sections 10.4.3 and 11.5 describe the proposed surface water management works for the municipal waste disposal site expansion.

The combined volume of the intercepting swales and infiltration basin provides freeboard to help ensure that the system is not overtopped and that potentially impacted surface water remains contained and is allowed to infiltrate into and through the site's proposed contaminant attenuation zone. Using post-development 1:100-year surface water flows developed for the site, the required storage volume for the 24 hour 1:100-year storm is 987m^3 (maximum achieved in just over 13 hours). The intercepting swales and infiltration basin will provide a total storage volume of approximately 2,981 m^3. Considering that more than 200% "freeboard volume" is provided by the site's stormwater management facilities and that a potential increase of up to 10% in runoff volume may occur due to climate change effects, it is anticipated that no additional works would be required to manage potential flows.

Additional effort may be required to maintain the site access and interior roads in addition to erosion and sediment control on the surface water management works due to potentially more severe rainfall events.

12.0 CONSULTATION

This Consultation Report is a companion document to The Town of Blind River Waste Management Plan Environmental Assessment Report.

In response to the identified decline in available municipal waste disposal capacity, The Town of Blind River (Town) initiated the Environmental Assessment (EA) process to develop a Waste Management Plan. To commence the EA planning process under the Environmental Assessment Act (EAA), an EA Terms of Reference (ToR) was prepared by the Town and approved by the Minister of the Environment, Conservation and Parks (MECP) in July of 2008. The ToR included a description of the proposed consultation program.

12.1 Consultation Program Proposed in the EA Terms of Reference

The ToR proposed the following general approach to consultation during the EA planning process:

1. include all interested or potentially affected parties in the consultation process;
2. provide a well-documented, traceable and clear consultation process;
3. provide opportunities for input and comment and provide timely responses;
4. be adaptable to new or changing issues that may be identified as the EA process progresses;
5. identify how comments/input have been considered during the EA process; and
6. resolve issues through open and documented discussion with concerned persons, agencies and/or affected groups/organizations.

The Consultation Plan states that formal consultation activities would be undertaken at key stages of the EA process (eg. when alternatives are developed, when the preferred is identified, etc.) and that activities may change or be removed and new activities added as the EA process develops and to meet the needs of the community as they become better defined. The Consultation Plan will be consistent with the MOE Code of Practice: Consultation in Ontario's Environmental Assessment Process.

Prior to the submission of the the EA Report, a Consultation Report would be compiled to provide a record of the consultation activities undertaken, input/comments received, the response(s) provided and how the input/comments were incorporated into the process (if required). Commitments made during the EA process were also to be documented in the Consultation Report. The following consultation activities were described in the ToR:

1. Issuance of a Notice of Commencement
2. Public Information Centres or Open Houses
3. Workshops
4. Meetings and Teleconferences
5. Newsletters and Notices
6. Availability of Information
7. Indigenous Community Consultation

Three (3) "Task Reports" were prepared during completion of the EA process to document the results of various EA steps for compilation into the EA Report.

- Task 1 Report – Description of the Problem/Opportunity

- Task 2 Report – Alternative Waste Management Systems and Diversion – Part A: "Alternatives to"
- Task 3 Report – Part B: Identification and Assessment of Alternative Methods

The Task 1 and 2 reports were prepared and submitted to the Town for review and documentation purposes and the Task 3 Report was submitted to the Town as well as other stakeholders and Indigenous Communities for review and comment.

12.2 NOTICE OF COMMENCEMENT

A notice of EA commencement was issued by the Town in February, 2009 by publishing in the local newspaper (February 11, 2009 - Elliot Lake Standard), posting on the Town web site, project web site, cable television channel and roadside message board.

In addition to general notification to the public, a copy of the Notice of Commencement was provided to government agencies, ministries, departments, utilities and Indigenous Communities via facsimile on February 19, 2009.

Appendix A of the Consultation Report includes copies of the Notice of Commencement. Table 12.1 presents a summary of government agencies, ministries, departments and utilities contacts and responses. Table 12.2 presents a summary of Indigenous Communities contacts and responses.

Table 12.1: Notice of Commencement Government Agencies, Ministries, Departments and Utilities Circulation and Responses		
Recipient	**Date**	**Response**
Town of Blind River Ken Corbiere, Clerk kencorb@blindriver.ca	January 19, 2009, via email.	None received.
Ontario Ministry of the Environment Alex Blasko, Project Officer 416-314-7774	February 19, 2009, via facsimile.	None received.
Ontario Ministry of the Environment Rod Stewart, Area Supervisor Rod.stewart@ontario.ca	January 19, 2009, via email.	January 19, 2009 email. "Thanks…no comments."
Ontario Ministry of the Environment Ron Dorscht, Environmental Officer Ron.dorscht@ontario.ca	January 19, 2009, via email.	None received.
Ontario Ministry of Transportation - Northeastern Region Paul Marleau, Regional Development Review Coordinator 705-497-5499	February 19, 2009, via facsimile.	None received.
Ontario Realty Corporation Hodan Egeh, Intermediate Land Use Planner 416-212-1131	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Agriculture, Food and Rural Affairs Ray Valaitis, Rural Planner 613-475-3835	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Culture Paige Campbell, Acting Archaeology Review Officer 807-475-1297	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Culture Chris Andersen, Heritage Planner 416-212-1802	February 19, 2009, via facsimile.	None received.

Table 12.1: Notice of Commencement Government Agencies, Ministries, Departments and Utilities Circulation and Responses		
Recipient	**Date**	**Response**
Ontario Ministry of Culture, Citizenship and Immigration Elaine Lynch, Manager 807-475-1297	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Health and Long-Terms Care Lisa Peters, Public Health Inspector 705 356-2494	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Health and Long-Terms Care Brenda Mitchell, Director 416-327-0984	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Municipal Affairs and Housing Laurie Brownlee, Acting Manager of Community Planning and Development 705- 564-6863	February 19, 2009, via facsimile.	March 26, 2009. Response from Charlsey White, Planner – Algoma District. Requesting continued circulation throughout the process. Important to work closely with Town planning staff to ensure compatibility with the Official Plan.
Ontario Ministry of Natural Resources Ernie Gatien, Senior Lands and Water Technician 705-356-7441	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Northern Development and Mines Susan Capling, Director 416-327-0634	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Northern Development and Mines Herb Shields, EA Coordinator 416-327-0634	February 19, 2009, via facsimile.	None received.
Environment Canada Sheila Allan, Senior Environmental Assessment Officer 905-336-8901	February 19, 2009, via facsimile.	None received.

Table 12.1: Notice of Commencement Government Agencies, Ministries, Departments and Utilities Circulation and Responses		
Recipient	**Date**	**Response**
Hydro One Networks Inc. Kent Taylor, Hydro One Real Estate Management 905-946-6287	February 19, 2009, via facsimile.	None received.
Fisheries and Oceans Canada Jennifer Hallett, Fish Habitat Biologist 705-941-2013	February 19, 2009, via facsimile.	None received.
Transport Canada Jeremy Craigs, Environmental Officer 416-952-0514	February 19, 2009, via facsimile.	None received.
Canadian Environmental Assessment Agency Jim Chan, Senior Program Officer 416-952-1573	February 19, 2009, via facsimile.	None received.

Table 12.2: Notice of Commencement Indigenous Communities Circulation and Responses		
Recipient	**Date**	**Response**
Ontario Ministry of Aboriginal Affairs Alan Kary, Deputy Director 416-326-4017	February 19, 2009, via facsimile.	None received.
Ontario Ministry of Aboriginal Affairs Surinder Singh Gill, Policy Advisor 416-326-4017	February 19, 2009, via facsimile.	None received.
Serpent River First Nation Chief Isadore Day 705-844-2757	February 19, 2009, via facsimile.	None received.
Serpent River First Nation Bruce Visitor, Director of Operations 705-844-2757	February 19, 2009, via facsimile.	None received.
Sagamok Anishnawbek First Nation Laura Owl 705-865-3307	February 19, 2009, via facsimile.	None received.
Mississauga First Nation Debbie Mayer, Band Manager 705-356-1740	February 19, 2009, via facsimile.	None received.
Zhiibaahaasing First Nation Chief Irene Sagon-Kells 705-283-3964	February 19, 2009, via facsimile.	None received.
Wikwemikong Unceded First Nation Melissa Cooper 705-859-3851	February 19, 2009, via facsimile.	None received.
Batchewana First Nation Chief Dean Sayers 705-759-9171	February 19, 2009, via facsimile.	None received.
Garden River First Nation Tyana Jones-Solomon	February 19, 2009, via facsimile.	None received.

Table 12.2: Notice of Commencement Indigenous Communities Circulation and Responses		
Recipient	**Date**	**Response**
705-945-1415		
Thessalon First Nation Chief David Giguere 705-842-2332	February 19, 2009, via facsimile.	None received.
Historic Sault Ste. Marie District Métis Community Council Steve Leffler, President 705-254-3515	February 26, 2009, via facsimile.	None received.
North Shore Métis Council Art Bennett, Interim President artyanceybennett@hotmail.com	February 26, 2009, via email.	None received.

12.3 PUBLIC INFORMATION CENTRES OR OPEN HOUSES

Public Open House sessions were conducted at numerous points during the EA process to present information to the public and solicit feedback. The Open House forum was opted for over the Public Meeting forum as it allows for discussion in smaller groups or one-on-one bases. Open House sessions were held at the following points during the EA process:

1. the initiation of the EA Planning Process;
2. the identification of the preliminary preferred "alternative to";
3. the identification of the preliminary preferred "alternative method";
4. the identification of the preferred solution; and
5. the completion of the draft EA Study Report.

Notifications for Open Houses were made via local newspapers, community television channel, community information board, the Town web site and social media. During each Open House session, information was conveyed using a combination of display panels, document hand-outs and discussion.

Subsections 12.4 to 12.8 present brief summaries of each Open House and Task Report. Comments received during these consultation activities are summarized chronologically in Tables 12.3 and 12.4, along with a summary of how the comments were addressed and/or incorporated into the EA process (if required).

12.4 Public Open House No. 1

Public Open House No. 1 was held following the issuance of the Notice of Commencement on April 22, 2009 in 2 sessions from 3pm to 5pm and 6pm to 8pm. The purpose of the meeting was to present background to the undertaking, the problem/opportunity statement, the waste characterisation and generation rate developed for consideration, a description of the existing waste management system, and to identify next steps in the process.

Appendix B of the Consultation Report includes copies of the Public Open House notice, information boards, sign-in sheet and comment sheet.

12.4.1 Task 1 Report

The Task 1 report, dated December 2009, was compiled to document the process up to and including Public Open House No. 1.

12.5 Public Open House No. 2

Public Open House No. 2 was held on September 13, 2011 in 2 sessions from 3pm to 5pm and 6pm to 8pm. The purpose of the meeting was to describe the process employed to assess alternative waste management plan components and programs, identify the preferred components and programs for implementation in Blind River, describe and present a waste reduction and diversion strategy, and to identify next steps in the process.

Appendix C of the Consultation Report includes copies of the Public Open House notice, information boards, sign-in sheet and comment sheets.

12.5.1 Waste Recycling Strategy

In 2011, the Town initiated the development of the May 17, 2012 Waste Recycling Strategy. Completed under a Waste Diversion Ontario initiative, the process included undertaking stakeholder interviews to identify key issues, concerns and opportunities and input was solicited from Blind River Chamber of Commerce members in the form of a survey. The purpose of the survey was to help gauge the quantities of waste and recyclables generated by the commercial and institutional sectors to gain insight into the potential to increase diversion,

12.5.2 Task 2 Report

The Task 2 report, dated February 2013, was compiled to document the process up to and including the assessment of "alternatives to" the undertaking (presented at Public Open House No. 2).

12.6 Public Open House No. 3

Public Open House No. 3 was held on February 22, 2016 in 1 session from 3pm to 6pm. The purpose of the meeting was to summarize the EA Tasks completed to that date, describe the process applied to assess alternative methods for providing additional waste disposal capacity, to identify and describe the preferred method, and to identify next steps in the process. The preferred method (expand existing site) was identified following a screening process and was accepted by Town Council by Resolution No. 15-148.

Appendix D of the Consultation Report includes copies of Resolution No. 15-148, the Public Open House notice, information boards and sign-in sheet.

12.6.1 Task 3 Report

The Task 3 report, dated May 2019, was compiled to document the process up to and including the assessment of "alternatives methods" (presented at Public Open House No. 3). Appendix E includes a copy of the Task 3 Report circulation email and covering letter in addition to a list of recipients. Copies of letters transmitting comments from the Ministry of Tourism, Culture and Sport as well as Ministry of the Environment, Conservation and Parks are also presented in Appendix E of the Consultation Report.

12.7 Public Open House No. 4

Public Open House No. 4 was held on November 4, 2019 in 1 session from 3pm to 6pm. The purpose of the meeting was to provide a re-cap of the progress to that date including descriptions of the: project background and problem statement; existing waste management system; preferred waste management plan components and programs; waste reduction and diversion strategy; candidate waste disposal site location review and identification of preferred location, as well as to present a preliminary conceptual design. Next steps in the process were also identified.

Appendix F of the Consultation Report includes copies of the Public Open House notice, information boards, sign-in sheet and comment sheet.

12.8 Public Open House No. 5

Public Open House No. 5 will be held once the EA report has been circulated to and comments received from stakeholders and Indigenous Communities.

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments

Consultation Point	Comment	Comment By	Response
Public Open House 1 – April 22, 2009			
	Locations for proposed sites should have been identified at this open house.	Resident Steve Elliott via email.	Proposed sites had not been identified at this stage in the EA Process.
	Have other alternatives been investigated other than a waste disposal site - i.e. incinerator or co-generation plant. If a new disposal area is required how will the old site be rehabilitated?	Resident Steve Elliott via email.	"Alternatives to" had not been identified at this stage in the EA Process.
	Will plans be made to recover materials deposited in the old site from past years such as recyclable metals, plastics and other wastes?	Resident Steve Elliott via email.	Landfill mining may be considered in the later stages of the EA Process.
	Whatever sites are chosen they should have area developed for disposal of hazardous waste and be operational when site is opened.	Resident Steve Elliott via email.	This will be considered on later stages of the EA Process.
	Present site has been taking and burying hazardous waste such as chemicals, medications, oils, paints, batteries, mercury light bulbs, pesticides, and so forth for years. If our present site is considered for future use it needs to be established that leaching of these materials are not leaving the site and contaminating surrounding lands and waters.	Resident Steve Elliott via email.	"Leaching" is considered during annual performance monitoring and reporting and would continue to be monitored should expansion of the existing site be the preferred approach to accommodating disposable wastes.
	Any future site needs to be constructed so that hazardous waste and metals, plastics and glass are not being deposited. A tank for used motor oil should be incorporated where citizens can deposit vehicle oil and filters.	Resident Steve Elliott via email.	This will be considered on later stages of the EA Process.
	Better control is needed to ensure separation of recyclable materials being brought in by large trucks. A forty percent diversion rate as stated at the meeting should not be viewed as acceptable or "better than most other" when it would be simple to increase this percentage by passing by-laws and better enforcement.	Resident Steve Elliott via email.	This will be addressed in site Operations documentation and noted for Town consideration.
	Staff employed at the site need to be better educated and supervised to ensure all laws and regulations are being followed and not ignored. Staff should not be doing other duties during the sites operating (open to public) hours such as covering debris on machines.	Resident Steve Elliott via email.	Levels of education and supervision will be provided and tasks completed as described on the site operations contract.
	Composting of leaves should be done rather than put in the landfill. Compost to be spread over the covered portion of the site to promote regeneration. Rehabilitation of covered areas need to be done on an annual basis.	Resident Steve Elliott via email.	This will be considered on later stages of the EA Process.
	Proposed future sites need to be constructed to prevent light plastic bags from leaving the area via wind, animals or birds. Present site conditions allow these bags to end up in surrounding areas and the waters of the North Channel.	Resident Steve Elliott via email.	This will be considered on later stages of the EA Process.
	A user pays system where the municipality charges a per bag fee via a sticker system similar to many other municipalities should be considered. Only clear plastic bags with stickers would be collected and only picked up if recyclable materials were not present. This would create additional jobs in our community and would increase the life span of any future site. If eighty	Resident Steve Elliott via email.	The Town updates this on a regular basis with a focus on continual improvement.

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments			
Consultation Point	**Comment**	**Comment By**	**Response**
	percent of our recyclables were recovered the contractor would have more product to sell and the town might be able to lower the amount it pays to have it collected. Costs to property owners to have garbage collected might also be lowered.		
	A bear proof fence should be planned around the future site. This would reduce the number of bears being attracted to the site and reduce nuisance bear problems in adjacent residential areas.	Resident Steve Elliott via email.	This will be considered on later stages of the EA Process.
Task 1 Report – December 2009			
	No Comments Received.		
Public Open House 2 – September 13, 2011			
	It is good to have all this information on waste management available. We all have to recognize the urgency of disposing of waste in a more environmentally conscious way. A long term waste management plan is essential.	Resident Sister Trina Bottos via Open House comment sheet.	Noted.
	I'd really like to be able to compost centrally – yard waste and organic matter are plentiful.	Resident Sister Trina Bottos via Open House comment sheet.	This will be considered on later stages of the EA Process.
	I gained some knowledge about the overall plan. It is a lot to absorb for me even though I am on the committee.	Resident Dolly Pigeon, Ecological Resources Committee member, via Open House comment sheet.	Noted.
	I liked the way the information was laid out in manageable sections.	Resident Dolly Pigeon, Ecological Resources Committee member, via Open House comment sheet.	Noted.
	Better control is needed to ensure separation of recyclable materials being brought to the landfill by large trucks.	Anonymous, verbal comment at Open House.	This will be addressed in site Operations documentation.
	Hazardous wastes should be collected more often.	Anonymous, verbal comment at Open House.	This will be considered on later stages of the EA Process.
	The Town should not be content with the current diversion rate if it may be increased by passing bylaws and/or better enforcement.	Anonymous, verbal comment at Open House.	This is noted for Town consideration.
Waste Recycling Strategy – May 17, 2012			
	Five (5) responses to the "Waste Recycling Strategy Questionnaire" describing and quantifying waste generated from various commercial businesses.	Various commercial businesses.	Noted and information incorporate into the Strategy developed.
	Most of our paper is professionally shredded.	Brokerlink Office via response to questionnaire dated March 5, 2012.	Noted.
	I have read your draft document and you have done a great job preparing it.	Waste Diversion Ontario via email dated May 17, 2012.	Noted.

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments Consultation Point	Comment	Comment By	Response
	I'm not sure where the stated anticipated "net cost of $540 per tonne" originated. WDO doesn't anticipate any program costs, rather it states the costs reported by municipalities. IS this number the "average reported" for municipalities similar to Blind River?	Waste Diversion Ontario via email dated May 17, 2012.	Yes, the $540 per tonne is identified as a "net cost target" in Table 1 of the Waste Recycling Strategy Guidebook for municipalities similar to Blind River. The Guidebook states this value was based on 2008 data call results. I will modify the text in the report accordingly.
Task 2 Report – February 2013			
	No Comments Received.		
Public Open House 3 – February 22, 2016			
	No Comments Received.		
Task 3 Report – May 2019			
	Table 1: Alternative Methods Criteria-Phase 1 (pg. 4). Cultural Environment 1. Potential for displacement or disruption of heritage or archaeological recourses. Section should be replaced with: 1. Potential for displacement of built heritage resources and/or cultural heritage landscape by removal and/or demolition and/or disruption by isolation. Section should also include: 2. Disturbance or destruction of archaeological resources that have been identified and documented. 3. Impacts to registered and unregistered cemeteries that have been identified and documented.	Ministry of Tourism, Culture and Sport via letter dated July 22, 2019 from Kimberley Livingstone.	Changes have been incorporated into Sections 8.1.2 and 8.1.3 of the EA Report as well as the following Tables of the EA Report: Table 8.1, Table 8.5, Table 8.7 and Table 8.8.
	Section 3.4 (pg. 30). Heritage resources, cultural landscapes and archaeological resources are identified in the Town's Official Plan as features that should be conserved where required in all land-use planning decisions. The paragraph should read (underlines are new text): "Cultural heritage resources include built heritage resources, cultural heritage landscapes, and archaeological resources. Cultural heritage resources are identified in the Town's Official Plan encourages the identification, recording, conservation, protection, restoration, maintenance and enhancement of all cultural heritage resources, including significant built heritage resources and significant cultural heritage landscapes.	Ministry of Tourism, Culture and Sport via letter dated July 22, 2019 from Kimberley Livingstone.	These clarifications are included in the revised text and Tables in the EA Report noted above and in Section 8.1.2 Criteria Group D: Cultural Environment.
	Section 3.4.1 (pg. 31). Locations 1-6. This section will need to be revised according to the comments on Table 1 (noted above). MTCS has developed screening criteria that may assist the project team in determining where there may be any known (recognized), or potential built heritage resources or cultural heritage landscapes in the proposed locations, and whether cultural heritage studies (such as an Heritage Impact Assessment (HIA) or Cultural Heritage Evaluation Report (CHER)) need to be undertaken. The finding and recommendations of the checklist should be summarized and included in this section.	Ministry of Tourism, Culture and Sport via letter dated July 22, 2019 from Kimberley Livingstone.	Comments have been incorporated into the revised text and Tables in the EA Report noted above.
	Section 3.4.1 (pg. 31). Location 1: An archaeological assessment completed for this location concluded that no heritage or archaeological areas are	Ministry of Tourism, Culture and Sport via letter dated July 22,	A copy of the requested archaeological report was provided. Text and Tables in the EA Report have been revised as noted above.

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments

Consultation Point	Comment	Comment By	Response
	found within its boundaries. The assessment also stated that no previously registered archaeological sites are located within 10km of this location. Location 1: Please provide MTCS with the title, date, Project Information Form Number and author of the archaeological assessment report. Locations 2-6: Given that these locations may have potential for archaeological resources, it is not clear why these were assigned medium impact when the report doesn't inform whether there could be any archaeological sites or resources there, apart from the proximity to water. MTCS has developed screening criteria that may assist the project team in determining whether a location may have archaeological potential: Criteria for Evaluating Archaeological Potential. The findings and recommendations of the checklist should be summarized and included in this section.	2019 from Kimberley Livingstone.	
	Section 3.4.3 (pg. 32). Table 5: Overall Impact Rankings- Cultural Environment Criteria Group. This Table may need to be revised to reflect potential impacts on cultural heritage resources on Locations 2-6.	Ministry of Tourism, Culture and Sport via letter dated July 22, 2019 from Kimberley Livingstone.	
	Table C.1 (Mitigation Measures Considered). See below for text and suggested edits. Refer to letter dated July 22, 2019 from the Ministry of Tourism, Culture and Sport in Appendix E of this Consultation Report.	Ministry of Tourism, Culture and Sport via letter dated July 22, 2019 from Kimberley Livingstone.	Table C.1 from the Task 3 report has been modified from its original format and re-presented in the Environmental Study Report. The comments provided by MTCS have been incorporated into the revised tables where appropriate.
	Although an EA scope of work can be developed, the EA must be prepared in accordance with the approved Terms of Reference (2008). Please note that the proponent is required to present a tabular summary of the ToR requirements and indicate where in the EA they are discussed according to Section 4.3.3 (Terms of Reference Requirements) of the EA Code of Practice.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	A tabular summary is provided in Section 1.3 of the EA Report.
	Section 1.1 (Background) mentions that the results of the evaluation of the alternatives to the undertaking completed in the "Task 2 – Part A: Alternatives To" report (2013) revealed that landfilling was the preferred method of waste disposal within the study area. The inclusion of a summary of the alternatives to the undertaking considered and the rationale for selecting landfilling as the preferred alternative would be beneficial in providing additional context for the evaluation of alternative landfilling sites in the Task 3 Report.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into Sections 5.0 and 6.0 of the EA Report.
	The municipal boundary study area referenced in Section 1.2 (Study Area) and shown in Appendix A (Referenced Drawings) appears unchanged from the ToR, even though it was mentioned in the report that the search area for the identification of alternative landfill sites was limited to five kilometres north of Highway 17. At the EA stage, different study areas for the types of alternatives considered and/or for each component of the environment (e.g. technical discipline) are developed depending on the alternatives and	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Clarification in this regard is included in the EA Report (Section 7.0).

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments			
Consultation Point	**Comment**	**Comment By**	**Response**
	geographic extent of potential environmental effects. Therefore, the Task 3 Report should present a candidate landfill site selection study area accompanied by a description of the environment within this study area. Rationales for study area boundaries need to be included in the EA.		
	The ministry notes that the tasks listed in Kresin Engineering's EA work plan do not include a description of the environment, which is a key requirement of the EA process. Section 4.2.3 (Description of the Environment) of the EA Code of Practice specifies that the proponent is expected to conduct studies and research to provide a final description of the environment within the study area that builds upon the description given in the approved ToR. The description of the environment is crucial as it provides the baseline conditions against which environmental effects are assessed.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into the EA Report (Section 4.0).
	Section 4.2.4 (Assessment and Evaluation) of the EA Code of Practice outlines the ministry's expectations for describing the alternatives considered and the rationale for choosing alternatives in accordance with the provisions outlined in the approved ToR. Section 2.1 (Candidate Locations) of the Task 3 Report should provide rationale for the selection of candidate landfill sites in addition to detailed information and mapping for each location. The environmental setting and characteristics of the six candidate landfill locations are unclear as this information is presented in various sections throughout the Task 3 Report. Detailed site information would highlight geographical constraints as well as the advantages and disadvantages of a particular location for landfilling. For example, Location 2 shown in Appendix A (Referenced Drawings) appears to be situated at a solar farm operated by the North Shore Power Group, which would make it unavailable for the establishment of a new landfill. Portions of Location 2 also overlap with Location 1.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Clarification in this regard is provided in the EA Report (Sections 8.0 and 9.0).
	Section 2.2 (Evaluation Criteria) of the Task 3 Report should specify indicators and data sources for each evaluation criterion. Section 4.2.4 (Assessment and Evaluation) of the EA Code of Practice discusses expectations for the systematic evaluation of alternatives and provides examples of criteria, indicators and data sources. The EA must present the final list of criteria followed by indicators that will identify how the potential environmental effects will be measured for each criterion. Section 2.3 (Data Collection and Analysis) of the Task 3 Report should provide a list of data resources, surveys, mapping and studies used to describe the existing environment and to support the analysis of alternative landfill locations. Section 4.3.2 (List of Studies and Reports) of the EA Code of Practice states this requirement.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Clarification in this regard is provided in the EA Report (Sections 8.0 and 9.0).

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments			
Consultation Point	**Comment**	**Comment By**	**Response**
	The environmental criteria in Table 1: (Alternative Methods Evaluation Criteria – Phase 1) of Section 2.2 (Evaluation Criteria) need to be tailored to the assessment of alternative landfill sites. There also appears to be evaluation criteria that are double-counted, such as "transportation related considerations" listed in both the social and economic environment categories. Evaluation criteria, indicators, and assessments should become more specific and detailed as the EA progresses. The criteria, indicators and data collected for the evaluation of alternative methods should be more comprehensive than those used for the evaluation of alternatives to the undertaking which tend to be more general since less information is known at earlier stages of an EA. For example, the technical criterion in Table 1 related to the ability of an alternative to address the stated problem or opportunity, would not be used in the evaluation of alternative landfill sites as this criterion is typically used to determine a reasonable range of alternatives to the undertaking as mentioned in Section 4.2.2 (Description of and Rationale for Alternatives) of the EA Code of Practice. Technical criteria specific to landfill siting could consider aspects such as site capacity, proximity to transportation infrastructure, and geotechnical properties of soil and rock.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into the EA Report (Sections 6.0, 8.0 and 9.0). Transportation related considerations are incorporated into the assessments of social and economic environments.
	Section 6.2.1 (Comparative Evaluation – Phase 1) of the approved ToR includes the commitment to modifying the proposed evaluation criteria based on public and agency input. It also mentions that the need to weigh criteria will also be assessed during the review of input from the public and participating agencies. Therefore, the Task 3 Report should discuss consultation activities and input from the public and agency stakeholders on evaluation criteria, weightings and scoring.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Clarification in this regard has been included in the EA Report (Sections 8.1 and 9.1).
	Section 6.2.1 (Comparative Evaluation – Phase 1) of the approved ToR indicates that Phase 1 involves the collection of general data and an evaluation based on the proposed criteria (in Table 6.2 of the ToR) including an assessment of associated advantages and disadvantages, net environmental effects and impact management measures. Section 6.2.2 (Comparative Evaluation – Phase 2) of the approved ToR states that Phase 2 involves a more detailed assessment of the alternative methods identified for further consideration under Phase 1 of the comparative evaluation.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into the EA Report (Sections 8.0 and 9.0).
	The text in Section 3.0 (Comparative Evaluation – Phase 1) of the Task 3 Report suggests that if only one candidate location received a "low" (overall) ranking following the Phase 1 evaluation, it would be selected as the preferred site and a Phase 2 evaluation would not be required. This approach does not seem consistent with the approved ToR which outlines that alternative methods carried forward from the Phase 1 evaluation will	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into the EA Report (Sections 4.0 and 7.0).

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments			
Consultation Point	**Comment**	**Comment By**	**Response**
	be assessed in greater detail in Phase 2. It is the ministry's understanding that the candidate location or locations carried forward from the Phase 1 evaluation would be further developed and assessed in Phase 2. The level of detail at which alternatives are evaluated should increase as the proponent proceeds through the EA planning process. Section 8.0 of the approved ToR (Flexibility of this Terms of Reference) discusses that if modifications to the process described in the approved ToR may be required, they will only be made following consultation with the public and relevant agencies. Adequate justification for the modifications need to be provided to the ministry.		
	Throughout the Task 3 Report, it is unclear how the rankings of low, medium and high for each alternative landfill location were determined. Section 4.2.4 (Assessment and Evaluation) of the EA Code of Practice states that the evaluation method chosen must be able to produce an assessment that is clear, logical and traceable. The potential effects (and net effects) of each candidate landfill location on the environment must also be clearly identified and described in detail. More detailed descriptions of each candidate location, environmental effects, and mitigation measures with respect to each environmental criterion are needed in the body of the report, Appendix B (Phase 1 Comparative Evaluation) and Appendix C (Mitigation Measures).	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been expanded on in the EA Report (Sections 8.0 and 9.0).
	Section 3.2.2 (Potential for Displacement or Disruption to Indigenous Communities) comments on the proximity of First Nations reserves relative to the candidate landfill locations. Proximity of First Nations reserves to a potential landfill location may not be an appropriate indicator of potential impacts to the historical and current uses of land and water in the traditional territories of Indigenous peoples. Specific indicators to assess potential impacts of each location on Aboriginal or Treaty Rights should be selected and the information used to assess potential impacts to the use of traditional lands and resources should be obtained through consultation with Indigenous communities. The naming of this evaluation criterion also does not reflect the identified purpose of this criterion which is to assess the potential of adverse impacts of the candidate landfill locations on lands, resources, traditional activities or other interests of Indigenous communities.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Modifications have been made in Sections 8.1.2 and 8.1.3 of the EA Report and in Table 8.1, Table 8.3, Table 8.7 and Table 8.8.
	It is the ministry's understanding that the purpose of the alternative landfill site evaluation in the Task 3 Report is to identify and compare suitable landfilling sites near Highway 17 that could meet the Town of Blind River's future waste disposal needs, and that each candidate landfill site would be considered and compared equally based on their advantages and	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	This has been incorporated into the EA Report (Sections 8.1.4 and 9.1.3).

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments

Consultation Point	Comment	Comment By	Response
	disadvantages to the environment. Section 4.2.4 (Assessment and Evaluation) of the EA Code of Practice states that the evaluation process is a trade-off process in which the advantages and disadvantages to the environment of the alternatives are weighed in terms of their effects, both positive and negative, on the environment. The consideration of advantages and disadvantages following the determination of net effects is part of the evaluation of the alternatives rather than a standalone exercise to confirm preference for an alternative.		
	Additional information is needed in Section 5.0 (Advantages and Disadvantages) to support the conclusion that Location 1 will have the least potential impact to the environment and that the expansion of the Blind River Municipal Landfill Site is the preferred undertaking. For example, Table 8 (Phase 1 Summary of Advantages and Disadvantages of Candidate Locations) mentions that there will be no loss or disruption to terrestrial features or wildlife since there will be no site clearing at Location 1. However, Location 1 as shown in Appendix A (Referenced Drawings) includes a significant amount of treed areas surrounding the Blind River Municipal Landfill Site. In another instance, the cultural heritage section of Table 8 states that Locations 3 to 6 are deemed to have a high impact to heritage and archaeological resources although no assessments have been completed.		The comparative evaluation of alternative methods (Locations) has been restructured with additional information in the EA Report (Sections 8.0 and 9.0).
	It is the ministry's understanding that the candidate location or locations carried forward from the Phase 1 evaluation will be further developed and assessed in Phase 2. Prior to completing Task 4: Landfill Site Conceptual Design, the ministry anticipates that alternative design concepts for landfill expansion will be developed and evaluated using quantitative data obtained from original field work, surveys and technical studies.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	The comparative evaluation of alternative methods (Locations) has been restructured with additional information in the EA Report (Sections 8.0 and 9.0). A conceptual design is presented in Section 10.0 of the EA Report.
	The Blind River Municipal Landfill Site was expected to operate for twenty-five years when a provisional certificate of approval was issued under the Environmental Protection Act in 1980. This landfill site has been operating under a dated approval for nearly fifty years, significantly beyond the original estimated design life. Therefore, the evaluation of alternative landfill sites should factor in the existing environmental impacts of the Blind River Municipal Landfill Site when determining whether it is suitable for providing waste disposal for another twenty years. It is anticipated that major site upgrades will be needed should this landfill site be expanded to meet current standards.	Ministry of the Environment, Conservation and Parks via letter dated June 7, 2019 from Carolyn Lee.	Existing impacts, as assessed in annual landfill operations and monitoring reports, 2002 hydrogeological report and 2021 hydrogeological and surface water assessment report have considered during the EA Process. The Town is in the process of implementing improvements at the existing site.
	The ministry considers site compliance issues when making decisions related to landfill expansion proposals. The ministry expects that proponents adequately address compliance issues prior to the ministry making decisions	Ministry of the Environment, Conservation and Parks via	The Town will submit an Application for ECA for a stormwater management plan in 2021 and has corresponded with the local MECP regarding litter management.

Table 12.3: Open House and Task Report Government Agencies, Ministries, Departments and Utilities Comments			
Consultation Point	**Comment**	**Comment By**	**Response**
	on environmental assessments for landfill expansions. Site inspections conducted in 2018 and most recently January 18, 2019 reveal ongoing operational issues within the Blind River Municipal Landfill Site and the surrounding natural environment. Issues include litter generation as well as surface water ponding and leachate seepage along the west side of the site due to the absence of a stormwater or leachate collection system. A Provincial Officer's Order was issued on January 30, 2019 under the Environmental Protection Act ordering the Town of Blind River to take immediate actions to address these issues. Actions include the preparation and submission of a litter management plan and stormwater management plan to the ministry.	letter dated June 7, 2019 from Carolyn Lee.	
Public Open House 4 – November 4, 2019			
	Healthy snacks are appreciated. Viewer's attention should have been directed by clearly numbered panels.	Resident Scott Dingwall via Open House comment sheet.	Noted.
	The site should be fenced to deter bears. Why should the Town provide a feeding station when MNRF discourages feeding the bears?	Resident Scott Dingwall via Open House comment sheet.	This will be considered during preparation of an Application for ECA.
	The stormwater settlement pond is laudable. No surface leachates or drainage should reach Lake Huron.	Resident Scott Dingwall via Open House comment sheet.	Noted.
	All groundwater leachates should be contained to percolate through the downgradient attenuation zone.	Resident Scott Dingwall via Open House comment sheet.	This will be incorporated into the site water management designs (surface and groundwater).
	The downgradient leachate should be sampled/monitored to map the migration and to confirm/assess the effectiveness of the zone in attenuating toxin migration to Lake Huron.	Resident Scott Dingwall via Open House comment sheet.	This practice will continue. A monitoring program has been in-place for several years at this location for this purpose.
	The question is "how well is the filter working?" Over time the pore spaces between soil particles can become plugged and the filter less effective.	Resident Scott Dingwall via Open House comment sheet.	Natural attenuation relies chiefly on dilution (available precipitation) rather than other chemical and physical processes in the soil and groundwater system.
Public Open House 5 – Date TBD			
	To be completed.		

Table 12.4: Open House and Task Report Indigenous Communities Comments Consultation Point	Comment	Comment By	Response
Public Open House 1 – April 22, 2009			
	No Comments Received.		
Public Open House 2 – September 13, 2011			
	No Comments Received.		
Public Open House 3 – February 22, 2016			
	No Comments Received.		
Task 3 Report – May 2019			
	Thank you for this. We will review and action as necessary.	Metis Nation of Ontario via email dated May 9, 2019.	Noted.
Public Open House 4 – November 4, 2019			
	No Comments Received.		
Public Open House 5 – Date TBD			
	To be completed.		

12.9 WORKSHOPS

The potential to provide workshop opportunities was included in the ToR as a means to involve stakeholders in the process. As the EA process progressed, and considering that the attendance at the Open Houses was such that in-depth discussion and interaction, similar to what would be provided at workshops, was able to be held with stakeholders, independent workshops were not convened.

12.10 MEETINGS

Formal meetings were anticipated in the ToR to occur on an as required basis should any significant issues or conflicts arise during the EA process. Tables 12.5 and 12.6 summarizes the formal meetings held during the EA Process.

Table 12.5: EA Process Formal Meetings with Government Agencies, Ministries, Departments and Utilities		
Meeting Date	**Setting and Topic**	**Outcome**
Thursday January 22, 2009.	Meeting with MECP and Town staff to review the EA work program and the Notice of Commencement.	Notice of Commencement was approved for circulation.
October 21, 2009.	Meeting with Town Public Works Committee staff to review the Task 1 Report.	During the meeting it was noted that recycling more is difficult due to limitations with the existing MRF in Blind River and that there are old landfills on municipal property.
June 16, 2011	Ecological Resources Committee meeting. Reviewed Task 1 Report, draft Task 2 Report and draft Waste Recycling Strategy work plan.	Reports accepted.
July 11, 2011	Ecological Resources Committee meeting. Meeting included representatives from the local recycling contractor to discuss opportunities to improve recycling participation rates and increase the volume of material diverted from landfill.	It was indicated that a 2 bag waste limit was being implemented in January 2012. General discussions on other diversion approaches including leaf and yard waste composting and backyard composting.
June 18, 2018	Council meeting providing a project status update.	Update accepted
July 8, 2019	Council meeting providing a project status update.	Update accepted

Table 12.6: EA Process Formal Meetings with Indigenous Communities		
Meeting Date	**Setting and Topic**	**Outcome**
July 28, 2017	Meeting between Métis Nation of Ontario (MNO) and the Town to discuss the EA Process and proposed project.	Background documentation was provided to MNO for their review. See subsection 8.1.1 for additional information.
August 31, 2017	Meeting between Mississauga First Nation (MFN) and the Town to discuss the EA Process and proposed project.	Background information was provided, MFN requested that they be kept informed as the EA process continues and that MFN committed to contact the Town if they have any questions. See subsection 8.1.2 for additional information.
September 26, 2017	Meeting between MNO and the Town to following-up on documentation provided following the July 28/17 meeting.	MNO requested that they be kept informed as the EA Process continues. See subsection 8.1.1 for additional information.

12.11 NOTICES

Notices were issued during the EA process in association with commencement, Public Open House sessions and stakeholder reengagement to provide project updates and opportunities for review and to provide input. Copies of notices are presented in Appendix G of the Consultation Report.

Notice of Commencement - February 2009

The Notice of Commencement announced that the Town had initiated the EA process to address declining capacity at the Town's landfill site for a period of 25 to 40 years, depending on the preferred alternative identified. A general description of the landfill site, a link to the ToR and confirmation that formal consultation activities will be undertaken at key stages of the EA process were also included.

Notice for Public Open House No. 1 – April 2009

The published notice for Public Open House No. 1 informed that the Town has recently begun implementing the EA process identified in the ToR and offered an opportunity to receive a description of the process and to provide input into the process. In addition to providing consultant contact information, a link to information available online was also provided.

Notice for Public Open House No. 2 – September 2011

Information with the notice for Public Open House No. 2 included that the Town has implemented a second phase of the EA process that identified functionally different ways of addressing the need for additional waste disposal capacity and that a waste diversion strategy is being developed in conjunction with identifying a preferred waste management system. In addition to providing consultant contact information, a link to information available online was also provided.

Notice for Public Open House No. 3 – February 2016

The notice for Public Open House No. 3 informed that the preferred waste management plan components had been identified including, among others, waste disposal by landfilling. It was described in the notice that a screening process had been undertaken and identified expansion of the current waste disposal site as the preliminary preferred location to provide additional waste disposal capacity, pending detailed site assessment and conceptual design. Consultant contact information was also provided in addition to a link to available online information.

April 2017 letter and June 2017 follow-up letter

On April 6, 2017 letters were circulated to Government Review Team members as well as Indigenous Communities to re-engage and confirm participation in the process. The letter included: a brief description of progress made during the EA process; provided a link to the online document repository; and, requested any comments in regard to the progress made. Additionally, it was noted that the preliminary preferred alternative approach incorporates expansion of the existing waste disposal site and that the Town has been making efforts to improve the operational and environmental performance of the existing site. Follow-up letters, including the same information, was sent to contacts who had not responded to the original (April 2017) letter on June 7, 2017. Tables 7 and 8 summarize the contacts and responses.

Table 12.7: Government Agencies, Ministries, Departments and Utilities Contacts and Responses – Letters date April and June 2017			
Recipient of Letter Dated April 6, 2017.	**Response Received**	**Follow-up Letter June 7, 2017**	**Response Received**
Lisa Peters, Public Health Inspector Algoma Public Health Ontario Ministry of Health and Long-Terms Care 15 Hanes Avenue Blind River, ON P0R 1B0	April 20/17 email response from Sherri Cleaves – APH would like to be included on consultation list and correspondence should be addressed to Chris Spooney. cspooney@algomapublichealth.com		
Rob Dobos, Manager Environmental Assessment Section Environmental Protection Branch – Ontario Region Environment and Climate Change Canada 867 Lakeshore Rd. Burlington, ON L7R 4A6	None received.	Follow-up letter sent on June 7, 2017.	None received.
Anjala Puvananathan Director, Ontario Region Canadian Environmental Assessment Agency 55 St. Clair Avenue East, Suite 907 Toronto, ON M4T 1M2	April 24/17 Letter response project does not appear to be of interest to CEEA. Please remove from list.		
Sault Ste. Marie District Ministry of Natural Resources and Forestry 64 Church Street Sault Ste. Marie, ON P6A 6V5 Attn: Marjorie Hall, Resource Management Planning Specialist	May 8, 2017 email response to please keep MNRF informed. Particular interest in potential MNRF permitting re: Crown land, lake/river/stream beds, SAR.		
John Fraser, Manager Northeastern Region Ministry of Transportation Ontario Government Bldg, Suite 301 447 McKeown Ave. North Bay, ON P1B 9S9	April 28/17 Email response from Jody Fennell asking that MTO be included on mailing list, direct info. To Mario.johnson@ontario.ca and Ray.marshall@ontario.ca.		
Jonathan Barrett, Manager (A) Strategic Support Unit Ministry of Northern Development & Mines Willet Green Miller Centre, 6th Flr 933 Ramsey Lake Road Sudbury, ON P3E 6B5	April 19/17 Email response from Stephanie Rocca asking that materials be sent to her attention via email – stephanie.rocca@ontario.ca		
Ms. Bridget Schulte-Hostedde, Manager Community Planning and Development Municipal Services Office – North (Sudbury) Ministry of Municipal Affairs & Housing 159 Cedar Street, Suite 401 Sudbury, ON P3E 6A5	April 12/17 Email response from Dave Welwood confirming they should remain on the contact list and that electronic documents are preferred. Also asked if the "Waste Disposal Assessment Area" would need to be modified. David.welwood@ontario.ca CK responded on May 31/17 that the area may need to be expanded to include the CAZ that extends south of Highway 17.		
Mr. Tony Amalfa, Manager Environmental Health Policy & Programs Ministry of Health and Long-Term Care 393 University Avenue, 21st Floor Toronto, ON M7A 2S1	None received.	Follow-up letter sent on June 7, 2017.	None received.
Ms. Rachael Manson-Smith, Manager Ministry Partnerships Unit Ministry of Aboriginal Affairs 4th Floor, 160 Bloor Street East Toronto, ON M7E 2E6	None received.	Follow-up letter sent on June 7, 2017.	None received.

Table 12.7: Government Agencies, Ministries, Departments and Utilities Contacts and Responses – Letters date April and June 2017			
Recipient of Letter Dated April 6, 2017.	**Response Received**	**Follow-up Letter June 7, 2017**	**Response Received**
Mr. John O'Neill, Rural Planner Environmental & Land Use Policy Ministry Agriculture, Food and Rural Affairs 1st Fl. -59 Ministry Road Box 2004, ORC Building Kemptville, ON K0G 1J0	None received.	Follow-up letter sent on June 7, 2017.	None received.
Ms. Laura Hatcher, Team Lead – Heritage Land Use Planning (A) - Heritage Program Unit Programs and Services Branch Ministry of Tourism and Culture 401 Bay St., Suite 1700 Toronto, ON M7A 0A7	April 18/17 Email response from Brooke Herczeg requesting confirmation on completion of archaeological review (similar to Paige Campbell below) and forwarding standard letter. Brooke.herczog@ontario.ca CK sent email in May 31, 2017 with explanation and asking if we should deal with Paige or Brooke (copied Paige this email).		
Patrick Morash, Manager (A) North Region Ministries of Citizenship and Immigration, Tourism, Culture & Sport 435 James Street South, Suite 334 Thunder Bay, ON P7E 6E3	April 25/17 Email response from Paige Campbell, Archaeology Review Officer asking if an archaeological review will be completed. Paige.campbell@ontario.ca CK confirmed on May 3/17 that one will be done this year. PC responded on May 3/17 asking to be informed of who will be doing the review.		

Table 12.8: Indigenous Communities Contacts and Responses – Letters date April and June 2017

Recipient of Letter Dated April 6, 2017.	Response Received	Follow-up Letter June 7, 2017	Response Received
Sagamok Anishnawbek First Nation Chief Paul Eshkakogan PO Box 610, 4007 Espaneil Street Massey, ON P0P 1P0	None received.	Follow-up letter sent on June 7, 2017.	None received.
Mississauga First Nation Chief Reginald Niganobe PO Box 1299, 64 Park Road Blind River, ON P0R 1B0	None received.	Follow-up letter sent on June 7, 2017.	June 13/17 email response from Peyton Pitawanakwat asking to remain on list.
Serpent River First Nation Chief Elaine Johnston 195 Village Road Cutler, ON P0P 1B0	May 4/17 Email response from Kerri Commanda, Lands and Resources Coordinating Unit asking to be contacted. Lrcu.srfn@gmail.com CK left voice message on May 5. No response received.		
Whitefish River First Nation Chief Shining Turtle P.O. Box A, 46 Bay of Islands Rd. Birch Island, ON P0P 1A0	None received.	Follow-up letter sent on June 7, 2017.	None received.
Bar River Metis Community Mr. Dave Johnston 916 Bar River Road, RR4 Echo Bay, ON P0S 1C0	None received.	Follow-up letter sent on June 7, 2017.	None received.
Thessalon First Nation Chief Alfred Bisaillon 40 Sugarbush Road, RR#2 Thessalon, ON P0R 1L0	None received.	Follow-up letter sent on June 7, 2017.	None received.
MNO Historic Sault Ste. Marie Metis Council Kim Powley, President 26 Queen Street East Sault Ste, Marie, ON P6A 1Y3	April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org.		
cc. Metis Consultation Unit Metis Nation of Ontario Head Office 500 Old St. Patrick Street, Unit D Ottawa, ON K1N 9G4	April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org.		
MNO North Channel Metis Council Yvonne Jensen, President P.O. Box 2020 Blind River, ON P0R 1B0	April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org. Will this expansion be lined? CK called Jesse Fieldwebster on May 3, 2017 to discuss and MNO requested a meeting between the Town and the MNO Consultation Committee.		

Notice to stakeholders and Indigenous Communities conveying the Task 3 Report – May 2019

On May 8, 2019 an email was circulated to stakeholders and Indigenous Communities providing a link to the Task 3 Report as well as an offer to provide hard copies of the report, if preferred. The stated purpose of the email was to inform that the Task 3 Report had been completed and that it summarized results from the evaluation of alternative methods to implement the preferred "alternative to" (waste disposal by landfilling). It was also stated that expansion of the current fill area was the identified preferred alternative. Comments of a general nature or specific to the Task 3 Report were requested by June 10, 2019, in addition to requesting confirmation whether the letter addressee wished to remain on the EA mailing list and/or the review team. Tables 9 and 10 summarize the contacts and responses.

Notice for Public Open House No. 4 – November 2019

The notice for Public Open House No. 4 conveyed a brief description of EA process progress and that the preferred waste management plan components had been identified, including waste disposal by landfilling. In addition to this, it was stated that a screening exercise was completed and identified expansion of the current waste disposal site as being the preliminary preferred location to provide additional waste disposal capacity. Further, it was informed that the Town is in the process of completing detailed assessments and conceptual designs. Consultant contact information was also provided in addition to a link to available online information.

Notice for Public Open House No. 5 – Date TBD

A notice for Public Open House No. 5 has not yet been issued.

Notice of Completion – Date TBD

A Notice of Completion has not yet been issued.

Table 12.9: Government Agencies, Ministries, Departments and Utilities Contacts and Responses – Notice May 2019, Task 3 Report		
Recipient of May 2019 Notice	**Response Received**	**Follow-up**
Mr. Chris Spooney, Manager of Environmental Health Algoma Public Health Ontario Ministry of Health and Long-Terms Care 294 Willow Avenue Sault Ste. Marie, ON P6B 0A9 cspooney@algomapublichealth.com	None received.	
Mr. Leigh Colpitts, District Manager (Acting) Sault Ste. Marie District Ministry of Natural Resources and Forestry 70 Foster Drive Sault Ste. Marie, ON P6A 6V5 Leigh.colpitts@ontario.ca	None received.	
Ms. Carolyn Lee, Project Officer Ministry of the Environment, Conservation and Parks Environmental Assessment Branch 135 St. Clair Avenue West Toronto, ON M4V 1P5	June 7, 2019 letter. See Table 2 for a summary of comments received.	See Table 2 for a summary of responses.
Mr. Ray Marshall, Head – Corridor Management Northeastern Region Ministry of Transportation Ontario Government Bldg, Suite 301 447 McKeown Ave. North Bay, ON P1B 9S9 Ray.marshall@ontario.ca	None received.	
Ms. Stephanie Rocca, Senior Strategic Initiatives Lead (Acting) Strategic Support Unit Ministry of Northern Development & Mines Willet Green Miller Centre, 6th Flr 933 Ramsey Lake Road Sudbury, ON P3E 6B5 Stephanie.rocca@ontario.ca	None received.	
Ms. Megan Grant, Manager (Acting) Municipal Services Office – North (Sudbury) Ministry of Municipal Affairs & Housing 159 Cedar Street, Suite 401 Sudbury, ON P3E 6A5 Megan.grant@ontario.ca	None received.	
Ms. Hilary Stone, Senior Policy and Program Advisor Environmental Health Policy & Programs Ministry of Health and Long-Term Care 393 University Avenue, 21st Floor Toronto, ON M7A 2S1 Hilary.stone@ontario.ca	None received.	
Mr. John O'Neill, Rural Planner Environmental & Land Use Policy Ministry Agriculture, Food and Rural Affairs 1st Fl. -59 Ministry Road Box 2004, ORC Building Kemptville, ON KOG 1J0 John.o'neill@ontario.ca	None received.	

Table 12.9: Government Agencies, Ministries, Departments and Utilities Contacts and Responses – Notice May 2019, Task 3 Report		
Recipient of May 2019 Notice	**Response Received**	**Follow-up**
Ms. Laura Hatcher, Team Lead – Heritage Land Use Planning (A) Heritage Program Unit, Programs and Services Branch Ministry of Tourism, Culture and Sport 401 Bay St., Suite 1700 Toronto, ON M7A 0A7 Laura.hatcher@ontario.ca	None received.	
Ms. Kimberly Livingstone, Heritage Planner (A) Culture Division, Program and Services Branch, Heritage Planning Unit Ministry of Tourism, Sport and Culture 401 Bay St., Suite 1700 Toronto, ON M7A 0A7 Kimberly.livingstone@ontario.ca	July 22, 2019 letter. See Table 2 for a summary of comments received.	See Table 2 for a summary of responses.
Ms. Paige Campbell, Archaeology Review Officer Archaeology Program Unit 435 James Street South, Suite 334 Thunder Bay, ON P7E 6S7 Paige.campbell@ontario.ca	May 9, 2019 email. "Thanks for the email. I have forwarded it to Karla Barboza (karla.barboza@ontario.ca) of the Heritage Planning Unit of our ministry as they are the ones to comment on all EA activities. Their MTCS file on this project is # 0006522. I would be interested to know if an archaeological assessment is planned yet? I see that I noted in my MTCS file 57WS002 that a Stage 1 assessment was recommended by the ministry back in 2005. Do you know if this ever happened and if not, when it might be expected to happen? I will enter into the process if and when an archaeological assessment is submitted to the ministry for review."	May 9, 2019 email. "Good morning Paige, An archaeological assessment was completed for the site in September of 2017. I have attached the report for your files. Entry of the report into the Ontario Public Register was completed on November 6, 2017. Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT BLIND RIVER MUNICIPAL WASTE SITE EXPANSION PART OF LOT 7, CONCESSION 1 (FORMER TOWNSHIP OF STRIKER) TOWN OF BLIND RIVER ALGOMA DISTRICT, ONTARIO", Dated Oct 16, 2017, Filed with MTCS Toronto Office on N/A, MTCS Project Information Form Number P094-0244-2017, MTCS File Number 0007325 Please let me know if you need any additional information." May 9, 2019 email from Karla Barboza. "Thanks for sending the report below to the Ministry of Tourism, Culture and Sport. Please note that there has been some changes in our unit (see full MTCS contact below). For this project (MTCS File 0006522), please continue to send any notices and/or information to Kimberly Livingstone, MTCS Heritage Planner, and me. Kimberly will review and provide comments, as appropriate, by June 10. Please remove Paige Campbell and Laura Hatcher from your contact list for this project. In the meantime, please let us know if you have any questions."

Table 12.10: Indigenous Communities Contacts and Responses – Notice May 2019, Task 3 Report		
Recipient of May 2019 Notice	**Response Received**	**Follow-up**
Sagamok Anishnawbek First Nation Chief Nelson Toulouse PO Box 610, 4007 Espaneil Street Massey, ON P0P 1P0 Executive_assistant@sagamok.ca	None received.	
Mississauga First Nation Ms. Peyton Pitawanakwat, Environmental Technician PO Box 1299, 64 Park Road Blind River, ON P0R 1B0 peyton@mississauga.com	None received.	
Serpent River First Nation Ms. Kerri Commanda, Lands Coordinator 195 Village Road Cutler, ON P0P 1B0 Lrcu.srfn@gmail.com	None received.	
Whitefish River First Nation Chief Shining Turtle P.O. Box A, 46 Bay of Islands Rd. Birch Island, ON P0P 1A0 chief@whitefishriver.ca	None received.	
Bar River Metis Community Mr. Dave Johnston, President 916 Bar River Road, RR4 Echo Bay, ON P0S 1C0 grfis@hotmail.com	None received.	
Thessalon First Nation Chief Edward Boulrice 40 Sugarbush Road, RR#2 Thessalon, ON P0R 1L0 Chiefedwardboulrice.tfn@vianet.ca	None received.	
cc. Metis Consultation Unit Metis Nation of Ontario Head Office 500 Old St. Patrick Street, Unit D Ottawa, ON K1N 9G4 jessef@metisnation.org	May 9, 2019 Email “Thank you for this. We will review and action as necessary.”	

12.12 AVAILABILITY OF INFORMATION

As was described in the ToR, a project web site was developed to act as a repository for the EA process and was maintained throughout the process, https://www.kresinengineering.ca/blind-river-waste-management-plan. Document hardcopies were/are available by contacting Kresin Engineering Corporation or the Town office.

12.13 INDIGENOUS COMMUNITY CONSULTATION

The Consultation Plan acknowledged that Indigenous Communities may have specific issues or concerns other than those identified by other stakeholders and proposed that communities potentially affected would be contacted directly during the process.

The following Indigenous Communities were consulted during the EA Process:

1. North Channel Métis Council
2. Historic Sault Ste. Marie Métis Council
3. Garden River First Nation
4. Batchewana First Nation
5. Wikwemikong Unceded First Nation
6. Zhiibaahaasing First Nation
7. Sagamok Anishnawbek First Nation
8. Mississauga First Nation
9. Serpent River First Nation
10. Whitefish River First Nation
11. Bar River Métis Community
12. Thessalon First Nation
13. Métis Nation of Ontario

Ontario Ministry of Indigenous Affairs were also consulted.

By way of letter dated March 29, 2017, the Ontario Ministry of Environment, Conservation and Parks delegated the procedural aspects of the Crown's duty to consult Indigenous Communities to the Town of Blind River. With the March 29 letter, MECP identified communities listed above under bullets number 1 to 9 (inclusive) as communities that should be consulted.

The following sub-sections summarize the consultation completed for each Indigenous Community.

12.13.1 North Channel Métis Council

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the North Channel Métis Council on February 26, 2009. A re-engagement letter was sent to North Channel Métis Council on April 6, 2017 with a response being received on April 27, 2017 from Jesse Fieldwebster (Consultation Assessment Coordinator) requesting that any further notifications are sent consultations@metisnation.org as well as asking a follow-up question regarding the landfill design. KEC called Jesse Fieldwebster on May 3, 2017 to discuss their question and MNO requested a meeting between the Town of Blind River and the MNO Consultation Committee. Meetings with MNO were held on May 3, 2017 and September 26, 2017. The Task 3 report was sent to the Métis Consultation

Unit on May 7, 2019 with a confirmation of receipt received on May 9, 2019. A summary of the meetings is included in Section 8.16.1.

12.13.2 Historic Sault Ste. Marie Métis Council

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Historic Sault Ste. Marie Métis Council on February 19, 2009. A re-engagement letter was sent to Historic Sault Ste. Marie Métis Council on April 6, 2017 with a response being received on April 27, 2017 from Jesse Fieldwebster (Consultation Assessment Coordinator) requesting that any further notifications are sent consultations@metisnation.org as well as asking a follow-up question regarding the landfill design. KEC called Jesse Fieldwebster on May 3, 2017 to discuss their question with MNO requesting a meeting between the Town of Blind River and the MNO Consultation Committee. Meetings with MNO were held on May 3, 2017 and September 26, 2017. The Task 3 report was sent to the Métis Consultation Unit on May 7, 2019 with a confirmation of receipt received on May 9, 2019. A summary of the meetings is included in Section 8.16.1.

12.13.3 Garden River First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Garden River First Nation on February 19, 2009. No comments were received. Following the March 29, 2017 letter from MECP, Garden River First Nation was removed from the mailing list for the project.

12.13.4 Batchewana First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Batchewana First Nation on February 19, 2009. No comments were received. Following the March 29, 2017 letter from MECP, Batchewana First Nation was removed from the mailing list for the project.

12.13.5 Wikwemikong Unceded First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Wikwemikong Unceded First Nation on February 19, 2009. No comments were received. Following the March 29, 2017 letter from MECP, Wikwemikong Unceded First Nation was removed from the mailing list for the project.

12.13.6 Zhiibaahaasing First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Zhiibaahaasing First Nation on February 19, 2009. No comments were received. Following the March 29, 2017 letter from MECP, Zhiibaahaasing First Nation was removed from the mailing list for the project.

12.13.7 Sagamok Anishnawbek First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Sagamok Anishnawbek First Nation on February 19, 2009. A re-engagement letter was sent to Sagamok Anishnawbek First Nation on April 6, 2017 with a follow-up letter being sent on June 7, 2019. The Task 3 report was sent to the Sagamok Anishnawbek First Nation on May 7, 2019. No comments were received.

12.13.8 Mississauga First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Mississauga First Nation on February 19, 2009. A re-engagement letter was sent to Mississauga First Nation on April 6, 2017 with a follow-up letter being sent on June 7, 2019. A response was received on June 13, 2017 requesting that Mississauga First Nation remain on the review team and mailing list. A meeting with Mississauga First Nation was held on August 31, 2017 with a summary included in Section 8.16.2. The Task 3 report was sent to the Mississauga First Nation on May 7, 2019. No comments were received.

12.13.9 Serpent River First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Serpent River First Nation on February 19, 2009. A re-engagement letter was sent to Serpent River First Nation with a response received from Kerri Commanda (Lands and Resources Coordinating Unit) requesting to be contacted (Lrcu.srfn@gmail.com). KEC called and left a voicemail for Kerri Commanda on May 5, 2017 and did not receive a response. The Task 3 report was sent to the Serpent River First Nation on May 7, 2019. No comments were received.

12.13.10 Whitefish River First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Whitefish River First Nation on February 19, 2009. A re-engagement letter was sent to Whitefish River First Nation on April 6, 2017 with a follow-up letter being sent on June 7, 2019. The Task 3 report was sent to the Whitefish River First Nation on May 7, 2019. No comments were received.

12.13.11 Bar River Métis Community

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Bar River Métis Community on February 19, 2009. A re-engagement letter was sent to Bar River Métis Community on April 6, 2017 with a follow-up letter being sent on June 7, 2019. The Task 3 report was sent to the Bar River Métis Community on May 7, 2019. No comments were received.

12.13.12 Thessalon First Nation

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Thessalon First Nation on February 19, 2009. A re-engagement letter was sent to Thessalon First Nation on April 6, 2017 with a follow-up letter being sent on June 7, 2019. The Task 3 report was sent to the Thessalon First Nation on May 7, 2019. No comments were received.

12.13.13 Métis Nation of Ontario

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Historic Sault Ste. Marie Métis Council on February 19, 2009 and the North Channel Métis Council on February 26, 2009. A re-engagement letter was sent to both on April 6, 2017 with a response being received on April 27, 2017 from Jesse Fieldwebster (Consultation Assessment Coordinator) requesting that any further notifications are sent consultations@metisnation.org as well as asking a follow-up question regarding the landfill design. KEC called Jesse Fieldwebster on May 3, 2017 to discuss their question and MNO requested a meeting between the Town of Blind River and the MNO Consultation Committee. Meetings with MNO were held on May 3, 2017 and September 26, 2017. A summary of the meetings is included in Section 8.16.1. The Task 3 report was sent to the Métis Consultation Unit on May 7, 2019 with a confirmation of receipt received on May 9, 2019.

12.13.14 Ontario Ministry of Indigenous Affairs

The Notice of Commencement of Environmental Assessment for the Town of Blind River Municipal Waste Management Plan was sent to the Ontario Ministry of Indigenous Affairs on February 19, 2009. A re-engagement letter was sent to Ontario Ministry of Indigenous Affairs on April 6, 2017 with a follow-up letter being sent on June 7, 2019. Due to the Ontario Ministry of Indigenous Affairs not being included in the March 29, 2017 letter from MECP, they were removed from the mailing list for the project.

12.13.15 Summary of Indigenous Communities Contacts and Responses

A summary of Indigenous Communities contacts and responses is provided in Table 12.11.

Correspondence with Indigenous Communities throughout the EA process is included in Appendix H of the Consultation Report.

Table 12.11: Indigenous Communities Contacts and Responses

Indigenous Community	Recipient	Notice of Commencement	2017 Re-engagement Contact	2019 Task 3 Report Notice
Ontario Ministry of Aboriginal Affairs	Alan Kary, Deputy Director Fax - 416-326-4017	February 19, 2009, via facsimile. No comment received.	Not on mailing list. Contact updated.	Not on mailing list. Contact updated.
	Surinder Singh Gill Policy Advisor Fax - 416-326-4017	February 19, 2009, via facsimile. No comment received.	Not on mailing list. Contact updated.	Not on mailing list. Contact updated.
	Ms. Rachael Manson-Smith Manager Ministry Partnerships Unit 4th Floor, 160 Bloor Street East Toronto, ON M7E 2E6	Not on original consultation list.	No response received from original letter of April 6, 2017 and follow-up letter of June 7, 2017.	Not on mailing list following MECP letter dated March 29, 2017.
North Channel Métis Council	Art Bennett Interim President artyanceybennett@hotmail.com	February 26, 2009, via email. No comment received.		
	Yvonne Jensen President P.O. Box 2020 Blind River, ON P0R 1B0		April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org. Will this expansion be lined? CK called Jesse Fieldwebster on May 3, 2017 to discuss and MNO requested a meeting between the Town and the MNO Consultation Committee.	
Historic Sault Ste. Marie District Métis Community Council	Steve Leffler President Fax - 705-254-3515	February 19, 2009, via facsimile. No comment received.		
	Kim Powley President 26 Queen Street East Sault Ste, Marie, ON P6A 1Y3		April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org.	

Table 12.11: Indigenous Communities Contacts and Responses

Indigenous Community	Recipient	Notice of Commencement	2017 Re-engagement Contact	2019 Task 3 Report Notice
Garden River First Nation	Tyana Jones-Solomon Fax - 705-945-1415	February 19, 2009, via facsimile. No comment received.	Not on mailing list following MECP letter dated March 29, 2017.	Not on mailing list following MECP letter dated March 29, 2017.
Batchewana First Nation	Chief Dean Sayers Fax - 705-759-9171	February 19, 2009, via facsimile. No comment received.	Not on mailing list following MECP letter dated March 29, 2017.	Not on mailing list following MECP letter dated March 29, 2017.
Wikwemikong Unceded First Nation	Melissa Cooper Fax - 705-859-3851	February 19, 2009, via facsimile. No comment received.	Not on mailing list following MECP letter dated March 29, 2017.	Not on mailing list following MECP letter dated March 29, 2017.
Zhiibaahaasing First Nation	Chief Irene Sagon-Kells Fax - 705-283-3964	February 19, 2009, via facsimile. No comment received.	Not on mailing list following MECP letter dated March 29, 2017.	Not on mailing list following MECP letter dated March 29, 2017.
Sagamok Anishnawbek First Nation	Laura Owl Fax - 705-865-3307	February 19, 2009, via facsimile. No comment received.		
	Chief Paul Eshkakogan PO Box 610, 4007 Espaneil Street Massey, ON P0P 1P0		No response received from original letter of April 6, 2017 and follow-up letter of June 7, 2017.	
	Chief Nelson Toulouse PO Box 610, 4007 Espaneil Street Massey, ON P0P 1P0 Executive_assistant@sagamok.ca			None received.
Mississauga First Nation	Debbie Mayer, Band Manager Fax - 705-356-1740	February 19, 2009, via facsimile. No comment received.		
	Chief Reginald Niganobe PO Box 1299 64 Park Road Blind River, ON P0R 1B0		No response received from original letter of April 6, 2017.	
	Ms. Peyton Pitawanakwat, Environmental Technician PO Box 1299 64 Park Road		June 13, 2017 email asking to remain on the review team and mailing list.	None received.

Table 12.11: Indigenous Communities Contacts and Responses				
Indigenous Community	**Recipient**	**Notice of Commencement**	**2017 Re-engagement Contact**	**2019 Task 3 Report Notice**
	Blind River, ON P0R 1B0 peyton@mississauga.com			
Serpent River First Nation	Chief Isadore Day Fax - 705-844-2757	February 19, 2009, via facsimile. No comment received.		
	Bruce Visitor Director of Operations Fax - 705-844-2757	February 19, 2009, via facsimile. No comment received.		
	Chief Elaine Johnston 195 Village Road Cutler, ON P0P 1B0		May 4/17 Email response from Kerri Commanda, Lands and Resources Coordinating Unit asking to be contacted. Lrcu.srfn@gmail.com	
	Ms. Kerri Commanda Lands Coordinator 195 Village Road Cutler, ON P0P 1B0 Lrcu.srfn@gmail.com		Voice message left on May 5. No response received.	None received.
Whitefish River First Nation	Chief Shining Turtle P.O. Box A 46 Bay of Islands Rd. Birch Island, ON P0P 1A0 chief@whitefishriver.ca		No response received from original letter of April 6, 2017 and follow-up letter of June 7, 2017.	None received.
Bar River Metis Community	Mr. Dave Johnston President 916 Bar River Road, RR4 Echo Bay, ON P0S 1C0 grfis@hotmail.com	Not on original consultation list.	No response received from original letter of April 6, 2017 and follow-up letter of June 7, 2017.	None received.
Thessalon First Nation	Chief David Giguere Fax - 705-842-2332	February 19, 2009, via facsimile. No comment received.		
	Chief Alfred Bisaillon 40 Sugarbush Road, RR#2 Thessalon, ON P0R 1L0		No response received from original letter of April 6, 2017 and follow-up letter of June 7, 2017.	
	Chief Edward Boulrice 40 Sugarbush Road, RR#2			None received.

Table 12.11: Indigenous Communities Contacts and Responses				
Indigenous Community	**Recipient**	**Notice of Commencement**	**2017 Re-engagement Contact**	**2019 Task 3 Report Notice**
	Thessalon, ON P0R 1L0 Chiefedwardboulrice.tfn@vianet.ca			
Metis Consultation Unit	Metis Nation of Ontario Head Office 500 Old St. Patrick Street, Unit D Ottawa, ON K1N 9G4 jessef@metisnation.org	Not on original consultation list.	April 27 Email response from Jesse Fieldwebster, Consultation Assessment Coordinator, requesting further notifications be sent to consultations@metisnation.org.	May 9, 2019 Email "Thank you for this. We will review and action as necessary."

12.14 Meetings

Following circulation of the 2017 re-engagement letters, meetings were convened with the Métis Nation of Ontario (MNO) and Mississauga First Nation (MFN), as described in subsections 12.14.1 and 12.14.2.

12.14.1 Métis Nation of Ontario

On May 3, 2017, MNO contacted Kresin Engineering Corporation (KEC) to inquire regarding the nature of the project being considered under the EA and to convey that the MNO Consultation Committee would like to meet to discuss the project. A meeting was convened on July 28, 2017 at the Blind River Town Office with the MNO Consultation Committee, MNO Consultation Assessment Coordinator, the Town, and KEC. During the meeting MNO delivered a slide presentation entitled "Métis 101" which was followed by an overview of the contents of the Task 3 Report. MNO requested additional information during the discussion to support their understanding of potential impacts and were provided with copies of the following documentation relating to the existing landfill site via email on July 31, 2017:

1. Excel spreadsheet summarizing historical monitoring results;
2. Contaminant attenuation zone drawing;
3. Hydrogeological report; and,
4. Annual Operations and Monitoring Report – 2016.

A follow-up meeting was held with the MNO Consultation Committee, MNO Consultation Assessment Coordinator, the Town and KEC on September 26, 2017. General discussion relating to the documentation provided on July 21, 2017 took place. Questions posed and responses provided during the meeting are summarized in Table 12.

Table 12.12: September 26, 2017 Meeting – MNO Questions and Responses

No.	Question	Response
1.	Should iron sludge from the Cameco Corporation water treatment plant be excluded from the list of acceptable waste noting elevated iron levels in groundwater local to the existing landfill?	Iron is elevated naturally in the local groundwater but has been determined to be greater at locations downgradient from the fill area. With proper disposal procedures in-place and an adequately sized contaminant attenuation zone, the site can continue to receive iron sludge.
2.	Land tenure. Is the Highway 17 right-of-way an easement or land use permit?	The Town understands that the right-of-way is Crown land under the authority of the Ministry of Transportation.
3.	Progressive capping. What is low permeability soil and is the permeability of soil verified prior to placement?	Soil with coefficients of permeability in the range of 10^{-5} to 10^{-8}, depending on final design specifications. Yes, permeability is typically determined from samples of soil collected from the source pit.
4.	Is the stability of fill side slopes monitored?	Yes. Annually during site visits related to preparation of Annual Operations and Monitoring Reports.

12.14.2 Mississauga First Nation

In July of 2017, representatives from MFN contacted the Town inquiring regarding the nature of the EA project and requesting additional information. In response, the following documents were provided via email on August 1, 2017:

1. Public Open House Boards from February 22, 2016;
2. Excel spreadsheet summarizing historical monitoring results;
3. Contaminant attenuation zone drawing;
4. Hydrogeological report; and,
5. Annual Operations and Monitoring Report – 2016.

A general discussion of the documentation provided was held at the Town Office on August 31, 2017 between the MFN Lands and Resources Manager, the MFN Environmental Technician, the Town and KEC. During the discussion, MFN requested that they be kept informed as the EA process continues and that MFN will contact the Town if they have any questions.

12.15 Preliminary Draft Environmental Assessment Report

A preliminary draft (pre-draft) version of the EA report was submitted to MECP in April 2021 for the completion of a cursory review. MECP reviewed the pre-draft report for format and completeness prior to its circulation to other stakeholders and Indigenous communities. Review comments were received in July 2021, April 2022, September 2022, October 2023 as well as December 2023 and have been incorporated into the Draft Environmental Report document.

A Hydrogeological and Surface Water Assessment report was prepared in support of the Environmental Assessment to present interpretations of existing conditions and those associated with the proposed expanded fill capacity. In January 2021, a copy of the report was sent to MECP for their review and comment. MECP comments were received in April 2021 (groundwater) and October 2021 (surface water).

Comments received during these MECP consultation activities are summarized in Table 12.13, along with a summary of how the comments were addressed and/or incorporated into the Draft EA report.

Table 12.13: Preliminary Draft Environmental Assessment Comments Consultation Point	Comment	Comment By	Response
Hydrogeological Assessment for Proposed Blind River Waste Disposal Site Expansion – April 2021			
	4. Groundwater Quality and Reasonable Use The report has recommended extending the contaminant attenuation zone CAZ (Figure 6) downgradient of the site boundary to address the trigger exceedances. It is recommended that the title deed to the CAZ should be registered as part of the site ECA.	Ministry of the Environment, Conservation and Parks via memorandum dated April 23, 2021 from Freduah Agyemang.	This will be completed and incorporated into the Application for ECA.
	5. Contaminant Attenuation Zone Based on the MECP reasonable use Guideline B-7 and chloride modelling, for the proposed landfill expansion to be acceptable, a 27.5 ha size of CAZ downgradient of the landfill area is required to dilute the leachate to acceptable concentration prior to exiting the downgradient boundary based on chloride as a surrogate. Therefore, it is recommended that the proposed CAZ is registered on the title deed and must form part of the site's expansion ECA application/amendment that will be submitted to the MECP.		This will be completed and incorporated into the Application for ECA.
	6. Proposed Groundwater Monitoring The proposed groundwater monitoring program outlined in Section 5.1 appears to be reasonable with the exception of the groundwater sampling parameters. It is recommended that the proposed groundwater analytical are revised to include all parameters listed under Column 1 of Schedule 5 of the Landfill Standards for groundwater samples from all the monitoring well network. It is also recommended that the monitoring well network is expanded to include a minimum of two CAZ boundary wells adjacent to the Canadian Pacific Rail line to assess compliance with MECP Reasonable Use Guideline B-7. Furthermore, it is recommended that a monitoring well is installed to the west of MW2-02 at the west CAZ boundary to asses compliance due to the groundwater towards the west.		This has been incorporated into the revised Hydrogeological and Surface Water Assessment. Potential locations of future boundary wells additional has been added to Drawing 6 found in Appendix A of the revised Hydrogeological and Surface Water Assessment.
Pre-Draft Environmental Study Report – July 2021			
Executive Summary	1. Include Section headings that appear in the main document followed by a summary of that section and the consultations reached. 2. Please update the EA documentation to include the proposed volumetric capacity with and without final cover. 3. Please update the EA documentation to include impact mitigation measures in the table of summary effects. 4. Please update the EA documentation to include waste diversion options and the waste diversion selections.	Ministry of the Environment, Conservation and Parks via memorandum dated July 6, 2021 from Devon Wills.	Completed. The Executive Summary has been updated to include section headings, volumetric capacity, table of summary effects and waste diversion options and selections.
List of Studies and Reports	*5.* Please include additional technical studies completed to support the EA (e.g. noise impact assessment, terrestrial/aquatic environment impact assessment).		Completed. Additional studies addressed in Section 8.1.1.
Other Approvals	*6.* Include an outline of what approvals will be required for the undertaking, and for what component of the undertaking.		Completed. Section 13.0 added.
Appendices			Completed. Additional studies addressed in Section 8.1.1

Table 12.13: Preliminary Draft Environmental Assessment Comments

Consultation Point	Comment	Comment By	Response
	7. In addition to the hydrogeological and surface water assessment report, and archaeological assessment reports in Appendix C and D, please provide additional studies completed to support the evaluation of alternative methods and the effects assessment for the preferred undertaking.		
Section 1.0 Introduction and Purpose			
	8. Section 1.0 Introduction and Purpose: Please remove references such as "This EA was carried out in accordance with the approved ToR".		Completed.
	9. Section 1.1 Background: Please update the EA documentation to provide the remaining landfill capacity in cubic metres.		Completed. Remaining landfill capacity added.
	10. Section 1.1 Background: Provide context of how the operational concerns identified in MECP's inspection reports will be or are being addressed by the Town as part of the description of the existing landfill site and its operation.		Completed. Description of how operational concerns are being addressed included.
Section 2.0 Description of the Problem/Opportunity			
	11. Section 2.1 (Service and Study Areas): Provide more rationale for the selection of study area(s) boundaries.		Completed. Further Study Area rationale provided.
Section 3.3 Waste Composition and Quantity			
	12. Section 3.3 Waste Disposal and Generation Rates: Please update the EA documentation to include the remaining waste disposal volume and the years of capacity at the existing landfill.		Completed. Remaining volume and years of capacity added.
Section 4.0 Description of the Environment			
	13. Please update the EA documentation outlining the planning objectives, policies and decisions that apply to the EA.		Completed. Section 4.2.6 added.
Section 6.0 Evaluation of Waste Management Plan Programs			
	14. Section 6.0 Please include a discussion in the EA of how the applicable policies in the Food and Organic Waste Policy Statement were considered in the evaluation of Blind River's waste		Completed. Food and Organic Waste Policy Statement addressed in Section 4.2.6.
Section 7.0 Alternative Methods			
	15. Section 7.1 Identification of Alternative Landfill Locations: Please provide a description of the candidate locations, rationale for the selection of these locations and a summary of their analysis in the main EA report.		Completed. Candidate location descriptions, rationale and analysis summary added.
Section 8.0 Phase 1 Evaluation of Alternative Methods			
	16. Section 8.1 (Comparative Evaluation- Phase 1): Please provide information on how stakeholder consultation was incorporated in the development of evaluation criteria and methods for evaluating alternatives.		Completed. Stakeholder input on evaluation criteria added.
	17. Section 8.1: Comparative Evaluation- Phase 1: Please update the EA to include each criterion followed by indicators (identifying how the potential environmental effects will be measured) and data sources for each criterion.		Completed. Both indicators and data sources added to Table 8.1.
	18. Section 8.1.2 under Criteria Group B: Social Environment, Criteria 3: Potential to Impact Indigenous Communities: Please provide a summary in the main EA report outlining how Indigenous communities were consulted on the evaluation of alternative landfill locations and how their input was considered.		Completed. Summary of Indigenous community consultation added.
Section 9.0 Phase 2 Evaluation of Alternative Methods			Completed. Both indicators and data sources added to Table 9.1.

Table 12.13: Preliminary Draft Environmental Assessment Comments Consultation Point	Comment	Comment By	Response
	19. Section 9.1: Comparative Evaluation- Phase 2: Please update the EA documentation to include what the indicators are for the impact assessment or net effects assessment of the project and the technical analysis that went into the support the assessment of impacts.		
Section 10.0 Landfill Expansion – Conceptual Design			
	20. Section 10.0: Landfill Expansion- Conceptual Design: Please update the EA documentation with the appropriate level of detail to provide its readers a greater understanding of the landfill expansion's conceptual design and its potential effects during all phases of the project.		Completed. Additional detail provided regarding landfill design and potential effects.
	21. Section 10.9: Conceptual Design: Please update the EA documentation with an additional drawing to demonstrate the potential height of the vertical expansion.		Completed. Drawing 10.3 added.
Section 11.0 Impact Management and Monitoring			
	22. Provide further detail on the description of environmental effects of all stages of the undertaking (construction, operation, and closure) as presented in Section 10.0.		Completed. Further detail provided on environmental effects during the undertaking.
	23. Please provide an assessment in the body of the EA explaining how climate change has the potential to affect the project and proposed mitigation measures.		Completed. Section 11.9.1 added.
	24. Include information about potential cumulative effects of the project in combination with past, present and reasonably foreseeable future activities where possible.		Completed. Section 11.9.2 added.
Section 12.0 Consultation			
	25. Section 12.0 Consultation: Please provide a summary of the consultation report in the main EA report and illustrate (e.g. in table format) how the comments and concerns raised during consultation were addressed.		Completed. A summary of the consultation report has been included in Section 12.0.
Hydrogeological and Surface Water Assessment Report - October 2021 (Surface Water Specialist Comments)			
	6. Currently approved fill volume and requested fill volume should be specified.	Ministry of the Environment, Conservation and Parks via memorandum dated October 22, 2021 from Eva Maciaszek.	Requested volumes have been added to Section 4.0 of the revised Hydrogeological and Surface Water Assessment Report.
<u>Drainage</u>			
	7. A more thorough and detailed and detailed description of surface drainage at site and in the area should be provided.		Text from the Surface Water Management Plan (SWMP) regarding surface drainage has been incorporated into subsection 3.1 of the revised Hydrogeological and Surface Water Assessment Report.
<u>Surface water features on site and in the vicinity</u>			
	8. A more thorough description of surface water features at Site and in the area, should be provided. This should include an inventory of seeps at and in the vicinity of the Site.		New sub-section 3.8 'Surface Water Features' has been added to the revised Hydrogeological and Surface Water Assessment Report and includes text from the SWMP.
<u>Impacts</u>			
	9. An evaluation of presence or absence of leachate impacts to surface waters beyond the pond to the southwest of fill area (where SW1 is located) should be provided. This includes ponds monitored by stations SW2 and SW3, surface water depression reported to the east of the fill area (reported in SWMP), wetlands that receive seasonal discharge from the pond to the southwest (reported in POO), and any other surface water features on or in the vicinity of the Site that may be receiving leachate impacted waters.		The typo regarding a depression to the east of the fill area has been corrected with MECP. A discussion on surface water locations SW2 and SW3 has been added to sub-section titled 'Surface Water Quality' of the Hydrogeological and Surface Water Assessment Report.
	10. An evaluation should be provided on how the proposed expansion would affect the presence of seeps as well as water quality of surface water features at and in the vicinity of the Landfill Stie.		The works proposed in the SWMP will reduce the potential impact to surface water by improving its management at and in the local area of the site.

Table 12.13: Preliminary Draft Environmental Assessment Comments Consultation Point	Comment	Comment By	Response
	11. An expansion should not be approved until leachate impacts to surface waters have been effectively addressed and measures are implemented to ensure that a landfill expansion will not lead to repeated or new degradation of surface waters.		Following the construction of the SWMP works, any observed surface water locations will be included in the annual monitoring program.
Characterization of surface water quality			
	12. A more thorough list of parameters should be reported on, as specified in the *Ontario Landfill Standards: A guideline on the regulatory and approval requirements for new or expanding landfilling sites*.		Additional parameters analysed for have been added to Table 2 of the revised Hydrogeological and Surface Water Assessment Report.
	13. Parameter concentration ranges and average values should be reported, time frame over which reported data represents should be specified and any trends in data noted.		A discussion on historical concentration ranges, average values, time frame and data trends has been added to Section 3.9 titled 'Surface Water Quality' of the revised Hydrogeological and Surface Water Assessment Report.
Monitoring Program			
	1. Parameters to be monitored for, and frequency, should follow the *Ontario Landfill Standards: A guideline on the regulatory and approval requirements for new or expanding landfilling sites*.		Parameters monitored for and frequency will be confirmed with MECP for incorporation into the ECA.
	2. A background monitoring station should be included to allow for a more accurate interpretation of the results.		Please see the "Ground and Surface Water Monitoring, Trigger Mechanisms and Contingency Plan" document in Appendix F of the revised "Surface Water Management Plan and System Design" document.
	3. All potentially impacted surface water features at and in the vicinity of the Site should be monitored for leachate impacts, including surface waters in the depression to the east of the fill area, seasonal drainage from the pond to the southwest of the fill area and wetlands receiving impacted surface water and/or groundwaters.		The typo regarding a depression to the east of the fill area has been corrected with MECP. Any observed surface water locations following the construction of the SWMP works will be included in the annual monitoring program (including water that pay be present within the proposed infiltration basin).
	4. Water quality guidelines used for comparison to water quality monitoring results, should be either PWQO or CWQG, whichever was more recently published, as these are based on more up to date science.		The most recent water quality guidelines will be used for the annual monitoring program.
	5. A surface water monitoring program should be included within the ECA for the Site.		Please see the "Ground and Surface Water Monitoring, Trigger Mechanisms and Contingency Plan" document in Appendix F of the revised "Surface Water Management Plan and System Design" document.
Trigger and Contingency Plan			
	6. A trigger and contingency plan must be proposed that is consistent with the site's monitoring program.		Please see the "Ground and Surface Water Monitoring, Trigger Mechanisms and Contingency Plan" document in Appendix F of the revised "Surface Water Management Plan and System Design" document.
	7. Trigger parameters and concentrations for surface waters should be defined and reviewed by the ministry for concurrence.		
	8. A trigger and contingency plan should be included in the ECA for the Site.		
Pre-Draft Environmental Study Report – April 2022			
Executive Summary		Ministry of the Environment, Conservation and Parks via	
	1. Comment addressed.		Acknowledged.

Table 12.13: Preliminary Draft Environmental Assessment Comments Consultation Point	Comment	Comment By	Response
	2. Comment addressed.	memorandum dated April 6, 2022 from Devon Wills.	Acknowledged.
	3. Comment addressed.		Acknowledged.
	4. Comment addressed.		Acknowledged.
List of Studies and Reports	5. Not complete. Section 8.1.1 Data Sources states. Technical studies such as noise, dust, etc. cannot be eliminated due to a history of not having issues with them.		Completed. A Noise Impact Assessment & Odour and Dust Management Plan has been added to Appendix F.
Other Approvals	6. Comment addressed.		Acknowledged.
Appendices	7. Not complete. Additional studies such as those to be completed for comment 5 should be listed in the Appendix.		Completed. A Noise Impact Assessment & Odour and Dust Management Plan has been added to Appendix F.
Section 1.0 Introduction and Purpose	8. Comment addressed.		Acknowledged.
	9. Comment addressed.		Acknowledged.
	10. Comment addressed.		Acknowledged.
Section 2.0 Description of the Problem/Opportunity	11. Comment addressed.		Acknowledged.
Section 3.3 Waste Composition and Quantity	12. Comment addressed.		Acknowledged.
Section 4.0 Description of the Environment	13. Not complete. Update with Food and Organic Waste Policy consideration below.		Additional comments provided in 4.2.6 considering other sections from the policy.
Section 6.0 Evaluation of Waste Management Plan Programs	14. Not complete. Although Organic Waste Policy section 4.1 to 4.5, the proponent must discuss how other section in the policy have been considered.		Additional comments provided in 4.2.6 considering other sections from the policy.
Section 7.0 Alternative Methods	15. Comment addressed.		Acknowledged.
Section 8.0 Phase 1 Evaluation of Alternative Methods	16. Comment addressed.		Acknowledged.
	17. Comment addressed.		Acknowledged.
	18. Comment addressed.		Acknowledged.
Section 9.0 Phase 2 Evaluation of Alternative Methods	19. Not completed. Update after addition of relevant studies (see comment 5). E.g. if a noise study is added it should be included as an indicator.		The indicator list for Group B: Items 1 and 4 has been revised.
Section 10.0 Landfill Expansion – Conceptual Design	20. Comment addressed.		Acknowledged.
	21. Comment addressed.		Acknowledged.

Table 12.13: Preliminary Draft Environmental Assessment Comments Consultation Point	Comment	Comment By	Response
Section 11.0 Impact Management and Monitoring			
	22. Comment addressed.		Acknowledged.
	23. Comment addressed.		Acknowledged.
	24. Comment addressed.		Acknowledged.
Section 12.0 Consultation			
	25. Not complete. A consultation summary must be provided in the main text and not a reference to an accompanying report.		Reference to accompanying report removed. Main text represents consultation summary.
Pre-Draft Environmental Study Report – September2022			
Executive Summary		Ministry of the Environment, Conservation and Parks via memorandum dated September 9, 2022 from Devon Wills.	
	1. Comment addressed.		Acknowledged.
	2. Comment addressed.		Acknowledged.
	3. Comment addressed.		Acknowledged.
	4. Comment addressed.		Acknowledged.
List of Studies and Reports			
	5. Not complete. A summary of the project's biology (terrestrial/aquatic environment impact assessment) to characterize existing conditions was not included.		Completed. An Environmental Impact Study has been included in Appendix G.
Other Approvals			
	6. Comment addressed.		Acknowledged.
Appendices			
	7. Not complete. Additional studies such as those to be completed for comment 5 should be listed in the Appendix.		Completed. An Environmental Impact Study has been included in Appendix G.
Section 1.0 Introduction and Purpose			
	8. Comment addressed.		Acknowledged.
	9. Comment addressed.		Acknowledged.
	10. Comment addressed.		Acknowledged.
Section 2.0 Description of the Problem/Opportunity			
	11. Comment addressed.		Acknowledged.
Section 3.3 Waste Composition and Quantity			
	12. Comment addressed.		Acknowledged.
Section 4.0 Description of the Environment			
	13. Comment addressed.		Acknowledged.
Section 6.0 Evaluation of Waste Management Plan Programs			
	14. Comment addressed.		Acknowledged.
Section 7.0 Alternative Methods			
	15. Comment addressed.		Acknowledged.
Section 8.0 Phase 1 Evaluation of Alternative Methods			
	16. Comment addressed.		Acknowledged.

Table 12.13: Preliminary Draft Environmental Assessment Comments

Consultation Point	Comment	Comment By	Response
	17. Not complete. Table 8.1 has been updated noise, dust and odour criteria, but Criteria Group A-Natural Environment makes reference to potential loss/disruption of terrestrial features, wildlife, aquatic features, but no studies have been undertaken for the project. There is also no mention of how the conclusion in the table's "Indicator" box has been reached if there are no studies for these criteria and no rationale.		Completed. The Noise Impact Assessment & Odour and Dust Management Plan (Appendix F) as well as the Environmental Impact Study (Appendix G) have been included as 'Data Sources' where appropriate.
	18. Comment addressed.		Acknowledged.
Section 9.0 Phase 2 Evaluation of Alternative Methods			
	19. Not complete. Update after addition of relevant studies (see comment 5). E.g. when a biological impact assessment has been completed it should be added it should be included as a data source.		Completed. The Noise Impact Assessment & Odour and Dust Management Plan (Appendix F) as well as the Environmental Impact Study (Appendix G) have been included as 'Data Sources' where appropriate.
Section 10.0 Landfill Expansion – Conceptual Design			
	20. Comment addressed.		Acknowledged.
	21. Comment addressed.		Acknowledged.
Section 11.0 Impact Management and Monitoring			
	22. Comment addressed.		Acknowledged.
	23. Comment addressed.		Acknowledged.
	24. Comment addressed.		Acknowledged.
Section 12.0 Consultation			
	25. Comment addressed.		Acknowledged.
Pre-Draft Environmental Study Report – October 2023			
	5. Completed	Ministry of the Environment, Conservation and Parks via memorandum dated October 17, 2023 from Devon Wills.	
	7. Completed.		
	17. Not completed. Section 4.2.4 Criteria, Indicators and Methodology of the EA Code (2014) discusses the importance of using evaluation methods to determine which alternative is best suited for the project. Documentation of scoring pathways in which evaluation criteria were determined or weighted is recommended.		Completed. Table 8.1 has been updated to provide quantifiable measures for physical indicators. Section 8.1.2 has been updated to document scoring pathways for evaluation criteria
	19. Not completed. Section 4.2.4 Criteria, Indicators and Methodology of the EA Code (2014) outlines requirements for Assessment and Evaluation processes. It is recommended to use quantitative measures, however, should qualitative measures be used, a rationale and source need to be provided.		Completed. Table 9.1 has been updated to provide quantifiable measures for physical indicators. Section 9.1.2 has been updated to document scoring pathways for those evaluation criteria with the EIS and Noise Impact Assessment as data sources.
Pre-Draft Environmental Study Report – December 2023			
I reviewed your latest pre-Draft EA report and have no further comment. As per Section 4.4- Draft Environmental Assessment of the EA Code of Practice, we recommend circulation of the Draft EA for review and comment by government agencies, Indigenous communities and members of the public. If you'd like to discuss the next steps, we can schedule a meeting to advise and discuss.		Ministry of the Environment, Conservation and Parks via email dated December 18, 2023 from Devon Wills.	Scheduled a Teams meeting for January 17, 2024 to discuss next steps with MECP.

12.16 Draft Environmental Assessment Report

Following MECP's review of the preliminary draft version of the EA report, comments received were incorporated into the draft version of the EA report. A link to the Draft EA report was provided to the Government Review Team (GRT) as well as other stakeholders and Indigenous communities in February 2024. Review comments were received in March and April 2024 and have been incorporated into the Final Environmental Assessment document.

Comments received during these MECP consultation activities are summarized in Table 12.14, along with a summary of how the comments were addressed and/or incorporated into the Final EA report.

On May 31, 2024, MECP informed KEC that the Regional Air Quality Analyst (MECP GRT) required additional details to the response included in Table 12.14. A response was provided to MECP via email on June 18, 2024 and a summary is provided in Table 12.15.

Table 12.14: Draft Environmental Assessment Comments					
Ministry		**Comment**		**KEC Response**	
MTO Ken Huen, P. Eng. Area Manager, Highway Engineering March 3, 2024		Is there a Traffic Assessment Report (or equivalent) for the proposed work that could be shared with MTO?		The proposed work is limited to an expansion of approved landfill site volume to accommodate waste generated within Blind River over the next 25 years. No changes to service area or site operation are proposed. As a result, no changes from current traffic volumes, flow or patterns are expected. (Ryan Wilson, March 7, 2024)	
MTO Michelle Cross Environmental Planner March 11, 2024		I am reviewing the Draft Municipal Waste Management Plan Environmental Assessment Report and I'm wondering if you could send me over a recent copy of their Annual Monitoring Report please (if you have it)?		Attached please find the Town of Blind River Landfill Site 2022 Annual Monitoring and Operations Report as requested. (Ryan Wilson, March 11, 2024)	
MNRF Robyn Jones Regional Planner March 19, 2024		Thank you for circulating notice of the *Draft Municipal Waste Management Plan Environmental Assessment Report* and *Consultation Report* for the Town of Blind River on February 22, 2024. The Ministry of Natural Resources and Forestry has reviewed the draft document and has no comments at this time. The Ministry would like to remain informed of how the project progresses since changes to the design may impact Crown lands and resources.		Acknowledged.	
Ministry	**Comment #**	**Reference to Draft EA**	**Comment & Rationale**	**Proposed Action/Solution**	**KEC Response**
MECP Climate Change Policy Branch Jason Fair Senior Policy Advisor March 20, 2024	1	General	There is minimal consideration of climate change impacts and greenhouse gas emissions in the proposal.	Suggest the document reference to the MECP's guide on considering climate change. Consider commitment to integrating consideration of climate change in identifying environmental components, identifying consideration of alternatives, and describing potential effects of the undertaking.	Section 11.10 "Consideration of Climate Change" has been expanded upon in the Draft EA Report.
	2	EA Report 11.9.2 Climate Change, pg. 163	"LFG generation and migration is not anticipated to be a problem at this site owing to its relative size."	While it is recognized that the landfill size is relatively small, and below regulatory thresholds for landfill gas collection in Ontario, the proponent could consider performing an estimate of annual landfill gas generation for the site and consideration of methods for mitigating the release of LFG into the atmosphere.	Section 11.10.1 "Effects of the Preferred Alternative on Climate Change" has been added to the Draft EA Report.
MECP Adaptation and Resiliency Branch, Climate Change and Resilience Division Heather Hawthorne Senior Policy Advisor March 21, 2024	1	Page 53 Section 7.1 identification of alternative landfill locations	Applies a buffer zone around key water and environmental features, and roads. Question: do these buffer zones take into account the potential current and future impact of climate change either in terms of major precipitation events, flooding or drought?	Suggest considering whether buffer zones take into account the potential current and future impact of climate change either in terms of major precipitation events, flooding or drought.	Yes, the buffer zones take into account the potential current and future impact of climate change.
	2	Page 118, discussion of impact of preferred alternatives on surface water	Report talks about historical impacts on surface water quality and proposed improvements to surface water management. Application for approval of this work was submitted to the Ministry of the Environment, Conservation and Parks (MECP) in June 2021 with an approval being issued	Consider enhancing this section to indicate how the EA has considered the possibility of future impacts of climate change on volume of precipitation and implications that might have for planning for surface water management works.	Section 11.10.2 "Effects of Climate Change on the Preferred Alternative" has been added to the Draft EA report.

			in October 2022. Construction of the surface water management works at the site is ongoing. Later in the document, section 11.9.2 mentions that the possible impact of climate change was considered with respect to surface water management works. Consider enhancing this section to indicate how the EA has considered the possibility of future impacts of climate change on volume of precipitation and implications that might have for planning for surface water management works.		
	3	Page 119, criteria 9, potential for flood hazard.	Suggest considering the potential impact of climate change on the project, including the possibility of increased extreme precipitation and the affect that might have on the likelihood of flooding.	Consider the potential impact of climate change on the project, including the possibility of increased extreme precipitation and the affect that might have on the likelihood of flooding.	Section 11.10.2 “Effects of Climate Change on the Preferred Alternative” has been added to the Draft EA report.
	4	Page 138 Section 10.3.6 surface water management	Consider the possibility of future impacts of climate change on volume of precipitation and implications for surface water management.	Consider the possibility of future impacts of climate change on volume of precipitation and implications for surface water management.	Section 11.10.2 “Effects of Climate Change on the Preferred Alternative” has been added to the Draft EA report.
	5	Page 163 section 11.9.2 climate change	Note: section acknowledges potential for impact of climate change on surface water and notes that the surface water management plan accounts for this. “. . . considered during the design of the Surface Water Management Plan (SWMP) where the approach used is consistent with the approaches described in Ontario’s Stormwater Management Planning and Design Manual and meets requirement identified in the 2012 MECP Landfill Standards. Factors of safety incorporated into the design allow the system to accommodate potential increases to the volume of surface water runoff generated.” Overall comment: this short section offers very little evidence of consideration for the impact of climate change on any phase of the project.	Suggest the document provide a more robust consideration of the potential effects of climate change on the project, (including during and after construction, and consideration of impact over the life of the expanded facility). As per the ministry’s guide on considering climate change in the environmental assessment process, 2017 the EA should highlight the following: 1. How vulnerable is the proposed project to a changing climate during its construction, operation, decommissioning, or post-closure? 2. Does the proposed project directly or indirectly contribute to the vulnerability or resilience of surrounding ecosystems to climate change? 3. Are there potential impacts that climate change may exert on the proposed project that may pose a risk to the environment? While not specific to this project or site location, the following provincial assessment reports will be of interest to consider: 1 - Ontario; Chapter 3 in Canada in a Changing Climate: Regional Perspectives Report, (ed.) F.J.	Section 11.10 “Consideration of Climate Change” has been expanded upon in the Draft EA Report.

				Warren, N. Lulham, D.L. Dupuis and D.S. Lemmen; Government of Canada, Ottawa, Ontario Chapter 3 — Regional Perspectives Report (changingclimate.ca) 2 – Ontario's Provincial Climate Change Impact Assessment Report Ontario Provincial Climate Change Impact Assessment | ontario.ca Would also recommend that the proponent consider using regional climate data, including Ontario's Climate Data Portal (along with other sources of climate data) available through the Climate Risk Institute's website here: https://climateriskinstitute.ca/climate-data/	
MECP Ranjani Munasinghe, Ph.D., P. Eng. Senior Waste Engineer March 25, 2024	1	Municipal Waste Management Plan Environmental Assessment, Environmental Assessment Report	Drawing 2.3 shows approximate fill area which is outside the approved fill limit. Proposed expanded fill area (Drawing 9.1) encompasses some of this but not all. During the EPA application stage this waste outside the proposed limit should be moved to the approved area.		Acknowledged.
MECP Indigenous Advisor Shannon Dennie March 26, 2024	1	Draft EA report page 85, 2nd paragraph	The report indicates that consultation was conducted with the identified communities but that only meetings were held with MFN and MNO.	Identify the list of Indigenous communities that were considered for consultation.	The following Indigenous Communities were contacted during the EA Process: 1. Mississauga First Nation 2. Métis Nation of Ontario 3. Thessalon First Nation 4. Bar River Métis Community 5. Historic Sault Ste. Marie Métis Council 6. North Channel Métis Council 7. Whitefish River First Nation 8. Serpent River First Nation 9. Sagamok Anishnawbek First Nation 10. Zhiibaahaasing First Nation 11. Wikwemikong Unceded First Nation 12. Batchewana First Nation 13. Garden River First Nation Ontario Ministry of Indigenous Affairs were also consulted.
	2	Draft EA report, page 578	Project Location Map identifies body of water as Lake Superior	The water body should be identified as Lake Huron.	Figure 1 in Appendix A of the Environmental Impact Study (EA Report, Appendix G) has been revised.
	3	Consultation Report Page 30	Table 6 provides a list of Indigenous communities who were contacted during the EA process; however, it remains unclear why some were not	There should be summary in the Consultation report for each community identified and what transpired. There should also be a section that	Sections 8.1-8.15 of the Consultation Report summarizes the consultation for each Indigenous Community. Appendix H has been added to the

			contacted in the 2017 Re-engagement Contact or the 2019 Task 3 Report Notice	provides correspondence going out and received. Have not found that within the document.	Consultation Report which includes all Indigenous Community correspondence from the EA process.
	4	Consultation Report in both the Draft EA and the Consultation Report	Indigenous consultation is lumped with the Public consultation and Government Consultation. The Indigenous consultation should be separate and clearly defined, instead of interspersed with the other two groups.	Provide a separate section for Indigenous consultation that clearly summarizes for each community what transpired, any questions or comments received, how they were addressed and any supporting information such as correspondence, meeting minutes, etc.	Indigenous Consultation has been moved to separate tables throughout the Consultation Report as well as Section 12 of the Draft EA Report. Sections 8.1-8.14 of the Consultation Report and Sections 12.13.1-12.13.14 summarize the consultation for each Indigenous Community. Appendix H has been added to the Consultation Report which includes all Indigenous Community correspondence from the EA process.
MECP Ed Snucins Surface Water Specialist April 4, 2024	1	Page 158. Section 11.7.2 Surface Water Monitoring	As part of demonstrating the ability to detect surface water effects, surface water sampling locations need to be identified. This is for the EA and for permitting.	Revision of the document. • SW7 was one of the surface water sampling locations recommended in the Hydrogeological and Surface Water Assessment (Appendix C). Add sampling location SW7 to the monitoring plan or provide rationale for not including it. • Include UTM coordinates (NAD83 datum) for each surface water sampling location. • Indicate that if information about groundwater flow direction changes, additional surface water monitoring locations may be required.	SW7 has been added to Section 11.7.2 of the Draft EA Report. A table (11.2) has been added to Section 11.7.2 of the Draft EA Report and includes UTM coordinates for each surface water sampling location. Text has been added to Section 11.7.2 of the Draft EA Report
	2	Page 160. Section 11.7.3 Monitoring Framework	As part of demonstrating the ability to detect surface water effects, the surface water sampling frequency should follow Ontario's Landfill Standards. This is for EA and for permitting.	Revision of the document. • In Table 11.2 indicate that surface water sampling will be done four times per year	Table 11.3 (formerly Table 11.2) has been revised to indicate that surface water sampling will occur four times per year
	3	Page 161. 11.8.1 Trigger Mechanisms Surface Water	Ontario's water management policies mention PWQO, but current ministry guidance is to use PWQO or more recently derived Canadian water quality guidelines when available. This is for EA and for permitting.	Revision of the document. • Trigger mechanism values are PWQO or CWQG, whichever is the more recently developed.	Text in Section 11.8.1 of the Draft EA report has been revised for surface water trigger concentrations.
	4	Page 163. Section 11.8.3 Mitigating Measures – Surface Water	The proposed system for maintaining acceptable surface water quality should be described. This is for the EA and for permitting.	Revision of the document. • In Table 11.3 add the potential environmental effect "exceedance of trigger concentration in surface water" and add possible mitigating measures.	Completed. Requested potential environmental effect added to Table 11.4 (formerly Table 11.3)
	5	Appendix C: Hydrogeological and Surface Water Assessment Report	Some of the values for PWQO and CWQG in Appendix C are not accurate. This can be corrected as part of permitting.	Revision of the document. In Appendix C Table 2 and Table 3 some of the PWQO and CWQG values should be corrected as follows. • The total phosphorus PWQO for streams is 30 ug/L and for lakes is 20 ug/L. For still waters use 20 ug/L. • For As, Pb, Cu, and Zn use the Interim PWQOs.	Completed. The PWQO values of 1 and 8.9 µg/L for Chromium were removed from Tables 2 and 3 since they are for hexavalent chromium and trivalent chromium, respectively. There is no CWQG or BCWQG.

				• The PWQO for pH is 6.5-8.5. • For sulphate, which does not have PWQO or CWQG, use the BCWQG. • Add the CWQG for Cr. • The CWQG for Nitrate is 3.0 mg NO3-N/L	The BCWQG for Nitrate of 3.0 mg/L is included in Tables 2 and 3.
MECP Shannon Heggie Hydrogeologist April 4, 2024	1	Section 8.1.2 Criteria Groups and Criteria, Table 8.2: Phase 1 Comparative Evaluation – Criteria Group A: Natural Environment, p. 76-77.	Table 8.2 indicates that there are no known downgradient drinking water wells for Location 1. However, satellite imagery shows residential properties (Huron Estates, Kennedy Road) along the shoreline of Lake Huron that are ~300 m southeast of the existing landfill property boundary on Highway 17. The water supply for these properties is unknown and may include unregistered water supply wells. A water supply well (Well ID 1101657) was also identified at the MTO Patrol Yard and is located ~170 m south of the existing landfill property boundary on Highway 17; it is unknown if this well is currently in use. Groundwater elevation monitoring at the current Blind River landfill site interprets groundwater flow towards the west-southwest. However, there are no groundwater monitoring wells in the vicinity of the closed Historical Fill Area towards the southeast, and the groundwater flow direction in this area of the site has not been confirmed. Local topographic contours and satellite imagery show the presence of a low wetland area southeast of the closed Historical Fill Area, suggesting potential groundwater flow towards the southeast. Therefore, it is unknown if the residential properties on Kennedy Road are hydraulically down-gradient of the active or historic landfilling areas. These issues must be addressed at the EA phase.	The EA should include a commitment for the confirmation of water supply sources and use for the MTO Patrol Yard and residential properties along Kennedy Road. The EA should include a commitment for the determination of groundwater flow direction and groundwater quality in the areas located southeast of the active landfilling area and the closed Historical Fill Area for Location 1.	The residential properties along Kennedy Road and the MTO Patrol Yard are all serviced by the municipal drinking water distribution system. The Town will confirm the use of the water supply well (Well ID 1101657) at the MTO Patrol yard located south of the landfill site. Section 11.7.1 and Figure 10.2 of the Draft EA Report has been revised to include proposed monitoring wells in the vicinity of the closed historical fill area and to the southeast of the active fill area in order to determine groundwater flow direction and groundwater quality.
	2	Section 8.1.2 Criteria Groups and Criteria, Table 8.6 – Phase 1 Comparative Evaluation – Criteria Group E: Technical Considerations, p. 96.	The Comparative Evaluation of Potential Environmental Effects and Mitigation measures for Locations 1-6 does not include additional land types that may need to be part of an expansion of the contaminant attenuation zone (CAZ) (e.g. highway, railway, North Channel Inshore Provincial Park, private properties). This issue must be addressed at the EA phase.	Revise the Draft EA document, Table 8.6 – Phase 1 Comparative Evaluation – Criteria Group E: Technical Considerations, Potential Environmental Effects column to include applicable right-of-ways, provincial park lands and private properties that may need to be included in a contaminant attenuation zone expansion (e.g. highway, railway, North Channel Inshore Provincial Park, private properties).	Potential land types that may need to be part of a CAZ expansion or establishment of a CAZ were added to Table 8.6 – Phase 1 Comparative Evaluation – Criteria Group E: Technical Considerations in the Potential Environmental Effects column.
	3	Section 9.1.2 Criteria Groups, Criteria and Criteria Ranking, Criteria 6: Potential for predicting	The current groundwater monitoring network at Location 1 does not include monitoring wells southeast of the existing landfilling area or the	The EA should include a commitment for the determination of groundwater flow direction and groundwater quality in the areas located	Please see the KEC response from Comment #1.

		groundwater migration pathways; and Criteria 7: Potential for impacting or disruption of groundwater resources, p. 117-118; and Figure 10.2 CAZ – Proposed Expanded Area, p. 150; and Section 11.7.1 Groundwater Monitoring, p. 158; and Appendix C: Hydrogeological and Surface Water Assessment Report.	closed Historical Fill Area (Construction Debris). Local topographic contours and satellite imagery show the presence of a low wetland area southeast of the closed Historical Fill Area, suggesting potential groundwater flow towards the southeast. Considering the proposed expansion of the existing landfilling area, I have concerns regarding the absence of information on groundwater flow direction and groundwater quality southeast of the site. The Appendix C: Hydrogeological and Surface Water Assessment indicates that a bedrock ridge was defined by bedrock boreholes located north of the existing landfilling area; however, no drilling was completed towards the southeast. These issues must be addressed at both the EA and permitting phases.	southeast of the active landfilling area and the closed Historical Fill Area for Location 1. Application for a MECP Environmental Compliance Approval (ECA) for expansion of Location 1 will require additional groundwater monitoring well installations southeast of the proposed landfill expansion area and the closed Historical Fill Area. Monitoring data from the new groundwater wells may affect the sizing and location of the contaminant attenuation zone (CAZ) for Location 1, and further leachate mitigation measures may be necessary for the site.	
	4	Section 11.8.1 Trigger Mechanisms, p. 160; and Appendix C: Hydrogeological and Surface Water Assessment Report.	Following a review of the 2020 groundwater monitoring data for Location 1 it was noted that road salt from Highway 17 may be impacting groundwater quality in several monitoring wells along the south property line, and additional impacts were noted in the background monitoring well (MW1-02). This issue must be addressed during the permitting phase.	The list of trigger parameters for the groundwater monitoring program should take into account the potential for road salt impacts to monitoring wells located proximal to Highway 17. Recent groundwater quality monitoring data at the background well (MW1-02) should be reassessed for other contaminant sources. This information should be included in the application for a MECP ECA for expansion of Location 1.	Acknowledged.
	5	Section 11.8.2 Trigger Mechanism Plan, p. 161-162.	The proposed Tier 1 – Annual Routine (Alert) Monitoring Program includes notification of the MECP if three consecutive sampling events show trigger concentration exceedances and initiation of Tier 2 level monitoring. With respect to groundwater trigger concentration exceedances, it is recommended that a trend analysis of the data is completed as part of the Tier 1 program. This issue must be addressed during the permitting phase.	The Tier 1 Trigger Mechanism Plan for the groundwater monitoring program should include requirement for a trend analysis for groundwater trigger concentration exceedances. This should be included in the application for a MECP ECA for expansion of Location 1.	The Tier 1 and Tier 2 monitoring programs in Section 11.8.2 of the Draft EA Report have been revised with a trend analysis for groundwater trigger concentration exceedances added to Tier 1.
MECP Guowang Qiu Air Quality Analyst April 5, 2024	1	Section 8.1.3 and Section 9.1.2 of the report	The potential for impairment to air quality was included as one of the criteria for the evaluation of alternative methods for Phase 1. The impact ranking is based on the potential change to air quality impacts from the existing landfill site. It should be noted that no potential change to air quality impacts from the existing landfill site does not mean the potential air quality impacts are low. In addition, potential adverse air quality impacts can occur from the activities of expansion in	Please include air quality impacts as one of the criteria under Criteria Group A - Natural Environment for Phase 2 evaluation. Provide more detailed information to support the conclusion of low potential air quality impacts from the expansion and operation of the landfill site and no quantitative assessment is required for this case.	The potential for impairment to air quality (e.g. dust and odour) has been added to Criteria Group A – Natural Environment for the Phase 2 Evaluation in Tables 9.1 and 9.2 as well as detailed information included in Section 9.1.2.

			addition to the operations of the landfill site. However, the potential air quality effects from the expansion of the existing landfill site and operation of the landfill site were not included as one of the criteria for Criteria Group A - Natural Environment for Phase 2 evaluation. Potential odour and dust issues due to access and haul roads were briefly mentioned, but no detailed information was provided, and no quantitative assessment has been undertaken to assess the potential air quality impacts from the expansion and operations of the landfill site for the project.		
	2	Section 9.1.2 of the report, and Section 3.0 - Odour and Dust Management Plan, Appendix F.	It appears mitigation measures will be taken to control odour and dust impacts during the expansion of the existing landfill site based on the information from the report. However, the report indicated that it is not anticipated that odour and dust mitigation will be required during future operation of the expanded Site. It is expected potential air quality impacts from the future operations of the landfill site may be similar compared to those from the operations of the existing landfill site. I believe some mitigation measures are being used to mitigate odour and dust impacts from the operation of the existing site, for example, landfill working face daily cover, traffic speed limit, applying water during the dry period, if necessary, etc.	Provide documentation to support that no mitigation is taken or required for the operation of the existing landfill site.	Section 9.1.2 of the Draft EA Report (Criteria Group B: Social Environment, Criteria 1 and 2) have been revised to clarify that the existing treed buffer and current mitigation measures will remain in place with no additional measures anticipated for the operation of the expanded site. Sections 2.8, 3.3.4 and 3.4.4 of the "*Noise Impact Assessment & Odour and Dust Management Plan*" have been revised to clarify that the existing treed buffer and current mitigation measures will remain in place with no additional measures anticipated for the operation of the expanded site.
MECP Species at Risk Branch Jackson Bellamy A/Management Biologist April 5, 2024	1	Pg. 18	• Bald Eagle is no longer on the Species at Risk list in Ontario • Smith's Bulrush, Greene's Rush and Milksnake are not Species at Risk (SAR) • Lake Sturgeon (Great Lakes - Upper St. Lawrence populations) is endangered not special concern – not likely to be affected unless there is in-water work/impacts occurring	• Recommend that the information contained in the EA is changed to reflect these comments • Consider how the expansion of the landfill could affect these species and/or their habitat • Contact MECP Species at Risk Branch if any impacts to SAR or their habitat will occur and/or if more information regarding SAR and how to remain compliant with the Endangered Species Act (ESA) is required	Completed. Acknowledged. Acknowledged.
	2	Pg. 65	• MECP Species at Risk Branch has moved from MNRF to MECP • MECP is now responsible for Threatened and Endangered Species under the ESA • MNRF remains responsible for Special Concern species	• Recommend only referencing Ontario Species at Risk List in report and not that it is MNRF's list, as this is incorrect • Ensure information and correspondence is sent to the proper ministry (and branch) to address SAR concerns and obligations under the ESA	Completed. Acknowledged.

	3	Pg. 115	• MECP SARB received and reviewed this report and provided comments	• MECP also provided advice regarding measures to avoid and mitigate impacts to Species at Risk in the form of a letter of assurance (LOA) • If the site footprint and/or other details have changed (as stated in the LOA) since MECP provided the LOA, the advice provided in the LOA may no longer apply and the proponent should reach out to MECP for advice	Acknowledged. Acknowledged.
	4	Pg. 573 of PDF (Pg. 19 of EIS)	• This is the advice that MECP provided in a LOA	• As long as the conditions can still be met and the project details have not changed, the advice provided in the LOA still applies and no action is needed	Acknowledged.

Ministry	**Comment**	**KEC Response**
MECP Gordon Brdar Senior Noise Engineer April 5, 2024	The following are my comments on the Corporation of the Town of Blind River Municipal Waste Disposal Site Expansion Noise Impact Assessment & Odour and Dust Management Plan report prepared by Kresin Engineering Corporation dated July 2022: 1. Section 2.2.2: Report states that MECP Publications NPC-205 and NPC-232 provides the applicable sound level limits. Ministry Publications NPC-205 and NPC-232 were superseded by Ministry Publication NPC-300 in 2013. Ministry Publication NPC-300 should be stated as the source of the applicable sound level limits for stationary sources.	Completed.
	The following are my comments on the Town of Blind River Municipal Waste Management Plan Environmental Assessment Consultation report prepared Kresin Engineering Corporation dated February 2024: 1. No comments at this time.	Acknowledged.

Ministry	**Comment #**	**Reference to Draft EA**	**Comment & Rationale**	**Proposed Action/Solution**	**KEC Response**
MCM Erika Leclerc Heritage Planner April 12, 2024	1	Throughout the report.	Please note that, in 2022, the responsibility for administration of the *Ontario Heritage Act* and matters related to cultural heritage have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Please update the Ministry's name throughout the report.	Revision to report.	Completed.
	2	*Executive Summary* (p.x)	Cultural heritage resources include: • • archaeological resources; • • built heritage resources; and • • cultural heritage landscapes.	Revision to report. See recommended edits below: "Social/Cultural environment features discussed included the following:	Completed.

			For consistency, please use each term when referring to each type individually, and the term "cultural heritage resources" when referring to all three types. We recommend revising this section to align with the current legislative framework. In addition, we also recommend editing this section to be consistent with the findings of the AA and the results of the completed MCM checklist (*Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*).	[…] 4. ~~Archaeological, Built and Cultural Heritage Potential – The potential for archaeological and historical site in the Study Area is considered to be high given the existence of documented sites and the length of time the north shore of Lake Huron has been inhabited by First Nations communities.~~ **A stage 1-2 archaeological assessment was completed for the preferred alternative and found that the study area does not retain archaeological potential and does not require further assessment. In addition, the Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (screening checklist) was completed for six candidate locations for the landfill. These six candidate locations, including the preferred alternative, were determined to have low potential for built heritage resources and cultural heritage landscapes, therefore, no further technical cultural heritage studies have been undertaken.**"	
	3	*Executive Summary,* Table C – Alternative Methods Evaluation Criteria – Phase 1 (p.xii)	To align with the legislative framework, we recommend edits under row D – Cultural Environment.	Revision to report. See recommended edits below. "2. Disturbance or destruction of archaeological resources ~~that have been identified and documented.~~"	Completed.
	4	*Executive Summary*, Table D – Alternative Methods Evaluation Criteria – Phase 2 (p.xiv)	See comment #2. To align with the legislative framework, we recommend edits under row D – Cultural Environment.	Revision to report. See recommended edits below. "1. Potential for impact to ~~known~~ archaeological resources or areas ~~with moderate to high~~ **of** archaeological potential. 2. Potential for removal of **built** heritage ~~features~~ **resources** and **cultural heritage** landscapes."	Completed.
	5	*4.2.4 – Archaeological, Built and Cultural Heritage Potential* (p.20-21)	See comment #2. The title of this section should be edited from "Archaeological, Built and Cultural Heritage Potential" to "Cultural Heritage Resources." We recommend that this section be revised to correctly document due diligence. Please see suggested text.	Revision to report. We recommend replacing the existing text under Section 4.2.4 with the following: "Cultural heritage resources include archaeological resources, built heritage resources, and cultural heritage landscapes. [Add the following sub-sections] 4.2.4.1 Archaeological Resources	Completed.

				The Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Archaeological Potential* (screening checklist) was completed for six landfill locations identified for consideration. The completed checklists identified that candidate locations 3,4,5, and 6 all have archaeological potential. Candidate Location 2 was identified as having low archaeological potential because it has been recently intensively and extensively disturbed. A Stage 1-2 archaeological assessment (under Project Information Form (PIF) number P094-0244-2017) was undertaken for Location 1 (the preferred alternative) on [date] by [consultant archaeologist] and is included in Appendix [X]. The report has been entered into the Ontario Public Register of Archaeological Reports. The AA found that the study area does not retain archaeological potential and does not require further assessment. 4.2.4.2 Built Heritage Resources and Cultural Heritage Landscapes The Ministry of Citizenship and Multiculturalism's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (screening checklist) was completed for six landfill locations identified for consideration (including the preferred alternative, Location 1). Through the completion of the checklist, it was determined that the six candidate locations have low potential for built heritage resources and cultural heritage landscapes, therefore, no further technical studies (e.g., Cultural Heritage Evaluation Report) have been undertaken."	
	6	*Section 8.1 – Comparative Evaluation – Phase 1*, Table 8.1: Alternative Methods Evaluation Criteria – Phase 1 (p.62)	See comment #1 regarding updating our ministry's name. In addition, to align with the current legislative framework, we recommend revisions under row D, Cultural Environment.	Revision to report. See recommended edits below. Under the "Evaluation Criteria" column: "2. Disturbance or destruction of archaeological resources ~~that have been identified and documented~~." Under the "Indicators" column: • "~~Archaeological resources on-site that would be displaced~~. **Areas of**	Completed.

				archaeological potential within the study area."	
	7	*Section 8.1.2 – Criteria Groups and Criteria* (p.70-71)	See comment #1 regarding updating our ministry's name. We recommend revising this section to clearly document due diligence. In addition, please note that Criterion 3 does not fall under MCM's mandate. The purpose of our checklist is to identify archaeological potential. This is not the appropriate tool to evaluate Criterion 3. We recommend deleting the last paragraph under Criterion 3 and discussing with the ministry responsible for administration of the *Funeral, Burial and Cremation Services Act.*	Revision to report. See recommended edits below. "Criteria 1: Potential for Displacement of Built Heritage Resources and/or Cultural Heritage Landscapes The purpose of this criterion is to assess the relative potential for displacement of built heritage resources and/or cultural heritage landscapes by removal and/or demolition and/or disruption by isolation. Following the completion of the ~~MHSTC~~ **MCM's** "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" checklist, locations with low potential for the existence of these resources ~~or/or landscapes~~ were assigned a low ranking **therefore no further technical cultural heritage studies (e.g., Cultural Heritage Evaluation Report) were undertaken**; ~~and, locations determined to require an archaeological assessment be completed were assigned a high ranking~~. […] Criteria 3: Potential for Impacts to Registered and Unregistered Cemeteries Criteria 3 considers the potential impact to registered and unregistered cemeteries that have been identified and documented. ~~Following the completion of the MHSTC "Criteria for Evaluating Archaeological Potential" checklist as well as talks with Town staff and the community plus review of historical records, those locations with low potential for the existence of adjacent cemeteries assigned a low ranking; and, locations determined to be adjacent to a registered or unregistered cemetery were assigned a high ranking~~."	Completed. The MCM checklist has been removed from the Data Sources column in Table 8.1 (pg. 62) for Criteria Group D, Criterion 3. The text in Section 8.1.2 has been revised for Criteria Group D, Criterion 3 (pg. 71). The text in Section 8.1.3 has been revised for Criteria Group D, Criterion 3 (pg. 93). Table 8.5 has been revised to include rows for Locations 1-6 under Criterion 3 (pgs. 94/95). Based on revisions to Table 8.5, the ratios in Section 8.1.4 (pg. 98) have been updated. Table 8.7 has been revised to assign disadvantages ("D") to Location 3, 4 and 5 under Criteria Group D, Criterion 3 (pg. 103/104). Table 8.8 has been revised to assign "Medium Ranking" to Locations 3, 4 and 5 under Criteria Group D, Criterion 3 (pg. 108).
	8	*Section 8.1.3 – Criteria Ranking: Net Environmental Effects* (p.93)	MCM recommends editing this section to clearly document that due diligence has been undertaken.	Revision to report. See recommended edits below. "Criteria 1: Potential for Displacement of Built	Completed.

			Please see comment #7 regarding cemeteries. We recommend discussing Criterion 3 with the ministry responsible for administration of the *Funeral, Burial and Cremation Services Act.* MCM's checklist is not the appropriate tool.	Heritage Resources and/or Cultural Heritage Landscapes This criteria was evaluated through completion of the checklist "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" (see Appendix E) for each candidate location. All of the candidate locations were determined to have ~~similar~~ l**ow** potential to cause displacement by removal and/or demolition and/or disruption by isolation of built heritage resources and/or cultural heritage landscapes**, therefore no technical studies (e.g., a Cultural Heritage Evaluation Report) were undertaken.** ~~No CHERs were undertaken during the Phase 1 evaluation to differentiate between locations; however, there is anticipated to be low potential for built heritage resources or cultural heritage landscapes to be present at each location~~. […] Criteria 3: Potential for Impacts to Registered and Unregistered Cemeteries ~~The potential to impact registered and unregistered cemeteries that have been identified and documented was assessed by considering the responses to question 4.b. in the checklist "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes". Specifically, "Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery? The response for all candidate locations is "no". Accordingly, this criteria is scored low for each case.~~"	Please see our responses to Comment #7.
	9	*Section 9.1 – Comparative Evaluation – Phase 2,* Table 9.1: Alternative Methods Evaluation Criteria – Phase 2 (p.112)	See comment #1 regarding updating the ministry's name. MCM recommends revising the language under row D to align with the legislative framework.	Revision to report. See recommended edits below. Under the "Evaluation Criteria" column: "1. Potential for impact to known archaeological resources or areas ~~with moderate to high~~ **of** archaeological potential. 2. Potential for removal of **built** heritage features **resources** and **cultural heritage** landscapes."	Completed.

				Under the "Indicators" column: • "Potential presence of archaeological resources or areas ~~with moderate to high~~ **of** archaeological potential at existing site." • "Potential presence of **built** heritage ~~features~~ **resources** and **cultural heritage** landscapes at existing site**."** Under the "Data Sources" column: • "~~Ministry of Tourism, Culture and Sport~~ **Citizenship and Multiculturalism** Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes checklist."	
	10	*Section 9.1.2 – Criteria Groups, Criteria and Criteria Rankings* (p.129-130)	See comment #1 regarding updating our ministry's name. In addition, MCM recommends editing this section to clearly document due diligence and to align with the legislative framework.	Revision to report. See recommended edits below. "Criteria 1: Potential for impact to known archaeological resources or areas with moderate to high archaeological potential A "Stage 1 and 2 Archaeological Assessment**,**" **under PIF number P094-0244-2017,** was undertaken by Archaeological Services Inc. (ASI) at Location 1 in 2017 (a copy is provided in Appendix D). […] Considering the results from the archaeological assessment, the potential for impact to known archaeological resources or **areas of archaeological potential** ~~moderate to high~~ potential is low. ~~In order to mitigate this potential, and in accordance with recommendations in the assessment report, the MHSTC, along with ASI, must be notified immediately should any archaeological remains (or suspected remains) be found during proposed development works.~~ **Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario***	Completed.

				Heritage Act*.** **The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act. Criteria 2: Potential for removal of built heritage resources and cultural heritage landscapes on and off site and along access/haul routes ~~On~~ **The** completion of the checklist "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" for Location 1 (see Appendix E)~~, it was~~ determined that the Location **has low potential for built heritage resources and cultural heritage landscapes and therefore** does not require the completion of a Cultural Heritage Evaluation Report (CHER). Similarly, a CHER is not required for potential off-site impacts as no changes to existing haul and access routes will be implemented. ~~Accordingly, the potential for removal of built heritage resources and/or cultural heritage landscapes is low.~~"	
	11	*Section 11.6 – Potential Impact Summary* (p.157)	We recommend edits to this section to align with the legislative framework.	Revision to report. See recommended edits below. "6. ~~Monitor site development work for indication of potential items of archaeological interests and, if encountered, stop work and notify MHSTC and archaeologists (ASI).~~ **Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the**	Completed.

				Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*.** **The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act. 8. ~~Monitor site development work for indication of potential items of cultural heritage significance and, if encountered, stop work and notify MHSTC and archaeologists (ASI).~~"	

Table 12.15: MECP Regional Air Quality Analyst Draft EA Report Review Comments – May 31, 2024	
MECP Comment	**KEC Response**
Our Regional Air Quality Analyst would like additional detail for your response to Comment #1, which would include adding the potential air quality impacts to Criteria Group and providing more information to support the conclusion of low potential air quality impacts from the expansion and operation of the landfill site as mentioned in the previous comment.	Our conclusion of low potential for air quality impacts during the construction and operation of the expanded landfill was drawn considering documented operational performance of the existing site over the past 2 decades and results from our "Noise Impact Assessment & Odour and Dust Management Plan" which assesses potential impacts quantitatively as well as qualitatively (i.e. frequency, intensity, duration, offensiveness and location – FIDOL – approach). A textual summary is provided below and the attached document show proposed modifications to Tables 9.1 and 9.2 of the Draft EA Report. The site is located in a remote area approximately 6 km from the centre of the Town of Blind River and is surrounded by forested areas including a treed buffer. Referencing annual operations reports completed over the past 20 years, no complaints relating to air quality impacts have been received by the Town. The proposed expansion areas have previously been cleared; therefore, the surrounding forested areas and treed buffer will continue to mitigate noise, odour and dust. Haul and access routes are long established for operation of the existing landfill site and no new routes will be constructed as part of the site expansion (construction or operation). Excavated materials will remain on-site for use as cover or other site features (e.g. berms or roads) thus mitigating potential off-site air quality impacts (i.e. noise, dust and other emissions) by minimizing the amount of additional vehicular traffic along the existing haul and access routes during construction. Dust suppression activities such as applying water along with chemical additives (i.e. calcium chloride) will be utilized during construction of the expansion. Other dust mitigating measures will also be employed, including minimizing the speed of descent and drop height during unloading, loading or unloading at downwind side of storage piles, and minimizing the height and slope of all temporary or long-term stockpiles. Noise mitigating practices such as limiting work hours and ensuring vehicles are equipped with proper and functioning muffling devices will continue to be practiced during construction and operation of the site expansion. The proposed expansion areas contain sub-soil characteristics (coarse-grained sand and gravel) that allows the site to passively ventilate odour causing landfill gas (LFG) through the waste mass and cover material, which is common to landfill of this size and nature

Table 12.15: MECP Regional Air Quality Analyst Draft EA Report Review Comments – May 31, 2024	
MECP Comment	**KEC Response**
	(i.e., natural attenuating site). Minimizing the introduction of water to the waste mass (by maintaining effective surface water drainage works and covering waste) will help reduce the formation of leachate and LFG. No change in operations of the site are anticipated following expansion with the operator continuing to deploy one loader and one sheepsfoot compactor. Vehicles entering the expanded site will be restricted to a maximum speed of 30 km/h to avoid producing excess amounts of airborne dust or suspended particulate matter. The amount of daily waste received at the site is not expected to increase following expansion (i.e. the service area remains unchanged). Operational mitigating measures include immediately covering any waste with a particularly strong odour, maintaining the size of the working area to a minimum along with covering waste following daily operations, frequently emptying waste from public drop-off bins and cleaning the bins when required, and progressively capping the fill area once it reaches its final contours. In addition to these measures, efforts will be made to avoid the generation of landfill leachate through the application of cover material and construction of small berms, as required, to direct surface water flow away from and around active disposal operations. During operation of the expanded site, waste handling and hauling equipment will be fitted with proper muffling devices to mitigate noise emissions. Dust generation will also be monitored and suppressants used as required to control dust emission. Should odour, noise and/or dust emissions become excessive, or public complaints be received, a detailed review will be undertaken and remedial efforts initiated (if required).

13.0 CLOSURE

This Consultation Report is a companion document to The Town of Blind River Waste Management Plan Environmental Assessment Report and contains a summary of consultation activities conducted. Throughout the EA process, input from and consultation with review team members and stakeholders was generally positive and constructive and will, ultimately, help ensure the resilience and acceptance of the preferred solution.

14.0 OTHER APPROVALS

The following other approvals are required for this Undertaking:

- Amendment to the existing Environmental Compliance Approval for approval under the Environmental Protection Act.
- Surface Water Management Plan and System design for approval under the Ontario Water Resource Act (OWRA).

APPENDIX A:

A WASTE RECYCLING STRATEGY

FOR

THE TOWN OF BLIND RIVER

KRESIN
Engineering Corporation

536 Fourth Line East
Sault Ste. Marie, ON P6A 5K8
tel: 705-949-4900
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working together...finding solutions

May 17, 2012
KEC Ref. 1136.01
By Email

Ms. Kathryn Scott, Clerk Administrator / Treasurer
katie.scott@blindriver.ca
Town of Blind River
11 Hudson Street
Blind River, ON
P0R 1B0

Dear Ms. Scott:

Re: Continuous Improvement Fund
Town of Blind River Waste Recycling Strategy

Enclosed with this letter is a copy of the document titled "A Waste Recycling Strategy for the Town of Blind River" dated May 17, 2012. The document was prepared in accordance with guidance prepared by, and to meet the requirements of, Waste Diversion Ontario (WDO) under their Continuous Improvement Fund (CIF).

Prior to its finalization, WDO reviewed the document and their comments were incorporated into the attached.

We understand that the Ecological Resources Committee has accepted the draft document and its recommendations, none of which have changed in the final version, and we look forward to working with the Municipality to assist with the implementation of recommendations.

Please note that the findings and recommendations identified in the Waste Recycling Strategy will also be adopted as part of the Waste Management Plan Environmental Assessment.

Should you have any questions or require clarification, please contact the undersigned.

Thank you.

Yours Very Truly,

Kresin Engineering Corporation

Chris Kresin, M.Sc.(Eng.), P. Eng.
Consulting Engineer

Copy to: Mr. Jim Harmar, Shelby Environmental Services

1136 covering letter.docx

BLIND RIVER
ONTARIO, CANADA

A Waste Recycling Strategy for

The Town of Blind River

May 17, 2012

Prepared with assistance from
Waste Diversion Ontario

KRESIN
Engineering Corporation

A Waste Recycling Strategy
For the Town of Blind River

Table of Contents

1. Introduction

Production of this Waste Recycling Strategy (WRS) was initiated by the Town of Blind (Town) to develop a plan to increase the efficiency and effectiveness of its recycling program and maximize the amount of blue box material diverted from landfill. Specifically, the purpose of this recycling plan is to identify opportunities to increase waste diversion from disposal and extend the capacity of the current and future landfills (or other disposal component of the municipal waste management plan).

Waste Diversion Ontario (WDO) identifies a "Reasonable Blue Box Diversion Goal" (ie. the capture rate of blue box materials) of 70% for municipalities like Blind River at a net program cost of $540 per tonne (or less). It is a goal of the Municipality to develop a WRS that maximizes the recyclables capture rate (thus increasing the waste diversion rate) and that is sustainable considering available materials markets.

The Town is responsible for managing its residential, and IC&I solid waste including reduction and diversion, handling and collection, and disposal. Waste is disposed of at the municipal waste disposal site by a contractor who collects municipal waste and by residential/commercial direct-haul. A curb side waste collection program is in place in the Town of Blind River, providing weekly refuse pick-up for residents of the community. A curb side recyclables program is also maintained by the Town with materials collected once every 2 weeks. The collection programs are run by a private company under contract with the Town.

The Town faces a number of waste management challenges, which this WRS will help address. In particular:

1. The WDO requirement that a WRS be in place;
2. The desire to maximize the life span of the current and future waste disposal sites; and,
3. The lack of local markets for recycled materials.

This WRS was developed with support from WDO, the Town's Ecological Resource Committee (ERC) and using the Continuous Investment Fund's *Guidebook for Creating a Municipal Waste Recycling Strategy*.

2. Overview of the Planning Process

This WRS was prepared through the efforts of the Town ERC with assistance from Kresin Engineering Corporation (KEC).

The steps involved in the development of this WRS include:

1. Characterize the waste stream;
2. Describe the existing recycling program;

3. Discuss and develop the WRS goals and initiatives with the ERC;
4. Identify potential improvements and/or additions to the recycling program;
5. Identify candidate improvements and/or additions;
6. Assess the feasibility of implementing improvements and/or additions (i.e. cost-benefit);
7. Involve the public;
8. Identify contingencies; and,
9. Develop implementation, monitoring and reporting plans.

The next steps in this process include:

1. Initiate the WRS implementation, monitoring and reporting plans.

To ensure the public and local stakeholders were able to participate in the preparation of this WRS, comments provided from public open house meetings and other formats/venues were taken into consideration. More details on the public consultation process are presented in Section 4.

3. Study Area

The study area for this WRS includes residential, commercial and institutional sectors in the Town of Blind River.

This WRS will address the following sectors:

1. Residential single family;
2. Residential multi-family;
3. Commercial (eg. small businesses); and,
4. Institutional (eg. schools).

Although waste generated in the industrial, commercial and institutional (IC&I) sectors is not counted in WDO's datacall, they are included in the WRS to help reduce the total volume of waste requiring disposal.

4. Public Consultation Process

The public consultation process followed in the development of this WRS consisted of the following activities:

1. Stakeholder interviews to identify key issues, concerns, and opportunities.
2. Open houses to provide updates to the public and to obtain public input/comments.
3. Notices (newspaper, cable television, etc.).

Stakeholder groups included in this consultation included:

1. Town (through the ERC);
2. Waste management contractors;
3. General public, businesses and institutions; and,
4. WDO.

The response from the public and stakeholders included:

Prior to initiating production of this WRS, a public open house was held by KEC and the Town in conjunction with the Waste Management Plan Environmental Assessment. At the open house, residents provided the following input and comment relating to increasing waste diversion:

1. Hazardous wastes should be collected more often.
2. Better control is needed to ensure separation of recyclable materials being brought to the landfill by large trucks.
3. The Town should not be content with the current diversion rate if it may be increased by passing bylaws and/or better enforcement.

A public open house was also conducted during production of this WRS (following identification of the Priority and Future strategies). A copy of the open house presentation boards is included in Appendix A and copies of the comments received are included in Appendix B. The residents who attended the WRS open house were all in favour of making improvements to the current WRS and diversion in general. Comments received, included:

1. Improvements should be made to the current recycling depot (hours of operation and maintenance).
2. Can a depot be placed in an accessible and central location.
3. More opportunities for waste diversion (including composting) are required.
4. The current processing plant has a limited capacity.

An email survey of Blind River Chamber of Commerce members was also conducted to help gauge the quantities of waste and recyclables generated by the commercial and institutional sectors and to obtain insight regarding the potential to divert additional materials from landfill. The following general conclusions are provided from a review of the few responses that were received (copies in Appendix C):

1. An industrial establishment produces a large volume of waste material that may be re-directed from landfill if an appropriate facility to accommodate water treatment plant sludge is provided.
2. Styrofoam and bubble wrap recycling could be considered.
3. These sectors produce large amounts of waste paper products and facilities to divert this material should be maintained and perhaps expanded.
4. More outreach and information should be provided for top-of-mind awareness.

5. Stated Problem

Management of municipal solid waste, including the diversion of blue box materials, is a key responsibility for all municipal governments in Ontario. The factors that encourage or hinder municipal blue box recycling endeavors can vary greatly and depends on a municipality's size, geographic location and population.

The key drivers and factors that led to the development of this WRS include:

1. the WDO requirement to have a WRS in place;
2. the desire to maximize the life span of the current and future waste disposal sites; and,
3. the lack of local markets for recycled materials.

6. Goals and Objectives

This WRS has identified a number of goals and objectives for the Town as presented in Table 6.1.

Table 6.1: Waste Recycling Goals and Objectives

Goals	Objectives
To maximize diversion of residential/municipal solid waste through the blue box/recycling program	• Divert 17% of municipal solid waste through the blue box/recycling program
To maximize capture rates of blue box materials through existing and future programs	• Capture 70% of blue box materials • Increase capture of blue box municipal solid waste by 18% within 3 years
To increase participation in the recycling program	• Make recycling services available to 90% of residents • Raise participation in blue box program to 75%
To expand the lifetime of our landfill	• Add 5 years to the lifespan of the landfill by increasing blue box diversion
To manage our waste in our community or as close to home as possible	• Dispose of all locally generated waste within municipal borders

This WRS has also identified as series of broader community goals to which it can contribute. These broader community goals are presented in Table 6.2.

Table 6.2: Community Goals and Objectives	
Goals	**Objectives**
To reduce our emissions and carbon footprint	• Reduce municipal greenhouse gas emissions by 10%
To enhance service/value for our taxpayers	

7. Current Solid Waste Trends, Practices and System and Future Needs

Community Characteristics

In 2010, the Town had a population of approximately 3,650. A total of 2,429 households are serviced by municipal curb side collection. Of these households, 2,216 are single-family households and 213 are multi-family households. There are also an additional 490 seasonal dwellings, which are generally occupied during the months of May to October.

Current Waste Generation and Diversion

Currently, the Town generates approximately 4,928.28 tonnes of residential solid waste per year. Of this, 609.01 tonnes, or 12.4 percent, is diverted through the blue box/recycling program. Currently, on a tonnage basis, the most common material recycled is old corrugated cardboard, while the least is glass.

Table 7.1 summarizes the current (2010) waste generation and blue box diversion rates.

Table 7.1: Residential Solid Waste Generated and Diverted through Blue Box		
Residential Waste Stream/Blue Box Material	**Tonnes**	**Percent of Total Waste**
Total waste generated	4,928.28	-
Papers (ONP, OMG, OCC, OBB and fine papers)	513.8	10.4%
Metals (aluminum, steel, mixed metal)	86.61	1.8%
Plastics (containers, film, tubs and lids)	Incl. above	Incl. above
Glass	8.6	0.2%
Total Blue Box material currently diverted	609.01	12.4%

As Table 7.2 indicates, the Town's current diversion rate is below average for its WDO municipal grouping.

Table 7.2: Average Blue Box Diversion Rate (2010)	
Town of Blind River	12.4%
Municipal Grouping: Rural Collection - North	20.29%

Potential Waste Diversion

The Town's current waste stream composition was estimated using data presented by WDO for "Ontario (Small Urban and Rural)" municipalities as shown in Figure 1 (taken from the CIF Guidebook).

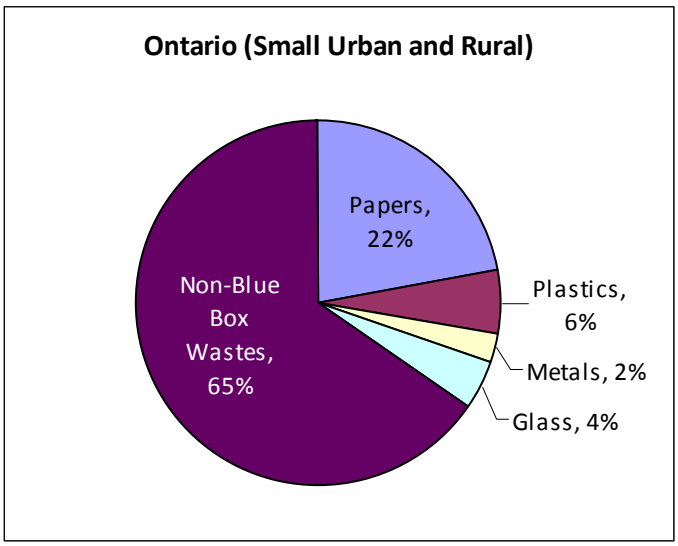


Figure 1: Typical Waste Stream Composition

Using the waste stream composition presented in Figure 1, a total of approximately 1,675.62 tonnes of blue box recyclable materials are present in the waste stream. Assuming a blue box material capture rate of 70%, approximately 1,172.93 tonnes of material are available for diversion, of which approximately 563.92 tonnes are still currently in the waste stream. Estimates of blue box material available for diversion are listed in the Table 7.3.

Table 7.3: Current and Potential Diversion			
Material	***Total Available in Waste Stream (tonnes/year)***	***Currently Recycled (tonnes/year)***	**Potential Increase *(tonnes/year)***
Papers (ONP, OMG, OCC, OBB and fine papers)	758.96	513.80	245.15
Metals (aluminum, steel, mixed metal)	69.00	86.61	189.37
Plastics (containers, film, tubs and lids)	206.99	Incl. above	Incl. above
Glass	138.00	8.6	129.39
Total	1,172.93	609.01	563.92

Diverting the blue box material remaining in the Town's waste stream, assuming a 70% blue box material capture rate, could raise its waste diversion rate to 23.8%.

Existing Programs and Services

Currently, the Town has the following policies and programs in place to manage residential solid waste:

- Bag limit (3 bags) for curbside collection.

Collection services of regular waste are provided to the residents by a contractor retained by the Town (curbside collection in the urban areas and depots in rural areas) and recycling services (urban areas only) are also provided by a contractor. Recycling pick-up is currently not provided to multi-residential developments.

Disposal and recycling services are paid for primarily through the general tax base. Once recyclable materials have been collected, they are taken to Municipal Waste Recycling Consultant's transfer station, located in Blind River.

Upcoming important collection-related milestones that may affect how collection services are administered include:

- Council to review the merits of implementing a 2 bag limit (from the current 3).

In 2010, the total net annual recycling cost to the Town was $170,640.00. This amounts to $280.19 per tonne, or $46.75 per capita. As shown in Table 7.4, the Town's net annual recycling costs are below average for its WDO municipal grouping.

Table 7.4: Net Recycling Cost (per tonne per year)	
Blind River	$280.19
Rural Collection – North	$508.83

Anticipated Future Waste Management Needs

The Town's solid waste generation rate is expected to remain fairly constant over the next 10 year planning period. Table 7.5 depicts the expected growth rates for solid waste generation and blue box material recovery (based on projected population growth rates).

Table 7.5: Anticipated Future Solid Waste Generation Rates and Available Blue Box Material

	Current Year	Current Year + 5	Current Year + 10
Population	3,650	3,606	3,585
Total Waste (tonnes)	4,928.28	4,868.86	4,840.50
Blue Box Material Available (tonnes)	1,172.93	1,158.79	1,152.04

8. Planned Recycling System

Overview of Planned Initiatives

The Town reviewed a number of options for consideration in its WRS. The options were then scored based on a series of criteria, which included:

1. Percentage of waste diverted from landfill (will the strategy decrease the current volume to waste directed to landfill?);
2. Proven results (is the strategy a best practice recognized by WDO?);
3. Reliable market / end use (will the strategy capture materials that have an established end market?);
4. Economically feasible (will the strategy be cost-effective?);
5. Accessible to the public (will the strategy be accepted/understood by the public?); and,
6. Ease of implementation (will the strategy be easily implemented with existing programs?).

A summary of the options reviewed and their scoring are provided in Appendix D.

Once scored, the top ranking WRS options were organized into Priority Initiatives (scoring 70% and greater) and Future Initiatives (scoring 60% to 69%), as shown in Appendix D. Strategies that were felt to be inappropriate scored less than 60% and are denoted in Appendix D with an "X". The current-day cost associated with the priority initiatives is estimated to be approximately $23,300.00, while cost associated with the future initiatives is estimated at $42,200.00.

Table 8.1 presents the Priority Initiatives and Future Initiatives and their estimated costs. A review of these initiatives and their steps for implementation are summarized on the following pages.

Table 8.1: Priority and Future Initiatives

Initiatives	Implementation Costs	Operation Costs
Priority Initiatives		
Public Education and Promotion Program	$7,300.00	$2,400.00
Training of Key Program Staff	n/a	$2,500.00
Bag Limits/Increase Materials Diverted	n/a	covered in education program
Provision of Free Blue Boxes	$6,100.00	$0.00
Assess Tools and Methods to Maximize Diversion	$5,000.00	n/a
Following Generally Accepted Principles for Effective Procurement and Contract Management	$0.00	n/a
Estimated Total Cost (Priority Initiatives)	$18,400.00	$4,900.00
Future Initiatives		
Optimization of Collection Operations	$10,000.00	$10,000.00
Enhancement of Recycling Depots	$7,300.00	$4,900.00
Multi-Municipal Collection and Processing of Recyclables	$5,000.00	ability to share services currently not known
Standardized Service Levels and Collaborative Recyclables	$5,000.00	extent of possible standardization currently not known
Estimated Total Cost (Future Initiatives)	$27,300.00	$14,900.00

8.1 Priority Initiatives

Initiative 1: Public Education and Promotion Program (Fundamental Best Practice)

Overview

Public education and promotion programs are crucial for ensuring the success of local recycling programs. Well-designed and implemented education and promotion programs can have impacts throughout the municipal recycling program, including participation, collection, processing, and marketing of materials. Furthermore, having a P&E plan contributes toward the amount of WDO funding a municipality receives as identified in best practice section of the WDO municipal datacall. For example, benefits of public education and promotion programs include:

1. Greater participation levels and community involvement;
2. Higher diversion rates;
3. Less contamination in recovered materials, potentially leading to higher revenues; and,
4. Lower residue rates at recycling facilities.

The WRS Guidebook describes that an enhanced communication and outreach program goes beyond the static use of brochures and online information. It establishes a dialogue between the municipality and the program user to assess barriers to participation and determine opportunities for improvement. An enhanced communication and outreach program might include:

1. Face-to-face contact to promote specific programs, possibly at community events or by going door-to-door;
2. Using neighbourhood champions or community leaders teach others or to lead by example (e.g., backyard composting);
3. Interactive on-line waste forums and feedback forms; and,
4. Community-based social marketing, among other things.

Stewardship Ontario has prepared a Recycling Program Promotion and Education Workbook and other materials, which are available on Stewardship Ontario's Recyclers' Knowledge Network (www.stewardshipontario.ca).

Implementation

Implementation steps include:

1. Prepare communication strategy, including target audience, key messages, message mediums (e.g., brochure, website);
2. Develop a distribution plan;
3. Prepare budget;
4. Draft copy and prepare graphic design; and,

5. Roll-out communications.

The Town intends to implement this strategy, pending Council approval to do so, by early to mid 2012.

Initiative 2: Training of Key Program Staff (Fundamental Best Practice)

Overview

A well-trained staff can lead to greater cost and time efficiencies and improved customer service. Knowledgeable staff (including both front-line staff and policy makers) have a greater understanding of their municipal programs and can perform their responsibilities more effectively. There are a number of low-cost training options available.

The CIF holds periodic Ontario Recycler Workshops that discuss recycling program updates (www.wdo.ca/cif/initiatives/orw.html). The MWA, Waste Diversion Ontario (WDO), the association of Municipalities of Ontario (AMO), Stewardship Ontario and the Solid Waste Association of Ontario (SWANA) can also be sources of information guides, workshops, or training on recycling or solid waste management.

Examples of skills and expertise that program coordinators and staff require, include:

1. Recycling program planning development, evaluation, and continuous improvement;
2. Recycling services procurement and contract administration;
3. Use of policy mechanisms to promote waste diversion and recycling, and promotion and education; and,
4. Operations planning and management.

It is also beneficial that front-line personnel (eg. waste disposal site gate attendant) possess the skills and expertise to: ensure compliance with Bylaws and Regulations; identify acceptable waste materials (eg. re-direct materials that can be diverted); and, ensure proper and compliant operation of the site.

Implementation

Pending Council approval to do so, the Town intends to begin implementation of this strategy in 2012. Training will be conducted periodically on an on-going basis.

Initiative 3: Bag Limits/Increase Materials Diverted (Fundamental Best Practice)

Overview

Bag limits restrict the number of bags of garbage a resident can dispose of per collection. This encourages residents to divert more recyclable materials in order to not exceed the

bag limit. These programs are usually implemented in conjunction with improved diversion opportunities.

Bag limits can also be used in conjunction with bag tags (e.g., user fees). For example, some municipalities allow residents to dispose of a number of bags for free, with additional bags requiring a purchased bag tag.

Implementation

The Town implemented a 3 bag limit on January 1, 2011 and Council has committed to review the effectiveness of this strategy and the potential to move to a 2 bag limit. It is suggested in the WRS Guidebook that, without a kitchen organics program, that a weekly bag limit of 3 is appropriate.

Initiative 4: Provision of Free Blue Boxes

Overview

Providing free blue boxes helps to ensure that residents have sufficient storage capacity for recyclables. While this is initially done at the roll-out of the blue box program, many municipalities offer free boxes to new residents or residents moving into new homes. Some municipalities also offer one extra free box or bin for residents per year. However, in municipalities offering only basic recycling services, one blue box container may be sufficient.

Implementation

Pending Council approval to do so, this strategy will be implemented by mid to late 2012.

Initiative 5: Assess Tools and Methods to Maximize Diversion

Overview

Waste recycling programs fail or succeed based on their ability to overcome public barriers to participation. Additional research on the appropriate tools and methods can help how best to maximize opportunities to divert Blue Box materials from the waste stream and reduce waste going to disposal. Possible topics may include:

1. The types of waste diversion behaviours currently undertaken in each household;
2. Perceived barriers to participation in waste diversion programs;
3. Willingness to participate in waste recycling programs;
4. How residents receive information or learn about local waste recycling programs; and,
5. The tools residents need to increase their participation in recycling programs.

This information can be collected through telephone surveys and focus groups. Methods and tools identified through the survey can be tested for performance using focus groups or through a pilot project.

Implementation

Pending Council approval to do so, this strategy will be implemented in 2012.

Initiative 6: Following Generally Accepted Principles for Effective Procurement and Contract Management (Fundamental Best Practice)

Overview

A considerable number of municipalities in Ontario contract out the collection and processing of recyclables. To ensure that municipalities obtain good value for money, Municipalities should follow generally accepted principles (GAP) for effective procurement and contract management. Key aspects of GAP include planning the procurement well in advance, issuing clear RFPs, obtaining competitive bids, and including performance-based incentives.

Implementation

A 6 Step approach to implement this strategy is presented in the WRS Guidebook, as follows:

Step 1: Precisely define services to be contracted;
Step 2: Determine contractor pool and your market position;
Step 3: Prepare a detailed, unambiguous RFP or Tender;
Step 4: Employ a fair and transparent contractor selection process;
Step 5: Negotiate a partnership-oriented contract; and,
Step 6: Maintain partnership approach in contract administration and monitoring through entire contract term.

Pending receipt of Council approval to do so, this strategy will be implemented to procure the next waste and recyclables collection contracts (in 2014).

8.2 Future Initiatives

Initiative 1: Optimization of Collection Operations (Fundamental Best Practice)

Overview

The purpose of optimizing collection operations is to collect more recyclables using fewer financial, capital and human resources. This requires critically assessing both collection and processing operations (as the two are closely linked) and making changes

that reduce costs while at the same time increases capture of blue box materials. The relevant options for optimization vary according to the size, composition and location of municipalities, as well as their available processing options.

Implementation

Pending Council approval to do so, this strategy will be implemented in late 2012 or early 2013.

Initiative 2: Enhancement of Recycling Depots

Overview

Where curbside collection programs are not feasible, recycling depots provide an inexpensive means for municipalities to divert recyclable materials from disposal. Enhancements to recycling depots may include (but are not limited to):

1. Providing satellite depots to improve public access and convenience;
2. Enhancing the conditions at the landfill depot (e.g., landscaping, general cleanliness, maintenance);
3. Incorporating friendly, easy-to-read signage; and,
4. Providing additional part-time staff to address seasonal fluctuations and visiting traffic.

Implementation

The Town recycling depot is currently situated on private property and is owned and operated by the recycling contractor. Town Council, through the Ecological Resources Committee, is considering options to improve access and conditions at the depot. This strategy is currently being implemented (review to identify possible improvements). Following review, improvements may be made pending Council approval.

Initiative 3: Multi-Municipal Collection and Processing of Recyclables (Fundamental Best Practice)

Overview

Small and medium-sized municipalities often face considerable cost and capital challenges when looking to collect and process recyclables from its residents. However, working collaboratively with other municipalities to provide these services can increase economies of scale and allow for the sharing of resources.

Co-operative recycling activities may involve establishing individual contracts that align with activities and services neighbouring municipalities may already be providing. It is possible to begin a co-operative planning process by synchronizing the expiry dates of municipal contracts so that contractors may bid on multiple contracts simultaneously.

Implementation

The WRS Guidebook advises that municipalities should follow the following seven steps when implementing this strategy:

1. Indentify service needs of each potential co-operating jurisdiction;
2. Identify and communicate advantages to working co-operatively;
3. Identify and implement communication and working protocols among potential co-operating municipalities (a steering committee of task group may be required);
4. Determine and document clearly how the multi-municipal program will be funded, using financial projections and a business plan;
5. Identify the governance strategies for providing for accountability, monitoring, and decision-making authority to participating jurisdictions. These may include a utility-type board, a sub-committee of municipal representatives, a municipal corporation, or a combination of the above;
6. Identify costs (and cost savings) associated with the co-operative program, using financial projections and business plan from Step 4; and,
7. Test multi-municipal strategies in low-risk circumstances, such as a joint advertising, container purchasing, promotion and education, etc., and build on successes of such efforts.

Implementation of this strategy may be initiated following Council review.

Initiative 4: Standardized Service Levels and Collaborative Recyclables

Overview

Collaborative haulage contracts for blue box materials can take advantage of increased purchasing power through municipal partnerships and ensures that the partner municipalities provide common levels of services to its residents. Standardizing collection programs among municipal partners increases the amount of materials being diverted from disposal, allows for common education and promotion materials, increases collector efficiencies, and can potentially reduce overall costs.

Implementation

Implementation steps and timing of this strategy would coincide with Future Initiative 3.

8.3 Contingencies

Implementation plans can be delayed by a variety of foreseen and unforeseen circumstances. Predicting and including contingencies can help to ensure that these risks are managed for minimum delay. Table 8.2 identifies contingencies for possible planning delays.

Table 8.2: Waste Recycling Strategy Contingencies	
Risk	**Contingency**
Insufficient funding	Explore and apply for other funding sources
	Delay lower-priority initiatives
Public opposition to planned recycling initiatives	Improve public communications
	Engage community/stakeholders to discuss initiatives/recycling plan
Lack of available staff	Prioritize department/municipal goals and initiatives
	Utilize consultants where required
Permit/Approvals requirements	Identify permit and approvals requirements early on in process

9. Monitoring and Reporting

The monitoring and reporting of Blind River's recycling program is considered a Blue Box program fundamental best practice and will be a key component of this WRS. Once implementation of the strategy begins, the performance of the WRS will be monitored and measured against the baseline established for the current system. This will include a baseline survey of set-out rates. Once the results are measured, they will be reported to Council and the public.

The approach for monitoring the Municipality's waste recycling program is outlined in Table 9.1.

Table 9.1: Recycling System Monitoring		
Monitoring Topic	**Monitoring Tool**	**Frequency**
Total waste generated (by type and by weight)	Measuring of wastes and recyclables collected.(e.g. contractor records).	Monthly
Diversion rates achieved (by type and by weight)	Formula: (Blue box materials + other diversion) ÷ Total waste generated * 100%.	Monthly
Waste disposed (by volume)	Measuring of wastes at the disposal site (e.g. topographic survey)	Annually
Program participation	Customer survey, monitoring set-out rates	Every 1 to 3 years
Customer satisfaction	Customer survey, tracking calls/complaints received to the	Every 1 to 3 years

Table 9.1: Recycling System Monitoring		
Monitoring Topic	**Monitoring Tool**	**Frequency**
	municipal office	
Opportunities for improvement	Customer survey, tracking calls/complaints received to the municipal office	Ongoing
Planning activities	Describe what initiatives have been fully or partially implemented, what will be done in the future	Annually
Review of Recycling Plan	A periodic review of the Recycling Plan to monitor and report on progress, to ensure that the selected initiatives are being implemented, and to move forward with continuous improvement	Every 3 to 5 years

10. Conclusion

Through completion of this WRS, the Town of Blind River is committed to a process of continuous improvement, as budget allows, in order to maximize the volume of material diverted from disposal in a feasible manner.

In order to improve the current systems, the Town will implement a number of priority initiatives spanning the next 3 years, including:

1. A promotion and education program;
2. Training of key program staff;
3. Bag limits / increase materials diverted;
4. Provision of free blue boxes;
5. Access tools and methods to maximize diversion; and,
6. Following generally accepted principles for effective procurement and contract management.

Additional initiatives of lower priority may also be implemented by the Town in the future.

The effectiveness of the initiatives implemented will be monitored to identify opportunities for improvement of specific programs as well as the WRS.

This WRS is considered a living document and success and lessons learned from the various initiatives implemented will be considered on a regular basis as they may affect the subsequent implementation of other initiatives.

APPENDIX A:

SEPTEMBER 2011 OPEN HOUSE PRESENTATION BOARDS

TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

PUBLIC OPEN HOUSE #2

BACKGROUND AND PROBLEM STATEMENT

1. Historically, waste has been deposited outside the approved fill area at the landfill. The MOE requires that this be addressed by the Town.

2. The remaining capacity of the approved fill area is estimated to be less than 6 years.

3. Given the above, the Town initiated the Environmental Assessment (EA) Planning Process to develop a long-term waste management plan (WMP).

4. The EA is being prepared in accordance with a Terms of Reference approved by the Minister of the Environment in 2008.

5. The EA Planning Process will address the non-hazardous residential, industrial, commercial and institutional (IC&I), construction and demolition (C&D), biosolid and iron sludge wastes currently being disposed of at the Municipal landfill site. Household hazardous waste will also be considered.

6. The proposed planning period will range from 25 to 40 years (or other duration) depending on the preferences identified during the EA Planning Process.

TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

EXISTING WASTE MANAGEMENT SYSTEM

1. The collection of waste and recyclables is currently administered by a private sector service provider.

2. Waste is collected from residential households weekly (max 3 bags without tags) and twice weekly from the IC&I sector. Dumpsters located throughout the municipality are also collected on a regular basis.

3. Residential recycling pickup occurs every second week and commercial recycling pickup occurs weekly.

4. The Town's Blue Box recycling program includes the collection of newsprint, magazines, catalogues, household papers, corrugated cardboard, boxboard, glass bottles/jars, steel and aluminum cans and plastics numbered 1 through 6.

5. Monthly bulk item pick-up - including furniture, fridges, stoves, washers and dryers, etc.

6. Direct-haul disposal is allowed on days when the landfill site is open.

7. Tires, scrap metals and white goods are stockpiled at the landfill site for recycling/diversion.

8. Household hazardous wastes including corrosive, toxic, reactive and flammable wastes are collected by a qualified contractor on Household Hazardous Waste Days (HHWD) scheduled by the Town.

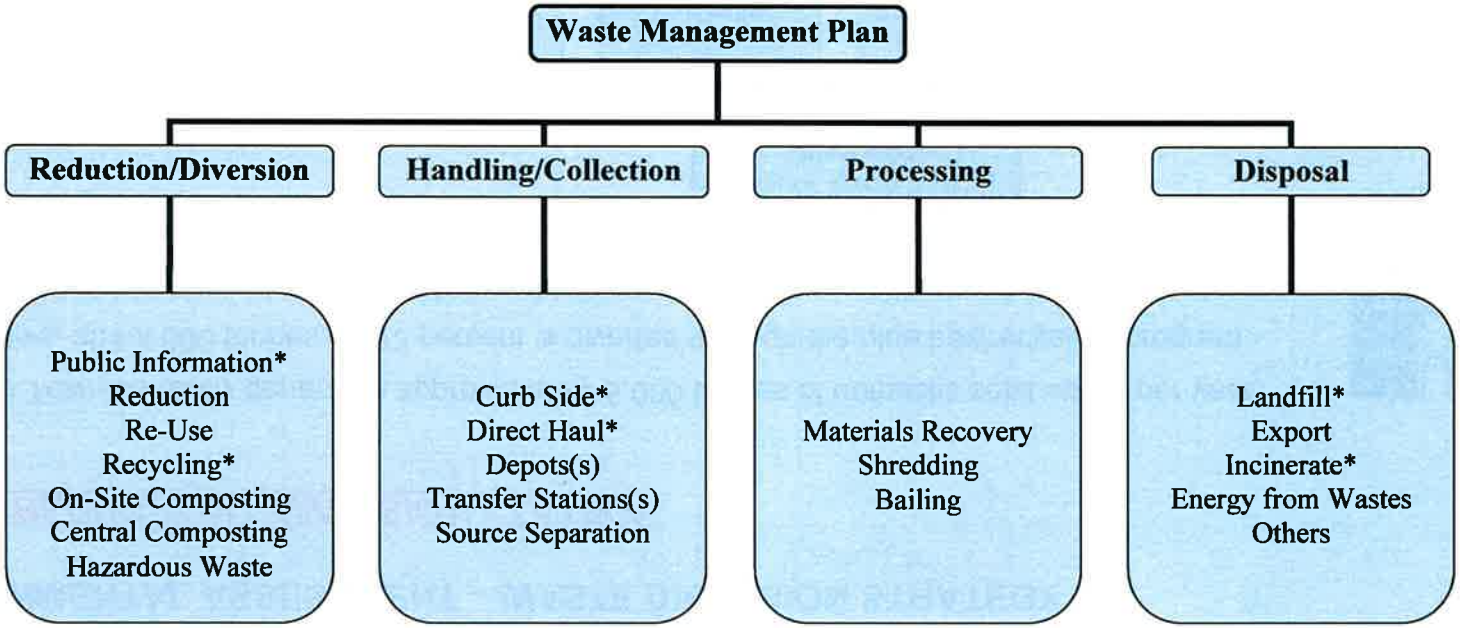
TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

IDENTIFICATION OF WASTE MANAGEMENT PLAN COMPONENTS

1. A WMP is comprised of several key components that may be categorized according to general functions.

2. Several programs exist within each component. Which program(s) are eventually adopted depends on considerations such as environmental impacts as well as the community's ability to operate, maintain and manage alternatives with varying complexities.

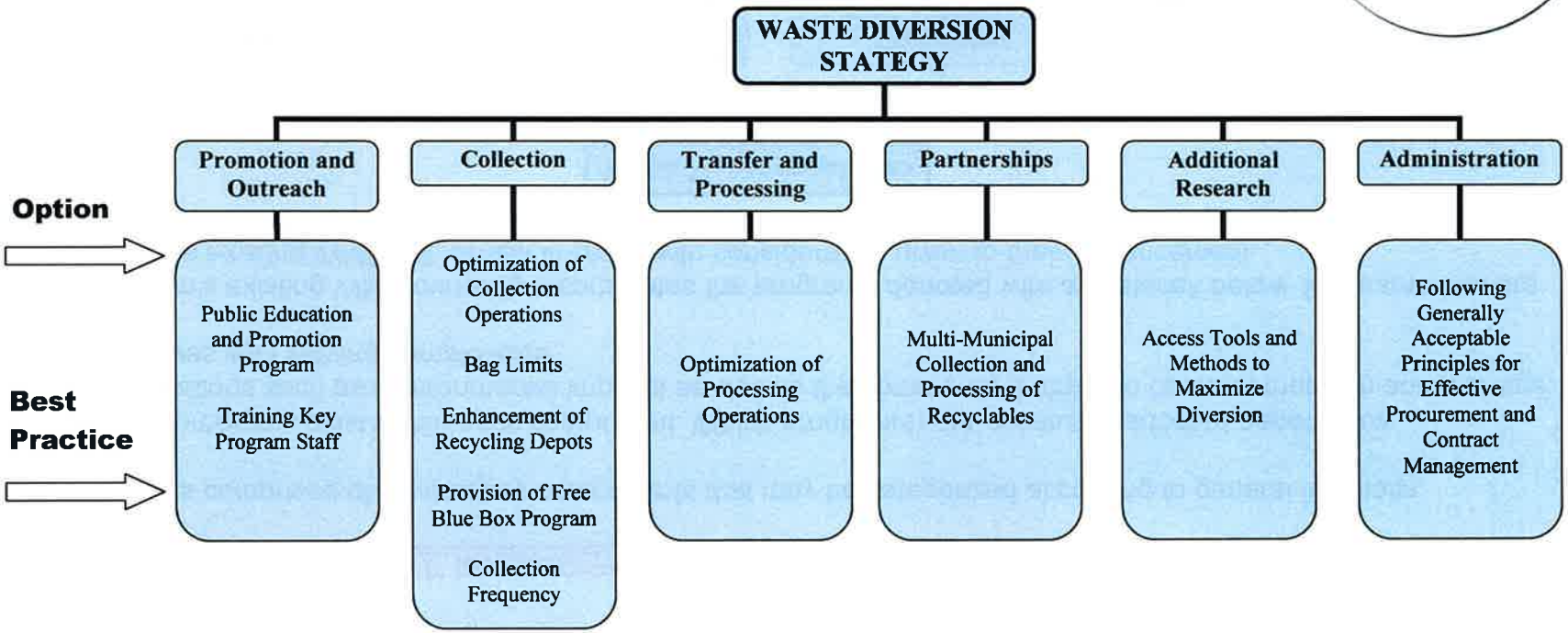
3. The Town's existing WMP currently incorporates the programs denoted with an asterisk below. Programs that are part of the existing WMP will remain in-place with consideration given to their enhancement.



TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

WASTE REDUCTION / DIVERSION STATEGY

1. The Town currently generates approximately 5,000 tonnes of domestic solid waste per year.
2. Of this, about 600 tonnes, or 12 percent is diverted through the blue box/recycling program.
3. The most common material recycled is old corrugated cardboard, the least common is glass.
4. The diversion rate may be increased by optimizing the current waste diversion strategy.



TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

WASTE REDUCTION / DIVERSION STATEGY

GOALS	OBJECTIVES
To maximize diversion of residential/municipal solid waste through the blue box/recycling program	• Divert 17% of municipal solid waste through the blue box/recycling program
To maximize capture rates of blue box materials through existing and future programs	• Capture 70% of blue box materials • Increase capture of blue box municipal solid waste by 18% within 3 years
To increase participation in the recycling program	• Make recycling services available to 90% of residents • Increase recyclable types collected
To expand the lifetime of the landfill	• Add 5 years to the lifespan of the landfill by increasing blue box diversion
To manage our waste in the community or as close to home as possible	• Dispose of all locally generated waste within municipal borders

Waste Recycling Strategies need to present cost effective, socially acceptable, and environmentally sound practices appropriate to the needs of the community and should consider the following principles:

- Maximized diversion of Blue Box materials;
- Innovation and Best Practices;
- Realistic long term planning;
- Flexibility and adaptability;
- Appropriate technological solutions;
- Maximized cost savings by contracting out services;
- Multi-municipal ventures where feasible; and
- Public consultation in an open and transparent planning process.

~ *Guidebook for Creating a Municipal Waste Recycling Strategy*

TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

SCREENING OF STRATEGY OPTIONS

	Option/Best Practices	Criteria (Score out of 3)						Total Criteria Score
		% Waste Diverted	Proven Results	Reliable Market/End Use	Economically Feasible	Accessible to Public	Ease of Implementation	
PROMOTION AND OUTREACH								
P	Public Education and Promotion Program	2	3	2	2	3	2	14/18 = 78%
P	Training of Key Program Staff	1	3	2	2	NA	3	11/15 = 73%
COLLECTION								
F	Optimization of Collection Operations	1	2	2	2	NA	2	9/15 = 60%
P	Bag Limits/Increase Materials Diverted	3	3	2	3	2	2	15/18 = 83%
F	Enhancement of Recycling Depots	1	2	2	2	3	2	12/18 = 67%
P	Provision of Free Blue Boxes	1	2	NA	2	3	3	11/18 = 73%
X	Collection Frequency	1	1	NA	2	3	3	10/18 = 56%
TRANSFER AND PROCESSING								
X	Optimization of Processing Operations	Municipality contracts of the processing of blue box material						
NA – Not Applicable								

TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

SCREENING OF STRATEGY OPTIONS

	Option/Best Practices	Criteria (Score out of 3)						Total Criteria Score
		% Waste Diverted	Proven Results	Reliable Market/End Use	Economically Feasible	Accessible to Public	Ease of Implementation	
PARTNERSHIPS								
F	Multi-Municipal Collection and Processing of Recyclables	1	2	2	2	3	2	12/18 = 67%
F	Standardized Service Levels and Collaborative Recyclables	1	2	2	2	3	2	12/18 = 67%
X	Intra-Municipal Committee	1	2	1	2	2	2	10/18 = 56%
ADDITIONAL RESEARCH								
P	Access Tools and Methods to Maximize Diversions	3	3	2	2	3	2	15/18 = 83%
ADMINISTRATION								
P	Following Generally Accepted Principles for Effective Procurement and Contract Management	2	3	2	3	1	3	14/18 = 78%

TOWN OF BLIND RIVER WASTE MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT – WASTE DIVERSION STRATEGY

NEXT STEPS IN THE PROCESS

1. The purpose of this Open House was to present information relating to Alternative Waste Management and Diversion Systems to interested residents and to provide the opportunity for input into the process.

2. Options/best practices scoring 70-100% will be considered as Priority Initiatives while options scoring 60-69% will be considered as possible Future Initiatives. These initiatives as well as their steps for implementation will be further reviewed as part of the Town's Municipal Waste Diversion Strategy.

3. A Task 2 summary report will be prepared to document Task activities and findings as well as comments and input received during this Open House,

4. Task 3 of the EA Planning Process ("Implement Diversion Strategy") will be initiated/documented in accordance with the Waste Diversion Strategy.

APPENDIX B:

SEPTEMBER 2011 OPEN HOUSE COMMENTS

0508.05
Sept 13/11
-copy to 4.36.01

Town of Blind River
Municipal Waste Management Plan - Environmental Assessment
Waste Diversion Strategy

PUBLIC OPEN HOUSE #2
COMMENT SHEET

I/We have reviewed the project material and have the following comments:

It is good to have all this information on waste management available. We all have to recognize the urgency of disposing of waste in a more environmentally conscious way. A long term waste management plan is essential. I'd really like to be able to compost centrally - yard waste + organic matter are plentiful.

Thank you for your comment(s). Please complete the following if you would like to be contacted for clarification, or if you wish to be added to the project Mailing List.

Sister TRINA BOTTOS
Name (print)

117 Rousseau Crescent
Address

705-356-7610
Phone No.

csjtrina@ontera.net
Email Address

Please leave the completed form with a representative of the Town or the Consultant or deliver or mail to:

Kresin Engineering Corporation
536 Fourth Line East
Sault Ste. Marie, Ontario
P6A 5K8

0508-05
Sept 13/11

Town of Blind River
Municipal Waste Management Plan - Environmental Assessment
Waste Diversion Strategy

PUBLIC OPEN HOUSE #2
COMMENT SHEET

I/We have reviewed the project material and have the following comments:

I gained some knowledge about the overall plan. It is a lot to absorb for me even though I am on the committee.

I liked the way the information was laid out in manageable sections

Thank you for your comment(s). Please complete the following if you would like to be contacted for clarification, or if you wish to be added to the project Mailing List.

Dolly Pigeon
Name (print)

B.R
Address

705-356-7763
Phone No.

Seniorpigeon@hotmail.com
Email Address

Please leave the completed form with a representative of the Town or the Consultant or deliver or mail to:

Kresin Engineering Corporation
536 Fourth Line East
Sault Ste. Marie, Ontario
P6A 5K8

APPENDIX C:

CHAMBER OF COMMERCE SURVEY RESPONSES

1136.01

Chris Kresin

From: Sandra Walker [chamber@blindriver.com]
Sent: Monday, April 09, 2012 11:10 AM
To: 'Chris Kresin'
Subject: FW: Waste Recycling Strategy Questionnaire

Importance: High

Hi Kris:

Please accept this email with the completed questionnaire survey that was sent to my email. It is late getting to you because I was away from the office for a month and just got back to work today.

Thank you,

Sandra Walker
Business Services Coordinator
Blind River Chamber of Commerce
Bus: 705-356-2555
Fax: 705-356-3911
e-mail: chamber@blindriver.com
www.brchamber.ca

From: Karin Pilon [mailto:Karin_Pilon@cameco.com]
Sent: Tuesday, March 20, 2012 9:29 AM
To: Sandra Walker
Cc: Laurie Cassidy; Chris Astles
Subject: FW: Waste Recycling Strategy Questionnaire

As requested, below is the questionnaire completed by Laurie Cassidy, our Senior Environmental Coordinator.
Thank you,
Karin

Karin Pilon
Support Services Administrator
Cameco Corporation
P.O. Box 1539, Blind River, Ont. P0R 1B0
p: 705-356-1496 ext. 3219 f: 705-356-4059
e-mail: karin_pilon@cameco.com

From: Laurie Cassidy
Sent: Friday, February 17, 2012 9:09 AM
To: Karin Pilon
Subject: FW: Waste Recycling Strategy Questionnaire

Town of Blind River

MUNICIPAL WASTE MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT
WASTE RECYCLING STRATEGY QUESTIONNAIRE - COMMERCIAL

A. WASTE QUANTITY

1. How much waste do you direct to the municipal landfill site in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   16 (6 yard) bins/week

2. How much waste do you divert/recycle in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   2 (6 yard) bins/week

3. Do you expect that this amount will increase or decrease in the next 2 years?

   Increase Decrease Stable

B. WASTE TYPE

4. Please indicate the types of waste produced by your organization, and estimate proportions.

   a) Construction/Demolition (i.e. shingles, drywall, flooring, etc.) 5%
   b) Metals (i.e. appliances, drums, rims, cars, etc.) 1 %
   c) Metals (i.e. pop cans, tins) 1 %
   d) Tires (i.e. passenger, vehicle, ATV, etc.) 0 %
   e) Clean wood waste (i.e. pallets, brush) 0 %
   f) Septic Tank Waste/Sludge 0 %
   g) Paper/Cardboard 25 %
   h) Glass 1 %

i) Plastics

7 %

j) Food Wastes

0%

k) Other Wastes

60 %

Please Give Examples of ("Other Wastes"):

Iron sludge

C. WASTE RECYCLING

5. What types of recyclables does your organization produce (eg: cardboard, paper, cans, glass, plastics)?
   Cardboard, paper, cans, glass and plastic

6. What types of materials does your organization currently recycle (eg: cardboard, paper, cans, glass, plastics)?
   Cardboard, paper, glass, plastics
   Cans are forwarded to the local animal shelter.

7. What types of materials would your organization consider recycling if possible?

   More types of plastics.

8. How can the current recycling program be improved (please use space on next page if required)?

   Expand to include Styrofoam and bubble wrap

PLEASE PROVIDE ANY RELATED COMMENTS OR CONCERNS BELOW:

Should you have any questions regarding this questionnaire, the WRS or the EA, please contact me,

Thanks,

Chris

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Kresin Engineering Corporation

536 Fourth Line East, Sault Ste. Marie, ON, P6A 5K8
tel: 705-949-4900, fax: 705-949-9965

The Town of Blind River is developing a Waste Recycling Strategy (WRS) as a component of an Environmental Assessment (EA) being completed in accordance with the EA Act to address the declining capacity at the Town's waste disposal site. The purpose of the WRS is to develop a plan to increase the efficiency and effectiveness of Town's recycling program and to maximize the amount of blue box material diverted from the waste disposal site.

Once the EA is completed, the resulting municipal waste management plan will address capacity for up to the next 40 years.

To assist with the process, would you please take a few moments to complete the brief questionnaire below by responding to this email and responding to the 8 questions below.

Thanks very much for your participation.

BLIND RIVER
ONTARIO, CANADA

Town of Blind River

MUNICIPAL WASTE MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT
WASTE RECYCLING STRATEGY QUESTIONNAIRE - COMMERCIAL

A. WASTE QUANTITY

1. How much waste do you direct to the municipal landfill site in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   1

2. How much waste do you divert/recycle in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   0

3. Do you expect that this amount will increase or decrease in the next 2 years?

2/15/2012

8. How can the current recycling program be improved (please use space on next page if required)?

most of our paper is professionally shredded

PLEASE PROVIDE ANY RELATED COMMENTS OR CONCERNS BELOW:

Should you have any questions regarding this questionnaire, the WRS or the EA, please contact me,

Thanks.

Chris

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Kresin Engineering Corporation
536 Fourth Line East, Sault Ste. Marie, ON, P6A 5K8
tel. 705-949-4900, fax 705-949-9965

1136.01

Eva Walls

From: John Thomas [jthomas@kjbeamish.ca]
Sent: Tuesday, February 28, 2012 8:20 AM
To: info@kresinengineering.ca
Subject: FW: Waste Recycling Strategy Questionnaire

K.J. Beamish Const. Co. Ltd. produces a minimal amount of garbage in the Blind River area.

John K. Thomas
Vice President
K.J. Beamish Construction Co; Ltd.

From: Kresin Engineering Corporation [mailto:info@kresninengineering.ca]
Sent: February 14, 2012 4:32 PM
To: info@kresinengineering.ca
Subject: Waste Recycling Strategy Questionnaire

Hello Blind River Chamber of Commerce Members:

The Town of Blind River is developing a Waste Recycling Strategy (WRS) as a component of an Environmental Assessment (EA) being completed in accordance with the EA Act to address the declining capacity at the Town's waste disposal site. The purpose of the WRS is to develop a plan to increase the efficiency and effectiveness of Town's recycling program and to maximize the amount of blue box material diverted from the waste disposal site.

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Thanks very much for your participation.

BLIND RIVER
ONTARIO. CANADA

Town of Blind River

MUNICIPAL WASTE MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT
WASTE RECYCLING STRATEGY QUESTIONNAIRE - COMMERCIAL

A. WASTE QUANTITY

1. How much waste do you direct to the municipal landfill site in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   ___

2. How much waste do you divert/recycle in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   ___

3. Do you expect that this amount will increase or decrease in the next 2 years?

   Increase Decrease Stable

B. WASTE TYPE

4. Please indicate the types of waste produced by your organization, and estimate proportions.

   a) Construction/Demolition (i.e. shingles, drywall, flooring, etc.) _%
   b) Metals (i.e. appliances, drums, rims, cars, etc.) _%
   c) Metals (i.e. pop cans, tins) _%
   d) Tires (i.e. passenger, vehicle, ATV, etc.) _%
   e) Clean wood waste (i.e. pallets, brush) _%
   f) Septic Tank Waste/Sludge _%
   g) Paper/Cardboard _%
   h) Glass _%
   i) Plastics _%
   j) Food Wastes _%
   k) Other Wastes _%

   Please Give Examples of ("Other Wastes"):

C. WASTE RECYCLING

5. What types of recyclables does your organization produce (eg: cardboard, paper, cans, glass, plastics)?

6. What types of materials does your organization currently recycle (eg: cardboard, paper, cans, glass, plastics)?

7. What types of materials would your organization consider recycling if possible?

8. How can the current recycling program be improved (please use space on next page if required)?

PLEASE PROVIDE ANY RELATED COMMENTS OR CONCERNS BELOW:

Should you have any questions regarding this questionnaire, the WRS or the EA, please contact me,

Thanks,

Chris

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Kresin Engineering Corporation
536 Fourth Line East, Sault Ste. Marie, ON, P6A 5K8
tel: 705-949-4900, fax: 705-949-9965

1136.01
Questionnaire replies

Eva Walls

From: Blind River Development Corporation [infobrdc@blindriver.ca]
Sent: Tuesday, February 21, 2012 8:27 AM
To: info@kresinengineering.ca
Subject: FW: Waste Recycling Strategy Questionnaire
Attachments: image003.jpg

From: Blind River Development Corporation [mailto:infobrdc@blindriver.ca]
Sent: February-15-12 12:08 PM
To: Kresin Engineering Corporation
Subject: RE: Waste Recycling Strategy Questionnaire

Betty Ann Dunbar
Office Adminisrator
Blind River Development Corporation
11c Hanes Ave.
Blind River, ON P0R 1B0
Ph: 705 356-5715 Ext. 221
Fax: 705 356-5720
Toll Free: 1 866-487-9495
infobrdc@blindriver.ca

From: Kresin Engineering Corporation [mailto:info@kresninengineering.ca]
Sent: February-14-12 4:32 PM
To: info@kresinengineering.ca
Subject: Waste Recycling Strategy Questionnaire

Hello Blind River Chamber of Commerce Members:

The Town of Blind River is developing a Waste Recycling Strategy (WRS) as a component of an Environmental Assessment (EA) being completed in accordance with the EA Act to address the declining capacity at the Town's waste disposal site. The purpose of the WRS is to develop a plan to increase the efficiency and effectiveness of Town's recycling program and to maximize the amount of blue box material diverted from the waste disposal site.

Once the EA is completed, the resulting municipal waste management plan will address capacity for up to the next 40 years.

To assist with the process, would you please take a few moments to complete the brief questionnaire below by responding to this email and responding to the 8 questions below.

Thanks very much for your participation.

BLIND RIVER
ONTARIO. CANADA

Town of Blind River

MUNICIPAL WASTE MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT
WASTE RECYCLING STRATEGY QUESTIONNAIRE - COMMERCIAL

A. WASTE QUANTITY

1. How much waste do you direct to the municipal landfill site in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   1 bag

2. How much waste do you divert/recycle in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   2 recycle boxes

3. Do you expect that this amount will increase or decrease in the next 2 years?

   Increase Decrease X Stable

B. WASTE TYPE

4. Please indicate the types of waste produced by your organization, and estimate proportions.

   a) Construction/Demolition (i.e. shingles, drywall, flooring, etc.) 0 %
   b) Metals (i.e. appliances, drums, rims, cars, etc.) 0 %
   c) Metals (i.e. pop cans, tins) 0 %
   d) Tires (i.e. passenger, vehicle, ATV, etc.) 0 %
   e) Clean wood waste (i.e. pallets, brush) 0 %
   f) Septic Tank Waste/Sludge 0 %
   g) Paper/Cardboard 90 %
   h) Glass 4 %

i) Plastics 4 %

j) Food Wastes 2 %

k) Other Wastes 0 %

Please Give Examples of ("Other Wastes"):

C. WASTE RECYCLING

5. What types of recyclables does your organization produce (eg: cardboard, paper, cans, glass, plastics)?

   Cardboard, paper, and plastics

6. What types of materials does your organization currently recycle (eg: cardboard, paper, cans, glass, plastics)?

   All of the above

7. What types of materials would your organization consider recycling if possible?

   Don't know

8. How can the current recycling program be improved (please use space on next page if required)?

   As a business we are satisfied with the program

PLEASE PROVIDE ANY RELATED COMMENTS OR CONCERNS BELOW:

Should you have any questions regarding this questionnaire, the WRS or the EA, please contact me,

Thanks,

Chris

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Kresin Engineering Corporation
536 Fourth Line East, Sault Ste. Marie, ON, P6A 5K8
tel: 705-949-4900, fax: 705-949-9965

1136.01

Eva Walls

From: Kim Graham [blindriver@elliotlakestandard.ca]
Sent: Wednesday, February 15, 2012 9:35 AM
To: info@kresinengineering.ca
Subject: FW: Waste Recycling Strategy Questionnaire
Attachments: image003.jpg

Survey filled out.

Kim Graham, Sales Representative
THE STANDARD
05.356-3222 Fax.356-3223
www.elliotlakestandard.ca

From: Kresin Engineering Corporation [mailto:info@kresninengineering.ca]
Sent: February 14, 2012 4:32 PM
To: info@kresinengineering.ca
Subject: Waste Recycling Strategy Questionnaire

Hello Blind River Chamber of Commerce Members:

The Town of Blind River is developing a Waste Recycling Strategy (WRS) as a component of an Environmental Assessment (EA) being completed in accordance with the EA Act to address the declining capacity at the Town's waste disposal site. The purpose of the WRS is to develop a plan to increase the efficiency and effectiveness of Town's recycling program and to maximize the amount of blue box material diverted from the waste disposal site.

Once the EA is completed, the resulting municipal waste management plan will address capacity for up to the next 40 years.

To assist with the process, would you please take a few moments to complete the brief questionnaire below by responding to this email and responding to the 8 questions below.

Thanks very much for your participation.

BLIND RIVER
ONTARIO, CANADA

Town of Blind River

MUNICIPAL WASTE MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT
WASTE RECYCLING STRATEGY QUESTIONNAIRE - COMMERCIAL

A. WASTE QUANTITY

1. How much waste do you direct to the municipal landfill site in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   .25 bag

2. How much waste do you divert/recycle in an average week? Please estimate number of bags, dumpsters, half ton loads, etc.

   1 bag

3. Do you expect that this amount will increase or decrease in the next 2 years?

   Increase Decrease *Stable

B. WASTE TYPE

4. Please indicate the types of waste produced by your organization, and estimate proportions.

   a) Construction/Demolition (i.e. shingles, drywall, flooring, etc.) __%
   b) Metals (i.e. appliances, drums, rims, cars, etc.) __%
   c) Metals (i.e. pop cans, tins) __%
   d) Tires (i.e. passenger, vehicle, ATV, etc.) __%
   e) Clean wood waste (i.e. pallets, brush) __%
   f) Septic Tank Waste/Sludge __%
   g) Paper/Cardboard 98 %
   h) Glass __%
   i) Plastics __%
   j) Food Wastes 2 %
   k) Other Wastes __%

   Please Give Examples of ("Other Wastes"):

C. WASTE RECYCLING

5. What types of recyclables does your organization produce (eg: cardboard, paper, cans, glass, plastics)?

   paper

6. What types of materials does your organization currently recycle (eg: cardboard, paper, cans, glass, plastics)?

   paper

7. What types of materials would your organization consider recycling if possible?

   —

8. How can the current recycling program be improved (please use space on next page if required)?

   More marketing for top of mind awareness & education

PLEASE PROVIDE ANY RELATED COMMENTS OR CONCERNS BELOW:

Should you have any questions regarding this questionnaire, the WRS or the EA, please contact me,

Thanks,

Chris

Chris Kresin, M.Sc.(Eng.), P.Eng.
Consulting Engineer

Kresin Engineering Corporation
536 Fourth Line East, Sault Ste. Marie, ON, P6A 5K8
tel: 705-949-4900, fax: 705-949-9965

APPENDIX D:

WASTE RECYCLING OPTION SCORES

Appendix D: Waste Recycling Option Scores

Priority (P), Future (F), or N/A (X)	Description of Options/Best Practices **(For more information:** *More information: Blue Box Program Enhancement and Best Practices Assessment Project Final Report, Volume 1)*	Criteria (Score out of 3)						Total Criteria Score
		% Waste Diverted	Proven Results	Reliable Market/ End Use	Economically Feasible	Accessible to Public	Ease of implementation	
Promotion and Outreach								
P	**Public Education and Promotion Program**	2	3	2	2	3	2	78%
P	**Training of Key Program Staff**	1	3	2	2	n/a	3	73%
Collection								
F	**Optimization of Collection Operations**	1	2	2	2		2	60%
P	**Bag Limits**	3	3	2	3	2	2	83%
F	**Enhancement of Recycling Depots**	1	2	2	2	3	2	67%
P	**Provision of Free Blue Boxes**	1	2		2	3	3	73%
X	**Collection Frequency**	1	1		2	3	3	56%
Transfer and Processing								
X	**Optimization of Processing Operations**	N/A – this is a contracted service.						

Priority (P), Future (F), or N/A (X)	Description of Options/Best Practices **(For more information:** *More information: Blue Box Program Enhancement and Best Practices Assessment Project Final Report, Volume 1)*	Criteria (Score out of 3)						Total Criteria Score
		% Waste Diverted	Proven Results	Reliable Market/ End Use	Economically Feasible	Accessible to Public	Ease of implementation	
Partnerships								
F	**Multi-Municipal Collection and Processing of Recyclables**	1	2	2	2	3	2	67%
F	**Standardized Service Levels and Collaborative Haulage Contracting**	1	2	2	2	3	2	67%
X	**Intra-Municipal Committee**	1	2	1	2	2	2	56%
Additional Research								
P	**Assess Tools and Methods to Maximize Diversion**	3	3	2	2	3	2	83%
Administration								
P	**Following Generally Accepted Principles for Effective Procurement and Contract Management**	2	3	2	3	1	3	78%

APPENDIX B:

NEW WASTE DISPOSAL CAPACITY

APPLICATION OF SITE SCREENING CRITERIA

TECHNICAL MEMORANDUM
TOWN OF BLIND RIVER: NEW WASTE DISPOSAL CAPACITY
APPLICATION OF SITE SCREENING CRITERIA

March 2015
KEC Ref: 0508.07

Prepared by:

KRESIN
Engineering Corporation

1.0 IDENTIFICATION OF POTENTIAL SITE LOCATIONS

This memo describes the results from the application of screening criteria to identify potential sites for new waste disposal capacity in the Town of Blind River.

1.1 Screening Criteria

A key consideration when identifying possible site locations is the proximity to where the majority of waste is being produced. This resulted in screening out lands beyond five kilometers to the north of Highway 17. If an inadequate number of potential sites are identified within the resultant boundary, then this distance may be expanded. **Figure 1** shows the search area based on this offset from Highway 17.

Criteria applied to identify suitable locations take into consideration: accessibility; various environmental considerations; terrain and area geology. The following WDS screening criteria were identified:

1. 200m buffers around lakes, streams, rivers, wetland areas, parks and conservation areas;
2. 500m buffers around built up areas of the community;
3. 50m from roadways;
4. Terrain should be relatively flat; and,
5. Geology (eg. soil type and expected conditions) should be appropriate for WDS development and operation.

Once the search area was established, the buffers identified above (Points 1, 2 and 3) were applied, as depicted on **Figure 2**.

Figure 3 is the "*Ontario Geological Survey Data Base Map*" for the Blind River area and is used to identify areas with morainal, glaciofacluvial and/or glaciolacustrine landforms (represented as green, yellow and blue areas). These geological landforms are preferred because of their tendency to assist with drainage and contain favourable granular materials for WDS development and operation. Other landforms such as organic and bedrock were excluded as being unsatisfactory for a WDS.

1.2 Area Required for a WDS

Considering a WDS design recently completed by KEC, it is anticipated that the area of a WDS to service Blind River would require a land area of at least 30 hectares (fill and buffer areas).

1.3 Identification and Review of Potential Site Locations

The six (6) potential locations identified on **Figure 4** "*Potential Site Locations*" are situated beyond the established buffers, within the 5km search area and in areas with morainal, glaciofacluvial and/or glaciolacustrine landforms.

1.3.1 Land Use Conflicts

The next step in review of the six (6) potential locations was to identify the locations on satellite imagery and to consider the Town's Official Plan to identify any potential land use conflicts. Following this review, five (5) sites were removed from further consideration leaving one (1) potential site. Table 1 presents a summary of the potential locations depicted on **Figure 4** as well as comments concerning each location. The "Distance from Centroid" shown on the Table is the approximate travel distance from the intersection of Highway 17 and Woodward Avenue to the potential WDS location.

Table 1: Summary of Potential WDS Locations

Location No.	Distance from Centroid (km)	Available Area (ha)	Comments
1	5.8	30	• Location includes the current WDS. • Access is from Highway 17. • Downgradient lands include Highway 17, on MTO maintenance compound, municipal land, HCR right-off-way and a portion of the North Channel Inshore Provincial Park. • Official Plan designates lands as "Waste Management Assessment", "Employment Area" and "Rural and Resource Area". • Downgradient lands designated as "Rural Resource Area" and "Open Space" in the Official Plan.
~~2~~	~~4.8~~	~~67~~	• Review of satellite imagery identifies that development exists in this industrial area just north of the highway. Site is therefore removed from further consideration. • Solar farm – part identified as "Employment Area" in the Official Plan.
~~3~~	~~3.0~~	~~31~~	• Includes parcels of private property and residences. • Residences are located near to the boundaries of this area. • Suspected bedrock outcrops within this area. • Limited downgradient land. • Official Plan identifies land as "Aggregate Resource Area".
4	~~3.~~	~~70~~	• Several homes downgradient of this area. • Parcels of private property extend into the area. • Part identified as "Aggregate Resource Area" and part as "Rural and Resource Area" in the Official Plan.

Table 1: Summary of Potential WDS Locations			
Location No.	Distance from Centroid (km)	Available Area (ha)	Comments
~~5~~	~~3.0~~	~~47~~	• Area includes parcels of privately owned land. • Downgradient lands include private residential properties. • Official Plan identifies land as "Aggregate Resource Area".
~~6~~	~~5.3~~	~~34~~	• Downgradient lands include private residential properties. • Part identified as "Aggregate Resource Area" and part as "Rural and Resource Area" in the Official Plan.

Note: shaded cells denote locations that have been removed from further consideration based on the identified land use(s).

1.4 Preliminary Preferred Location

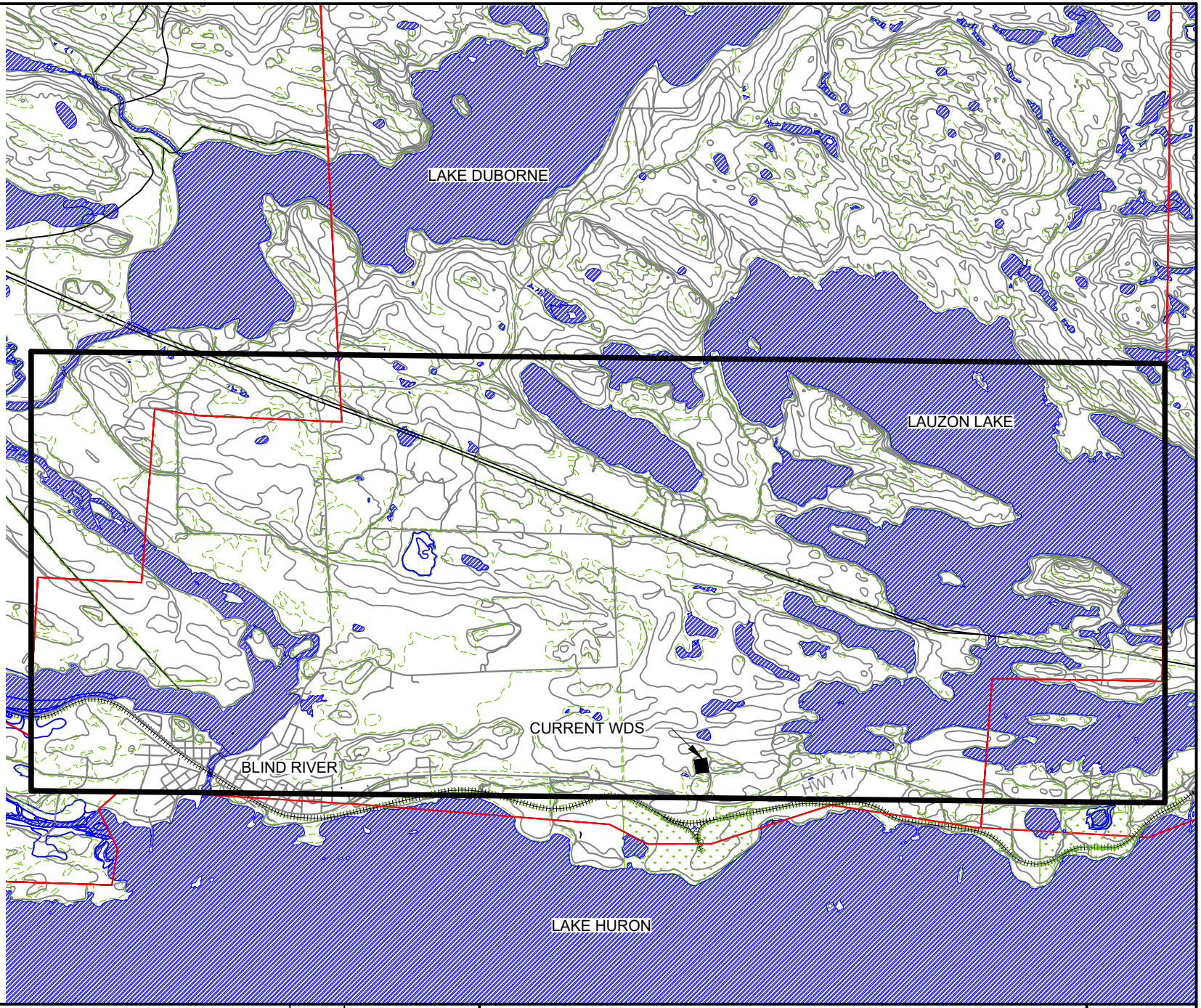
As a result of the screening exercise described, location number 1 is identified as being the preliminary preferred location for development of additional waste disposal capacity.

1.5 Next Steps

Following acceptance of the preliminary preferred location by the Town, additional site-specific information will be collected to further assess the site to confirm its acceptability and to identify development requirements. This may include site visits, surveys, the completion of a hydrogeological assessment, and/or discussion with the Ministry of Natural Resources, Ministry of Transportation and Ministry of the Environment and Climate Change, etc.

Respectfully Submitted by:
Kresin Engineering Corporation

Chris Kresin, M.Sc(Eng.), P.Eng.
Consulting Engineer



LEGEND

- LAKE, STREAM, WETLAND
- WOODLANDS
- ROADWAY
- MUNICIPAL BOUNDARY
- PROVINCIAL PARK
- SEARCH AREA

KRESIN
Engineering Corporation

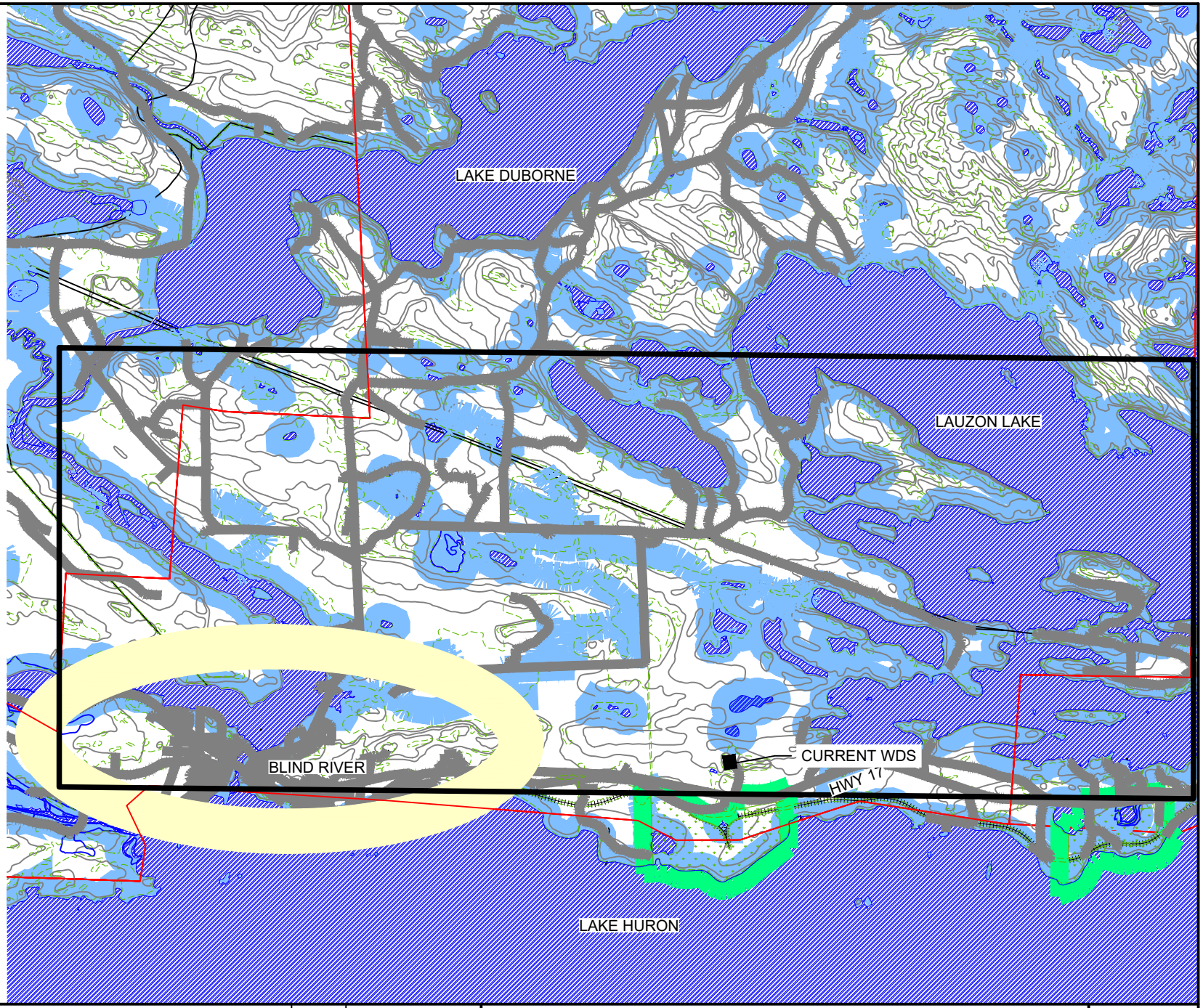
DESIGN	
DRAWN	K.Sherlock Feb 2015
CHECKED	
PROJECT	0508.07
FILENAME	0508 memo figures
SCALE	1:62,500

BLIND RIVER WASTE DISPOSAL SITE
CORPORATION OF THE TOWN OF BLIND RIVER

5 KM SEARCH AREA

Figure 1

Rev 0



LEGEND

- 200m PARK BUFFER
- 200m WATER BUFFER
- 50m ROADWAY BUFFER
- 500m COMMUNITY BUFFER
- LAKE, STREAM, WETLAND
- WOODLANDS
- ROADWAY
- MUNICIPAL BOUNDARY
- PROVINCIAL PARK
- SEARCH AREA

KRESIN Engineering Corporation

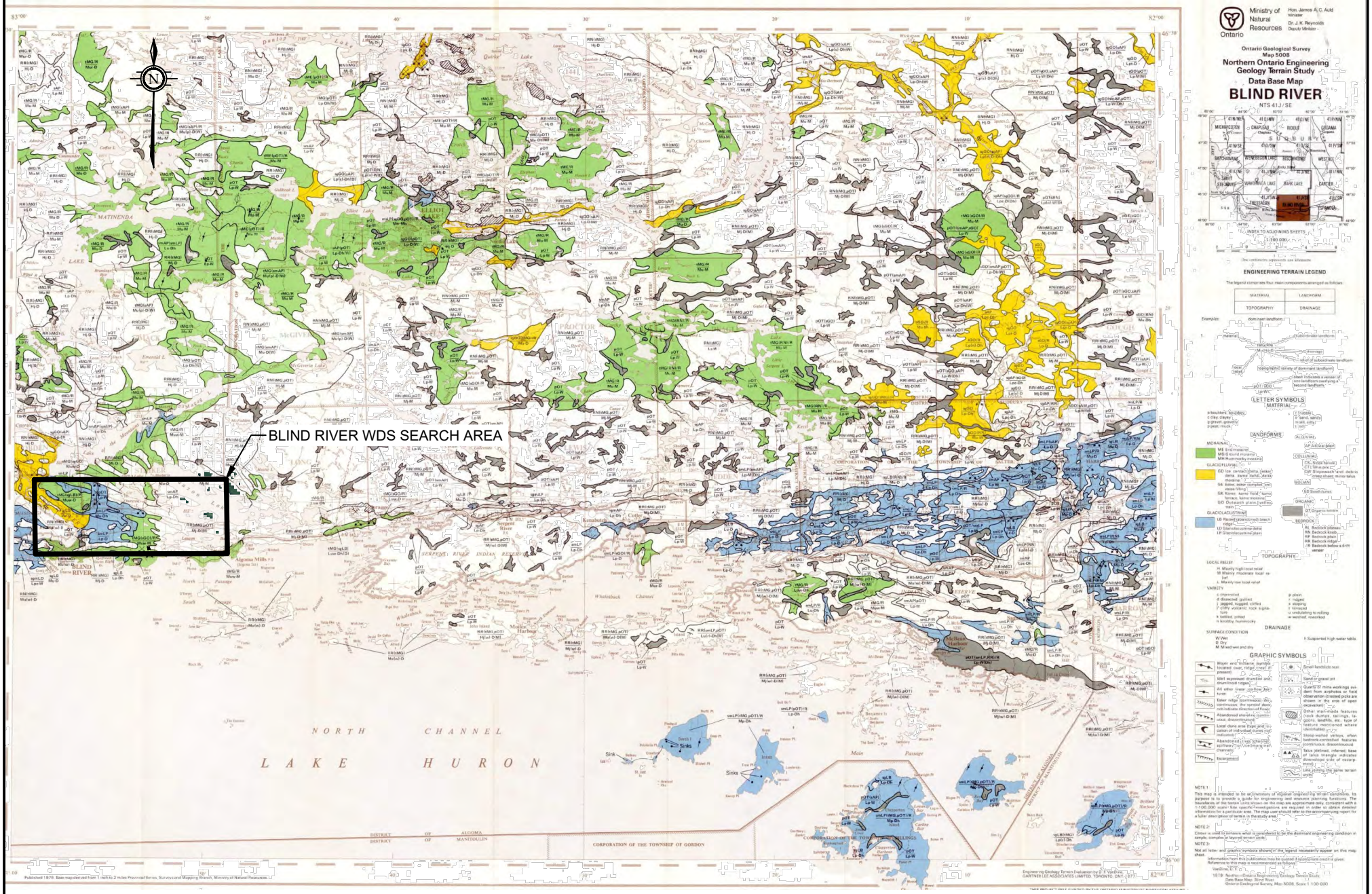
DESIGN	
DRAWN	K.Sherlock Feb 2015
CHECKED	
PROJECT	0508.07
FILENAME	0508 memo figures
SCALE	1:62,500

BLIND RIVER WASTE DISPOSAL SITE
CORPORATION OF THE TOWN OF BLIND RIVER

BUFFER AREAS

Figure 2

Rev 0



KRESIN
Engineering Corporation

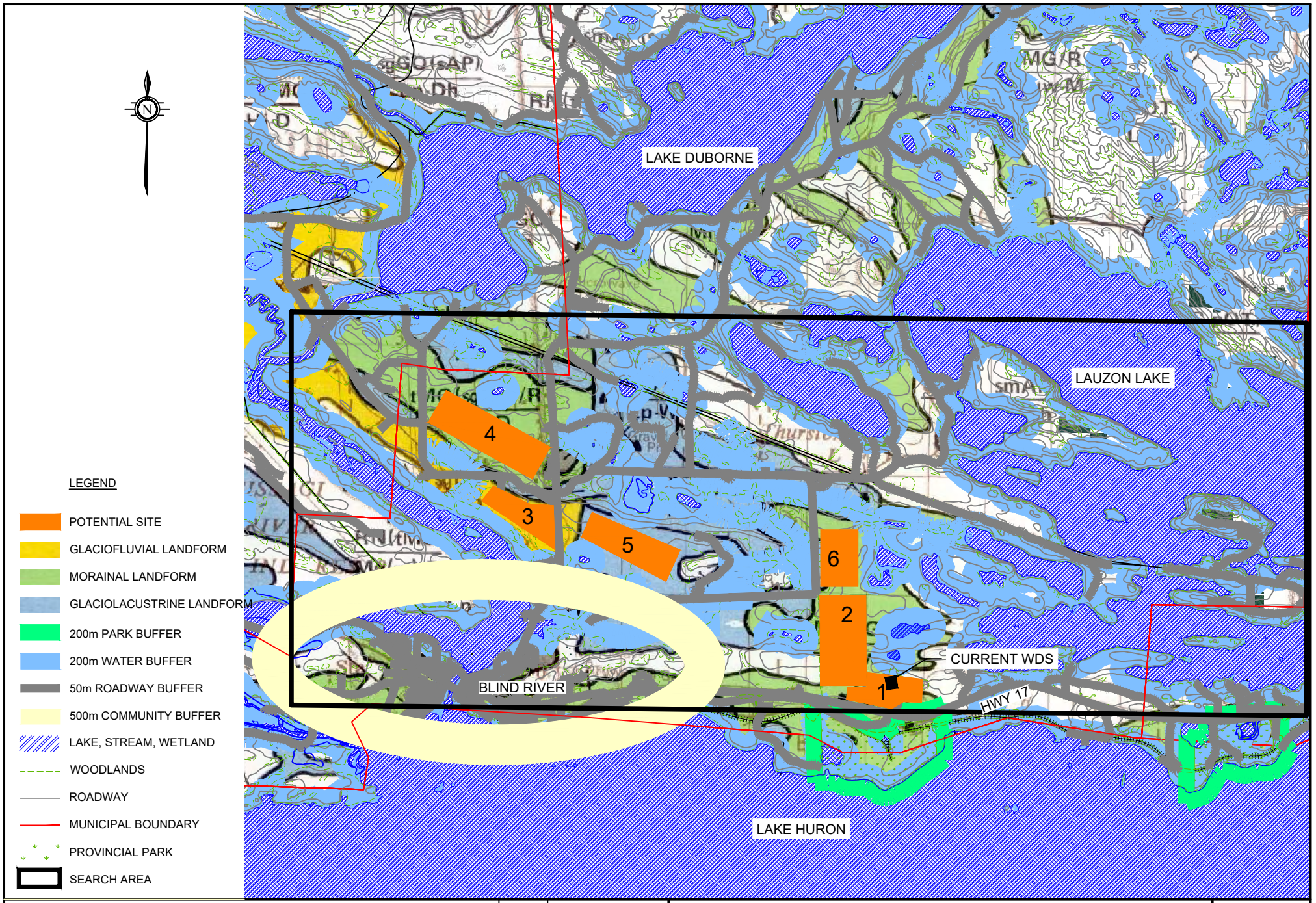
DESIGN	
DRAWN	K.Sherlock Aug 2014
CHECKED	
PROJECT	0508.07
FILENAME	0508 memo figures
SCALE	AS SHOWN

BLIND RIVER WASTE DISPOSAL SITE
CORPORATION OF THE TOWN OF BLIND RIVER

DATA BASE MAP SURVEY

Figure 3

Rev 0



KRESIN Engineering Corporation

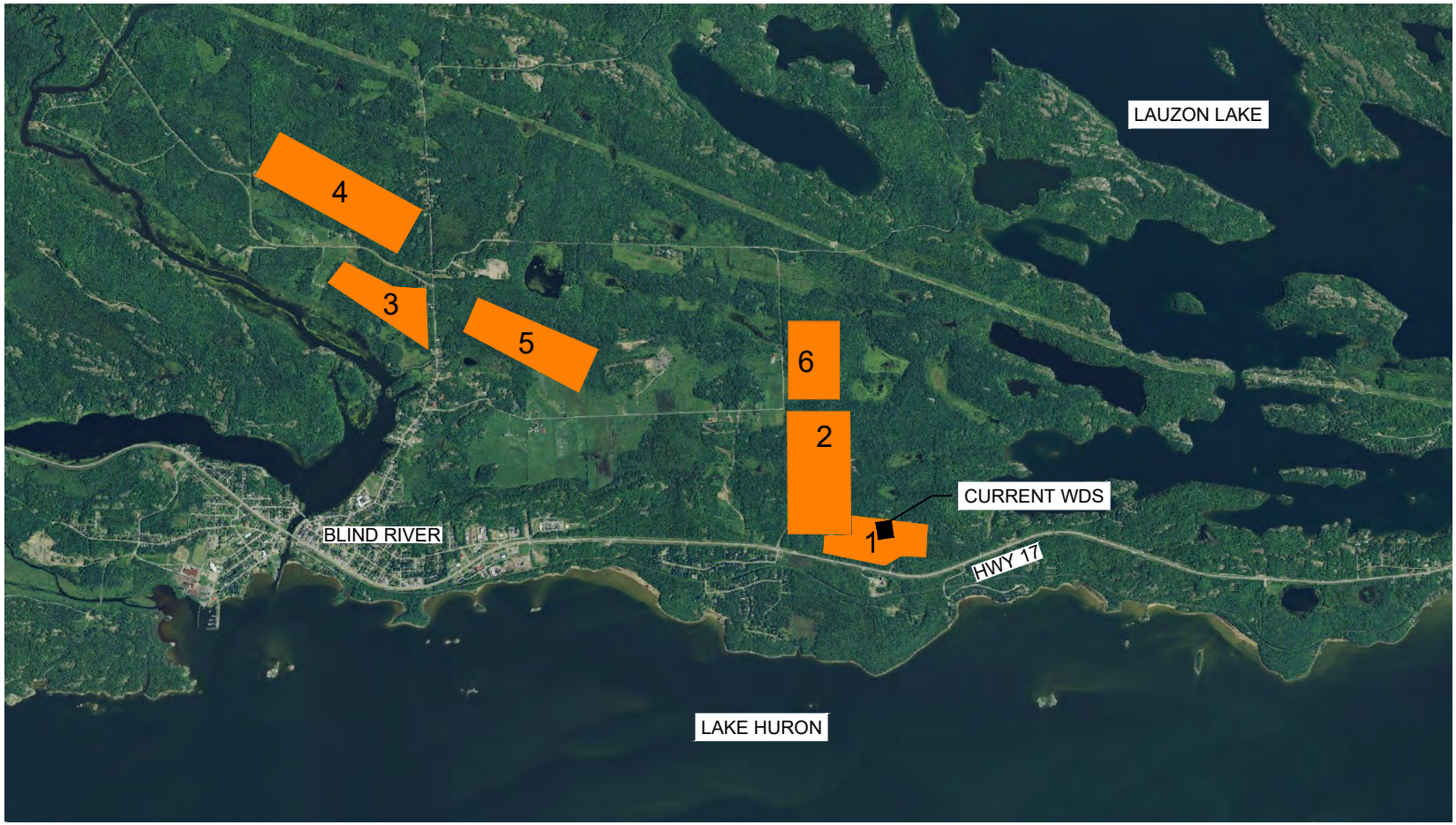
DESIGN	
DRAWN	K.Sherlock Feb 2015
CHECKED	
PROJECT	0508.07
FILENAME	0508 memo figures
SCALE	1:62,500

BLIND RIVER WASTE DISPOSAL SITE
CORPORATION OF THE TOWN OF BLIND RIVER

POTENTIAL SITE LOCATIONS

Figure 4

Rev 0



LEGEND

POTENTIAL SITE

KRESIN Engineering Corporation

DESIGN	
DRAWN	K.Sherlock Mar 2015
CHECKED	
PROJECT	0508.07
FILENAME	0508 memo figures
SCALE	1:62,500

BLIND RIVER WASTE DISPOSAL SITE
CORPORATION OF THE TOWN OF BLIND RIVER

MAP OF POTENTIAL SITE LOCATIONS

Figure 5

Rev 0

APPENDIX C:

HYDROGEOLOGICAL AND SURFACE WATER ASSESSMENT REPORT

Blind River

Hydrogeological and Surface Water Assessment

Municipal Waste Disposal Site

(Existing and Proposed Expanded)

KRESIN Engineering Corporation

Revision 3: May 2024
Revision 2: April 2022
Revision 1: January 2022
January 2021
0508.12

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1.0 INTRODUCTION

An expansion of the municipal waste disposal site in the Town of Blind River (Town) has been identified as being the preferred option to address the Town's future waste disposal needs. The site is accessed from Highway 17 and is situated approximately 2 kilometers west of the Town's core (see Drawing 1 of Appendix A).

Part V of the Environmental Protection Act requires supporting hydrogeological documentation to assess and demonstrate the site's suitability for a landfilling operation. In this context, the purpose and scope of the hydrogeological assessment described in this report are to present:

1. An assessment of the conditions at the site and vicinity;
2. A description of the existing hydrogeological conditions below and down gradient of the proposed facility;
3. An outline of soil composition, stratigraphy, groundwater flow and the depth to the water table;
4. An estimate of the quality of leachate generated and the leachate attenuation capability of the soils;
5. A determination of possible exceedances of the Ministry of the Environment, Conservation and Parks (MECP) document entitled, "Incorporation of the Reasonable Use Concept into MECP Groundwater Management Activities" Guideline B-7 (Formerly 15-08)";
6. An estimate of the impacts of waste disposal on the ground and surface water at the proposed site and along property boundaries; and,
7. A proposal for a monitoring program to characterize chemical and physical parameters of concern for both ground and surface water.

Similarly, an assessment of surface water conditions on and in the vicinity of a landfilling site is also required to address:

1. A description of the area (watershed) in which the site is located and the surface water features nearby the site;
2. A detailed investigation and description of the surface water conditions on the site and any surface water features receiving a direct discharge from the landfilling site;
3. A water quality assessment program, based on an extensive list of monitoring parameters; and,
4. An assessment of the suitability of the site for landfilling.

2.0 FIELD AND LABORATORY WORK

Field work was initiated in 2002 with the installation of 6 groundwater monitoring wells at the waste disposal site. A single borehole was also advanced to refusal at a location north of the fill area. Groundwater monitoring and sample collection also commenced in 2002 for the purpose of defining the hydrogeological setting at the site and assessing potential groundwater impacts. Since 2002, the monitoring well network has been expanded to include a total of 12 active wells in order to supplement the understanding of groundwater conditions at the site. Drawing 2 in Appendix A identifies the location of the monitoring wells currently included as part of the site's groundwater monitoring network.

Borehole logs recorded during monitoring well installation show that the overburden consists of mixed sand and gravel layers under a thin layer of topsoil. North of the landfill (MW1-02) the sand and gravel layer is underlain by a silty sand and gravel till layer and, elsewhere, by medium to coarse grained sand layers to a silt layer (MW2-02). At the location of MW6-02 however, the medium grained sand layer overlies a sand and gravel layer. The till generally ranges from 1 to 4 meters in thickness and approaches 10m thick in locations; however, not all boreholes were fully penetrating. In 2020, a series of 9 bedrock probes were advanced along the trail to the north of the fill area to aid the interpretation of groundwater movement. Copies of borehole logs are presented in Appendix B.

The monitoring well installations were completed by means of a soil drill rig using hollow-stem augers to permit routine split-spoon sampling and subsequent monitoring well installations. Boreholes were equipped with a standpipe assembly, comprising a 50mm diameter, flush-jointed PVC riser pipe and 1.5m or 3.0m PVC screen (depending on final well depth). The annulus opposite the screened interval was backfilled using silica filter sand and sealed with bentonite hole plug.

To determine background water conditions and to assess the potential effects of landfill leachate on groundwater quality, water samples have been collected and analytical data is available for a single sampling event completed in 2002 and for the sampling events (twice annually) conducted from 2004 - 2020. Water samples from a pooling of water southwest of the fill area have also been collected and analyzed historically.

3.0 SITE SPECIFIC CONDITIONS

The Blind River waste disposal site is located within the physiographic region known as the Canadian Shield Forest Lands with landscape consisting of undulating terrain with relatively thin overburden and occasional rock outcrops. Lakes and poorly drained wetland areas are common in the area. As shown on Ontario Geological Survey Map 5008, the waste disposal site is located within a ground moraine landform (subordinate landform is outwash plain, valley terrain) consisting of sandy till material bound by bedrock ridges. The area is underlain by bedrock and the site location appears on Map 5008 to be identified as a sand/gravel pit.

3.1 Drainage

The site is located in an area having moderate local relief with wet and dry drainage conditions. Topographically, the land surface gradually slopes in a south/southwesterly direction toward Highway 17 and ultimately to Lake Huron (Drawing 1).

The terrain to the east and north of the waste disposal site fill area is at higher elevations than to the west and south. Surface water runoff that may be generated from graded and capped areas of the fill area would flow beyond the toe of slope and disperse in accordance with the localized topography. Surface water runoff from areas adjacent to the fill area would flow in a similar manner. In general, the topography of areas immediately downstream of the fill area toe of slope have been graded to promote drainage away from the fill area. Once beyond the toe of slope and fill area buffer, surface water runoff flows in a south westerly direction toward the Highway 17 right-of-way.

No drainage channels or conveyance structures have been constructed by the Town to formally manage surface water flow originating from the Site. A ditch was constructed to the west of the fill area a number of years ago in connection with development of the adjacent solar farm. Along the south limits of and 55m beyond the toe of the fill area, what may have been an historically constructed drainage channel has apparently been impacted by previous fill and/or grading operations impeding flow at locations and creating localized ponding areas (SW4 and SW5). Considering their depth, leachate seeps may also contribute to these ponding areas. Under conditions where the volume of surface water allows (e.g. spring freshet), water flows in a westerly direction in this channel.

Water that ponds at a location roughly 80m beyond the southwest corner of the fill area (SW1) had historically been interpreted to be leachate impacted surface water and expressed groundwater from the fill area. With the construction of drainage works associated with the solar farm to the west of the Site, a drainage ditch was constructed that directs surface water runoff toward the northwest corner of the fill area. This water then flows in a southerly direction adjacent to the west limit of the fill area into the ponded area near the southwest corner of the fill area. Seasonally, water has been observed to overflow the ponded area and flow overland along an access road and into the adjacent low area to the southwest where it infiltrates to the groundwater system.

In the event that surface water overflows from the proposed infiltration basin, a ditch south of the proposed spillway (i.e. Drainage Ditch 2) will direct the overflow towards the adjacent low area to the

southwest, via a culvert beneath the existing gravel road, where it will infiltrate to the groundwater system.

There are no direct surface water flow channels/ditches from the waste disposal site to either SW2 or SW3 and both locations were excavated / constructed in connection with development of these adjacent properties. SW2 is a depression that was excavated to an elevation that is apparently below the water table. SW3 is located within a drainage ditch that collects surface water runoff from locations within the solar farm and contractor's yard and conveys it to a location within the Highway 17 right-of-way, west of the contaminant attenuation zone (CAZ) limit. Water is not always available for collection from SW3, dependent upon antecedent conditions.

Water ponds in a low area located roughly 120m west of the southwest corner of the CAZ. Situated between the Highway 17 right-of-way to the north and railway tracks to the south, natural drainage from this area appears to be impeded by the rail line. A highway cross culvert conveys water to this area from the north side of Highway 17. The potential for surface water at the wetland to be impacted by waste disposal site operations is considered to be low noting its upgradient contributors, similar to and including the SW3 drainage ditch.

3.2 Overburden

Auger drilling completed during monitoring well installation indicates the presence of sandy and gravelly deposits over bedrock with the occurrence of cobbles and silt. The coarse-grained (sand and gravel) overburden enables the downward flow of water and contaminants, consequently providing limited protection to the overburden aquifer from surface sources of contamination. Overburden in the area of the site can be but is typically not a local source of drinking water.

Stratigraphic sections were prepared from the borehole information to interpret the distribution of the overburden formations beneath the study area and are shown in on Drawing 3 in Appendix A.

3.2.1 Hydraulic Conductivity

Hydraulic conductivity testing was conducted via a slug test (falling head) completed on a monitoring well constructed at the MTO patrol yard south of the waste disposal site and Highway 17. The well was constructed and tested by Terraprobe[1] in 2002 and is screened in the local sand and gravel unit. The test results estimated a hydraulic conductivity of 2×10^{-6} meters/second; copies of the Hvorslev calculation sheet are included in Appendix D.

3.3 Bedrock

The bedrock in the Blind River area dates to the Late Precambrian Huronian period and the site is located near the contact of the Elliot Lake, Hough Lake and Quirke Lake Groups and the Cobalt Group. Auger refusal was encountered at depths of:

[1] Terraprobe. September 30, 2002. Monitoring Well Installation and Sampling Program, MTO Patrol Yard, Blind River, ON.

- 2.9m (BH1-02), 4.0m (MW5-02) and 7.2m (MW6-02);
- 2.3m (MW2-03);
- 2.3m (MW2-15); and,
- 5.5m (MW4-15).

Bedrock probes advanced along the trail north of the fill area in 2020 encountered refusal at depths ranging from 1.2m to 4.0m. The probing program confirmed the existence of an apparent bedrock ridge that serves as a restriction to flow in northerly and easterly directions from the fill area. Area bedrock is of relatively low permeability and effectively forms the base of the local groundwater flow system.

3.4 Groundwater Recharge

Reasonable Use calculations described in Section 4.0 were completed assuming an annual groundwater recharge rate of 250mm/year in keeping with the Ministry of the Environment and Climate Change (MECP) approach. It is likely, though, that the annual water surplus available to infiltrate to the groundwater system exceeds this value.

3.5 Groundwater Movement

Groundwater contours interpreted using water table elevations determined in the spring and fall of 2020 are shown on Drawings 4A and 4B (Appendix A). From these contours, the potentiometric surface (Drawing 5) is interpreted to slope toward the southwesterly from the fill area.

Referencing the water table elevations noted on Drawings 4A and 4B, lateral groundwater gradients from the fill area (MW2-02) to the Highway 17 right-of-way (MW6-02) were estimated to be 0.022 (spring 2020) and 0.023 (fall 2020). Upward vertical gradients of 0.07 and 0.09 were determined using spring and fall 2020 water level data obtained from monitoring wells MW3-02 and MW6-02. Both of these wells are located within a topographically low-lying area.

Considering the above, precipitation infiltrating the existing and proposed fill and catchment areas is expected to move through surficial formations to the groundwater transmission zone, being the underlying sand and gravel formation. Available information implies that groundwater is moving westerly and southerly from the fill area.

3.6 Groundwater Velocity

Groundwater movement is influenced by the hydraulic conductivity and the prevailing hydraulic gradients of the transmitting formations and may be estimated by the following Darcy flow equation:

$$v = \frac{ki}{Sy}$$

where: v = groundwater velocity (L/t)
k = hydraulic conductivity (L/t)
i = hydraulic gradient, dimensionless
Sy = specific yield, dimensionless (estimated to be 0.3)

At the calculated lateral gradients (see Appendix C), the groundwater may move approximately 4.6 meters per year within the predominantly sand and gravel overburden. The travel time for a leachate plume originating at the proposed (expanded) fill area to reach the downgradient site boundary (limits of proposed CAZ is estimated to be in the range of 115 years (roughly the year 2135).

These conditions are expected to be similar throughout the limits of the CAZ calculated in Section 4.3 and delineated on Drawing 6 in Appendix A.

3.7 Groundwater Quality

Groundwater samples have been collected and analyzed since 2002 from the monitoring wells constructed in 2002 and starting in the year of their construction for the remaining monitoring wells. Median concentrations of selected indicator parameters, including data up to and including the 2020 spring and fall sampling events, are shown in Table 1. Associated Ontario Drinking Water Quality Standard (ODWS) values are also shown in Table 1, where available.

Analytical results are reviewed and reported on annually and have been interpreted to indicate that a leachate plume originating at the landfill is impacting groundwater quality to the extent that some parameters exceed Reasonable Use concentrations. Certificates of Analysis for the 2020 spring and fall sampling events are presented in Appendix D.

3.7.1 Drinking Water Well Inventory

There is 1 well within 500m of the site boundary, located at the MTO patrol yard south of the site and south of Highway 17. The well is no longer used for consumption, however, as the Town provided a service connection to the municipal drinking water system in the early 2000's. All adjacent and downgradient developed properties are serviced with municipal drinking water.

Table 1: Median Concentrations of Selected Leachate Indicator Parameters

Parameter	Monitoring Well and Concentration (mg/L)									Representative Range in Leachate[2]
	ODWS	1-02	2-02	3-02	4-02	5-02	6-02	1-03	2-17	
Potassium	NP	1.6	141.5	31.3	12.8	1.5	3.6	20.2	0.9	200-1,000
Sodium	200	6.1	157.00	49.0	29.3	4.0	34.0	53.5	9.1	200-2,500
Calcium	NP	20.6	**220.0**	66.7	32.2	14.2	54.2	26.9	18.2	200-3,000
Magnesium	NP	5.7	**50.4**	16.9	9.8	4.1	14.5	14.6	6.0	50-1,500
Manganese	0.05	**0.06**	**0.54**	**0.31**	**0.30**	0.00	**0.95**	**0.17**	0.00	NP
Chloride	250	0.9	**220.0**	71.5	40.9	0.8	53.7	67.4	8.2	200-3,000
Sulphate	500	12.5	1.6	4.5	1.0	12.3	0.5	0.8	10.6	50-1,000
Alkalinity*	500	74.0	**1160**	313	149.5	9.7	206.5	190	64.9	1,000-10,000
Iron	0.3	0.05	**76.25**	**0.35**	**4.01**	0.02	**19.7**	**5.9**	0.06	50-1,200
Nitrate	10	0.03	0.16	0.12	0.03	0.13	0.11	0.03	0.08	5-40
COD	NP	10.7	208.5	64.7	25.0	10.0	41.0	85.4	129.5	3,000-60,000
Conductivity*	NP	171	2790	813	420	127	553	606	167	NP
TDS	500	95	**1470**	**530**	287	100	349	375	162	5,000-40,000[3]

Notes:
ND – Not Detected; NP – None Provided
Bolded Values exceed ODWS; Shaded and bold values fall within or above representative range in leachate
*Units for alkalinity are mg/L as CaCO3; conductivity are us/cm

[2] Representative Ranges for new landfills *"Integrated Solid Waste Management, Tchobangolous, 1993".*

[3] Representative Range from "The Fate of Landfill Leachate in Waste Water Treatment Plants and in Groundwater at Attenuation Landfills, MOEE, 1994"

3.8 Surface Water Features

As described in section 3.1, what appears to be leachate impacted surface water collects in the ponded area southwest of the fill area (denoted as location SW1). Surface water potentially impacted by leachate seeps south of the fill area is also observed to pond at a location south of the southeast corner (SW4) and southwest of the southeast corner (SW5) of the fill area. This location is potentially an historical drainage channel where flow has been impeded. Under certain flow conditions (e.g. spring freshet) this surface water would flow in a westerly direction toward the pond southwest of the fill area (SW1). During these flow conditions, the pond has historically been observed to overtop as described in section 3.1. This condition seems to have been exacerbated with the direction of flow from the solar farm toward the fill area and, ultimately, into the pond area (SW1). Two additional nearby areas of ponded water are situated within the solar farm development (SW2) and adjacent to a contractor's yard (SW3) With the exception of SW4 and SW5, water samples have historically been collected for analysis from these locations.

3.9 Surface Water Quality

Surface water samples have historically been collected from the pooled water near the southwest corner of the fill area (SW1) twice annually. Sampling has occurred from pooled water at 2 additional locations (SW2 and SW3) situated on the Town-owned parcel of property abutting the westerly landfill site property boundary. It is proposed to commence sampling at SW4, SW5, SW6 and SW7 starting in 2022. Surface water monitoring locations are depicted on Drawing 7 in Appendix A.

Analytical data is available for sample events at SW1 for: fall of 2004, spring/fall of 2005 to 2018 and spring/fall of 2020. Analytical data is available for sample events at SW2/SW3 for: fall of 2018, spring 2020 (SW3 only) and fall 2020. All locations were frozen during the winter 2020 sampling event.

Analytical results are reviewed and reported on annually and have been interpreted to indicate that water quality at SW1 is impacted by waste disposal site operations. It is noted that the water pooling at location SW1 has been characterized in a previous hydrogeological assessment as being expressed groundwater and that it had been suggested the area be filled to eliminate this occurrence. Certificates of Analysis for the 2020 spring and fall sampling events are presented in Appendix D.

Results from the analysis of previous surface water samples from SW2 and SW3 have displayed apparent water quality impacts. There are no direct surface water flow channels/ditches from the waste disposal site to either SW2 or SW3 and both locations were excavated / constructed in connection with activities that developed these adjacent properties.

SW2 is a depression that was excavated to an elevation that is apparently below the water table and, considering that it is situated within the delineated limits of the CAZ, the presence of contaminants originating from the waste disposal site would not be unexpected. There is no apparent inlet to or outlet from SW2 and it may ultimately be advisable to backfill this depression. SW3 is a drainage ditch that collects surface water runoff from locations within the solar farm and contractor's yard and conveys it to a location within the Highway 17 right-of-way. Water is not always available for collection from SW3,

dependent upon antecedent conditions. The potential for surface water at SW3 to be impacted by waste disposal site operations is considered to be low noting its elevation, depth and apparent contributors.

Water ponds in a low area (SW7) located roughly 120m west of the southwest corner of the contaminant attenuation zone (CAZ). Situated south of the Highway 17 right-of-way, a highway cross culvert conveys water to this area from the north side of Highway 17. The potential for surface water at this location to be impacted by waste disposal site operations is felt to be low noting its upgradient contributors, similar to and including the SW3 drainage ditch.

The data in Table 2 presents a comparison of median concentrations of surface water constituents to Provincial Water Quality Standards (PWQO), Canadian Water Quality Guidelines and criteria listed under MECP's *Table A: Assessment Criteria for Waste Disposal Sites, Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water – Technical Guidance Document, 2010*.

Table 2: Median Concentrations of Surface Water Quality Parameters

Parameter	Sample Location and Concentration						
	PWQO	Alternative Assessment Criteria[4]	Units	SW1	SW2	SW3	MW2-02 (source)
Chloride	-	180 (128)	mg/L	85	12.4	15.7	220
Sulphate	-	100 (128)	mg/L	4.6	0.3	7.2	1.6
Phosphorus	0.02		mg/L	**0.055**	**0.038**	**0.023**	0.33
pH	-	6.5-8.5		7.74	7.62	6.66	6.9
Arsenic	5	150	µg/L	1	0.81	0.48	1
Barium	-	2300	µg/L	80	22	16.8	452
Boron	200	3550 (1500)	µg/L	**630**	184	10.5	1290
Cadmium	0.2	0.21 (0.017)	µg/L	0.09	0.057	0.025	0.5
Chromium	-	64	µg/L	0.104	0.65	1.3	4.1
Iron	300	1000	µg/L	**1430**	**1020**	**3595**	76250
Lead	1/3/5	2	µg/L	0.1	0.7	0.18	16.1
Zinc	20	89 (30)	µg/L	6.6	3.1	12	20.5
Copper	1/5	6.9	µg/L	1	1	2.2	2.1
Nitrate	-	[3.0]	mg/L	0.13	0.02	0.07	0.16
Nitrite	-	(0.06)	mg/L	0.1	0.01	0.01	0.20
Conductivity	-	-	µs/cm	1275	298	121.3	2790
TSS	-	-	mg/L	18.6	6.7	32.6	356
TDS	-	-	mg/L	735	221	83	1360
Alkalinity	-	-	mg/L $CaCO_3$	508	133	27.4	1160
Ammonia	-	-	mg/L	21.4	0.04	0.57	77.7
TKN	-	-	mg/L	23.2	0.88	1.1	75.7
Mercury	0.2	(26)	µg/L	0.1	0.005	0.007	4
BOD	-	-	mg/L	3.8	2	2	9.9
COD	-	-	mg/L	78.1	63	47.5	208.5
Phenols	1	40 (4)	µg/L	**9**	**40**	**16**	**13**

Note: *( ) Standard in bracket applies to Canadian Water Quality Guideline criteria; [ ] Standard in bracket applies to British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture*
Bolded values exceed PWQO criteria

The data in Table 3 presents a comparison of average concentrations of surface water constituents to Provincial Water Quality Standards (PWQO), Canadian Water Quality Guidelines and criteria listed under MECP's *Table A: Assessment Criteria for Waste Disposal Sites, Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water – Technical Guidance Document, 2010*. The range of concentrations of surface water constituents is also provided.

[4] *Alternative assessment criteria from "Table A: Assessment Criteria for Waste Disposal Sites Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface water – Technical Guidance Document, MOE, 2010"*

Table 3: Concentration Averages and Ranges for Surface Water Quality Parameters

Parameter	PWQO	Alternative Assessment Criteria	Units	Sample Location							
				SW1		SW2		SW3		MW2-02 (source)	
				Average	Range	Average	Range	Average	Range	Average	Range
Chloride	-	180 (128)	mg/L	103.5	29.86-238	14.7	9.6-21.9	15.7	7.34-24.1	194.3	65-305
Sulphate	-	100 (128)	mg/L	14	0.4-79.6	13.1	13.1	7.5	1.16-13.2	12.73	0.35-167
Phosphorus	0.02		mg/L	**0.085**	0.02-0.31	**0.075**	0.16-0.17	**0.024**	0.02-0.03	0.57	0.17-3.58
pH	-	6.5-8.5		7.73	7.08-8.29	7.68	7.61-7.80	6.66	6.35-6.97	6.97	6.42-7.67
Arsenic	5	150	µg/L	1	0.43-3	0.78	0.49-1.04	0.48	0.28-0.68	1.8	0.94-9
Barium	-	2300	µg/L	80	36.2-146	26	21-35.1	16.8	12.7-20.8	397.1	116-566
Boron	200	3550 (1500)	µg/L	**588**	70.1-1030	190.7	97-291	11	11	1390.6	690-2110
Cadmium	0.2	0.21 (0.017)	µg/L	0.1	0.0071-0.4	0.025	0.006-0.04	0.025	0.024-0.025	334.2	0.2-1002
Chromium		64	µg/L	2.37	0.64-13.3	1.37	0.6-2.87	1.28	1.05-1.51	12.4	2-74
Iron	300	1000	µg/L	**2489**	180-10,800	**1533**	781-2800	**3595**	1360-5830	73,122	282-198,000
Lead	1/3/5	2	µg/L	1.7	0.061-11.1	0.46	0.061-1.25	0.18	0.14-0.22	16.1	6.2-26
Zinc	20	89 (30)	µg/L	11	1-43	7.95	3.1-12.8	12	3.8-20.2	265.9	1.5-3670
Copper	1/5	6.9	µg/L	2	0.54-11.5	2.95	2.95	2.15	2.04-2.26	12	1-64
Nitrate	-	[3.0]	mg/L	0.43	0.05-2.06	0.056	0.056	0.07	0.032-0.11	0.15	0.041-0.32
Nitrite	-	(0.06)	mg/L	0.13	0.01-0.41	ND	ND	ND	ND	0.19	0.023-0.32
Conductivity	-	-	µs/cm	1143	517-1820	294	252-332	121.3	83.6-159	2668	1160-3790
Total Suspended Solids	-	-	mg/L	45.3	2-391	98.4	6.7-190	32.55	14.7-50.4	527.7	150-1900
Total Dissolved Solids	-	-	mg/L	683.7	282-1050	209	168-238	83	80-86	1404.9	1000-2580
Alkalinity	-	-	mg/L $CaCO_3$	464.2	198-678	133	121-146	27.4	24.3-30.5	1228.9	800-1650
Ammonia	-	-	mg/L	18.6	2.61-32.5	0.22	0.017-0.62	0.57	0.26-0.87	82.1	0.02-179
TKN	-	-	mg/L	20.1	4.27-35.1	1.2	0.8-1.93	1.1	0.94-1.25	79.8	9.2-145
Mercury	0.2	(26)	µg/L	**0.46**	0.03-0.9	0.17	0.17	0.007	0.0054-0.0085	4	0.066-8
BOD	-	-	mg/L	5.8	2.6-21.9	5.8	5.8	ND	ND	11.9	5-47
COD	-	-	mg/L	80.8	45-150	74	48-111	47.5	33-62	400.5	66-6350
Phenols	1	40 (4)	µg/L	**11**	1.3-42	**40**	40	**30**	30	14.3	1-46

Note: *( ) Standard in bracket applies to Canadian Water Quality Guideline criteria; [ ] Standard in bracket applies to British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture*
Bolded values exceed PWQO criteria

4.0 LANDFILL IMPACT

The existing site operates as a natural attenuation landfill where the gases and leachate produced by the refuse are discharged to the natural environment without the need for engineered control and treatment facilities. It is proposed that the expanded fill area would also operate in this manner. The current approved volume of the exiting site is 117,848m^3 with the expansion accommodating 201,203m^3 of municipal solid waste and daily/interim cover material (20% allowance) and an additional 7,041m^3 (dry volume) of biosolids.

4.1 Landfill Gases/Odour

The existing and proposed fill areas incorporate below grade disposal and above grade landfilling to a final top of fill elevation of 223m. It is expected that refuse-derived gases should be readily attenuated by natural venting through the refuse capping and within the adjacent 30m unsaturated buffer zone.

Odours may be an occasional nuisance for distances of a few hundred meters, but should be manageable by adherence to proper landfilling procedures. The nearest residence is located more than 700m from the site and is not expected to be adversely impact by landfill odours.

4.2 Leachate Generation

Leachate is produced when precipitation infiltrates through the landfill cover and underlying waste material causing contaminants to leach into solution. Landfill leachate would most significantly be generated during the seasonal water-surplus periods when precipitation and/or snow melt infiltrate into the landfill. Assuming a recharge of 250mm/yr, approximately 9.5L/min of leachate would be produced through the existing 2ha fill area (5,000m^3 per year). This estimate of leachate produced would double with the proposed 2ha fill area expansion.

4.2.1 Chloride Strength

Chloride strength varies according to several factors, including the method and rate of disposal, infiltration of precipitation, degree of groundwater mounding and the specific refuse composition. Long term quality sampling of moderate-sized Ontario landfills suggests that the chloride concentration may range from about 100 mg/l to over 1000 mg/l, dependent in part on the number of refuse lifts. Over the past several years of groundwater quality monitoring at the existing Blind River waste disposal site, the maximum chloride concentration was determined to be 305mg/L.

Applying a method described by Gehrels and Puumala (2000)[5] to approximate the anticipated chloride concentration in landfill leachate generated at Northern Ontario landfill sites, a concentration of 775mg/L is developed for the existing fill area, increasing to 980mg/L including the expansion area. Calculations are presented in Appendix C.

[5] Gehrels, J. and M. Puumala. 2000. A Method for Predicting Chloride Concentrations in Leachate at Natural Attenuation Landfills in the Precambrian Shield Regions of Ontario, Canada. Groundwater Monitoring and Remediation, Summer 2000. Pp. 169-176.

The leachate chloride strength used in the attenuation calculations for the existing and proposed fill areas, as described in the following subsections, are 775mg/L and 980mg/L, respectfully.

4.3 Leachate Attenuation

Several processes are locally available to attenuate leachate including:

1. Dilution by groundwater underflow;
2. Dilution by infiltrating precipitation on the adjacent downgradient lands;
3. Adsorption onto the soils beneath and downgradient from the landfill; and,
4. Chemical and biological transformations in the underlying groundwater system.

As adsorption and bio-chemical attenuation cannot be reliably quantified, dilution is relied on as the attenuation mechanism when assessing what water quality impacts may occur within the groundwater system downgradient of the proposed landfill.

Natural attenuation landfill assessments are typically focused on demonstrating that adequate dilution is perennially available to decrease the surrogate landfill contaminant. The assessment described herein considers the fate of chloride as a non-reacting, mobile leachate constituent, it is also assumed that other less mobile and/or more reactive leachate constituents would be attenuated to acceptable levels. Historically, such assessments have been accepted by the Province, provided that routine water quality monitoring is undertaken to promptly detect adverse quality variations resulting from the landfilling operation, and provided that mitigation measures are implemented before unacceptable quality conditions occur at the downgradient property or CAZ boundary.

To comply with MECP requirements, acceptable groundwater quality must be maintained as assessed by applying the Reasonable Use concept. The Reasonable Use concept requires that the concentration of specific constituents at the downgradient site boundary must be less than their maximum permissible Reasonable Use concentration. Reasonable Use concentrations are calculated using the following equation from the MECP's Reasonable Use Guideline B-7.

$$Cm = Cb + x(Cr - Cb)$$

where: Cm = Reasonable Use concentration (mg/L)
Cb = background concentration (mg/L)
Cr = maximum drinking-water concentration of a particular parameter (mg/L)
x = factor, 0.5 for aesthetic and 0.25 for health-related parameters

At the median background concentration of 0.87mg/L (considering all available groundwater quality data from MW1-02), the maximum allowable chloride concentration is calculated to be about 125.4mg/L at the downgradient boundary of the CAZ.

In accordance with the method described in MECP Procedure B-7-1 "*Determination of Contaminant Limits and Attenuation Zones*", the maximum concentration of chloride originating from the disposal site

that can be permitted to reach the site boundary and not cause the Reasonable Use concentration to be exceeded is determined applying the following relationship:

$$Cw = Cm - Cp - Co$$

where: Cw = Maximum concentration originating from disposal site (mg/L)
Cm = Reasonable Use concentration (mg/L)
Cp = Background concentration (mg/L)
Co = Potential increase from other sources (mg/L)

As the site is remote from other development, it is assumed that a no additional chloride inputs would occur. The maximum concentration of chloride originating from the disposal site that can be permitted to reach the site boundary is thus estimated to be 124.0mg/L.

The size of the required CAZ was determined to be about 10.4 hectares for the existing fill area and 27.5 hectares for the expanded fill area by applying the equation:

$$CAZ = \frac{A * (C - Cm)}{(Cm - Cb}$$

where: CAZ = Contaminant Attenuation Zone (ha)
A = Fill Area (ha)
Cm = Reasonable Use concentration (mg/L)
Cb = Background concentration (mg/L)

It is estimated that the leachate plume will gradually advance through the CAZ (see Drawing 6), eventually discharging beyond the CAZ boundary some 115 years from the initiation of site development. It is expected that contaminant attenuation mechanisms will reduce the concentration of critical contaminants to below Reasonable Use concentrations prior to the plume advancing beyond the CAZ boundary.

Although the analysis described herein indicates that acceptable water quality impacts are expected, effective control of surface water so as to not direct surface water onto the fill area and progressive capping of completed portions of the landfill must be incorporated in the Design and Operations Report. The goal of these tasks is to reduce the water available as well as potential groundwater mounding to minimize contact time between the waste and groundwater in an effort to minimize leaching.

4.4 Surface Water Management

As identified in the MECP "Landfill Standards" (June 2010, revised 2012), "surface water control at a landfilling site is required to ensure drainage onto or leaving the site does not adversely affect site operations, on-site surface water or surface water in the vicinity of the site." The overall objective of the surface water management plan is to meet the requirement identified in the Landfill Standards and to maintain the existing surface water and groundwater systems. As the proposed landfill site relies on

natural attenuation to comply with MECP requirements, infiltration of all surface water runoff originating from the site is accommodated in the surface water management system design.

All of the surface water management system components will remain within the originating drainage basin so as to not impact the local water budget. The system will incorporate infiltration ditches/swales and infiltration basins to:

1. Collect surface runoff from the landfill area;
2. Intercept surface water runoff from adjacent upgradient areas prior to flowing onto the fill area;
3. Provide storage capacity;
4. Promote infiltration; and
5. Reduce the potential for on-site erosion.

The approach used to develop the surface water management facilities is consistent with the approaches described in the MECP publication “Stormwater Management Planning and Design Manual (March 2003)”.

5.0 MONITORING/MITIGATION

Given complexities of interpreting groundwater systems, once operating, a natural attenuation landfill may function differently than anticipated and/or a constituent other than chloride may be identified as the critical contaminant. Accordingly, it is essential to develop and implement a comprehensive groundwater and surface water monitoring program to monitor site performance.

5.1 Groundwater Monitoring

Groundwater monitoring comprises an integral component of site operations, with the objectives being to monitor groundwater quality in the overburden aquifer to:

1. Identify and characterize the landfill derived contaminants moving through the overburden aquifer;
2. evaluate the effectiveness of the defined CAZ; and,
3. assess the need for implementation of a contingency plan.

A groundwater monitoring network consisting of fourteen (14) monitoring wells is currently in-place at the landfill site. Monitoring wells MW1-02, MW2-02, MW3-02, MW4-02, MW5-02 and MW6-02 were installed in May 2002 while MW1-03, MW2-03 and MW3-03 were installed in October 2003. In December of 2015, MW2-03 and MW3-03 were both decommissioned and replaced with two (2) wells, MW2-15 and MW3-15, installed a short distance away from the original locations. MW1-15 and MW4-15 were also installed in 2015 just north of the fill area. MW1-17 and MW2-17 were installed close to King's Highway 17 in July 2017 south of the fill area. MW1-20 was installed in September of 2020 on the south side of King's Highway 17, approximately 370m west of the landfill access road. Drawing 2 in Appendix A identifies the location of the monitoring wells currently included as part of the site's groundwater monitoring network.

Water levels and groundwater samples will be collected from the entire monitoring well network twice per year including during the maximum and minimum water level conditions (spring and fall). The collected samples are required to be analyzed by a licensed laboratory capable of analyzing for the parameters listed in Schedule 5 of the Ontario Landfill Standards to concentrations below the Reasonable Use criteria. Samples collected from the leachate source monitor will be analyzed for parameters listed under Column 1 of Schedule 5. Samples collected from the remaining monitoring locations will be analyzed for parameters in Column 1 of Schedule 5 once annually and for parameters in Column 2 of Schedule 5 for the remaining monitoring event. In addition to the parameters listed in the referenced Schedules, total cyanide, fluoride, organic nitrogen and hardness will also be analyzed for.

During each monitoring event, field pH, temperature, dissolved oxygen and conductivity will be recorded prior to sampling.

5.2 Surface Water Monitoring

It is proposed to maintain the existing surface water sampling network (SW1, SW2 and SW3) along with the additions of SW4 and SW5 as well as a background location (SW6) and wetland location (SW7) southwest of the landfill as shown on Drawing 7.

Surface water samples will be collected from the entire network four times per year including during the maximum and minimum water level conditions (spring and fall). The collected samples are required to be analyzed by a licensed laboratory capable of analyzing for the parameters listed in Schedule 5 of the Ontario Landfill Standards. Samples collected will be analyzed for parameters identified in Schedule 5, Column 3 of the MECP Landfill Standards. Detection limits for the water quality analysis will be lower than the Provincial Water Quality Objectives (PWQOs) or the Canadian Water Quality Guidelines (CWQG), whichever is more recently published. In addition to the parameters listed in the referenced Schedules, manganese, zinc, hardness and DOC will also be analyzed for.

During each monitoring event, field pH, temperature, dissolved oxygen and conductivity will be recorded prior to sampling.

Surface Ponding Locations

The existing sampling locations, described below, will continue to be monitored:

- SW1 (formerly SW) is sampled approximately 80m southwest of the fill area where surface water pools. As has been interpreted in the past, groundwater may also express at this location.
- SW2 is sampled approximately 330m southwest of the fill area adjacent to the solar farm development from a depression that was excavated to an elevation that is apparently below the water table.
- SW3 is a drainage ditch located approximately 440m southwest of the fill area that collects surface water runoff from locations within the solar farm and contractor's yard and conveys it to a location within the Highway 17 right-of-way, west of the CAZ.

The following new sampling locations will be established:

- SW4 and SW5 are ponding areas at locations approximately 95m south of the southeast corner (SW4) and 110m southwest of the southeast corner (SW5) of the fill area, respectively. Both of these locations may contain surface water potentially impacted by a leachate seep(s).
- SW6 will be established as a background monitor and is located approximately 250m north of the fill area.
- SW7 is ponded water in a low area located southwest of the landfill site and south of the Highway 17 right-of-way.

Sampling locations SW1 to SW7 are shown on Drawing 7 of Appendix A.

Surface Water Management Infrastructure

Following construction of surface water management infrastructure, and if at the time of sample collection water is observed within any such infrastructure, samples from these locations will also be collected. Samples collected will be labeled with unique identifiers and their locations documented for inclusion in the annual report.

5.3 Trigger Mechanisms

5.3.1 Groundwater

In order to develop a list of trigger parameters, median concentrations in leachate and ambient (background) groundwater should be compared. The ratios of concentrations in groundwater from source (leachate) monitor MW2-02 and background monitor MW1-02 will be determined to identify the trigger parameters. This will be completed on an annual basis during preparation of the required annual report. Specific trigger parameters are expected to remain consistent; however, they may change from year to year as the assessment is based on ratios of median values of analytical results that are, by their nature, variable.

Site-specific trigger concentrations, developed based on MECP's Reasonable Use Concept (RUC, Guideline B-7) and described in Procedure B-7-1, will be established for the trigger parameters as determined above. Trigger concentrations will be established as the 75th percentile RUC values, calculated using the 75th percentile background concentration using the 10 most recent sampling results, for each trigger parameter.

In addition to the assessment described above, groundwater quality in monitoring wells closest to the wetland on the south side of Highway 17 (ex. MW1-20) will be assessed considering compliance with the PWQO or CWQG, whichever is more recently published.

5.3.2 Surface Water

To assess compliance with water management policies and to monitor the effectiveness of contingency plans (if implemented), a surface water trigger mechanism plan has been developed. Specifically:

- Policy 1 – In areas which have water quality better than Provincial Water Quality Objectives, water quality shall be maintained at or above the PWQO.

- Policy 2 – Water quality which does not meet PWQOs shall not be degraded further and all practical measures shall be taken to upgrade water quality to the objectives.

Trigger parameters are the leachate indicator parameters identified in Schedule 5, Column 3 of the MECP Landfill Standards and will be assessed on an annual basis.

Trigger concentrations are equivalent to the 75th percentile values calculated using the 10 most recent background surface water quality sample results (or all available data until 10 sample events have been completed) from the proposed background sampling location (SW6).

5.4 Trigger Mechanism Plan

The objective of the trigger mechanisms plan is to monitor the potential impact(s) to groundwater and surface water and to establish a structured approach to verifying potential impact(s) and confirming the need to implement the contingency plan to mitigate such impact(s).

The trigger mechanisms plan is comprised of the following 3 tiers:

- Tier I – Annual routine monitoring program;
- Tier II – Intensive monitoring program; and,
- Tier III – Compliance monitoring program.

Tier 1 – Annual Routine (Alert) Monitoring Program

Routine monitoring at the Site will include the collection of samples from the groundwater and surface water monitoring networks. If a trigger parameter exceeds its trigger concentration (groundwater and/or surface water) or PWQO and CWQG (including monitoring wells closest to the wetland on the south side of Highway 17) on three (3) consecutive sampling events, the MECP shall be informed and an investigation into the cause and the need for implementation or remedial contingency actions shall be carried out. Tier 2 level monitoring will be initiated.

Tier 2 – Intensive (Confirmation) Monitoring Program

Tier 2 is confirmatory monitoring which includes: an increased sampling frequency; a review of supplemental analytical results to confirm the degree and nature of the exceedance; and, discussions with concerned parties.

When Tier 2 is activated, the collection and analysis of samples would be required on a monthly basis, for a period of six (6) months (subject to winter accessibility and ice conditions), from both the background monitoring location and the location where the Tier 1 exceedance(s) occurred. Tier 2 monitoring is conducted to facilitate an assessment of whether an observed exceedance is due solely to landfill impact or is partly or wholly caused by other influences.

If Tier 2 monitoring confirms that the exceedance is related to landfill operations discussions will be held between the Town, the Town's consultant, and the MECP to determine whether implementation of the Contingency Plan is warranted. This discussion should occur 8 months following the implementation of Tier 2 in order to allow for 6 months of intensive (confirmation) sampling plus preparation and submission of an assessment report to MECP. The discussions will define the optimum course of action and review contingency measures available to the Town (e.g. progressive closure and capping). If the MECP confirms that the Tier 2 monitoring indicates an unacceptable impact to the groundwater and/or surface water, the Contingency Plan will be implemented in concert with the Tier 3 monitoring program.

Tier 3 – Compliance Monitoring Program

The Tier 3 compliance monitoring is designed to assess the effectiveness of any contingency measure implemented following the Tier 2 assessment. Specifics of the Tier 3 program details would be determined in conjunction with the development and implementation of the preferred contingency plan. The compliance monitoring trigger parameters, concentrations, locations and monitoring frequency would also be determined at that time.

5.5 Potential Contingency Measures

In general, the Contingency Plan involves the identification, assessment and application of alternative remedial measures to limit the generation and off-site migration of leachate-impacted groundwater and

surface water. The alternative measures will ultimately be influenced by the degree, nature, and sources(s) of and exceedance and include, but are not be limited to:

1. Grading and application of a low-permeability cover material to reduce infiltration through the fill areas that have reached final contours;
2. Cover and/or cap areas of historical fill and shape to promote surface drainage away from the disposal area thus reducing potential leachate production;
3. Repair/properly maintain surface water management facilities as needed;
4. Increase the size of the CAZ; and,
5. Engineered measures/facilities (e.g. leachate collection and treatment) if conditions require.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were derived from the hydrogeological and surface water assessment:

1. The landfill site (existing and proposed fill areas) is located within a ground moraine that is largely comprised of permeable coarse-grained sand and gravel that ranges in thickness from 1 to 4 meters, but can be up to 10 meters in some locations.

2. Borehole logs recorded during monitoring well construction and results from rock probing suggest that a Precambrian bedrock ridge is present to the north and east of the fill area, effectively restricting groundwater flow in these directions.

3. Lateral groundwater and leachate movement is interpreted to advance southwesterly within the overburden based on elevations recorded within the groundwater monitoring network during spring and fall sampling events conducted since 2002

4. Considering the measured hydraulic gradients and the interpreted hydraulic conductivities of the predominant formation, the groundwater (and ultimately the leachate) velocity within the underlying saturated formations may be a moving laterally at a rate of approximately 4.6 meters per year. Vertical velocity was calculated to be 1.7 meters per year.

5. The assessment described in this report identifies that groundwater traveling southwest from the expanded site would require a minimum 27.5 hectare CAZ to attenuate the design chloride concentration, from the expanded fill area, to a concentration meeting the Reasonable Use requirement. Additional dilution may be available from contributions to groundwater flow from surrounding lands (i.e. underflow) although it is expected that this would be minimal.

6. Routine water-level/water-quality monitoring will be required to demonstrate compliance with the Reasonable Use concept downgradient from the site. Findings from the monitoring program should continue to be documented in an annual report for submission to the MECP.

7. Should groundwater quality exceedances be verified by the trigger mechanisms and, if required, contingency measures may involve the acquisition of additional downgradient lands and/or entering into agreements allowing the establishment of the CAZ beneath private/Crown lands.

The following recommendations are presented for the Town's consideration:

1. The monitoring program, trigger mechanism plan and contingency plan described in this report should be accepted and implemented by the Town to help ensure that the expanded site will operate in conformance with MECP requirements with respect to groundwater quality.

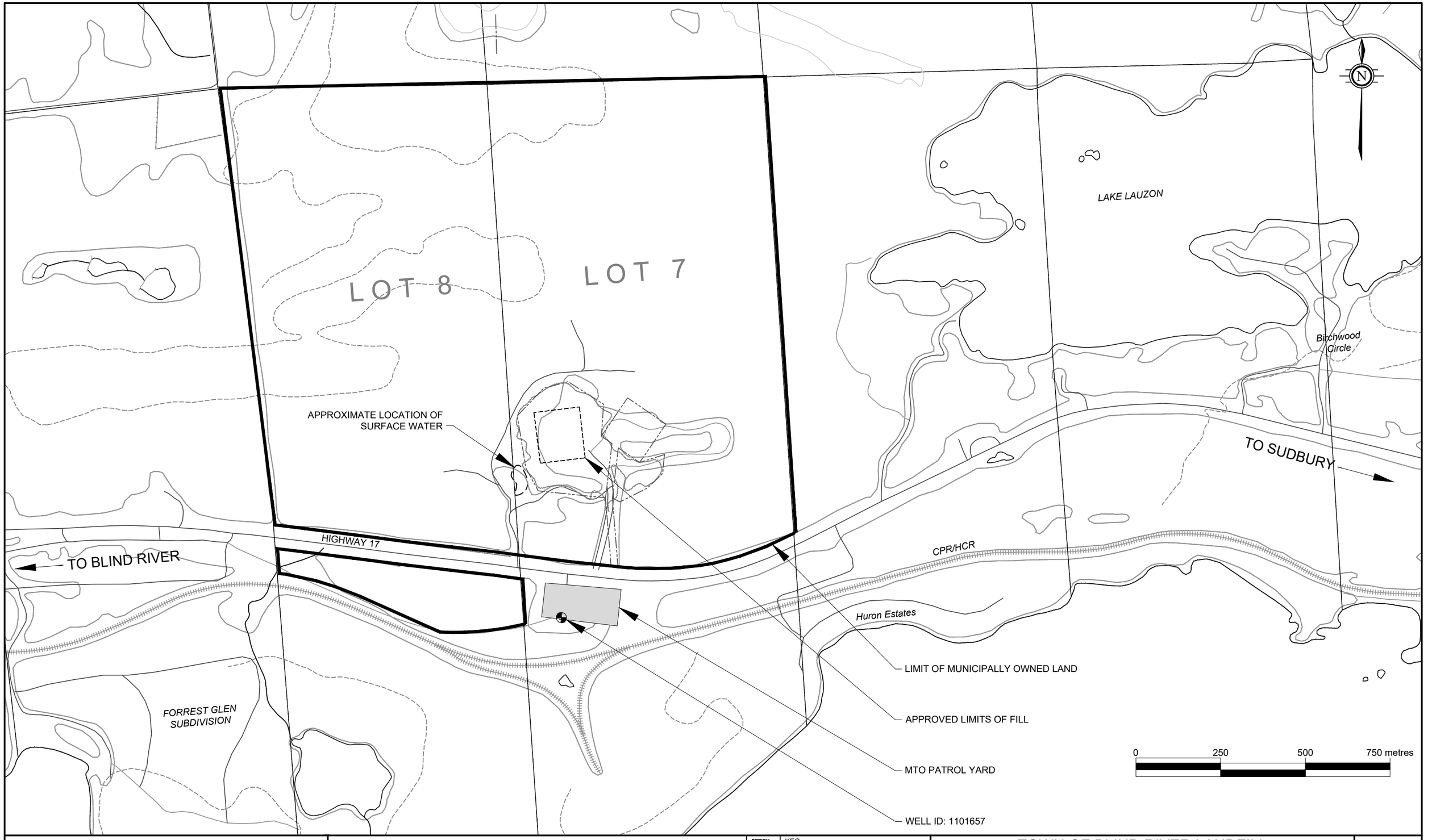
2. This report should be submitted to the MECP along with the Environmental Assessment as well as in partial support of a Part V application under the Environmental Protection Act following EA Act approval.

This report prepared by:
Kresin Engineering Corporation

Ryan Wilson, P.Eng.
Project Engineer

APPENDIX A

REFERENCED DRAWINGS



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NOTES

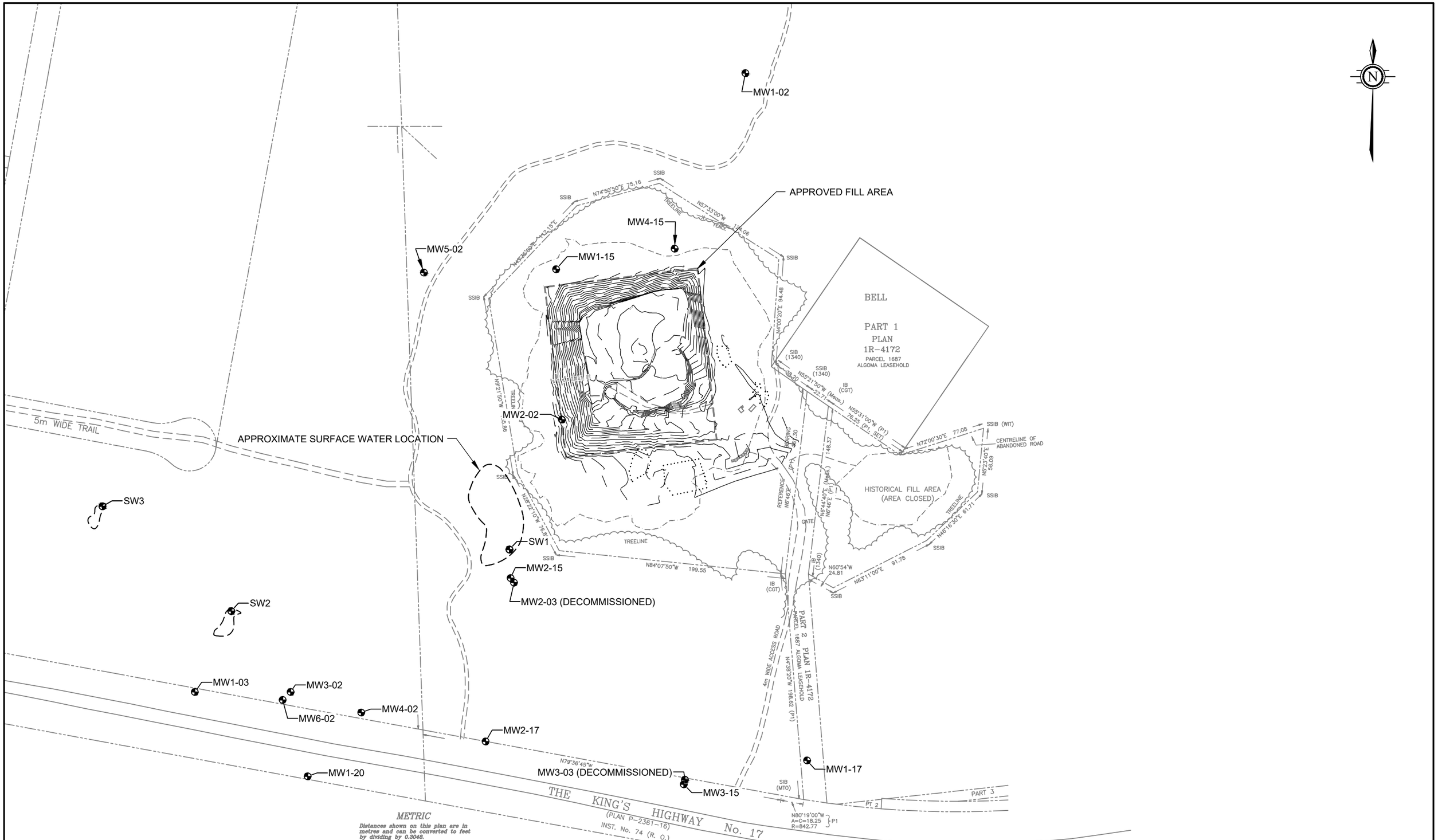
DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 location plan	
SCALE	1:1000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

LOCATION PLAN

1

Rev 0



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NOTES

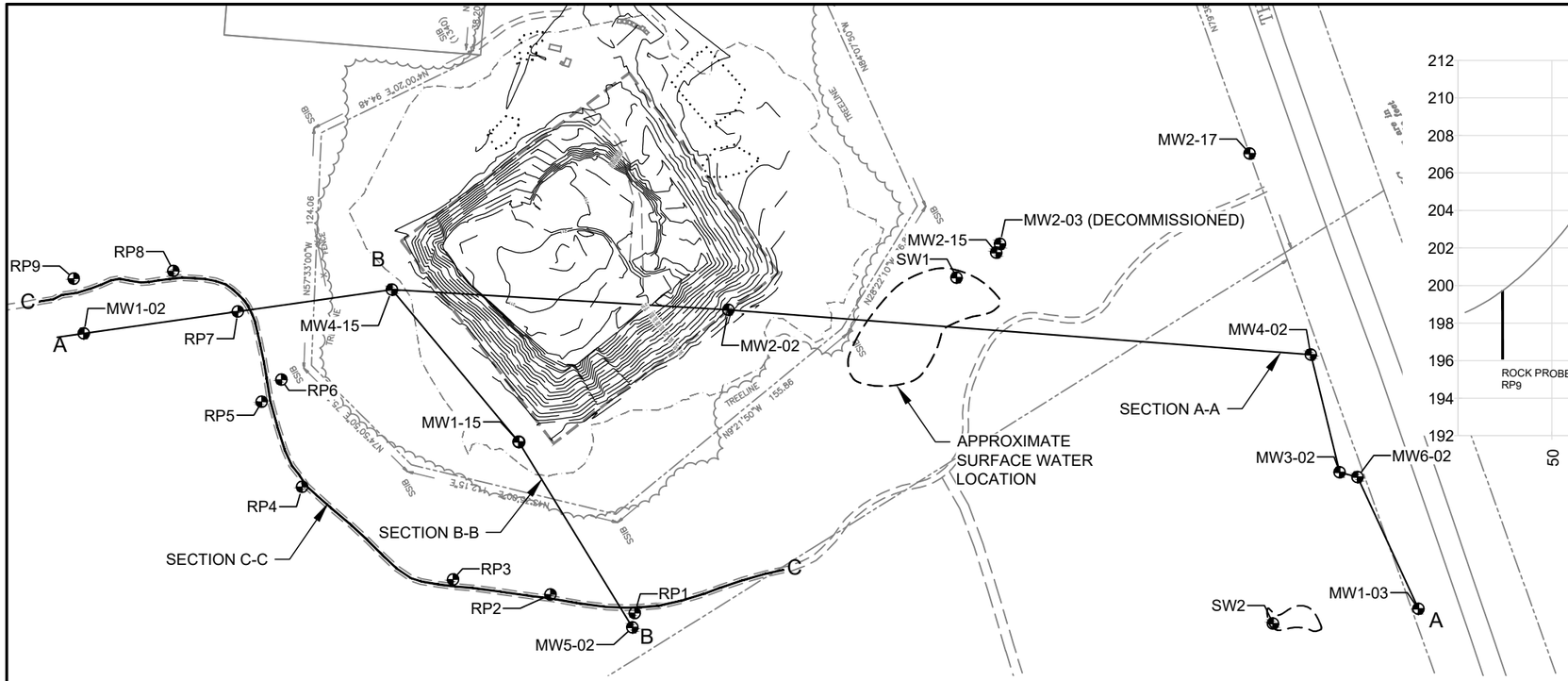
DESIGN		
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 existing monitoring well locations	
SCALE	1:3000	

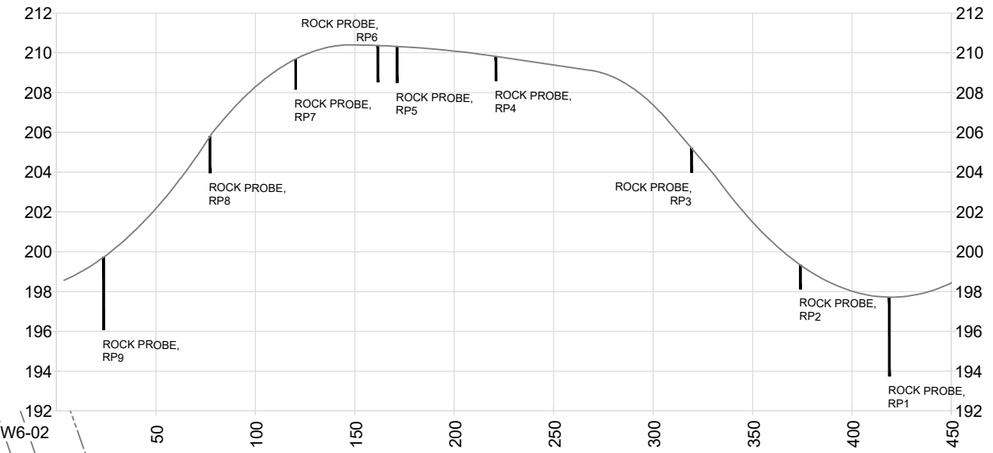
TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

EXISTING MONITORING LOCATIONS

2

Rev 0





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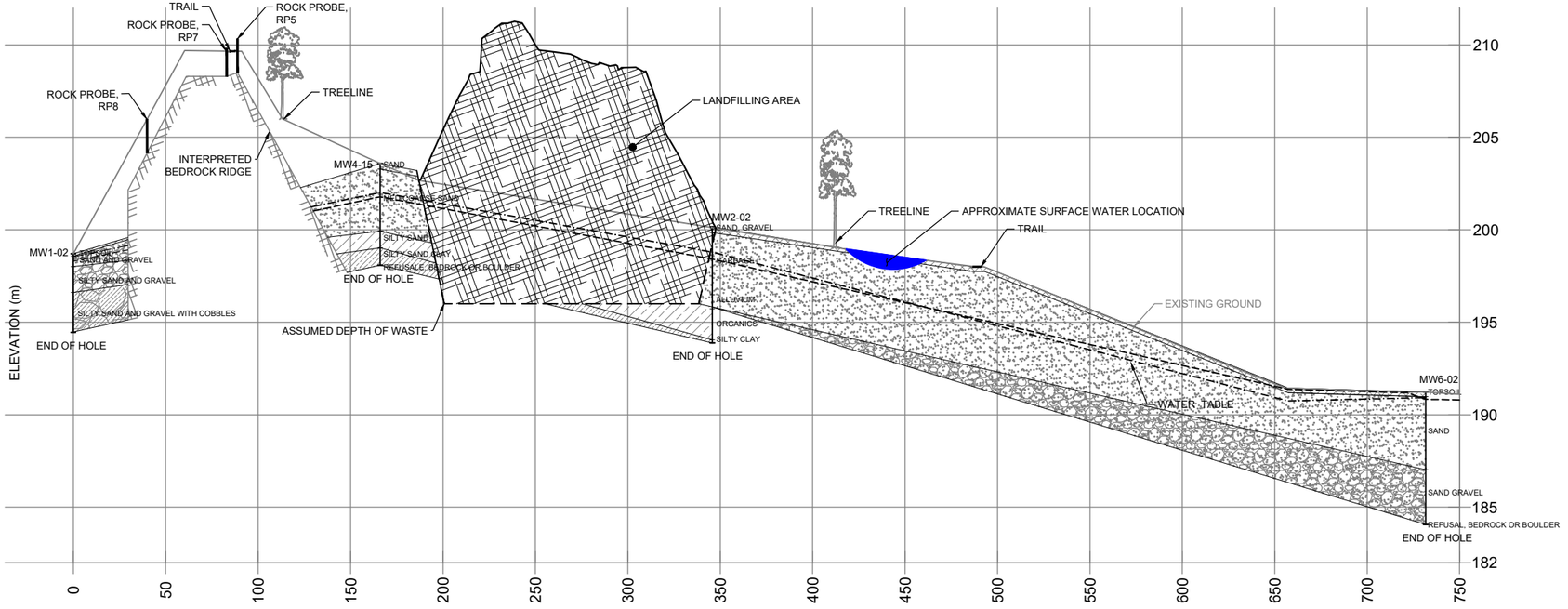

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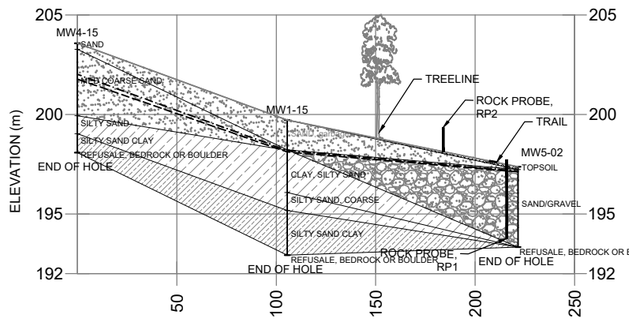


SECTION B-B

SPRING 2020 WATER TABLE

FALL 2020 WATER TABLE

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

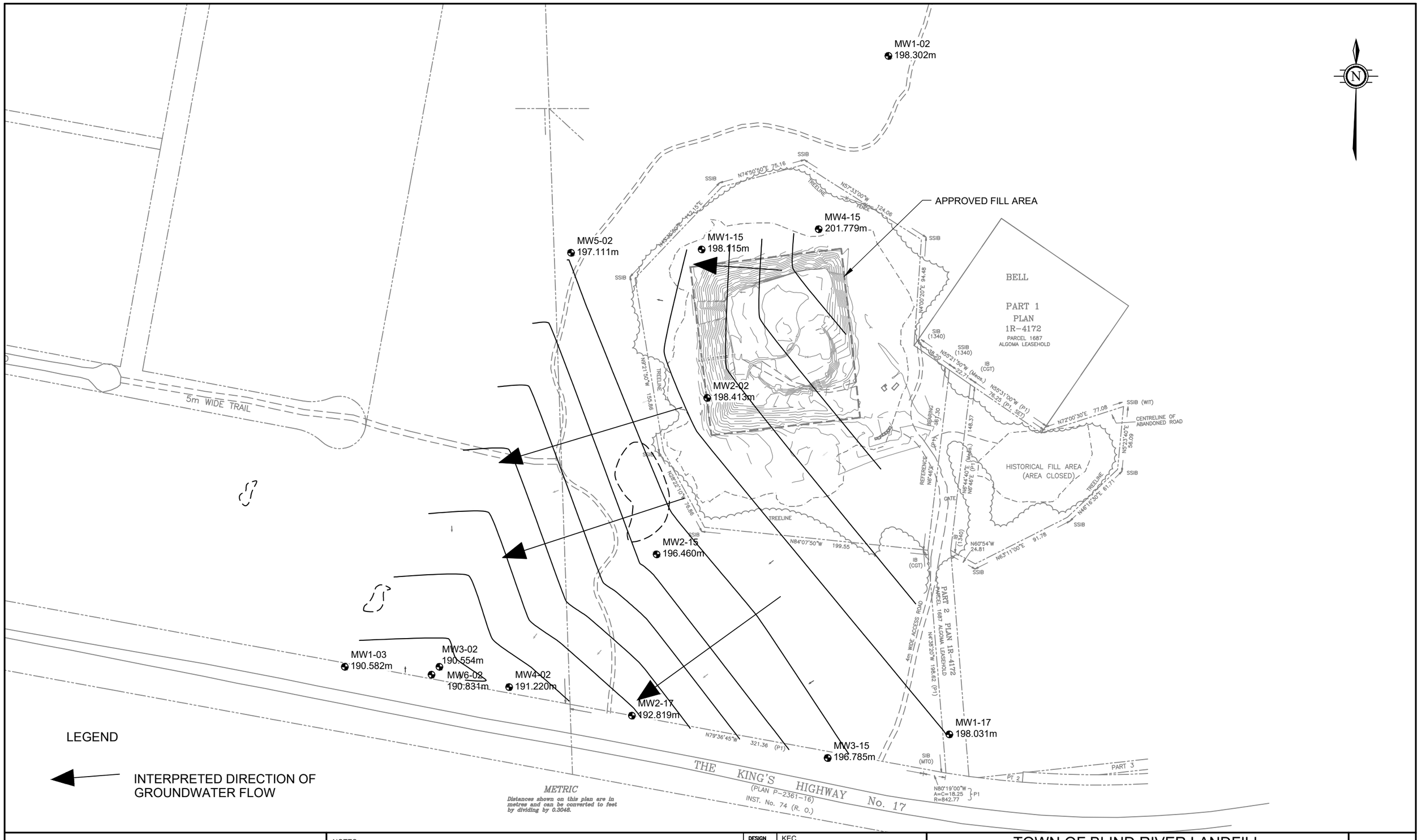
DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 stratigraphic sections	
SCALE	1:3000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

STRATIGRAPHIC SECTIONS

3

Rev 0



KRESIN Engineering Corporation Sault Ste. Marie, Ontario (705) 949-4900

NOTES

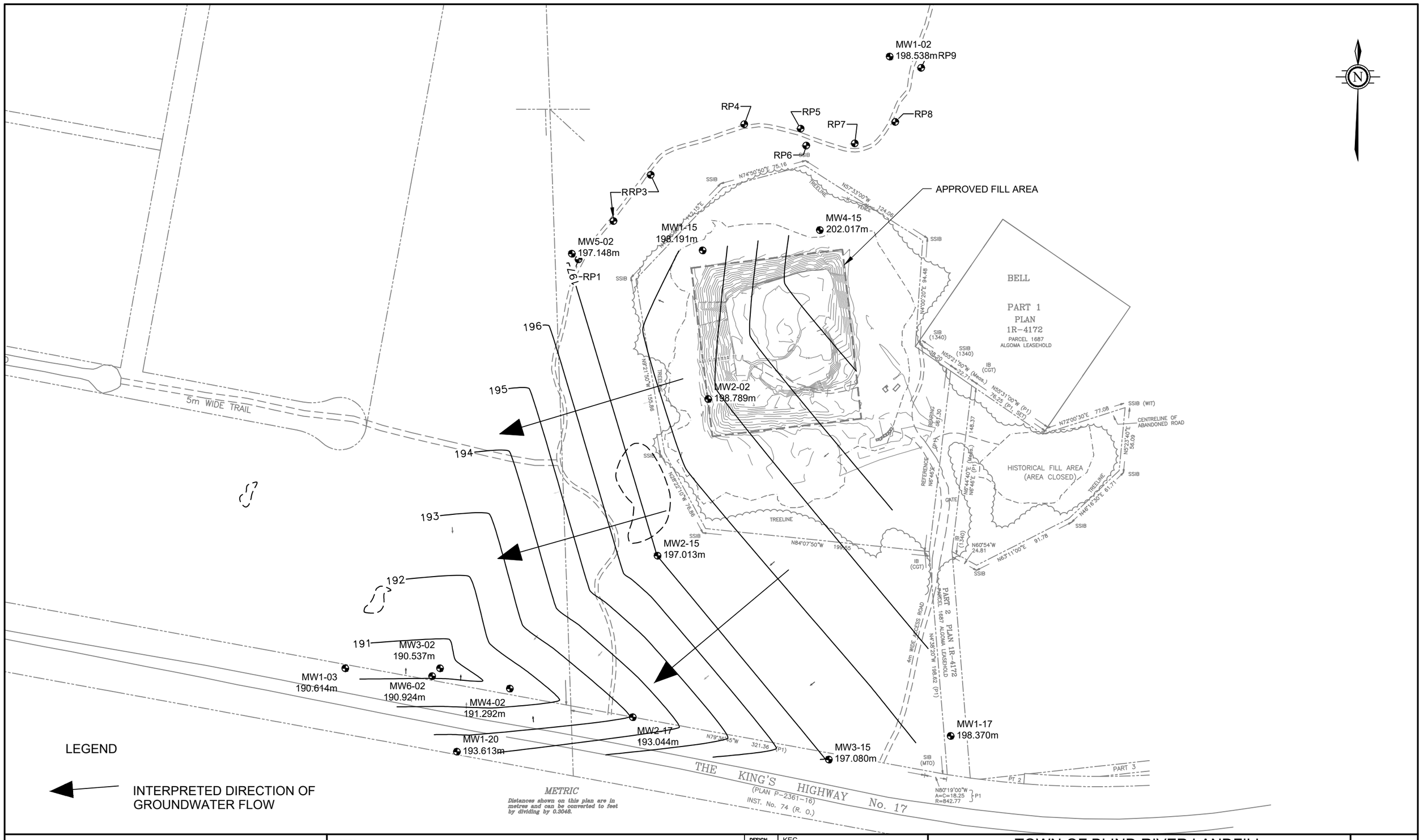
DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 gw spring	
SCALE	1:3000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

INTERPRETED GROUNDWATER CONTOURS - SPRING 2020

4A

Rev 0



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

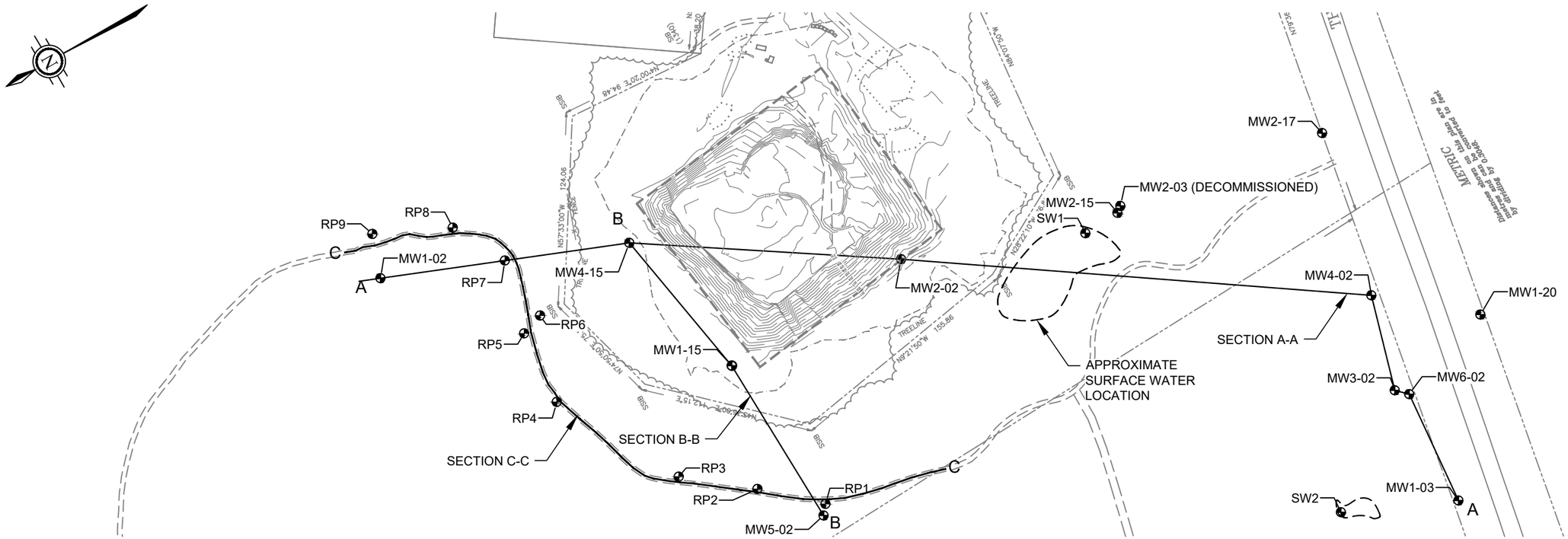
DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 gw fall	
SCALE	1:3000	

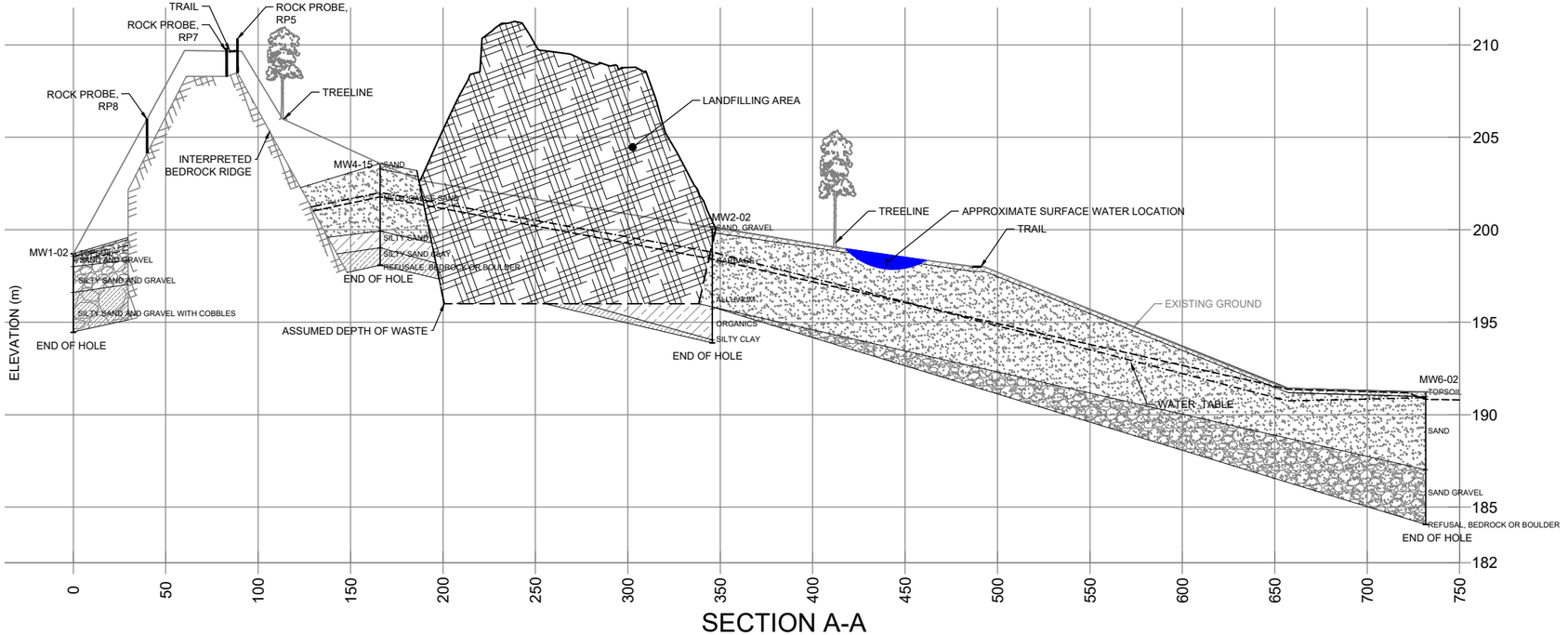
TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

INTERPRETED GROUNDWATER CONTOURS - FALL 2020

4B

Rev 0





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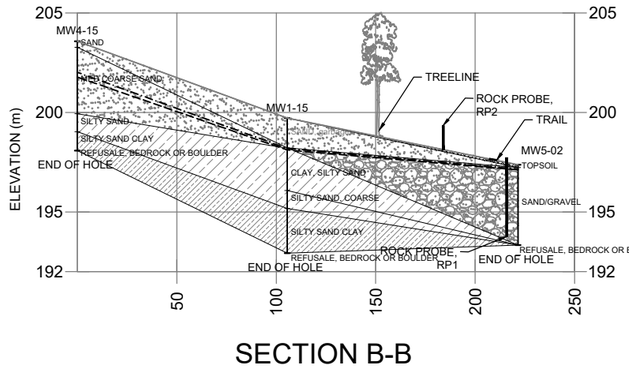


SECTION B-B

SPRING 2020 WATER TABLE

FALL 2020 WATER TABLE

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	KEC	
DRAWN	K.SHERLOCK	01/2021
CHECKED	C.KRESIN	
PROJECT	0508.12	
FILENAME	0508.12 stratigraphic sections	
SCALE	1:3000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

POTENTIOMETRIC SURFACE

5

Rev 0

LEGEND

MW2-15 EXISTING MONITORING WELL

MW FUTURE BOUNDARY WELL

EXISTING WETLANDS

ATTENUATION ZONE WITHIN MTO ROW

MW5-02
MW1-15
MW4-15
PROPOSED EXPANDED FILL AREA
POTENTIAL LOCATION OF FUTURE BOUNDARY WELL
APPROVED FILL AREA
BELL
MW1-02
CONSTRUCTION DEBRIS
MW2-15
POTENTIAL LOCATION OF FUTURE HISTORICAL FILL AREA WELL
TOWN
MW1-03
MW3-02
MW6-02
MW4-02
470m
POTENTIAL LOCATION OF FUTURE WELL SOUTHEAST OF CURRENT FILL AREA
LANDFILL ENTRANCE ROAD
MW2-17
MW1-20
MW3-03 (DECOMMISSIONED)
MW3-15
MW1-17
TOWN
EXISTING RAILWAY
POTENTIAL LOCATION OF FUTURE BOUNDARY WELL
CANADIAN PACIFIC RAILWAY
CROWN-HIGHWAY 17 RIGHT OF WAY
EXISTING WATER MAIN
EXISTING TRAIL
TOWN
CROWN
CROWN
TOWN
CROWN
POTENTIAL LOCATION OF FUTURE BOUNDARY WELL
CONTAMINANT ATTENUATION ZONE (27.6ha)
CROWN

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

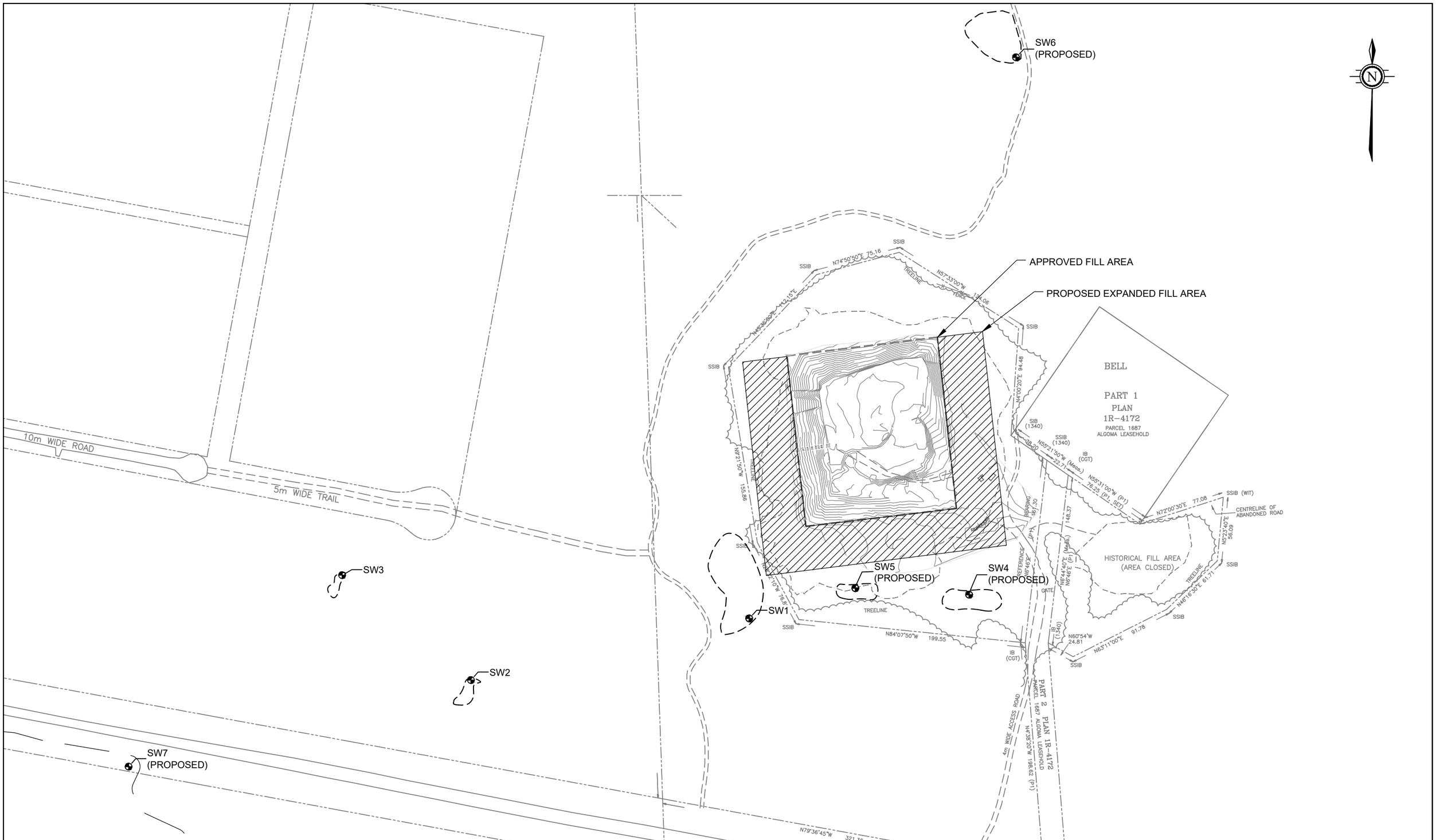
DESIGN	RW	05/24
DRAWN	RW	05/24
CHECKED	CK	05/24
PROJECT	0508.12	
FILENAME	0508.12 CAZ plan	
SCALE	1:3000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

CAZ PLAN

6

Rev 2



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	RW	01/2022
DRAWN	RW	01/2022
CHECKED	C.KRESIN	01/2022
PROJECT	0508.12	
FILENAME	0508.12 sw monitoring locations	
SCALE	1:3000	

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

SURFACE WATER MONITORING LOCATIONS

7

Rev 2

APPENDIX B

MONITORING LOCATION DETAILS – BOREHOLE LOGS

Log of MW-1

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 2
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH
Grout →			TOPSOIL, ~130 mm thick over	0.13	0
			SAND & GRAVEL, light brown, wet. (compact)		
Bentonite →			SILTY SAND & GRAVEL, occasional cobbles from ~1.1 to 1.6 m depth, light brown, wet. (compact)	0.70	1
Sand Pack →			TILL, silty sand & gravel, cobble layers from ~2.6 to 3.0 m & from 3.5 to 3.8 m depths, grey, wet. (very dense)	2.10	2
Monitoring Well →					3
					4
			END OF BOREHOLE	4.60	

N Value (20 40 60 80) Shear Strength

O/150 mm
O/150 mm
O/75 mm

Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)

Natural Unit Weight kN/m³

LBHM3 S02403E GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 6, 2002.
3. Monitoring well installed to ~4.26 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS	
Measurement date	Water Elevation (m)

Log of MW-2

Trow

Auger Sample ⊠
SPT (N) Value ○○ ⊡ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at Overburden Press. 0 / 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test + S Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▼

Project: Blind River Monitoring Well Installation — Fig. No. 4
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH	N Value / Shear Strength (20 40 60 80)	Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)	Natural Unit Weight kN/m³
			SAND & GRAVEL FILL,	0.30 GL	0			
			GARBAGE,	0.20				
					1			
					2			
					3	○		
			ALLUVIUM, brown, wet. (soft)	3.66				
			ORGANICS, with some clay at base. (soft)	4.42	4			
					5	○		
					6	○		
			SILTY CLAY, grey, wet. (stiff)	6.10				
			END OF BOREHOLE	6.55				

Grout
Bentonite Seal
Drill Cuttings
Sand Pack
Monitoring Well

LBHM3 S02403E GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~6.09 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)
May 14/02	0.20

Log of MW-3

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at Overburden Press. 0 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test + S Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 5
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GW	SYMBOL	Soil Description	Depth Below Grade m	DEPTH
			TOPSOIL, ~230 mm thick over	GL 0.23	0
Grout →			SAND, medium grained, grey, wet. (loose to compact)		1
Bentonite →					2
Sand Pack →					3
Monitoring Well →					4
			SAND & GRAVEL, fine to coarse grained, trace of silt, occasional cobble sizes, wet. (compact)	4.20	
			END OF BOREHOLE	5.03	5

N Value 20 40 60 80 — Shear Strength

Natural Moisture Content and Atterberg Limits % Dry Weight 10 20 30

Natural Unit Weight kN/m³

LBHM3 S02403E GPJ 09/10/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced uncased using hand augering equipment on May 14, 2002.
3. Monitoring well installed to ~4.27 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

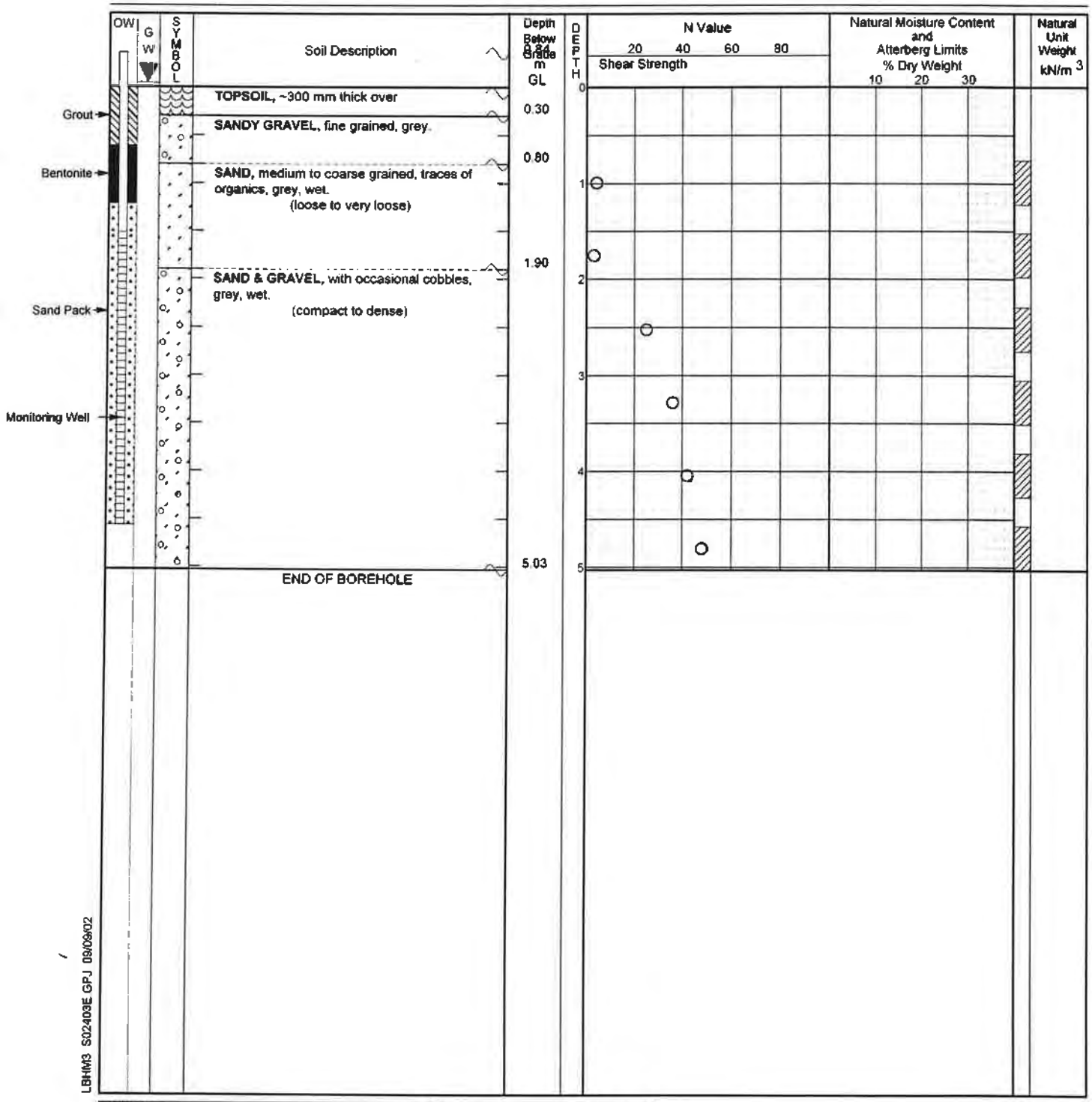
Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-4

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at Overburden Press. 0 / 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test + S Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 6
Landfill Site
Blind River, Ontario — Project No: S02403E
Borehole Location and elevation datum shown on Drawing No. 1



LBHM3 S02403E GPJ 09/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~4.57 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-5

Trow

Auger Sample ⊠
SPT (N) Value ○○ ◪ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No. 7
Landfill Site
Blind River, Ontario — Project No. S02403E
Borehole Location and elevation datum shown on Drawing No. 1

OW	GWL	SYMBOL	Soil Description	Depth Below Grade m	DEPTH	N Value / Shear Strength (20 40 60 80)	Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)	Natural Unit Weight kN/m³
			TOPSOIL, ~150 mm thick over	GL 0.15	0			
Grout			SAND & GRAVEL, alternating layers of light brown and grey, wet, occasional cobble sizes below ~2.3 m depth. (dense becoming very dense with increasing depth)		1			
Bentonite					2			
Sand Pack					3	O/75 mm & Bouncing		
Monitoring Well				4.04	4	O/75 mm		
			END OF BOREHOLE DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER					

LBHM3 S02403E.GPJ 06/09/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 6, 2002.
3. Monitoring well installed to ~3.96 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS	
Measurement date	Water Elevation (m)

Log of MW-6

Trow

Auger Sample ⊠
SPT (N) Value ○○ ▨ Natural Moisture ×
Dynamic Cone Test —— PL & LL ⊢—○
Shelby Tube ●● ■ Undrained Triaxial at 0
Rock Core ⊠ Overburden Press. 15⊕5
Field Vane Test + S % Strain at Failure 10
Penetrometer ▲

Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Monitoring Well Installation — Fig. No: 8
Landfill Site
Blind River, Ontario — Project No.: S02403E
Borehole Location and elevation datum shown on Drawing No.: 1

OW	GW	SYMBOL	Soil Description	Depth Below Grade m	DEPTH	N Value / Shear Strength (20 40 60 80)	Natural Moisture Content and Atterberg Limits % Dry Weight (10 20 30)	Natural Unit Weight kN/m³
			TOPSOIL, ~250 mm thick over	0.25	0			
Grout			SAND, medium grained, grey, wet. (loose to compact)		1			
Bentonite					2			
Sand Pack					3			
				4.20	4			
Bentonite			SAND & GRAVEL, fine to coarse grained, trace of silt to ~6.0 m depth, occasional cobble sizes, wet. (compact)		5			
Sand Pack					6	○		
Monitoring Well				7.16	7	○/150 mm & Bouncing		
			END OF BOREHOLE DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER					

LBHM3 S02403E GPJ 09/10/02

NOTES:
1. Borehole data requires interpretation assistance from Trow before use by others
2. Borehole advanced using continuous flight hollow stem augering equipment on May 14, 2002.
3. Monitoring well installed to ~7.01 m depth on completion.
4. See Drawing 2 for Notes on Sample Descriptions
5. This Drawing to be read with Trow report S02403E

WATER LEVEL RECORDS

Measurement date	Water Elevation (m)
May 14/02	0.00

Log of MW-1

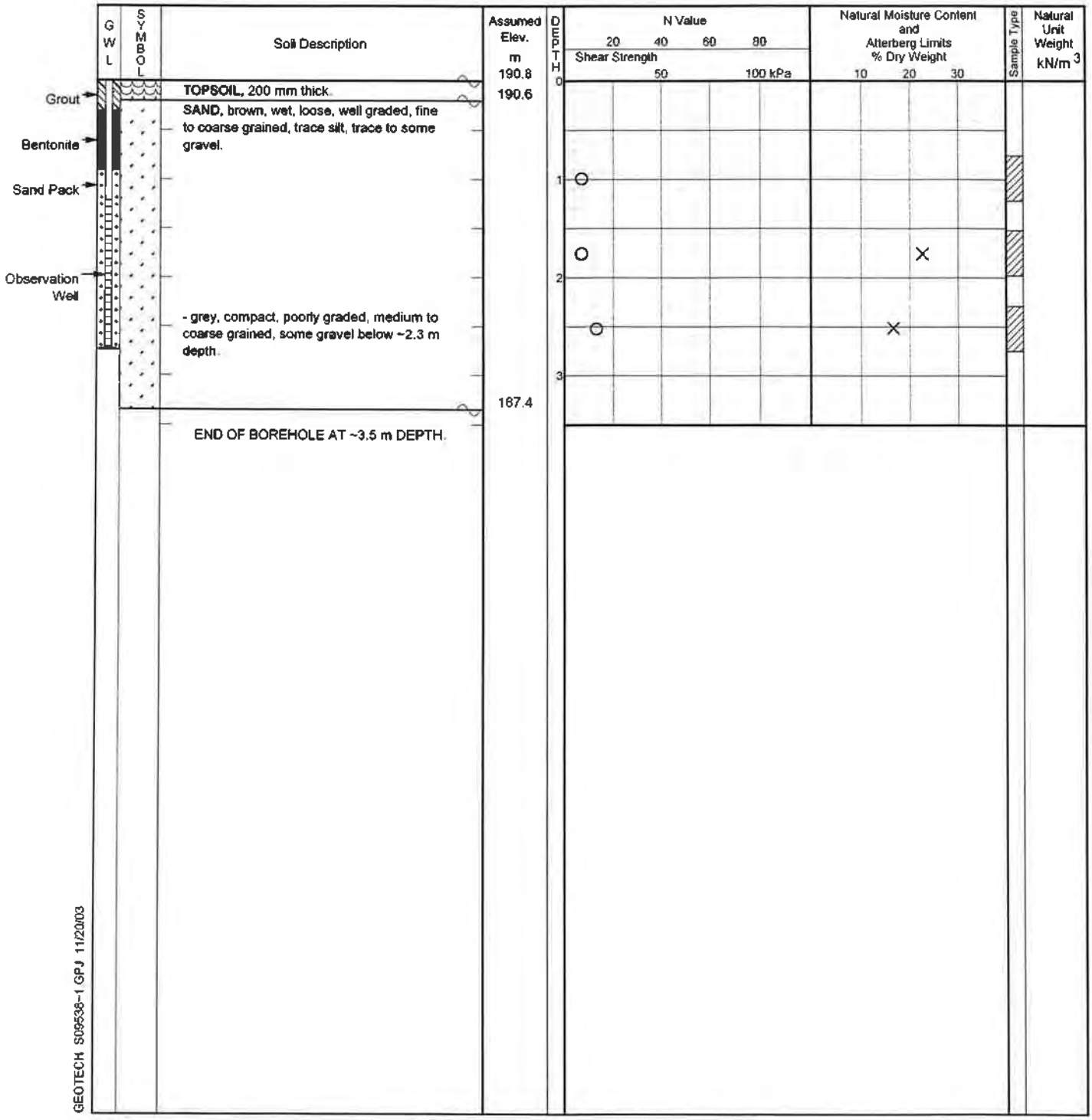
Trow

Auger Sample ⊠ Split Spoon Sample ⊠
SPT (N) Value (blows/0.3m) ○ Natural Moisture ×
Dynamic Cone Test —— Plastic & Liquid Limit ⊢—⊖
Shelby Tube ■ Undrained Triaxial at Overburden Pressure 0 / 15 ⊕ 5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test & Sensitivity + Pocket Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▼

Project: Blind River Landfill — Fig. No. 16

Blind River, Ontario — Project No. S09538G

Hole location and datum see Drawing No. 2



GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

Log of MW-2

Trow

Auger Sample ⊠ Split Spoon Sample ▨
SPT (N) Value (blows/0.3m) ○ Natural Moisture ×
Dynamic Cone Test —— Plastic & Liquid Limit ⊢●
Shelby Tube ■ Undrained Triaxial at Overburden Pressure 0 / 15⊕5
Rock Core ⊠ % Strain at Failure 10
Field Vane Test & Sensitivity +S= Pocket Penetrometer ▲
Water Level: Est.: ▽ Measured: ▼ Perched: ▽

Project: Blind River Landfill — Fig. No. 17

Blind River, Ontario — Project No. S09538G

Hole location and datum see Drawing No. 2

GWL	SYMBOL	Soil Description	Assumed Elev. m GL	DEPTH	N Value / Shear Strength	Natural Moisture Content and Atterberg Limits % Dry Weight	Sample Type	Natural Unit Weight kN/m³
		TOPSOIL, 80 mm thick.	0.1	0	20 40 60 80 / Shear Strength 50 100 kPa	10 20 30		
		SAND, brown, moist, compact, well graded, fine to coarse grained, some cobbles.		1				
		- wet below ~1.52 m depth	1.6					
		SILTY SAND, brown, wet, compact to dense, poorly graded, coarse grained, some cobbles.		2				
		AUGER REFUSAL ON BEDROCK OR BOULDER AT ~2.29 m DEPTH.	2.3					

Grout
Bentonite
Sand Pack
Observation Well

GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

Log of MW-3

Trow

Auger Sample | Split Spoon Sample
SPT (N) Value (blows/0.3m) | Natural Moisture
Dynamic Cone Test | Plastic & Liquid Limit
Shelby Tube | Undrained Triaxial at Overburden Pressure
Rock Core | % Strain at Failure
Field Vane Test & Sensitivity | Pocket Penetrometer
Water Level: Est.: | Measured: | Perched:

Project: Blind River Landfill — Fig. No. 18

Blind River, Ontario — Project No. S09538G

Hole location and datum see Drawing No. 2

Soil Description	Assumed Elev. m	Depth
BOULDERS AND COBBLES, some sand.	198.4	0
SILTY SAND, brown, moist, dense, poorly graded, fine to medium grained, (TILL).	197.7	1
COBBLES, (TILL)	196.9	2
SAND, brown, moist to wet, compact, poorly graded, fine to medium grained, some silt. - some cobbles below ~2.74 m depth. - wet below ~3.05 m depth.	196.1	3
		4
END OF BOREHOLE AT ~5.03 m depth.	193.4	5

Grout
Bentonite
Sand Pack
Observation Well

N Value: 20 40 60 80 — Shear Strength: 50 100 kPa

Natural Moisture Content and Atterberg Limits % Dry Weight: 10 20 30

Sample Type

Natural Unit Weight kN/m³

Auger refusal encountered at 0.3 to 0.6 m depth, 4 times in this area prior to drilling this borehole due to presence of boulders and cobbles.

GEOTECH S09538-1.GPJ 11/20/03

NOTES:
1. Soils log data requires interpretation assistance from Trow before use by others.
2. Borehole advanced using continuous flight hollow stem augers on October 17, 2003.
3. Groundwater not encountered at time of drilling.
4. See Fig. 1A & 1B for Notes on Sample Descriptions.
5. This Drawing to be read with Trow Consulting Engineers Ltd. report S09538G.
6. Borehole logged by S. McAuliffe & Approved by T. Crilly.

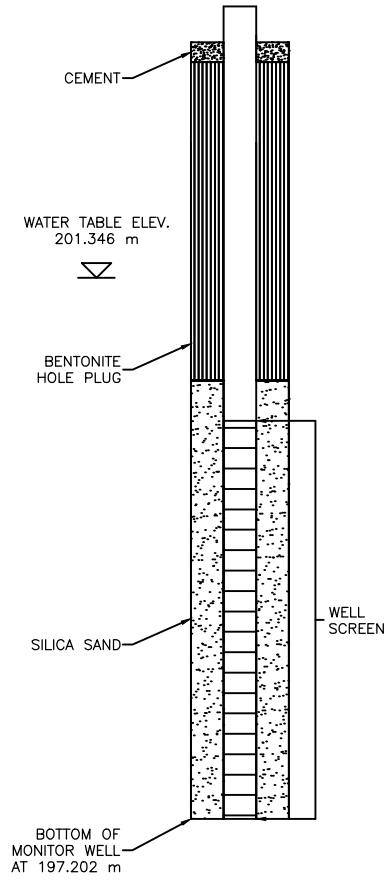
WATER LEVEL RECORDS

Date Measured	Water Level Depth Below Grade (m)	Hole Open To (m)

MW1–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 2, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	203.151 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0						0.0
1.0		MEDIUM GRAINED SAND/SMALL ROCKS/GARBAGE/MOIST				1.0
2.0		CLAY/SILTY SAND/COARSE SAND/WET				2.0
3.0				2,4,12,8		3.0
4.0		SILTY SAND/MEDIUM TO COARSE SAND/WET				4.0
5.0		SILTY SAND/CLAY/WET				5.0
6.0				2,2,2,1		6.0
7.0		END OF BOREHOLE AT 6.798 m				7.0
8.0						8.0
9.0						9.0



NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.849 m; STEEL PROTECTIVE CASING 0.957 m; BOTTOM OF MONITOR WELL INSTALLED AT 5.949 mbgs.

KRESIN Engineering Corporation

DESIGN	. .
DRAWN	. Dec 2015
CHECKED	. .
PROJECT	1567.02
FILENAME	1567.02 well logs
SCALE	NTS

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

1

Rev 0

MW2–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 1, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	199.933 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0		MEDIUM GRAINED SAND/SMALL ROCKS/MOIST			WATER TABLE ELEV. 199.293 m; CEMENT; BENTONITE HOLE PLUG; WELL SCREEN; SILICA SAND; BOTTOM OF MONITOR WELL AT 197.202 m	0.0
1.0						1.0
2.0		SILTY SAND/MEDIUM TO COARSE SAND/WET				2.0
		END OF BOREHOLE 2.286 m DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER				
3.0						3.0
4.0						4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 1.067 m; STEEL PROTECTIVE CASING 1.202 m; BOTTOM OF MONITOR WELL INSTALLED AT 1.948 mbgs.

ATTEMPTED TO TAKE SAMPLE AT 2.286 m – SPLIT SPOON WOULD NOT ADVANCE (BOUNCE).

KRESIN Engineering Corporation

DESIGN	. .
DRAWN	. Dec 2015
CHECKED	. .
PROJECT	1567.02
FILENAME	1567.02 well logs
SCALE	NTS

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

2

Rev 0

MW3–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 2, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	196.198 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0		BOULDERS/COBBLES/SOME SAND			CEMENT	0.0
1.0		SILTY SAND/FINE TO MEDIUM SAND/MOIST			WATER TABLE ELEV. 194.858 m	1.0
2.0		BOULDERS/COBBLES/SOME SAND			BENTONITE HOLE PLUG	2.0
3.0		SILTY SAND/FINE TO MEDIUM SAND/ SOME COBBLES/WET			WELL SCREEN; SILICA SAND/BACKFILL	3.0
4.0						4.0
5.0		END OF BOREHOLE 5.03 m			BOTTOM OF MONITOR WELL AT 191.835 m	5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.802 m; STEEL PROTECTIVE CASING 0.921 m; BOTTOM OF MONITORING WELL INSTALLED AT 4.363 mbgs.

BOREHOLE LOCATION WITHIN EXISTING MW3–03 LOCATION, PREVIOUSLY INSTALLED BY TROW ASSOCIATES INC.

BOREHOLE DESCRIPTION FROM GEOTECHNICAL INVESTIGATION – PROPOSED WATER SUPPLY SYSTEM UPGRADE LANDFILL MONITORING WELLS, BLIND RIVER ONTARIO BY TROW ASSOCIATES INC. 2003.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	.	Dec 2015
CHECKED	.	.
PROJECT	1567.02	
FILENAME	1567.02 well logs	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

3

Rev 0

MW4–15

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	1567.02
CLIENT	TOWN OF BLIND RIVER	DATE	DECEMBER 1, 2015
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	197.165 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE: STRATIGRAPHIC DESCRIPTION	SAMPLE: SAMPLE DEPTH (m)	SAMPLE: BLOW COUNT	MONITORING WELL DETAILS	DEPTH (m)
0.0		SAND/SMALL ROCKS/MOIST			CEMENT	0.0
1.0					BENTONITE HOLE PLUG	1.0
2.0		MEDIUM TO COARSE SAND/SMALL ROCKS/CLAY/GARBAGE/WOOD/MOIST			WATER TABLE ELEV. 195.317 m	2.0
3.0				3,3,4,7	SILICA SAND; WELL SCREEN	3.0
4.0		SILTY SAND/FINE TO MEDIUM SAND/ SOME COBBLES/WET				4.0
5.0		SILTY SAND/CLAY/WET			BOTTOM OF MONITOR WELL AT 192.528 m	5.0
6.0		END OF BOREHOLE 5.486 m DUE TO AUGER REFUSAL ON BEDROCK OR BOULDER				6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.849 m; STEEL PROTECTIVE CASING 0.957 m; BOTTOM OF MONITORING WELL INSTALLED AT 4.637 mbgs.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	.	Dec 2015
CHECKED	.	.
PROJECT	1567.02	
FILENAME	1567.02 well logs	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2015

4

Rev 0

MW1-17

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	0508.11
CLIENT	TOWN OF BLIND RIVER	DATE	JULY 12, 2017
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	RW
GROUND ELEVATION	199.034 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0					CEMENT BENTONITE HOLE PLUG WATER TABLE ELEV. 198.090 m WELL SCREEN SILICA SAND BOTTOM OF MONITOR WELL AT 196.596 m	0.0
1.0		COBBLES/GRAVEL/FINE SAND/DRY				1.0
2.0		COBBLES/GRAVE/FINE SAND/WET				2.0
3.0						3.0
4.0						4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0

NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.815 m; STEEL PROTECTIVE CASING 0.940 m; BOTTOM OF MONITOR WELL INSTALLED AT 2.438 mbgs.

COBBLES PREVENTED SPLIT SPOON SAMPLE COLLECTION.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Oct 2017
CHECKED	.	.
PROJECT	0508.11	
FILENAME	0508.11 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2017

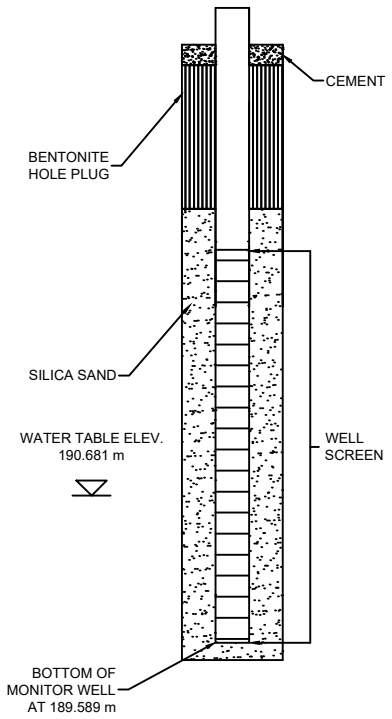
1

Rev 0

MW2-17

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	0508.11
CLIENT	TOWN OF BLIND RIVER	DATE	JULY 12, 2017
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	RW
GROUND ELEVATION	194.034 m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE			MONITORING WELL DETAILS	DEPTH (m)
		STRATIGRAPHIC DESCRIPTION	SAMPLE DEPTH (m)	BLOW COUNT		
0.0						0.0
1.0		FINE SAND/DRY				1.0
2.0		MEDIUM SAND/WET				2.0
3.0				1,6,9,6		3.0
4.0		MEDIUM SAND/WET				4.0
5.0						5.0
6.0						6.0
7.0						7.0
8.0						8.0
9.0						9.0



NOTES: SAND POINT USED FOR INSTALLATION OF MONITORING WELL.

WELL STICK UP 0.78 m; STEEL PROTECTIVE CASING 0.94 m; BOTTOM OF MONITOR WELL INSTALLED AT 4.445 mbgs.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Oct 2017
CHECKED	.	.
PROJECT	0508.11	
FILENAME	0508.11 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2017

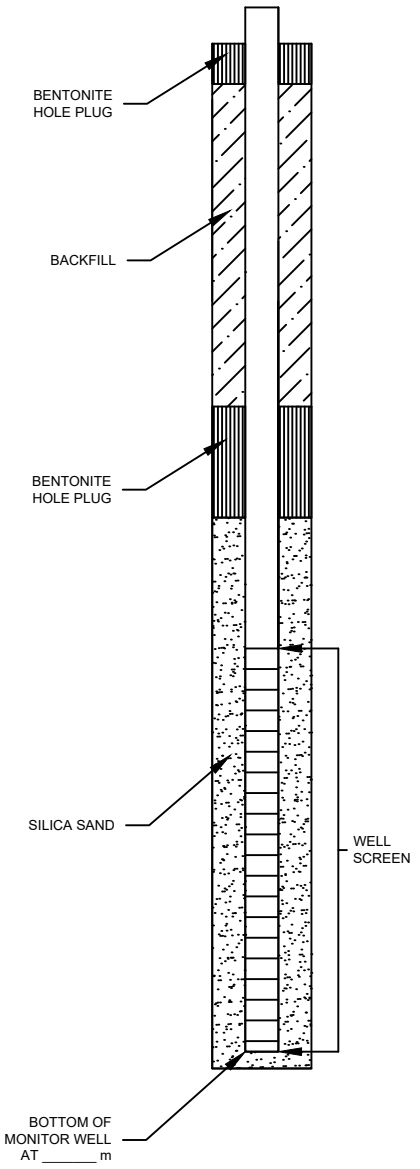
2

Rev 0

MW1-20

PROJECT NAME	BLIND RIVER LANDFILL SITE	PROJECT NO.	2049.02
CLIENT	TOWN OF BLIND RIVER	DATE	September 1, 2020
BOREHOLE TYPE	203 mm (8 inch) DIAMETER AUGER	FIELD SUPERVISOR	JS
GROUND ELEVATION	m	ENGINEER	

DEPTH (m)	STRATIGRAPHY	SAMPLE: STRATIGRAPHIC DESCRIPTION	SAMPLE: SAMPLE DEPTH (m)	SAMPLE: BLOW COUNT	MONITORING WELL DETAILS	DEPTH (m)
0.0						0.0
		ORGANIC MATERIAL/FINE SANDY SILT/WET				
1.0						1.0
		DENSE SILTY CLAY/WET				
2.0						2.0
3.0		LOOSE SILTY CLAY/WET				3.0
4.0						4.0
5.0		DENSE SILTY CLAY/WET				5.0
6.0		DENSE SILTY CLAY/SMALL COBBLES/WET				6.0
7.0		DENSE SILTY CLAY/WET				7.0
8.0						8.0
9.0						9.0



NOTES: BOTTOM OF WELL SCREEN IS CAPPED

WELL STICK UP 0.853 m; STEEL PROTECTIVE CASING 0.915 m; BOTTOM OF MONITOR WELL INSTALLED AT 7.62 mbgs.

KRESIN Engineering Corporation

DESIGN	.	.
DRAWN	JS	Sept 2020
CHECKED	.	.
PROJECT	2049.02	
FILENAME	2049..02 MW1-20 well log	
SCALE	NTS	

TOWN OF BLIND RIVER
MUNICIPAL LANDFILL SITE

MONITORING WELL INSTALLATION - 2020

1-20

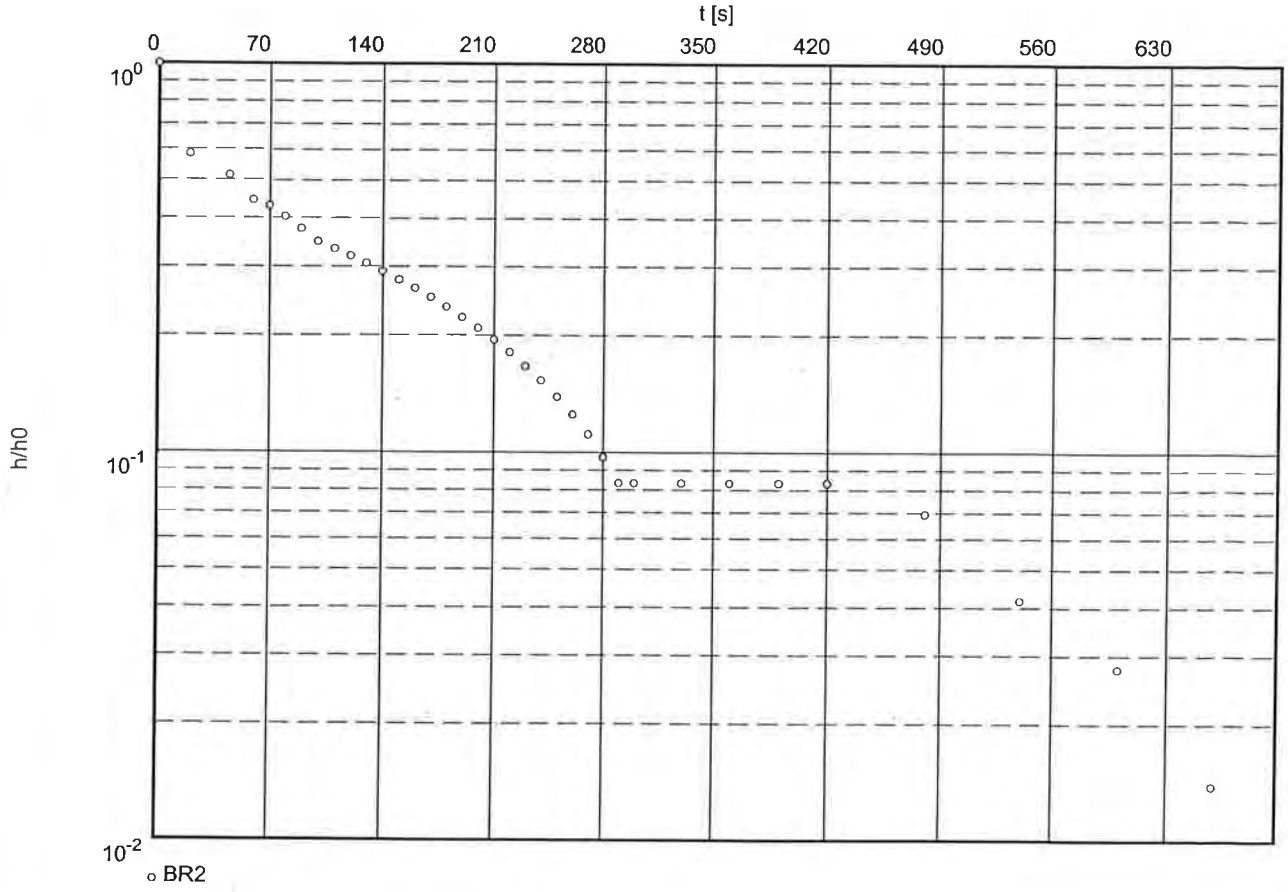
Rev 0

APPENDIX C

HYDRAULIC CONDUCTIVITY ANALYSIS RESULTS
AND
CALCULATION SHEETS

Terraprobe Limited 1012 Kelly Lake Road #1 Sudbury,Ontario,Canada Tel: +1 (705) 670-0460	slug/bail test analysis HVORSLEV's method	Date: 29.01.2002	Page 1
		Project: MTO Blind River Patrol yard	
		Evaluated by: DAM	

Slug Test No.	Test conducted on: January 16, 2002
BR2	



Hydraulic conductivity [m/s]: 1.98×10^{-6}

Terraprobe Limited 1012 Kelly Lake Road #1 Sudbury,Ontario,Canada Tel: +1 (705) 670-0460	slug/bail test analysis HVORSLEV's method	Date: 29.01.2002	Page 2
		Project: MTO Blind River Patrol yard	
		Evaluated by: DAM	

Slug Test No.	Test conducted on: January 16, 2002
BR2	BR2

Static water level: 1.370 m below datum

	Pumping test duration [s]	Water level [m]	Change in Waterlevel [m]
1	0	0.650	-0.720
2	20	0.950	-0.420
3	45	1.000	-0.370
4	60	1.050	-0.320
5	70	1.060	-0.310
6	80	1.080	-0.290
7	90	1.100	-0.270
8	100	1.120	-0.250
9	110	1.130	-0.240
10	120	1.140	-0.230
11	130	1.150	-0.220
12	140	1.160	-0.210
13	150	1.170	-0.200
14	160	1.180	-0.190
15	170	1.190	-0.180
16	180	1.200	-0.170
17	190	1.210	-0.160
18	200	1.220	-0.150
19	210	1.230	-0.140
20	220	1.240	-0.130
21	230	1.250	-0.120
22	240	1.260	-0.110
23	250	1.270	-0.100
24	260	1.280	-0.090
25	270	1.290	-0.080
26	280	1.300	-0.070
27	290	1.310	-0.060
28	300	1.310	-0.060
29	330	1.310	-0.060
30	360	1.310	-0.060
31	390	1.310	-0.060
32	420	1.310	-0.060
33	480	1.320	-0.050
34	540	1.340	-0.030
35	600	1.350	-0.020
36	660	1.360	-0.010

Terraprobe

WELL SLUG TEST

Project Name: Blind River
Well #: BR 2
Beginning time:

Project #: 01-1047
Date: Jan 16/02

Water Level Measurements: Recovery Data

Well I.D.: BR 2 stick-up = 0,95

Radius of well casing (r) = 2"
Length of well screen (L) = 10'

Radius of Auger used (R) =
Static Water Level = 2.32

Read. Time (sec)	Read. (Tape)	Read. (m)
Static		
0		
20	1.90	
45	1.95	
60	2.00	
70	2.01	
80	2.03	
90	2.05	
100	2.07	
110	2.08	
120	2.09	
130	2.10	
140	2.11	
150	2.12	
160	2.13	
170	2.14	
180	2.15	
190	2.16	
200	2.17	
210	2.18	

Continued on Back

Terraprobe

WELL SLUG TEST

Project Name: Bling River
Well #: BR2
Beginning time:

Project #: 01-1047
Date: Jan 16/02

Water Level Measurements: Recovery Data

Well I.D.: BR 2

Radius of well casing (r) = 2"
Length of well screen (L) = 10'

Radius of Auger used (R) =
Static Water Level =

Read. Time	Read. (Tape)	Read. (m)
Static		
~~8~~		
220	2.19	
230	2.26	
240	2.21	
250	2.22	
260	2.23	
270	2.24	
280	2.25	
290	2.26	
300	2.26	
330	2.26	
360	2.26	
390	2.26	
420	2.26	
480	2.27	
540	2.29	
600	2.30	
666	2.31	

Continued on Back

A) GROUNDWATER GRADIENTS

i) LATERAL — MW2-02 → MW6-02 (SEE DRAWING A1 ON PAGE 2)

JUNE 2020

$$G_L = \frac{198.413\,m - 190.831\,m}{345\,m}$$

$G_L = 0.022\ m/m$ ✓

NOV 2020

$$G_L = \frac{198.789\,m - 190.924\,m}{345\,m}$$

$G_L = 0.023\ m/m$ ✓

ii) VERTICAL - USING WT ELEVATIONS AT:

- MW3-02 (SHALLOW)
- MW6-02 (DEEP)

JUNE 2020

	WT (m)	DEPTH (m)*
MW 3-02	190.554	1.5m
MW 6-02	190.831	5.2m
	Δ = 0.277m ✓	3.7m ✓

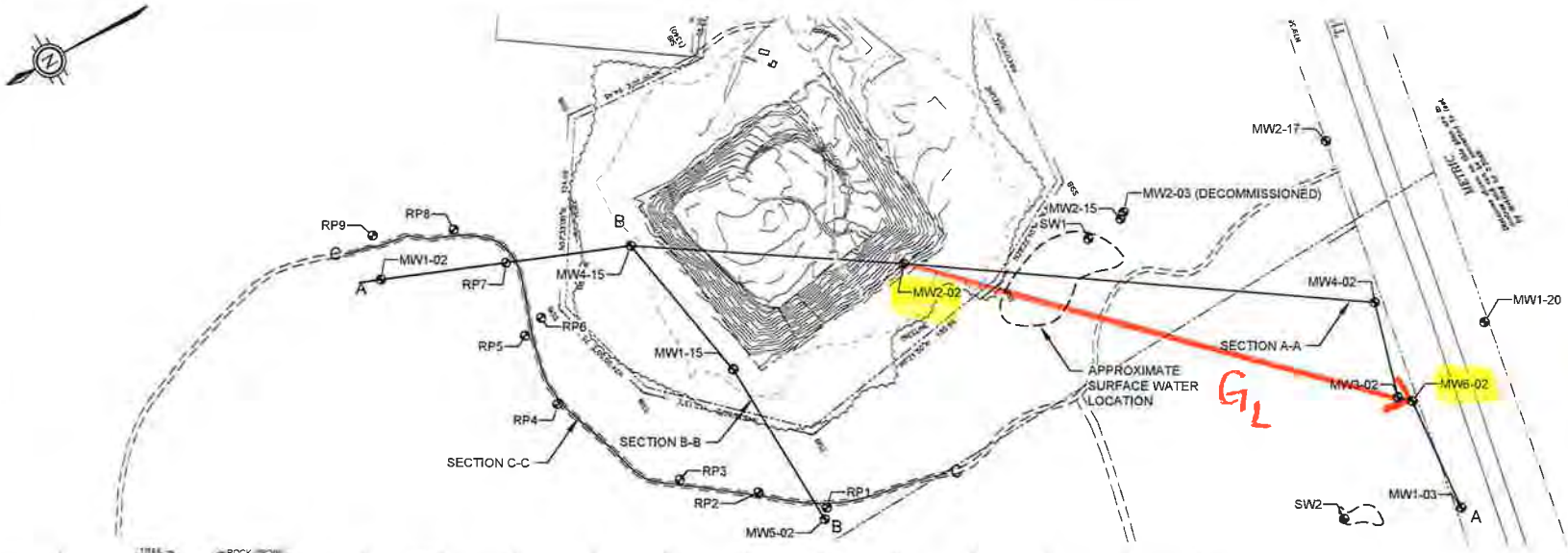
*TO TOP OF SCREEN

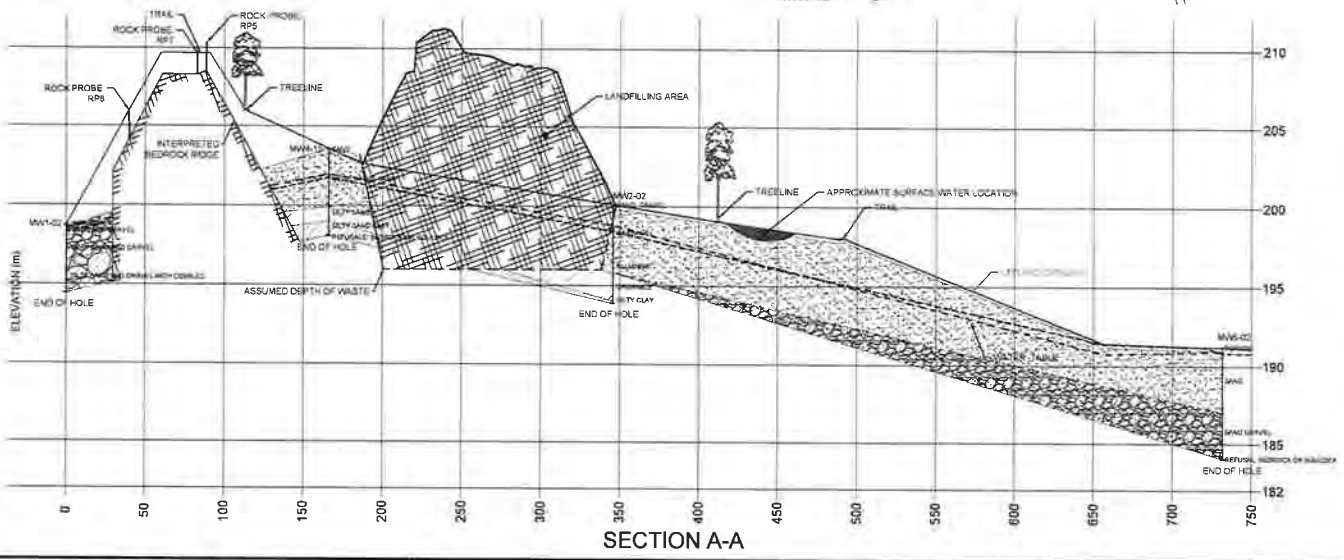
$$G_V = \frac{0.277\,m}{3.7\,m} = 0.07\ m/m \text{ (UPWARD)}$$ ✓

NOV 2020

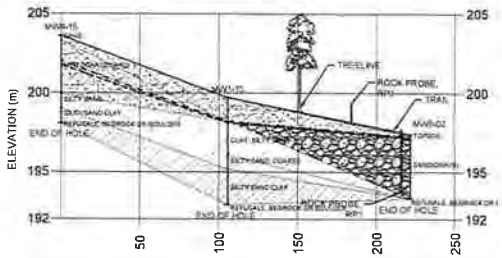
$$G_V = \frac{(190.924 - 190.573)\,m}{3.7\,m}$$

$G_V = 0.09\ m/m$ (UPWARD) ✓





SECTION A-A



SECTION B-B

SPRING 2020 WATER TABLE
FALL 2020 WATER TABLE

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 946-4900

NOTES

DESIGN	KEC
DRAWN	K.SHERLOCK 01/2021
CHECKED	C.KRESIN
PROJECT	
FILENAME	
SCALE	1:2000

TOWN OF BLIND RIVER LANDFILL
HYDROGEOLOGICAL ASSESSMENT REPORT

POTENTIOMETRIC SURFACE

5

Rev 0

215

B) GROUNDWATER VELOCITIES

i) LATERAL

$$v = \frac{Ki}{Sy}$$

$$v = \frac{2 \times 10^{-6}\ m/s \times 0.022}{0.3}$$

$$v = 4.6\ m/yr^{(1)} \quad \checkmark$$

K = Hydraulic Conductivity
= 2×10^{-6} m/s * (sand & gravel)

i = Lateral Gradient (G_L)
= 0.022

Sy = Specific Yield
= 0.3 (Table 5.2 "Groundwater and Wells")

*Terraprobe "Monitoring Well Installation and Sampling Program MTO Patrol Yard Blind River, ON" September, 2002

ii) VERTICAL

$$v = \frac{Ki}{Sy}$$

$$v = 1.7\ m/yr \quad \checkmark$$

$K = 2 \times 10^{-7}$ m/s – ASSUMED 1 ORDER OF MAGNITUDE LOWER THAN LATERAL K

$i = 0.08$ (G_v)

$S_y = 0.3$

---

(1) NOTE:

$$\frac{M}{\cancel{s}} \times 86{,}400\ \frac{\cancel{s}}{\cancel{d}} \times 365\ \frac{\cancel{d}}{yr} = \frac{M}{yr}$$

DESCRIPTION:

KRESIN Engineering Corporation				
	DESIGNER	CK	DATE	DEC 30/20
	CHECKED	M. Kresin	DATE	Jan 25/21
	PROJECT No.	0508.12	SHEET	3/5

C) TRAVEL TIMES

i) LATERAL – MW2-02 → MW6-02 (REFER TO PAGE 2/5)

$T = L/v$

$T = 530m^{*} / 4.6m/yr$

$T = 115$ yrs ✓

* 530m FROM DRAWING 6 "CAZ PLAN"

ii) VERTICAL – REFER TO MW2-02 WELL LOG, ASSUME DEPTH OF OVERBURDEN TO WT IS 0.1m

$T = L/v$

$T = 0.1m / 1.7m/yr$

$T = 0.059yr \doteq 21$ days ✓

D) REASONABLE USE

i) CHLORIDE CONCENTRATION

$C_{Cl} = 0.00098V + 463$ *

$C_{Cl} = 0.00098 \cdot 318{,}000\ m^3 + 463$

$C_{Cl} \doteq 775$ mg/L ✓

→ WITH AN ADDITIONAL $210{,}000\ m^3$

$C_{Cl} \doteq 980$ mg/L ✓

(ASSOCIATED WITH PROPOSED SITE EXPANSION)

* METHOD DESCRIBED BY GEHRELS AND PULLMALA (2000) TO ESTIMATE LEACHATE CHLORIDE CONCENTRATION AT ONTARIO LANDFILLS IN PRECAMBRIAN SHIELD

NOTE – THE MAXIMUM CHLORIDE CONCENTRATION AT THE SOURCE WELL IS 305mg/L
↳ SINCE 2002

V = FILL VOLUME
V = 318,000 EXISTING (m^3)
V ≐ 210,000 PROPOSED (m^3)

DESCRIPTION:

KRESIN Engineering Corporation				
	DESIGNER	CK	DATE	DEC 30/20
	CHECKED	M. Kresin	DATE	Jan 25/21
	PROJECT No.	0508.12	SHEET	4/5

D) REASONABLE USE CONT'D

ii) MAXIMUM ALLOWABLE CHLORIDE CONCENTRATION @ BOUNDARY

$$C_m = C_b + \chi (C_r - C_b)$$

C_b = BACKGROUND $[Cl] = 0.87\ mg/L$ (MW1-02)

$C_r = 250\ mg/L \rightarrow$ ODWQS

$\chi = 0.5 \rightarrow$ NON-HEALTH RELATED PARAMETER

$$C_m = 125.4\ mg/L \checkmark$$

iii) MAXIMUM CONCENTRATION ORIGINATING FROM LANDFILL

$$C_W = C_m - C_p - C_o$$

$$C_W = (125.4 - 0.87 - 0)\ mg/L \checkmark$$

$C_p = C_b$

$C_o = \emptyset$ (POTENTIAL FROM OTHER SOURCES)

$$C_W = 124.53\ mg/L$$

$$C_W \doteq 124\ mg/L$$

iv) REQUIRED AREA FOR ATTENUATION

a) EXISTING

$$CAZ = \frac{A \times (C - C_m)}{C_m - C_b}$$

$$CAZ = \frac{2.0\,ha\,(775 - 125.4)\ mg/L}{(125.4 - 0.87)\ mg/L} \checkmark$$

$$CAZ = 10.4\ ha$$

NOTE: A = FILL AREA

b) EXISTING + PROPOSED

$$CAZ = \frac{A \times (C - C_m)}{C_m - C_b}$$

$$CAZ = \frac{4.0\,ha\,(980 - 125.4)\ mg/L}{(125.4 - 0.87)\ mg/L}$$

$$CAZ = 27.5\ ha \checkmark$$

DESCRIPTION:

KRESIN Engineering Corporation				
	DESIGNER	CK	DATE	DEC 30/20
	CHECKED	M. Kresin	DATE	Jan 25/21
	PROJECT No.	0508.12	SHEET	5/5

APPENDIX D

ANALYTICAL RESULTS

KRESIN ENGINEERING CORP.
ATTN: Jennifer Sharpe
536 Fourth Line East
Sault Ste Marie ON P6A 5K8

Date Received: 15-JUN-20
Report Date: 24-JUN-20 15:38 (MT)
Version: FINAL

Client Phone: 705-949-4900

Certificate of Analysis

Lab Work Order #: L2461003

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Christine Paradis
Project Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-1 MW1-02 Sampled By: JS on 12-JUN-20 @ 09:12 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	148		1.0	uS/cm		16-JUN-20	R5120976
pH	6.99		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	417		3.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	199		13	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	74.7		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	74.7		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.012		0.010	mg/L		19-JUN-20	R5125117
Chloride (Cl)	0.87		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.039		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	5.94		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	1.64			meq/L		19-JUN-20	
Cation Sum	1.53			meq/L		19-JUN-20	
Cation - Anion Balance	-3.6			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	4.29		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	LAB					18-JUN-20	R5125646
Barium (Ba)-Dissolved	0.00773		0.00010	mg/L	18-JUN-20	18-JUN-20	R5125737
Boron (B)-Dissolved	0.011		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Calcium (Ca)-Dissolved	17.4		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5125737
Magnesium (Mg)-Dissolved	5.18		0.0050	mg/L	18-JUN-20	18-JUN-20	R5125737
Manganese (Mn)-Dissolved	0.0279		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Potassium (K)-Dissolved	0.860		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Sodium (Na)-Dissolved	4.84		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	18		10	mg/L		19-JUN-20	R5126192
Trihalomethanes							
Total THMs	<1.0		1.0	nounits		16-JUN-20	
L2461003-2 MW3-02 Sampled By: JS on 12-JUN-20 @ 14:37 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	636		1.0	uS/cm		16-JUN-20	R5120976
pH	7.85		0.10	pH		16-JUN-20	R5120976

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-2 MW3-02 Sampled By: JS on 12-JUN-20 @ 14:37 Matrix: Groundwater							
Physical Tests							
Total Suspended Solids	19.3		3.0	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	365		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	228		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	228		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.163		0.010	mg/L		18-JUN-20	R5125117
Chloride (Cl)	68.1		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.107		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	11.4		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	6.72			meq/L		19-JUN-20	
Cation Sum	6.39			meq/L		19-JUN-20	
Cation - Anion Balance	-2.5			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	13.7		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.0154		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	0.432		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	52.0		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00066		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	0.035		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	0.000064		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	13.6		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.0477		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	30.5		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	43.2		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	49		10	mg/L		19-JUN-20	R5126192
L2461003-3 MW4-02 Sampled By: JS on 12-JUN-20 @ 14:00 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	300		1.0	uS/cm		16-JUN-20	R5120976
pH	7.44		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	333		7.5	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	195		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	121		2.0	mg/L		16-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-3 MW4-02 Sampled By: JS on 12-JUN-20 @ 14:00 Matrix: Groundwater							
Anions and Nutrients							
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	121		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.84	DLHC	0.10	mg/L		19-JUN-20	R5125117
Chloride (Cl)	26.8		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.020		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	1.48		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	3.20			meq/L		19-JUN-20	
Cation Sum	3.35			meq/L		19-JUN-20	
Cation - Anion Balance	2.3			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	7.60		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.0570		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	0.099		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	23.8		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	3.61		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	7.90		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.270		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	11.1		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	23.4		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	2.1		2.0	mg/L		16-JUN-20	R5126790
COD	32		10	mg/L		19-JUN-20	R5126192
L2461003-4 MW5-02 Sampled By: JS on 12-JUN-20 @ 09:35 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	127		1.0	uS/cm		16-JUN-20	R5120976
pH	7.78		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	71.3		3.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	100		13	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	55.5		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	55.5		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.018		0.010	mg/L		19-JUN-20	R5125117

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-4 MW5-02 Sampled By: JS on 12-JUN-20 @ 09:35 Matrix: Groundwater							
Anions and Nutrients							
Chloride (Cl)	0.93		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.164		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	10.0		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	1.36			meq/L		19-JUN-20	
Cation Sum	1.22			meq/L		19-JUN-20	
Cation - Anion Balance	-5.3			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	3.19		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.00785		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	13.9		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00343		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	0.000133		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	4.21		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.00083		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	1.07		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	3.46		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	<10		10	mg/L		19-JUN-20	R5126192
L2461003-5 MW6-02 Sampled By: JS on 12-JUN-20 @ 14:27 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	551		1.0	uS/cm		16-JUN-20	R5120976
pH	7.59		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	314		7.5	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	345		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	219		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	219		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	1.75	DLHC	0.50	mg/L		19-JUN-20	R5125117
Chloride (Cl)	57.2		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.292		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	<0.30		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	6.02			meq/L		19-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-5 MW6-02 Sampled By: JS on 12-JUN-20 @ 14:27 Matrix: Groundwater							
Anions and Nutrients							
Cation Sum	5.60			meq/L		19-JUN-20	
Cation - Anion Balance	-3.6			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	14.1		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	LAB					18-JUN-20	R5125646
Barium (Ba)-Dissolved	0.140		0.00010	mg/L	18-JUN-20	18-JUN-20	R5125737
Boron (B)-Dissolved	0.122		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Calcium (Ca)-Dissolved	56.5		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Iron (Fe)-Dissolved	0.049		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5125737
Magnesium (Mg)-Dissolved	15.4		0.0050	mg/L	18-JUN-20	18-JUN-20	R5125737
Manganese (Mn)-Dissolved	0.796		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Potassium (K)-Dissolved	5.71		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Sodium (Na)-Dissolved	30.7		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Aggregate Organics							
Biochemical Oxygen Demand	3.0		2.0	mg/L		16-JUN-20	R5126790
COD	64		10	mg/L		19-JUN-20	R5126192
L2461003-6 MW1-03 Sampled By: JS on 12-JUN-20 @ 15:05 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	2150		1.0	uS/cm		16-JUN-20	R5120976
pH	6.73		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	105		7.5	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	1300		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	157		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	157		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	3.79	DLHC	0.50	mg/L		19-JUN-20	R5125117
Chloride (Cl)	628	DLDS	2.5	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	16.0	DLDS	1.5	mg/L		18-JUN-20	R5125964
Anion Sum	21.2			meq/L		19-JUN-20	
Cation Sum	21.6			meq/L		19-JUN-20	
Cation - Anion Balance	1.0			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-6 MW1-03 Sampled By: JS on 12-JUN-20 @ 15:05 Matrix: Groundwater							
Organic / Inorganic Carbon							
Dissolved Organic Carbon	13.9		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.676		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	0.280		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	101		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00084		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	23.0		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	43.7		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.885		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	60.0		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	235	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	59		10	mg/L		19-JUN-20	R5126192
L2461003-7 MW1-15 Sampled By: JS on 12-JUN-20 @ 10:25 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	1600		1.0	uS/cm		16-JUN-20	R5120976
pH	6.86		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	2020		7.5	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	989		20	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	893		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	893		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.171		0.010	mg/L		18-JUN-20	R5125117
Chloride (Cl)	84.2	DLDS	2.5	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.10	DLDS	0.10	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	<1.5	DLDS	1.5	mg/L		18-JUN-20	R5125964
Anion Sum	20.2			meq/L		19-JUN-20	
Cation Sum	21.0			meq/L		19-JUN-20	
Cation - Anion Balance	1.8			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	17-JUN-20	R5123736
Dissolved Organic Carbon	18.1		0.50	mg/L	12-JUN-20	22-JUN-20	R5129297
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.189	DLHC	0.0010	mg/L	18-JUN-20	18-JUN-20	R5124877

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-7 MW1-15 Sampled By: JS on 12-JUN-20 @ 10:25 Matrix: Groundwater							
Dissolved Metals							
Boron (B)-Dissolved	1.24	DLHC	0.10	mg/L	18-JUN-20	19-JUN-20	R5124877
Calcium (Ca)-Dissolved	205	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	9.19	DLHC	0.10	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	87.3	DLHC	0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	4.47	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	3.79	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	64.4	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	3.6		2.0	mg/L		16-JUN-20	R5126790
COD	104		10	mg/L		19-JUN-20	R5126192
L2461003-8 MW2-15 Sampled By: JS on 12-JUN-20 @ 13:15 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	30.1		1.0	uS/cm		16-JUN-20	R5120976
pH	5.93		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	1190		3.8	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	33		10	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	11.2		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	11.2		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	<0.010		0.010	mg/L		18-JUN-20	R5125117
Chloride (Cl)	<0.50		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.054		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	2.13		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	0.27			meq/L		19-JUN-20	
Cation Sum	0.26			meq/L		19-JUN-20	
Cation - Anion Balance	-2.9			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	4.20		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.00420		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	19-JUN-20	R5124877
Calcium (Ca)-Dissolved	2.49		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	0.050		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-8 MW2-15 Sampled By: JS on 12-JUN-20 @ 13:15 Matrix: Groundwater							
Dissolved Metals							
Lead (Pb)-Dissolved	0.000101		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	0.376		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.00505		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	0.319		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	1.92		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	91		10	mg/L		19-JUN-20	R5126192
L2461003-9 MW3-15 Sampled By: JS on 12-JUN-20 @ 12:23 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	75.9		1.0	uS/cm		16-JUN-20	R5120976
pH	6.50		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	1420		5.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	182		13	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	17.6		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	17.6		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.012		0.010	mg/L		18-JUN-20	R5125117
Chloride (Cl)	9.01		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.077		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	4.01		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	0.69			meq/L		19-JUN-20	
Cation Sum	0.69			meq/L		19-JUN-20	
Cation - Anion Balance	-0.6			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	10.3		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	LAB					18-JUN-20	R5125646
Barium (Ba)-Dissolved	0.00276		0.00010	mg/L	18-JUN-20	18-JUN-20	R5125737
Boron (B)-Dissolved	0.115		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Calcium (Ca)-Dissolved	4.01		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Chromium (Cr)-Dissolved	0.00056		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Iron (Fe)-Dissolved	0.486		0.010	mg/L	18-JUN-20	18-JUN-20	R5125737
Lead (Pb)-Dissolved	0.000163		0.000050	mg/L	18-JUN-20	18-JUN-20	R5125737
Magnesium (Mg)-Dissolved	1.18		0.0050	mg/L	18-JUN-20	18-JUN-20	R5125737
Manganese (Mn)-Dissolved	0.605		0.00050	mg/L	18-JUN-20	18-JUN-20	R5125737
Potassium (K)-Dissolved	0.378		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-9 MW3-15 Sampled By: JS on 12-JUN-20 @ 12:23 Matrix: Groundwater							
Dissolved Metals							
Sodium (Na)-Dissolved	7.49		0.050	mg/L	18-JUN-20	18-JUN-20	R5125737
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	77		10	mg/L		19-JUN-20	R5126192
L2461003-10 MW4-15 Sampled By: JS on 12-JUN-20 @ 10:15 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	90.3		1.0	uS/cm		16-JUN-20	R5120976
pH	6.53		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	277		3.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	76		13	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	39.1		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	39.1		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.141		0.010	mg/L		18-JUN-20	R5125117
Chloride (Cl)	1.37		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.229		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	5.75		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	0.96			meq/L		19-JUN-20	
Cation Sum	0.93			meq/L		19-JUN-20	
Cation - Anion Balance	-1.6			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	3.60		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.00675		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	9.26		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	0.291		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	3.18		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.217		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	0.693		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	3.46		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	2.4		2.0	mg/L		16-JUN-20	R5126790
COD	15		10	mg/L		19-JUN-20	R5126192

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-11 MW1-17 Sampled By: JS on 12-JUN-20 @ 12:00 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	287		1.0	uS/cm		16-JUN-20	R5120976
pH	7.05		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	6660		15	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	364		40	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	110		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	110		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	1.02	DLHC	0.50	mg/L		19-JUN-20	R5125117
Chloride (Cl)	17.6		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.118		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	25.1		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	3.22			meq/L		19-JUN-20	
Cation Sum	3.40			meq/L		19-JUN-20	
Cation - Anion Balance	2.8			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	14.7		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.0281		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	0.030		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	16.7		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00111		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	3.58		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	0.00108		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	6.86		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.618		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	1.62		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	39.2		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	3.9		2.0	mg/L		16-JUN-20	R5126790
COD	242		10	mg/L		19-JUN-20	R5126192
L2461003-12 MW2-17 Sampled By: JS on 12-JUN-20 @ 12:40 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	162		1.0	uS/cm		16-JUN-20	R5120976
pH	7.25		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	363		5.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	154		13	mg/L		16-JUN-20	R5121679

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-12 MW2-17 Sampled By: JS on 12-JUN-20 @ 12:40 Matrix: Groundwater							
Physical Tests							
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	69.0		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	69.0		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.026		0.010	mg/L		19-JUN-20	R5125117
Chloride (Cl)	6.02		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.074		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	10.5		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	1.77			meq/L		19-JUN-20	
Cation Sum	1.69			meq/L		19-JUN-20	
Cation - Anion Balance	-2.5			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	3.92		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.0106		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	17.9		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00066		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	6.01		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.00057		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	0.830		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	6.41		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	42		10	mg/L		19-JUN-20	R5126192
L2461003-13 MW2-02 Sampled By: JS on 12-JUN-20 @ 11:20 Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	3450		1.0	uS/cm		16-JUN-20	R5120976
pH	6.94		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	176		7.5	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	1690		20	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	1650		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-13 MW2-02 Sampled By: JS on 12-JUN-20 @ 11:20 Matrix: Groundwater							
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	1650		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	148	DLHC	10	mg/L		19-JUN-20	R5125117
Chloride (Cl)	266	DLDS	5.0	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.20	DLDS	0.20	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	<3.0	DLDS	3.0	mg/L		18-JUN-20	R5125964
Anion Sum	40.5			meq/L		19-JUN-20	
Cation Sum	35.1			meq/L		19-JUN-20	
Cation - Anion Balance	-7.2			%		19-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	95.9	DLM	5.0	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					24-JUN-20	R5130872
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.419	DLHC	0.0010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	1.96	DLHC	0.10	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	194	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.0050	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	67.3	DLHC	0.10	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.00050	DLHC	0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	74.2	DLHC	0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.411	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Mercury (Hg)-Dissolved	<0.000025	DLM	0.000025	mg/L	24-JUN-20	24-JUN-20	R5130972
Potassium (K)-Dissolved	186	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	252	DLHC	0.50	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	9.9		2.0	mg/L		16-JUN-20	R5126790
COD	228		10	mg/L		19-JUN-20	R5126192
Volatile Organic Compounds							
Acetone	22		20	ug/L		22-JUN-20	R5126887
Benzene	2.97		0.50	ug/L		22-JUN-20	R5126887
Bromodichloromethane	<1.0		1.0	ug/L		22-JUN-20	R5126887
Bromoform	<1.0		1.0	ug/L		22-JUN-20	R5126887
Bromomethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
Carbon Disulfide	<1.0		1.0	ug/L		22-JUN-20	R5126887
Carbon tetrachloride	<0.20		0.20	ug/L		22-JUN-20	R5126887
Chlorobenzene	5.78		0.50	ug/L		22-JUN-20	R5126887
Dibromochloromethane	<1.0		1.0	ug/L		22-JUN-20	R5126887
Chloroethane	1.1		1.0	ug/L		22-JUN-20	R5126887
Chloroform	<1.0		1.0	ug/L		22-JUN-20	R5126887
Chloromethane	<1.0		1.0	ug/L		22-JUN-20	R5126887
1,2-Dibromoethane	<0.20		0.20	ug/L		22-JUN-20	R5126887

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-13 MW2-02 Sampled By: JS on 12-JUN-20 @ 11:20 Matrix: Groundwater							
Volatile Organic Compounds							
1,2-Dichlorobenzene	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,3-Dichlorobenzene	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,4-Dichlorobenzene	1.17		0.50	ug/L		22-JUN-20	R5126887
Dichlorodifluoromethane	<1.0		1.0	ug/L		22-JUN-20	R5126887
1,1-Dichloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,2-Dichloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,1-Dichloroethylene	<0.50		0.50	ug/L		22-JUN-20	R5126887
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JUN-20	R5126887
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JUN-20	R5126887
Dichloromethane	<2.0		2.0	ug/L		22-JUN-20	R5126887
1,2-Dichloropropane	<0.50		0.50	ug/L		22-JUN-20	R5126887
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JUN-20	R5126887
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JUN-20	R5126887
Ethylbenzene	<0.50		0.50	ug/L		22-JUN-20	R5126887
n-Hexane	<0.50		0.50	ug/L		22-JUN-20	R5126887
2-Hexanone	<20		20	ug/L		22-JUN-20	R5126887
Methyl Ethyl Ketone	<20		20	ug/L		22-JUN-20	R5126887
Methyl Isobutyl Ketone	<20		20	ug/L		22-JUN-20	R5126887
MTBE	1.08		0.50	ug/L		22-JUN-20	R5126887
Styrene	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
Tetrachloroethylene	<0.50		0.50	ug/L		22-JUN-20	R5126887
Toluene	<0.40		0.40	ug/L		22-JUN-20	R5126887
1,1,1-Trichloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
1,1,2-Trichloroethane	<0.50		0.50	ug/L		22-JUN-20	R5126887
Trichloroethylene	<0.50		0.50	ug/L		22-JUN-20	R5126887
Trichlorofluoromethane	<1.0		1.0	ug/L		22-JUN-20	R5126887
Vinyl chloride	<0.50		0.50	ug/L		22-JUN-20	R5126887
o-Xylene	<0.30		0.30	ug/L		22-JUN-20	R5126887
m+p-Xylenes	9.55		0.40	ug/L		22-JUN-20	R5126887
Xylenes (Total)	9.55		0.50	ug/L		22-JUN-20	
Surrogate: 4-Bromofluorobenzene	95.5		70-130	%		22-JUN-20	R5126887
Surrogate: 1,4-Difluorobenzene	98.9		70-130	%		22-JUN-20	R5126887
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		22-JUN-20	
L2461003-14 SW Sampled By: JS on 12-JUN-20 @ 13:25 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	888		1.0	uS/cm		16-JUN-20	R5120976
pH	8.09		0.10	pH		16-JUN-20	R5120976

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-14 SW Sampled By: JS on 12-JUN-20 @ 13:25 Matrix: Surface Water							
Physical Tests							
Total Suspended Solids	5.9		3.0	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	545		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	409		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	409		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	8.28	DLHC	0.50	mg/L		23-JUN-20	R5130892
Chloride (Cl)	57.3		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.227		0.020	mg/L		18-JUN-20	R5125964
Nitrite (as N)	0.094		0.010	mg/L		18-JUN-20	R5125964
Total Kjeldahl Nitrogen	10.5	DLHC	0.30	mg/L	18-JUN-20	18-JUN-20	R5125401
Phosphorus, Total	0.0230		0.0030	mg/L	17-JUN-20	19-JUN-20	R5125938
Sulfate (SO4)	8.57		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	9.99			meq/L		19-JUN-20	
Cation Sum	9.95			meq/L		19-JUN-20	
Cation - Anion Balance	-0.2			%		19-JUN-20	
Total Metals							
Arsenic (As)-Total	<0.0010	DLHC	0.0010	mg/L	18-JUN-20	18-JUN-20	R5124897
Barium (Ba)-Total	0.0863	DLHC	0.0010	mg/L	18-JUN-20	18-JUN-20	R5124897
Boron (B)-Total	0.72	DLHC	0.10	mg/L	18-JUN-20	18-JUN-20	R5124897
Cadmium (Cd)-Total	<0.000050	DLHC	0.000050	mg/L	18-JUN-20	18-JUN-20	R5124897
Chromium (Cr)-Total	<0.0050	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124897
Copper (Cu)-Total	<0.0050	DLHC	0.0050	mg/L	18-JUN-20	18-JUN-20	R5124897
Iron (Fe)-Total	1.42	DLHC	0.10	mg/L	18-JUN-20	18-JUN-20	R5124897
Lead (Pb)-Total	<0.00050	DLHC	0.00050	mg/L	18-JUN-20	18-JUN-20	R5124897
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		22-JUN-20	R5127564
Zinc (Zn)-Total	<0.030	DLHC	0.030	mg/L	18-JUN-20	18-JUN-20	R5124897
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	69		10	mg/L		19-JUN-20	R5126192
Phenols (4AAP)	0.0013		0.0010	mg/L		18-JUN-20	R5126148
L2461003-15 SW3 Sampled By: JS on 12-JUN-20 @ 16:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	298		1.0	uS/cm		16-JUN-20	R5120976
pH	7.80		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	<3.0		3.0	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	221		20	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	146		2.0	mg/L		16-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-15 SW3 Sampled By: JS on 12-JUN-20 @ 16:00 Matrix: Surface Water							
Anions and Nutrients							
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	146		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.038		0.010	mg/L		23-JUN-20	R5130892
Chloride (Cl)	12.4		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.020		0.020	mg/L		18-JUN-20	R5125964
Nitrite (as N)	<0.010		0.010	mg/L		18-JUN-20	R5125964
Total Kjeldahl Nitrogen	0.88		0.15	mg/L	18-JUN-20	18-JUN-20	R5125401
Phosphorus, Total	0.0157		0.0030	mg/L	18-JUN-20	19-JUN-20	R5126031
Sulfate (SO4)	<0.30		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	3.27			meq/L		19-JUN-20	
Cation Sum	3.44			meq/L		19-JUN-20	
Cation - Anion Balance	2.6			%		19-JUN-20	
Total Metals							
Arsenic (As)-Total	0.00081		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124897
Barium (Ba)-Total	0.0210		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124897
Boron (B)-Total	0.184		0.010	mg/L	18-JUN-20	18-JUN-20	R5124897
Cadmium (Cd)-Total	0.0000057		0.0000050	mg/L	18-JUN-20	18-JUN-20	R5124897
Chromium (Cr)-Total	0.00065		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124897
Copper (Cu)-Total	<0.0010		0.0010	mg/L	18-JUN-20	18-JUN-20	R5124897
Iron (Fe)-Total	0.781		0.010	mg/L	18-JUN-20	18-JUN-20	R5124897
Lead (Pb)-Total	0.000061		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124897
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		22-JUN-20	R5127564
Zinc (Zn)-Total	0.0031		0.0030	mg/L	18-JUN-20	18-JUN-20	R5124897
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	63		10	mg/L		19-JUN-20	R5126192
Phenols (4AAP)	<0.0010		0.0010	mg/L		18-JUN-20	R5126148
L2461003-16 DUPLICATE Sampled By: JS on 12-JUN-20 @ 12:50 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	168		1.0	uS/cm		16-JUN-20	R5120976
pH	7.29		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	402		5.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	150		13	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	66.4		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	66.4		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.030		0.010	mg/L		23-JUN-20	R5130892

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-16 DUPLICATE Sampled By: JS on 12-JUN-20 @ 12:50 Matrix: Surface Water							
Anions and Nutrients							
Chloride (Cl)	8.01		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	0.081		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	10.3		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	1.77			meq/L		22-JUN-20	
Cation Sum	1.72			meq/L		22-JUN-20	
Cation - Anion Balance	-1.4			%		22-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	3.03		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	0.0109		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	18.4		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	0.00061		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	0.011		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	6.14		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	0.00073		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	0.838		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	6.40		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	50		10	mg/L		19-JUN-20	R5126192
L2461003-17 FIELD BLANK Sampled By: JS on 12-JUN-20 @ 15:34 Matrix: Water							
Physical Tests							
Conductivity (EC)	1.0		1.0	uS/cm		16-JUN-20	R5120976
pH	5.47		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	<3.0		3.0	mg/L		16-JUN-20	R5121307
Total Dissolved Solids	<10		10	mg/L		16-JUN-20	R5121957
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.019		0.010	mg/L		23-JUN-20	R5130892
Chloride (Cl)	<0.50		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.020		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	<0.30		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	<0.10			meq/L		22-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-17 FIELD BLANK Sampled By: JS on 12-JUN-20 @ 15:34 Matrix: Water							
Anions and Nutrients							
Cation Sum	<0.10			meq/L		22-JUN-20	
Cation - Anion Balance	0.0			%		22-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546
Dissolved Organic Carbon	<0.50		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	<0.00010		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	<10		10	mg/L		19-JUN-20	R5126192
L2461003-18 TRAVEL BLANK Sampled By: JS on 12-JUN-20 Matrix: Water							
Physical Tests							
Conductivity (EC)	1.1		1.0	uS/cm		16-JUN-20	R5120976
pH	5.47		0.10	pH		16-JUN-20	R5120976
Total Suspended Solids	<3.0		3.0	mg/L		16-JUN-20	R5121218
Total Dissolved Solids	<10		10	mg/L		16-JUN-20	R5121679
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		16-JUN-20	R5120976
Ammonia, Total (as N)	0.043		0.010	mg/L		23-JUN-20	R5130892
Chloride (Cl)	<0.50		0.50	mg/L		18-JUN-20	R5125964
Nitrate (as N)	<0.020		0.020	mg/L		18-JUN-20	R5125964
Sulfate (SO4)	<0.30		0.30	mg/L		18-JUN-20	R5125964
Anion Sum	<0.10			meq/L		22-JUN-20	
Cation Sum	<0.10			meq/L		22-JUN-20	
Cation - Anion Balance	0.0			%		22-JUN-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD				12-JUN-20	18-JUN-20	R5125546

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-18 TRAVEL BLANK Sampled By: JS on 12-JUN-20 Matrix: Water							
Organic / Inorganic Carbon							
Dissolved Organic Carbon	<0.50		0.50	mg/L	12-JUN-20	23-JUN-20	R5130058
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					18-JUN-20	R5123960
Barium (Ba)-Dissolved	<0.00010		0.00010	mg/L	18-JUN-20	18-JUN-20	R5124877
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-JUN-20	18-JUN-20	R5124877
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-JUN-20	18-JUN-20	R5124877
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	18-JUN-20	18-JUN-20	R5124877
Manganese (Mn)-Dissolved	<0.00050		0.00050	mg/L	18-JUN-20	18-JUN-20	R5124877
Potassium (K)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Sodium (Na)-Dissolved	<0.050		0.050	mg/L	18-JUN-20	18-JUN-20	R5124877
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		16-JUN-20	R5126790
COD	<10		10	mg/L		19-JUN-20	R5126192
L2461003-19 TRAVEL SPIKE Sampled By: JS on 12-JUN-20 Matrix: Water							
Volatile Organic Compounds							
Acetone	147		20	ug/L		22-JUN-20	R5126887
Benzene	112		0.50	ug/L		22-JUN-20	R5126887
Bromodichloromethane	117		1.0	ug/L		22-JUN-20	R5126887
Bromoform	103		1.0	ug/L		22-JUN-20	R5126887
Bromomethane	119		0.50	ug/L		22-JUN-20	R5126887
Carbon Disulfide	104		1.0	ug/L		22-JUN-20	R5126887
Carbon tetrachloride	110		0.20	ug/L		22-JUN-20	R5126887
Chlorobenzene	102		0.50	ug/L		22-JUN-20	R5126887
Dibromochloromethane	107		1.0	ug/L		22-JUN-20	R5126887
Chloroethane	119		1.0	ug/L		22-JUN-20	R5126887
Chloroform	118		1.0	ug/L		22-JUN-20	R5126887
Chloromethane	138		1.0	ug/L		22-JUN-20	R5126887
1,2-Dibromoethane	107		0.20	ug/L		22-JUN-20	R5126887
1,2-Dichlorobenzene	106		0.50	ug/L		22-JUN-20	R5126887
1,3-Dichlorobenzene	98.6		0.50	ug/L		22-JUN-20	R5126887
1,4-Dichlorobenzene	101		0.50	ug/L		22-JUN-20	R5126887
Dichlorodifluoromethane	97.9		1.0	ug/L		22-JUN-20	R5126887
1,1-Dichloroethane	115		0.50	ug/L		22-JUN-20	R5126887
1,2-Dichloroethane	109		0.50	ug/L		22-JUN-20	R5126887
1,1-Dichloroethylene	106		0.50	ug/L		22-JUN-20	R5126887
cis-1,2-Dichloroethylene	110		0.50	ug/L		22-JUN-20	R5126887
trans-1,2-Dichloroethylene	102		0.50	ug/L		22-JUN-20	R5126887

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2461003-19 TRAVEL SPIKE Sampled By: JS on 12-JUN-20 Matrix: Water							
Volatile Organic Compounds							
Dichloromethane	111		2.0	ug/L		22-JUN-20	R5126887
1,2-Dichloropropane	119		0.50	ug/L		22-JUN-20	R5126887
cis-1,3-Dichloropropene	69.7		0.30	ug/L		22-JUN-20	R5126887
trans-1,3-Dichloropropene	75.8		0.30	ug/L		22-JUN-20	R5126887
Ethylbenzene	109		0.50	ug/L		22-JUN-20	R5126887
n-Hexane	54.0		0.50	ug/L		22-JUN-20	R5126887
2-Hexanone	111		20	ug/L		22-JUN-20	R5126887
Methyl Ethyl Ketone	105		20	ug/L		22-JUN-20	R5126887
Methyl Isobutyl Ketone	110		20	ug/L		22-JUN-20	R5126887
MTBE	109		0.50	ug/L		22-JUN-20	R5126887
Styrene	97.4		0.50	ug/L		22-JUN-20	R5126887
1,1,1,2-Tetrachloroethane	108		0.50	ug/L		22-JUN-20	R5126887
1,1,2,2-Tetrachloroethane	92.2		0.50	ug/L		22-JUN-20	R5126887
Tetrachloroethylene	98.8		0.50	ug/L		22-JUN-20	R5126887
Toluene	110		0.40	ug/L		22-JUN-20	R5126887
1,1,1-Trichloroethane	112		0.50	ug/L		22-JUN-20	R5126887
1,1,2-Trichloroethane	112		0.50	ug/L		22-JUN-20	R5126887
Trichloroethylene	106		0.50	ug/L		22-JUN-20	R5126887
Trichlorofluoromethane	104		1.0	ug/L		22-JUN-20	R5126887
Vinyl chloride	116		0.50	ug/L		22-JUN-20	R5126887
o-Xylene	110		0.30	ug/L		22-JUN-20	R5126887
m+p-Xylenes	99.3		0.40	ug/L		22-JUN-20	R5126887
Xylenes (Total)	209		0.50	ug/L		22-JUN-20	
Surrogate: 4-Bromofluorobenzene	98.1		70-130	%		22-JUN-20	R5126887
Surrogate: 1,4-Difluorobenzene	98.3		70-130	%		22-JUN-20	R5126887
Trihalomethanes							
Total THMs	445		2.0	ug/L		22-JUN-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Dissolved Organic Carbon	MS-B	L2461003-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2461003-1, -5, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2461003-1, -5, -9
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2461003-1, -5, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2461003-1, -5, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2461003-10, -11, -12, -13, -16, -17, -18, -2, -3, -4, -6, -7, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2461003-1, -5, -9
Matrix Spike	Iron (Fe)-Total	MS-B	L2461003-14, -15
Matrix Spike	Ammonia, Total (as N)	MS-B	L2461003-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Ammonia, Total (as N)	MS-B	L2461003-14, -15, -16, -17, -18
Matrix Spike	Nitrate (as N)	MS-B	L2461003-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -2, -3, -4, -5, -6, -7, -8, -9

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3-TITR-CALC-TB	Water	Alkalinity, Carbonate (as CaCO3)	CALCULATION
ALK-HCO3TITR-CALC-TB	Water	Alkalinity, Bicarbonate (as CaCO3)	CALCULATION
ALK-OH-TITR-CALC-TB	Water	Alkalinity, Hydroxide (as CaCO3)	CALCULATION
ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BOD-TB	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

COD-T-WT	Water	Chemical Oxygen Demand	APHA 5220 D

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-TITR-TB	Water	Conductivity	APHA 2510 B

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HG-D-CVAA-VA	Water	Diss. Mercury in Water by CVAAS or CVAFS	APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

IONBALANCE-TB	Water	Ion Balance Calculation	APHA 1030 E - CALCULATION

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-WT	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically

Reference Information

after persulphate digestion of the sample.

PH-TITR-TB	Water	pH	APHA 4500-H

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

TSS-TB	Water	Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry

VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260

Aqueous samples are analyzed by headspace-GC/MS.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-TB	**Water**							
Batch R5120976								
WG3343369-3 DUP		**L2461003-6**						
Alkalinity, Total (as CaCO3)		157	157		mg/L	0.4	20	16-JUN-20
WG3342997-2 LCS								
Alkalinity, Total (as CaCO3)			104.5		%		85-115	16-JUN-20
WG3343369-2 LCS								
Alkalinity, Total (as CaCO3)			103.9		%		85-115	16-JUN-20
WG3342997-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUN-20
WG3343369-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUN-20
BOD-TB	**Water**							
Batch R5126790								
WG3343022-2 LCS								
Biochemical Oxygen Demand			97.4		%		85-115	16-JUN-20
WG3343022-6 LCS								
Biochemical Oxygen Demand			101.8		%		85-115	16-JUN-20
WG3343022-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	16-JUN-20
WG3343022-5 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	16-JUN-20
CL-IC-N-WT	**Water**							
Batch R5125964								
WG3345451-12 LCS								
Chloride (Cl)			100.7		%		90-110	18-JUN-20
WG3345451-7 LCS								
Chloride (Cl)			100.5		%		90-110	18-JUN-20
WG3345451-11 MB								
Chloride (Cl)			<0.50		mg/L		0.5	18-JUN-20
WG3345451-6 MB								
Chloride (Cl)			<0.50		mg/L		0.5	18-JUN-20
COD-T-WT	**Water**							
Batch R5126192								
WG3345710-2 LCS								
COD			100.9		%		85-115	19-JUN-20
WG3345710-6 LCS								
COD			100.1		%		85-115	19-JUN-20
WG3345710-1 MB								
COD			<10		mg/L		10	19-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
COD-T-WT	**Water**							
Batch R5126192								
WG3345710-5 MB								
COD			<10		mg/L		10	19-JUN-20
DOC-WT	**Water**							
Batch R5129297								
WG3344517-2 LCS								
Dissolved Organic Carbon			106.0		%		80-120	22-JUN-20
WG3344517-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	22-JUN-20
Batch R5130058								
WG3345372-3 DUP		**L2461003-8**						
Dissolved Organic Carbon		4.20	4.66		mg/L	10	20	23-JUN-20
WG3345372-2 LCS								
Dissolved Organic Carbon			108.1		%		80-120	23-JUN-20
WG3345372-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	23-JUN-20
WG3345372-4 MS		**L2461003-8**						
Dissolved Organic Carbon			116.1		%		70-130	23-JUN-20
EC-TITR-TB	**Water**							
Batch R5120976								
WG3343369-3 DUP		**L2461003-6**						
Conductivity (EC)		2150	2150		uS/cm	0.0	10	16-JUN-20
WG3342997-2 LCS								
Conductivity (EC)			96.9		%		90-110	16-JUN-20
WG3343369-2 LCS								
Conductivity (EC)			98.7		%		90-110	16-JUN-20
WG3342997-1 MB								
Conductivity (EC)			<1.0		uS/cm		2	16-JUN-20
WG3343369-1 MB								
Conductivity (EC)			<1.0		uS/cm		2	16-JUN-20
HG-D-CVAA-VA	**Water**							
Batch R5130972								
WG3348630-3 DUP		**L2461003-13**						
Mercury (Hg)-Dissolved		<0.000025	<0.000025	RPD-NA	mg/L	N/A	20	24-JUN-20
WG3348630-2 LCS								
Mercury (Hg)-Dissolved			96.5		%		80-120	24-JUN-20
WG3348630-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	24-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-VA	**Water**							
Batch R5127564								
WG3347427-2 LCS								
Mercury (Hg)-Total			99.4		%		80-120	22-JUN-20
WG3347427-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	22-JUN-20
MET-D-CCMS-WT	**Water**							
Batch R5124877								
WG3344618-2 LCS								
Barium (Ba)-Dissolved			102.7		%		80-120	18-JUN-20
Boron (B)-Dissolved			103.0		%		80-120	18-JUN-20
Calcium (Ca)-Dissolved			100.8		%		80-120	18-JUN-20
Chromium (Cr)-Dissolved			102.2		%		80-120	18-JUN-20
Iron (Fe)-Dissolved			97.8		%		80-120	18-JUN-20
Lead (Pb)-Dissolved			98.4		%		80-120	18-JUN-20
Magnesium (Mg)-Dissolved			109.3		%		80-120	18-JUN-20
Manganese (Mn)-Dissolved			101.2		%		80-120	18-JUN-20
Potassium (K)-Dissolved			106.4		%		80-120	18-JUN-20
Sodium (Na)-Dissolved			108.0		%		80-120	18-JUN-20
WG3344618-1 MB								
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	18-JUN-20
Boron (B)-Dissolved			<0.010		mg/L		0.01	18-JUN-20
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	18-JUN-20
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	18-JUN-20
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	18-JUN-20
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	18-JUN-20
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	18-JUN-20
Potassium (K)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
Batch R5125737								
WG3345493-2 LCS								
Barium (Ba)-Dissolved			101.8		%		80-120	18-JUN-20
Boron (B)-Dissolved			97.0		%		80-120	18-JUN-20
Calcium (Ca)-Dissolved			100.3		%		80-120	18-JUN-20
Chromium (Cr)-Dissolved			97.8		%		80-120	18-JUN-20
Iron (Fe)-Dissolved			96.9		%		80-120	18-JUN-20
Lead (Pb)-Dissolved			100.0		%		80-120	18-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT	**Water**							
Batch R5125737								
WG3345493-2 LCS								
Magnesium (Mg)-Dissolved			98.6		%		80-120	18-JUN-20
Manganese (Mn)-Dissolved			97.6		%		80-120	18-JUN-20
Potassium (K)-Dissolved			98.9		%		80-120	18-JUN-20
Sodium (Na)-Dissolved			97.8		%		80-120	18-JUN-20
WG3345493-1 MB								
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	18-JUN-20
Boron (B)-Dissolved			<0.010		mg/L		0.01	18-JUN-20
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	18-JUN-20
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	18-JUN-20
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	18-JUN-20
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	18-JUN-20
Manganese (Mn)-Dissolved			<0.00050		mg/L		0.0005	18-JUN-20
Potassium (K)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	18-JUN-20
MET-T-CCMS-WT	**Water**							
Batch R5124897								
WG3344594-2 LCS								
Arsenic (As)-Total			99.3		%		80-120	18-JUN-20
Barium (Ba)-Total			99.4		%		80-120	18-JUN-20
Boron (B)-Total			96.3		%		80-120	18-JUN-20
Cadmium (Cd)-Total			99.8		%		80-120	18-JUN-20
Chromium (Cr)-Total			101.1		%		80-120	18-JUN-20
Copper (Cu)-Total			100.0		%		80-120	18-JUN-20
Iron (Fe)-Total			100.5		%		80-120	18-JUN-20
Lead (Pb)-Total			99.6		%		80-120	18-JUN-20
Zinc (Zn)-Total			99.5		%		80-120	18-JUN-20
WG3344594-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	18-JUN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	18-JUN-20
Boron (B)-Total			<0.010		mg/L		0.01	18-JUN-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	18-JUN-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	18-JUN-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	18-JUN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	18-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	**Water**							
Batch R5124897								
WG3344594-1 MB								
Lead (Pb)-Total			<0.000050		mg/L		0.00005	18-JUN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	18-JUN-20
NH3-F-WT	**Water**							
Batch R5125117								
WG3344212-2 LCS								
Ammonia, Total (as N)			104.6		%		85-115	18-JUN-20
WG3344212-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	18-JUN-20
Batch R5130892								
WG3347383-2 LCS								
Ammonia, Total (as N)			95.8		%		85-115	23-JUN-20
WG3347383-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	23-JUN-20
NO2-IC-WT	**Water**							
Batch R5125964								
WG3345451-12 LCS								
Nitrite (as N)			101.1		%		90-110	18-JUN-20
WG3345451-11 MB								
Nitrite (as N)			<0.010		mg/L		0.01	18-JUN-20
NO3-IC-WT	**Water**							
Batch R5125964								
WG3345451-12 LCS								
Nitrate (as N)			99.96		%		90-110	18-JUN-20
WG3345451-7 LCS								
Nitrate (as N)			99.8		%		90-110	18-JUN-20
WG3345451-11 MB								
Nitrate (as N)			<0.020		mg/L		0.02	18-JUN-20
WG3345451-6 MB								
Nitrate (as N)			<0.020		mg/L		0.02	18-JUN-20
P-T-COL-WT	**Water**							
Batch R5125938								
WG3344316-2 LCS								
Phosphorus, Total			98.9		%		80-120	19-JUN-20
WG3344316-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	19-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WT	**Water**							
Batch R5126031								
WG3344510-2 LCS								
Phosphorus, Total			96.6		%		80-120	19-JUN-20
WG3344510-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	19-JUN-20
PH-TITR-TB	**Water**							
Batch R5120976								
WG3343369-3 DUP		**L2461003-6**						
pH		6.73	6.75	J	pH	0.02	0.2	16-JUN-20
WG3342997-2 LCS								
pH			6.93		pH		6.9-7.1	16-JUN-20
WG3343369-2 LCS								
pH			6.92		pH		6.9-7.1	16-JUN-20
PHENOLS-4AAP-WT	**Water**							
Batch R5126148								
WG3343970-2 LCS								
Phenols (4AAP)			104.3		%		85-115	18-JUN-20
WG3343970-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	18-JUN-20
SO4-IC-N-WT	**Water**							
Batch R5125964								
WG3345451-12 LCS								
Sulfate (SO4)			101.5		%		90-110	18-JUN-20
WG3345451-7 LCS								
Sulfate (SO4)			101.1		%		90-110	18-JUN-20
WG3345451-11 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	18-JUN-20
WG3345451-6 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	18-JUN-20
TDS-TB	**Water**							
Batch R5121679								
WG3343236-3 DUP		**L2461003-16**						
Total Dissolved Solids		150	142		mg/L	5.7	20	16-JUN-20
WG3343236-2 LCS								
Total Dissolved Solids			98.8		%		85-115	16-JUN-20
WG3343236-1 MB								
Total Dissolved Solids			<10		mg/L		10	16-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TDS-TB	**Water**							
Batch R5121957								
WG3343313-3 DUP		**L2461003-14**						
Total Dissolved Solids		545	538		mg/L	1.3	20	16-JUN-20
WG3343313-2 LCS								
Total Dissolved Solids			98.5		%		85-115	16-JUN-20
WG3343313-1 MB								
Total Dissolved Solids			<10		mg/L		10	16-JUN-20
TKN-WT	**Water**							
Batch R5125401								
WG3344508-2 LCS								
Total Kjeldahl Nitrogen			113.7		%		75-125	18-JUN-20
WG3344508-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	18-JUN-20
TSS-TB	**Water**							
Batch R5121218								
WG3343234-3 DUP		**L2461003-16**						
Total Suspended Solids		402	330		mg/L	20	20	16-JUN-20
WG3343234-2 LCS								
Total Suspended Solids			94.8		%		85-115	16-JUN-20
WG3343234-1 MB								
Total Suspended Solids			<3.0		mg/L		3	16-JUN-20
Batch R5121307								
WG3343305-3 DUP		**L2461003-14**						
Total Suspended Solids		5.9	6.7		mg/L	13	20	16-JUN-20
WG3343305-2 LCS								
Total Suspended Solids			93.5		%		85-115	16-JUN-20
WG3343305-1 MB								
Total Suspended Solids			<3.0		mg/L		3	16-JUN-20
VOC-ROU-HS-WT	**Water**							
Batch R5126887								
WG3346315-1 LCS								
1,1,1,2-Tetrachloroethane			101.7		%		70-130	22-JUN-20
1,1,2,2-Tetrachloroethane			89.2		%		70-130	22-JUN-20
1,1,1-Trichloroethane			104.8		%		70-130	22-JUN-20
1,1,2-Trichloroethane			106.6		%		70-130	22-JUN-20
1,2-Dibromoethane			103.4		%		70-130	22-JUN-20
1,1-Dichloroethane			107.2		%		70-130	22-JUN-20
1,1-Dichloroethylene			101.8		%		70-130	22-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5126887								
WG3346315-1 LCS								
1,2-Dichlorobenzene			103.7		%		70-130	22-JUN-20
1,2-Dichloroethane			104.3		%		70-130	22-JUN-20
1,2-Dichloropropane			111.6		%		70-130	22-JUN-20
1,3-Dichlorobenzene			101.3		%		70-130	22-JUN-20
1,4-Dichlorobenzene			103.8		%		70-130	22-JUN-20
2-Hexanone			104.6		%		60-140	22-JUN-20
Acetone			113.2		%		60-140	22-JUN-20
Benzene			106.4		%		70-130	22-JUN-20
Bromodichloromethane			110.8		%		70-130	22-JUN-20
Bromoform			100.2		%		70-130	22-JUN-20
Bromomethane			132.7		%		60-140	22-JUN-20
Carbon Disulfide			111.1		%		70-130	22-JUN-20
Carbon tetrachloride			104.2		%		70-130	22-JUN-20
Chlorobenzene			100.7		%		70-130	22-JUN-20
Chloroethane			112.9		%		70-130	22-JUN-20
Chloroform			110.9		%		70-130	22-JUN-20
Chloromethane			132.7		%		60-140	22-JUN-20
cis-1,2-Dichloroethylene			105.4		%		70-130	22-JUN-20
cis-1,3-Dichloropropene			111.1		%		70-130	22-JUN-20
Dibromochloromethane			102.4		%		70-130	22-JUN-20
Dichlorodifluoromethane			103.6		%		50-140	22-JUN-20
Dichloromethane			107.1		%		70-130	22-JUN-20
Ethylbenzene			106.9		%		70-130	22-JUN-20
m+p-Xylenes			99.4		%		70-130	22-JUN-20
Methyl Ethyl Ketone			99.8		%		60-140	22-JUN-20
Methyl Isobutyl Ketone			103.9		%		50-150	22-JUN-20
n-Hexane			106.0		%		70-130	22-JUN-20
MTBE			104.0		%		70-130	22-JUN-20
o-Xylene			106.7		%		70-130	22-JUN-20
Styrene			97.4		%		70-130	22-JUN-20
Tetrachloroethylene			104.9		%		70-130	22-JUN-20
Toluene			106.2		%		70-130	22-JUN-20
trans-1,2-Dichloroethylene			104.4		%		70-130	22-JUN-20
trans-1,3-Dichloropropene			123.9		%		70-130	22-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5126887								
WG3346315-1 LCS								
Trichloroethylene			105.5		%		70-130	22-JUN-20
Trichlorofluoromethane			100.0		%		60-140	22-JUN-20
Vinyl chloride			113.5		%		60-140	22-JUN-20
WG3346315-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	22-JUN-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	22-JUN-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	22-JUN-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	22-JUN-20
1,2-Dibromoethane			<0.20		ug/L		0.2	22-JUN-20
1,1-Dichloroethane			<0.50		ug/L		0.5	22-JUN-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	22-JUN-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	22-JUN-20
1,2-Dichloroethane			<0.50		ug/L		0.5	22-JUN-20
1,2-Dichloropropane			<0.50		ug/L		0.5	22-JUN-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	22-JUN-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	22-JUN-20
2-Hexanone			<20		ug/L		20	22-JUN-20
Acetone			<20		ug/L		20	22-JUN-20
Benzene			<0.50		ug/L		0.5	22-JUN-20
Bromodichloromethane			<1.0		ug/L		1	22-JUN-20
Bromoform			<1.0		ug/L		1	22-JUN-20
Bromomethane			<0.50		ug/L		0.5	22-JUN-20
Carbon Disulfide			<1.0		ug/L		1	22-JUN-20
Carbon tetrachloride			<0.20		ug/L		0.2	22-JUN-20
Chlorobenzene			<0.50		ug/L		0.5	22-JUN-20
Chloroethane			<1.0		ug/L		1	22-JUN-20
Chloroform			<1.0		ug/L		1	22-JUN-20
Chloromethane			<1.0		ug/L		1	22-JUN-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	22-JUN-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	22-JUN-20
Dibromochloromethane			<1.0		ug/L		1	22-JUN-20
Dichlorodifluoromethane			<1.0		ug/L		1	22-JUN-20
Dichloromethane			<2.0		ug/L		2	22-JUN-20
Ethylbenzene			<0.50		ug/L		0.5	22-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5126887								
WG3346315-2 MB								
m+p-Xylenes			<0.40		ug/L		0.4	22-JUN-20
Methyl Ethyl Ketone			<20		ug/L		20	22-JUN-20
Methyl Isobutyl Ketone			<20		ug/L		20	22-JUN-20
n-Hexane			<0.50		ug/L		0.5	22-JUN-20
MTBE			<0.50		ug/L		0.5	22-JUN-20
o-Xylene			<0.30		ug/L		0.3	22-JUN-20
Styrene			<0.50		ug/L		0.5	22-JUN-20
Tetrachloroethylene			<0.50		ug/L		0.5	22-JUN-20
Toluene			<0.40		ug/L		0.4	22-JUN-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	22-JUN-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	22-JUN-20
Trichloroethylene			<0.50		ug/L		0.5	22-JUN-20
Trichlorofluoromethane			<1.0		ug/L		1	22-JUN-20
Vinyl chloride			<0.50		ug/L		0.5	22-JUN-20
Surrogate: 1,4-Difluorobenzene			100.2		%		70-130	22-JUN-20
Surrogate: 4-Bromofluorobenzene			97.6		%		70-130	22-JUN-20

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2461003-COFC

COC Number: 17 - 9

Page 1 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☐ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	11353 / Q78965	AFE/Cost Center:	PO#:
Job #:	Blind River Landfill	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	L2461003	ALS Contact:	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

NUMBER OF CONTAINERS

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Schedule 5 Column 2 :	* (Alkalinity, BOD, Chloride, COD, DOC,	EC, Dissolved B, Ba, Ca, Fe, Mg, Na	NH3, NO3, pH, SO4, TDS, TSS)	Dissolved Cr, Pb, Mn, K	CO3, HCO3, OH	Ion Balance	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW1-02	12/06/20	9:12am	Groundwater	6	x				x	x	x		
	MW3-02		2:37	Groundwater		x				x	x	x		
	MW4-02		2:00	Groundwater		x				x	x	x		
	MW5-02		9:35	Groundwater		x				x	x	x		
	MW6-02		2:27	Groundwater		x				x	x	x		
	MW1-03		3:05	Groundwater		x				x	x	x		
	MW1-15		10:25	Groundwater		x				x	x	x		
	MW2-15		1:15	Groundwater		x				x	x	x		
	MW3-15		12:23	Groundwater		x				x	x	x		
	MW4-15		10:15	Groundwater		x				x	x	x		
	MW1-17		12:00	Groundwater		x				x	x	x		
	MW2-17		12:40	Groundwater	✓	x				x	x	x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please compare to ODWS. All sample Field Filtered & preserved when indicated.

Dissolved Metals, Dissolved Mercury and DOC require Laboratory Filtering

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☑ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
3	5.4				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Jennifer Sharpe	Date: June 15, 2020	Time: 11:15	Received by: JD	Date: June 15 2020	Time: 5:20	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCT 2018 FPOUT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2461003-COFC

COC Number: 17 -

Page 2 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☐ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	jennifer@kresinengineering.ca
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	annette@kresinengineering.ca
Email 2	

Project Information	
ALS Account # / Quote #:	11353 / Q78965
Job #:	Blind River Landfill
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 1:	(Alk, BOD, Chloride, COD, DOC, EC,	Dissolved Hg, Dissolved As, B, Ba, Ca,	Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Pb, Zn,	NH3, NO2, NO3, Total Phosph, pH,	Phenols, SO4, TDS, TKN, TSS, VOC's)	CO3, HCO3, OH	Ion Balnce	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW2-02	12/06/20	11:20	Groundwater	9	x						x	x		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Please compare to OPWS. Field filtered + preserved when indicated. "Dissolved Metals, Dissolved Mercury and DOC require Laboratory Filtering"
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No	☐
Ice Packs	☑ Ice Cubes ☑	Custody seal intact	Yes ☐	No	☐
Cooling Initiated	☑				

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
5.4							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	June 15 2020	11:15	JD	5:20 June 15/20	5:20			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Oct 2019 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2461003-COFC

COC Number: 17 - 9

Page 3 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	jennifer@kresinengineering.ca
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	annette@kresinengineering.ca
Email 2	

Project Information	
ALS Account # / Quote #:	11353 / Q78965
Job #:	Blind River Landfill
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)		
AFE/Cost Center:		PO#
Major/Minor Code:		Routing Code:
Requisitioner:		
Location:		

ALS Lab Work Order # (lab use only):	ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5, Coloumn 3	(Alkalinity, BOD, Cl, COD, Total Mercury	Conductivity, Total Metals (With Reportables)	NH3,NO2, NO3, Total Phosphorus, pH,	Phenols 4AAP, SO4, TDS, TKN, TSS)	CO3, HCO3, OH	Ion Balnce	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	SW	12/06/20	1:25	Surface Water	6	x					x	x		
	~~GW2~~	~~—~~	~~—~~	~~Surface Water~~	~~—~~	~~x~~	~~—~~	~~—~~	~~—~~	~~—~~	~~x~~	~~x~~	~~—~~	~~—~~
	SW3	↓	4:00	Surface Water	6	x					x	x		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Please Compare to PWQO. Preserved when indicated (metals)
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No	☐
Ice Packs	☑ Ice Cubes ☑	Custody seal intact	Yes ☐	No	☐
Cooling Initiated	☑				

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.4					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: JD	Date: June 15 2020	Time: 5:20	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2461003-COFC

COC Number: 17 - 4

Page 4 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): ☐ 4 day [P4-20%] ☐ 3 day [P3-25%] ☐ 2 day [P2-50%]

EMERGENCY: ☐ 1 Business day [E - 100%] ☐ Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	11353 / Q78965
Job #:	Blind River Landfill
PO / AFE:	
LSD:	
ALS Lab Work Order # (lab use only):	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact:	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 2 :	(Alkalinity, BOD, Chloride, COD, DOC,	EC, Dissolved B, Ba, Ca, Fe, Mg, Na	NH3, NO3, pH, SO4,TDS, TSS)	Dissolved Cr, Pb, Mn, K	CO3, HCO3, OH	Ion Balance	VOC Spike	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	Duplicate	17/06/20	12:50	Groundwater	6	x				x	x	x			
	Field Blank	↓	3:34	Water		x				x	x	x			
	Travel Blank			Water		x				x	x	x			
	Travel Spike			Water									x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please compare to ODWS. Duplicate field filtered + preserved.

Dissolved Metals, Dissolved Mercury and DOC require Laboratory Filtering

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☑ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
5.4	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	June 15, 2020	11:15	JD	June 15 2020	5:20			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCT 2018 FRONT

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Client: Kresin Engineering

L2461003-COFC

	Verified By	Date	Time	
Sample Layout Verification:	Y	2020 06 16	NA	Sample Integrity Issues Enter information on back page
Labels Verification:	Verified By: Y			Do any samples require prep? NO P F/P

		Sample #:																
1L	Plastic																	
500mL	Plastic																	
250mL	Plastic																	
145mL	Plastic																	
60mL	Plastic																	
Micro																		
Toxicity Pail																		
1L	Glass																	
500mL	Glass																	
250mL	Glass																	
120mL	Glass																	
60mL	Glass																	
40mL	Vial (Glass)																	
40mL	Methanol Vials																	
Soil Jar (120, 250 or 500mL)																		
Other:																		
Other:																		
Total Number of Bottles																		

Trip/Travel/Field Blank Information

Solids Batch#:	Metals Batch#:	T:	D:
Routine Batch#:	Mercury Batch#:	T:	D:
BOD Batch#:	Cyanide Batch#:	T:	D:
Nutrients Batch#:	OGG Batch#:		
DOC/Carbon Batch#:	Phenols Batch#:		
VOC Batch#:			
Other:			

COOLER TRACKING

EPP		Coleman	
Small		Micro (5QT)	
Med		Sm(9QT)	
Lrg		Med(16QT)	
Micro Box		Lrg(28QT)	
		Lrg(48QT)	

KRESIN ENGINEERING CORP.
ATTN: Jennifer Sharpe
536 Fourth Line East
Sault Ste Marie ON P6A 5K8

Date Received: 12-NOV-20
Report Date: 30-NOV-20 21:43 (MT)
Version: FINAL

Client Phone: 705-949-4900

Certificate of Analysis

Lab Work Order #: L2528521

Project P.O. #: NOT SUBMITTED
Job Reference: BLIND RIVER LANDFILL
C of C Numbers:
Legal Site Desc:

C. Paradis

Christine Paradis
Project Manager

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-1 MW1-02							
Sampled By: JS on 11-NOV-20 @ 08:47							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	2590		1.0	uS/cm	12-NOV-20		
pH	7.23		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	12700		15	mg/L	14-NOV-20		
Total Dissolved Solids	2260		40	mg/L	14-NOV-20		*500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	17-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	83.4		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	83.4		2.0	mg/L	12-NOV-20		30-500
Ammonia, Total (as N)	2.28		0.050	mg/L	19-NOV-20		
Chloride (Cl)	729		0.50	mg/L	13-NOV-20		*250
Nitrate (as N)	0.25		0.10	mg/L	13-NOV-20	10	
Sulfate (SO4)	7.3		1.5	mg/L	13-NOV-20		500
Anion Sum	22.4			meq/L	17-NOV-20		
Cation Sum	24.5			meq/L	17-NOV-20		
Cation - Anion Balance	4.4			%	17-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	11.7	DLM	2.5	mg/L	18-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.309		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	0.011		0.010	mg/L	16-NOV-20	5	
Calcium (Ca)-Dissolved	187		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00036		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	18.5		0.010	mg/L	16-NOV-20		*0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	55.2		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	7.09		0.00010	mg/L	16-NOV-20		*0.05
Potassium (K)-Dissolved	2.25		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	214		0.050	mg/L	16-NOV-20	*20	*200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	75		20	mg/L	17-NOV-20		
L2528521-2 MW3-02							
Sampled By: JS on 11-NOV-20 @ 13:05							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	666		1.0	uS/cm	14-NOV-20		
pH	7.95		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	13.9		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	390		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-2 MW3-02							
Sampled By: JS on 11-NOV-20 @ 13:05							
Matrix: Groundwater							
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	272		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	272		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.198		0.0050	mg/L	19-NOV-20		
Chloride (Cl)	56.5		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	0.075		0.020	mg/L	18-NOV-20	10	
Sulfate (SO4)	2.83		0.30	mg/L	18-NOV-20		500
Anion Sum	7.08			meq/L	23-NOV-20		
Cation Sum	7.03			meq/L	23-NOV-20		
Cation - Anion Balance	-0.4			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	18.0	DLM	2.5	mg/L	18-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.0151		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	0.362		0.010	mg/L	16-NOV-20	5	
Calcium (Ca)-Dissolved	54.7		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00094		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	0.086		0.010	mg/L	16-NOV-20		0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	14.1		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	0.0992		0.00010	mg/L	16-NOV-20		*0.05
Potassium (K)-Dissolved	34.9		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	51.3		0.050	mg/L	16-NOV-20	*20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	13-NOV-20		
Chemical Oxygen Demand	47		20	mg/L	17-NOV-20		
L2528521-3 MW4-02							
Sampled By: JS on 11-NOV-20 @ 12:34							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	303		1.0	uS/cm	14-NOV-20		
pH	7.29		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	965		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	332		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	112		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	112		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.646		0.050	mg/L	19-NOV-20		
Chloride (Cl)	30.6		0.10	mg/L	18-NOV-20		250

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-3	MW4-02							
Sampled By:	JS on 11-NOV-20 @ 12:34							
Matrix:	Groundwater							
Anions and Nutrients								
	Nitrate (as N)	0.041		0.020	mg/L	18-NOV-20	10	
	Sulfate (SO4)	<0.30		0.30	mg/L	18-NOV-20		500
	Anion Sum	3.10			meq/L	23-NOV-20		
	Cation Sum	3.30			meq/L	23-NOV-20		
	Cation - Anion Balance	3.2			%	23-NOV-20		
Organic / Inorganic Carbon								
	Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
	Dissolved Organic Carbon	7.4	DLM	2.5	mg/L	18-NOV-20		*5
Dissolved Metals								
	Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
	Barium (Ba)-Dissolved	0.0629		0.00010	mg/L	16-NOV-20	1	
	Boron (B)-Dissolved	0.080		0.010	mg/L	16-NOV-20	5	
	Calcium (Ca)-Dissolved	24.0		0.050	mg/L	16-NOV-20		
	Chromium (Cr)-Dissolved	0.00050		0.00010	mg/L	16-NOV-20	0.05	
	Iron (Fe)-Dissolved	3.61		0.010	mg/L	16-NOV-20		*0.3
	Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	16-NOV-20	0.01	
	Magnesium (Mg)-Dissolved	7.57		0.0050	mg/L	16-NOV-20		
	Manganese (Mn)-Dissolved	0.279		0.00010	mg/L	16-NOV-20		*0.05
	Potassium (K)-Dissolved	9.17		0.050	mg/L	16-NOV-20		
	Sodium (Na)-Dissolved	22.8		0.050	mg/L	16-NOV-20	*20	200
Aggregate Organics								
	Biochemical Oxygen Demand	2.4		2.0	mg/L	13-NOV-20		
	Chemical Oxygen Demand	60		20	mg/L	17-NOV-20		
L2528521-4	MW5-02							
Sampled By:	JS on 11-NOV-20 @ 09:09							
Matrix:	Groundwater							
Physical Tests								
	Conductivity (EC)	124		1.0	uS/cm	12-NOV-20		
	pH	7.84		0.10	pH	12-NOV-20		6.5-8.5
	Total Suspended Solids	67.1		3.0	mg/L	16-NOV-20		
	Total Dissolved Solids	94		13	mg/L	16-NOV-20		500
Anions and Nutrients								
	Acceptable % Difference	PASS			No Unit	17-NOV-20		
	Alkalinity, Bicarbonate (as CaCO3)	52.4		2.0	mg/L	12-NOV-20		
	Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
	Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
	Alkalinity, Total (as CaCO3)	52.4		2.0	mg/L	12-NOV-20		30-500
	Ammonia, Total (as N)	<0.0050		0.0050	mg/L	17-NOV-20		
	Chloride (Cl)	1.41		0.10	mg/L	13-NOV-20		250
	Nitrate (as N)	0.128		0.020	mg/L	13-NOV-20	10	
	Sulfate (SO4)	9.50		0.30	mg/L	13-NOV-20		500
	Anion Sum	1.29			meq/L	17-NOV-20		
	Cation Sum	1.33			meq/L	17-NOV-20		
	Cation - Anion Balance	1.2			%	17-NOV-20		
Organic / Inorganic Carbon								

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-4 MW5-02							
Sampled By: JS on 11-NOV-20 @ 09:09							
Matrix: Groundwater							
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	2.03		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.00812		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	16-NOV-20	5	
Calcium (Ca)-Dissolved	15.4		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00463		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	16-NOV-20		0.3
Lead (Pb)-Dissolved	0.000058		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	4.43		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	0.00083		0.00010	mg/L	16-NOV-20		0.05
Potassium (K)-Dissolved	1.25		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	3.64		0.050	mg/L	16-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	<20		20	mg/L	17-NOV-20		
L2528521-5 MW6-02							
Sampled By: JS on 11-NOV-20 @ 12:51							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	523		1.0	uS/cm	14-NOV-20		
pH	7.39		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	324		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	344		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	196		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	196		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.599		0.050	mg/L	19-NOV-20		
Chloride (Cl)	54.2		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	0.592		0.020	mg/L	18-NOV-20	10	
Sulfate (SO4)	<0.30		0.30	mg/L	18-NOV-20		500
Anion Sum	5.48			meq/L	23-NOV-20		
Cation Sum	5.66			meq/L	23-NOV-20		
Cation - Anion Balance	1.6			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	11.3	DLM	2.5	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.137		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	0.107		0.010	mg/L	16-NOV-20	5	

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2
L2528521-5 MW6-02							
Sampled By: JS on 11-NOV-20 @ 12:51							
Matrix: Groundwater							
Dissolved Metals							
Calcium (Ca)-Dissolved	51.7		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00041		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	5.34		0.010	mg/L	16-NOV-20		*0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	15.2		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	0.384		0.00010	mg/L	16-NOV-20		*0.05
Potassium (K)-Dissolved	5.49		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	30.8		0.050	mg/L	16-NOV-20	*20	200
Aggregate Organics							
Biochemical Oxygen Demand	3.1		2.0	mg/L	13-NOV-20		
Chemical Oxygen Demand	83		20	mg/L	17-NOV-20		
L2528521-6 MW1-03							
Sampled By: JS on 11-NOV-20 @ 13:17							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	2050		1.0	uS/cm	14-NOV-20		
pH	7.13		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	221		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	1170		20	mg/L	16-NOV-20		*500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	177		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	177		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	2.60		0.050	mg/L	19-NOV-20		
Chloride (Cl)	530		2.0	mg/L	18-NOV-20		*250
Nitrate (as N)	<0.40	DLM	0.40	mg/L	18-NOV-20	10	
Sulfate (SO4)	17.5		6.0	mg/L	18-NOV-20		500
Anion Sum	18.8			meq/L	23-NOV-20		
Cation Sum	19.8			meq/L	23-NOV-20		
Cation - Anion Balance	2.5			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	20.5	DLM	2.5	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.470		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	0.287		0.010	mg/L	16-NOV-20	5	
Calcium (Ca)-Dissolved	64.2		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00178		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	15.6		0.010	mg/L	16-NOV-20		*0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	26.6		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	0.580		0.00010	mg/L	16-NOV-20		*0.05

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-6 MW1-03							
Sampled By: JS on 11-NOV-20 @ 13:17							
Matrix: Groundwater							
Dissolved Metals							
Potassium (K)-Dissolved	50.5		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	278		0.050	mg/L	16-NOV-20	*20	*200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	13-NOV-20		
Chemical Oxygen Demand	83		20	mg/L	17-NOV-20		
L2528521-7 MW1-15							
Sampled By: JS on 11-NOV-20 @ 09:49							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	1640		1.0	uS/cm	12-NOV-20		
pH	7.09		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	1350		7.5	mg/L	16-NOV-20		
Total Dissolved Solids	979		20	mg/L	16-NOV-20		*500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	17-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	881		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	881		2.0	mg/L	12-NOV-20		*30-500
Ammonia, Total (as N)	0.315		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	76.4		0.20	mg/L	13-NOV-20		250
Nitrate (as N)	<0.040	DLDS	0.040	mg/L	13-NOV-20	10	
Sulfate (SO4)	0.69		0.60	mg/L	13-NOV-20		500
Anion Sum	19.8			meq/L	17-NOV-20		
Cation Sum	20.6			meq/L	17-NOV-20		
Cation - Anion Balance	2.1			%	17-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	30.4	DLM	5.0	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	13-NOV-20		
Barium (Ba)-Dissolved	0.184		0.00010	mg/L	16-NOV-20	1	
Boron (B)-Dissolved	1.36		0.10	mg/L	16-NOV-20	5	
Calcium (Ca)-Dissolved	203		0.050	mg/L	16-NOV-20		
Chromium (Cr)-Dissolved	0.00056		0.00010	mg/L	16-NOV-20	0.05	
Iron (Fe)-Dissolved	10.1		0.010	mg/L	16-NOV-20		*0.3
Lead (Pb)-Dissolved	0.000096		0.000050	mg/L	16-NOV-20	0.01	
Magnesium (Mg)-Dissolved	84.5		0.0050	mg/L	16-NOV-20		
Manganese (Mn)-Dissolved	3.91		0.00010	mg/L	16-NOV-20		*0.05
Potassium (K)-Dissolved	4.16		0.050	mg/L	16-NOV-20		
Sodium (Na)-Dissolved	63.4		0.050	mg/L	16-NOV-20	*20	200
Aggregate Organics							
Biochemical Oxygen Demand	3.2		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	105		20	mg/L	17-NOV-20		

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-8 MW2-15							
Sampled By: JS on 11-NOV-20 @ 11:47							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	35.6		1.0	uS/cm	12-NOV-20		
pH	6.18		0.10	pH	12-NOV-20		*6.5-8.5
Total Suspended Solids	1060		3.8	mg/L	16-NOV-20		
Total Dissolved Solids	35		10	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	19-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	15.1		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	15.1		2.0	mg/L	12-NOV-20		*30-500
Ammonia, Total (as N)	<0.0050		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	0.43		0.10	mg/L	13-NOV-20		250
Nitrate (as N)	0.108		0.020	mg/L	13-NOV-20	10	
Sulfate (SO4)	1.53		0.30	mg/L	13-NOV-20		500
Anion Sum	0.35			meq/L	19-NOV-20		
Cation Sum	0.37			meq/L	19-NOV-20		
Cation - Anion Balance	2.2			%	19-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	3.41		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.00519		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-NOV-20	5	
Calcium (Ca)-Dissolved	3.74		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.00032		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	0.095		0.010	mg/L	18-NOV-20		0.3
Lead (Pb)-Dissolved	0.000092		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	0.562		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.0119		0.00010	mg/L	18-NOV-20		0.05
Potassium (K)-Dissolved	0.328		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	2.55		0.050	mg/L	18-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	42		20	mg/L	17-NOV-20		
L2528521-9 MW3-15							
Sampled By: JS on 11-NOV-20 @ 11:14							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	76.7		1.0	uS/cm	12-NOV-20		
pH	6.58		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	1200		5.0	mg/L	16-NOV-20		
Total Dissolved Solids	127		13	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	19-NOV-20		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-9 MW3-15							
Sampled By: JS on 11-NOV-20 @ 11:14							
Matrix: Groundwater							
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	19.3		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	19.3		2.0	mg/L	12-NOV-20		*30-500
Ammonia, Total (as N)	0.0096		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	9.21		0.10	mg/L	13-NOV-20		250
Nitrate (as N)	0.047		0.020	mg/L	13-NOV-20	10	
Sulfate (SO4)	3.30		0.30	mg/L	13-NOV-20		500
Anion Sum	0.72			meq/L	19-NOV-20		
Cation Sum	0.88			meq/L	19-NOV-20		
Cation - Anion Balance	10.1			%	19-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	8.19		0.50	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.00729		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	0.255		0.010	mg/L	18-NOV-20	5	
Calcium (Ca)-Dissolved	3.80		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.00106		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	1.81		0.010	mg/L	18-NOV-20		*0.3
Lead (Pb)-Dissolved	0.000387		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	1.39		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.881		0.00010	mg/L	18-NOV-20		*0.05
Potassium (K)-Dissolved	0.468		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	9.69		0.050	mg/L	18-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	55		20	mg/L	17-NOV-20		
L2528521-10 MW4-15							
Sampled By: JS on 11-NOV-20 @ 09:32							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	81.5		1.0	uS/cm	12-NOV-20		
pH	7.20		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	416		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	79		13	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	20-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	35.3		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	35.3		2.0	mg/L	12-NOV-20		30-500
Ammonia, Total (as N)	0.110		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	1.09		0.10	mg/L	13-NOV-20		250

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-10 MW4-15							
Sampled By: JS on 11-NOV-20 @ 09:32							
Matrix: Groundwater							
Anions and Nutrients							
Nitrate (as N)	0.146		0.020	mg/L	13-NOV-20	10	
Sulfate (SO4)	5.20		0.30	mg/L	13-NOV-20		500
Anion Sum	0.85			meq/L	20-NOV-20		
Cation Sum	0.85			meq/L	20-NOV-20		
Cation - Anion Balance	-0.2			%	20-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	2.59		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.00631		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	19-NOV-20	5	
Calcium (Ca)-Dissolved	8.29		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.00030		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	0.451		0.010	mg/L	18-NOV-20		*0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	2.83		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.224		0.00010	mg/L	18-NOV-20		*0.05
Potassium (K)-Dissolved	0.698		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	3.35		0.050	mg/L	18-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	29		20	mg/L	17-NOV-20		
L2528521-11 MW1-17							
Sampled By: JS on 11-NOV-20 @ 10:56							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	314		1.0	uS/cm	12-NOV-20		
pH	6.91		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	3000		7.5	mg/L	16-NOV-20		
Total Dissolved Solids	263		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	19-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	110		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	110		2.0	mg/L	12-NOV-20		30-500
Ammonia, Total (as N)	0.707		0.050	mg/L	17-NOV-20		
Chloride (Cl)	11.5		0.10	mg/L	13-NOV-20		250
Nitrate (as N)	0.093		0.020	mg/L	13-NOV-20	10	
Sulfate (SO4)	37.7		0.30	mg/L	13-NOV-20		500
Anion Sum	3.30			meq/L	19-NOV-20		
Cation Sum	3.37			meq/L	19-NOV-20		
Cation - Anion Balance	1.1			%	19-NOV-20		
Organic / Inorganic Carbon							

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-11 MW1-17							
Sampled By: JS on 11-NOV-20 @ 10:56							
Matrix: Groundwater							
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	21.7	DLM	2.5	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.0317		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	0.042		0.010	mg/L	18-NOV-20	5	
Calcium (Ca)-Dissolved	16.6		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.00187		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	2.34		0.010	mg/L	18-NOV-20		*0.3
Lead (Pb)-Dissolved	0.000751		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	6.27		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.623		0.00010	mg/L	18-NOV-20		*0.05
Potassium (K)-Dissolved	1.75		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	40.4		0.050	mg/L	18-NOV-20	*20	200
Aggregate Organics							
Biochemical Oxygen Demand	6.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	83	HSED	20	mg/L	19-NOV-20		
L2528521-12 MW2-17							
Sampled By: JS on 11-NOV-20 @ 11:31							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	162		1.0	uS/cm	14-NOV-20		
pH	7.19		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	1510		7.5	mg/L	16-NOV-20		
Total Dissolved Solids	163		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	64.8		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	64.8		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.0079		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	7.27		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	0.084		0.020	mg/L	18-NOV-20	10	
Sulfate (SO4)	10.7		0.30	mg/L	18-NOV-20		500
Anion Sum	1.73			meq/L	23-NOV-20		
Cation Sum	1.64			meq/L	23-NOV-20		
Cation - Anion Balance	-2.7			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	4.51		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.0120		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-NOV-20	5	

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2		
L2528521-12 MW2-17									
Sampled By: JS on 11-NOV-20 @ 11:31									
Matrix: Groundwater									
Dissolved Metals									
Calcium (Ca)-Dissolved	17.4		0.050	mg/L	18-NOV-20				
Chromium (Cr)-Dissolved	0.00089		0.00010	mg/L	18-NOV-20	0.05			
Iron (Fe)-Dissolved	0.046		0.010	mg/L	18-NOV-20		0.3		
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01			
Magnesium (Mg)-Dissolved	5.33		0.0050	mg/L	18-NOV-20				
Manganese (Mn)-Dissolved	0.00103		0.00010	mg/L	18-NOV-20		0.05		
Potassium (K)-Dissolved	0.844		0.050	mg/L	18-NOV-20				
Sodium (Na)-Dissolved	6.86		0.050	mg/L	18-NOV-20	20	200		
Aggregate Organics									
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20				
Chemical Oxygen Demand	128		20	mg/L	19-NOV-20				
L2528521-13 MW1-20									
Sampled By: JS on 11-NOV-20 @ 13:51									
Matrix: Groundwater						#1	#2		
Physical Tests									
Conductivity (EC)	162		1.0	uS/cm	14-NOV-20				
pH	7.36		0.10	pH	14-NOV-20		6.5-8.5		
Total Suspended Solids	388		3.0	mg/L	16-NOV-20				
Total Dissolved Solids	162		13	mg/L	16-NOV-20		500		
Anions and Nutrients									
Acceptable % Difference	PASS			No Unit	23-NOV-20				
Alkalinity, Bicarbonate (as CaCO3)	76.1		2.0	mg/L	12-NOV-20				
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20				
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20				
Alkalinity, Total (as CaCO3)	76.1		2.0	mg/L	14-NOV-20		30-500		
Ammonia, Total (as N)	<0.0050		0.0050	mg/L	17-NOV-20				
Chloride (Cl)	0.77		0.10	mg/L	18-NOV-20		250		
Nitrate (as N)	0.091		0.020	mg/L	18-NOV-20	10			
Sulfate (SO4)	9.85		0.30	mg/L	18-NOV-20		500		
Anion Sum	1.75			meq/L	23-NOV-20				
Cation Sum	1.94			meq/L	23-NOV-20				
Cation - Anion Balance	5.1			%	23-NOV-20				
Organic / Inorganic Carbon									
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20				
Dissolved Organic Carbon	2.63		0.50	mg/L	19-NOV-20		5		
Dissolved Metals									
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20				
Barium (Ba)-Dissolved	0.0136		0.00010	mg/L	18-NOV-20	1			
Boron (B)-Dissolved	0.018		0.010	mg/L	18-NOV-20	5			
Calcium (Ca)-Dissolved	21.6		0.050	mg/L	18-NOV-20				
Chromium (Cr)-Dissolved	0.00058		0.00010	mg/L	18-NOV-20	0.05			
Iron (Fe)-Dissolved	0.061		0.010	mg/L	18-NOV-20		0.3		
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01			
Magnesium (Mg)-Dissolved	6.66		0.0050	mg/L	18-NOV-20				
Manganese (Mn)-Dissolved	0.0163		0.00010	mg/L	18-NOV-20		0.05		

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2		
L2528521-13 MW1-20									
Sampled By: JS on 11-NOV-20 @ 13:51									
Matrix: Groundwater									
Dissolved Metals									
Potassium (K)-Dissolved	1.66		0.050	mg/L	18-NOV-20				
Sodium (Na)-Dissolved	6.17		0.050	mg/L	18-NOV-20	20	200		
Aggregate Organics									
Biochemical Oxygen Demand	<2.0		2.0	mg/L	13-NOV-20				
Chemical Oxygen Demand	67		20	mg/L	19-NOV-20				
L2528521-14 DUPLICATE									
Sampled By: JS on 11-NOV-20 @ 09:40									
Matrix: Groundwater						#1	#2		
Physical Tests									
Conductivity (EC)	83.4		1.0	uS/cm	12-NOV-20				
pH	7.19		0.10	pH	12-NOV-20		6.5-8.5		
Total Suspended Solids	446		3.0	mg/L	16-NOV-20				
Total Dissolved Solids	86		13	mg/L	16-NOV-20		500		
Anions and Nutrients									
Acceptable % Difference	PASS			No Unit	19-NOV-20				
Alkalinity, Bicarbonate (as CaCO3)	36.6		2.0	mg/L	12-NOV-20				
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20				
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20				
Alkalinity, Total (as CaCO3)	36.6		2.0	mg/L	12-NOV-20		30-500		
Ammonia, Total (as N)	0.0912		0.0050	mg/L	17-NOV-20				
Chloride (Cl)	1.00		0.10	mg/L	13-NOV-20		250		
Nitrate (as N)	0.133		0.020	mg/L	13-NOV-20	10			
Sulfate (SO4)	5.05		0.30	mg/L	13-NOV-20		500		
Anion Sum	0.87			meq/L	19-NOV-20				
Cation Sum	0.84			meq/L	19-NOV-20				
Cation - Anion Balance	-2.1			%	19-NOV-20				
Organic / Inorganic Carbon									
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20				
Dissolved Organic Carbon	2.49		0.50	mg/L	19-NOV-20		5		
Dissolved Metals									
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20				
Barium (Ba)-Dissolved	0.00948		0.00010	mg/L	18-NOV-20	1			
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-NOV-20	5			
Calcium (Ca)-Dissolved	8.26		0.050	mg/L	18-NOV-20				
Chromium (Cr)-Dissolved	0.00038		0.00010	mg/L	18-NOV-20	0.05			
Iron (Fe)-Dissolved	0.481		0.010	mg/L	18-NOV-20		*0.3		
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01			
Magnesium (Mg)-Dissolved	2.73		0.0050	mg/L	18-NOV-20				
Manganese (Mn)-Dissolved	0.223		0.00010	mg/L	18-NOV-20		*0.05		
Potassium (K)-Dissolved	0.709		0.050	mg/L	18-NOV-20				
Sodium (Na)-Dissolved	3.26		0.050	mg/L	18-NOV-20	20	200		
Aggregate Organics									
Biochemical Oxygen Demand	2.3		2.0	mg/L	12-NOV-20				
Chemical Oxygen Demand	47		20	mg/L	19-NOV-20				

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-15 FIELD BLANK							
Sampled By: JS on 11-NOV-20							
Matrix: Water							
Physical Tests							
Conductivity (EC)	1.4		1.0	uS/cm	14-NOV-20		
pH	5.98		0.10	pH	14-NOV-20		*6.5-8.5
Total Suspended Solids	<3.0		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	<10		10	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L	14-NOV-20		**30-500
Ammonia, Total (as N)	<0.0050		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	<0.10		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	<0.020		0.020	mg/L	18-NOV-20	10	
Sulfate (SO4)	<0.30		0.30	mg/L	18-NOV-20		500
Anion Sum	<0.10			meq/L	23-NOV-20		
Cation Sum	<0.10			meq/L	23-NOV-20		
Cation - Anion Balance	0.0			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	0.63		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	0.00067		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-NOV-20	5	
Calcium (Ca)-Dissolved	0.088		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.00063		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-NOV-20		0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	0.0070		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.00014		0.00010	mg/L	18-NOV-20		0.05
Potassium (K)-Dissolved	<0.050		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	0.245		0.050	mg/L	18-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	<20		20	mg/L	19-NOV-20		
L2528521-16 TRAVEL BLANK							
Sampled By: JS on 11-NOV-20							
Matrix: Water							
Physical Tests							
Conductivity (EC)	<1.0		1.0	uS/cm	14-NOV-20		
pH	5.49		0.10	pH	14-NOV-20		*6.5-8.5
Total Suspended Solids	<3.0		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	<10		10	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-16 TRAVEL BLANK							
Sampled By: JS on 11-NOV-20							
Matrix: Water							
Anions and Nutrients							
Alkalinity, Bicarbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L	14-NOV-20		**30-500
Ammonia, Total (as N)	<0.0050		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	<0.10		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	<0.020		0.020	mg/L	18-NOV-20	10	
Sulfate (SO4)	<0.30		0.30	mg/L	18-NOV-20		500
Anion Sum	<0.10			meq/L	23-NOV-20		
Cation Sum	<0.10			meq/L	23-NOV-20		
Cation - Anion Balance	0.0			%	23-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	0.65		0.50	mg/L	19-NOV-20		5
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Barium (Ba)-Dissolved	<0.00010		0.00010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	<0.010		0.010	mg/L	18-NOV-20	5	
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	18-NOV-20	0.05	
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	18-NOV-20		0.3
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	<0.00010		0.00010	mg/L	18-NOV-20		0.05
Potassium (K)-Dissolved	<0.050		0.050	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	<0.050		0.050	mg/L	18-NOV-20	20	200
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	<20		20	mg/L	19-NOV-20		
L2528521-17 TRAVEL SPIKE							
Sampled By: JS on 11-NOV-20							
Matrix: Water							
Volatile Organic Compounds							
Acetone	127		20	%	19-NOV-20		
Benzene	99.2		0.50	%	19-NOV-20		
Bromodichloromethane	106		1.0	%	19-NOV-20		
Bromoform	103		1.0	%	19-NOV-20		
Bromomethane	108		0.50	%	19-NOV-20		
Carbon Disulfide	90.8		1.0	%	19-NOV-20		
Carbon tetrachloride	97.5		0.20	%	19-NOV-20		
Chlorobenzene	99.1		0.50	%	19-NOV-20		*0.000003
Dibromochloromethane	106		1.0	%	19-NOV-20		
Chloroethane	98.2		1.0	%	19-NOV-20		
Chloroform	104		1.0	%	19-NOV-20		
Chloromethane	108		1.0	%	19-NOV-20		

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-17 TRAVEL SPIKE Sampled By: JS on 11-NOV-20 Matrix: Water							
Volatile Organic Compounds							
1,2-Dibromoethane	112		0.20	%	19-NOV-20		
1,2-Dichlorobenzene	98.1		0.50	%	19-NOV-20		*0.0000003
1,3-Dichlorobenzene	95.3		0.50	%	19-NOV-20		
1,4-Dichlorobenzene	95.1		0.50	%	19-NOV-20		*0.0000001
Dichlorodifluoromethane	70.3		1.0	%	19-NOV-20		
1,1-Dichloroethane	101		0.50	%	19-NOV-20		
1,2-Dichloroethane	98.3		0.50	%	19-NOV-20		
1,1-Dichloroethylene	87.5		0.50	%	19-NOV-20		
cis-1,2-Dichloroethylene	97.2		0.50	%	19-NOV-20		
trans-1,2-Dichloroethylene	85.5		0.50	%	19-NOV-20		
Dichloromethane	94.9		2.0	%	19-NOV-20		
1,2-Dichloropropane	97.2		0.50	%	19-NOV-20		
cis-1,3-Dichloropropene	68.2		0.30	%	19-NOV-20		
trans-1,3-Dichloropropene	82.0		0.30	%	19-NOV-20		
Ethylbenzene	94.5		0.50	%	19-NOV-20		*0.00000024
n-Hexane	41.9		0.50	%	19-NOV-20		
2-Hexanone	91		20	%	19-NOV-20		
Methyl Ethyl Ketone	110		20	%	19-NOV-20		
Methyl Isobutyl Ketone	84		20	%	19-NOV-20		
MTBE	103		0.50	%	19-NOV-20		
Styrene	91.1		0.50	%	19-NOV-20		
1,1,1,2-Tetrachloroethane	101		0.50	%	19-NOV-20		
1,1,2,2-Tetrachloroethane	97.2		0.50	%	19-NOV-20		
Tetrachloroethylene	95.3		0.50	%	19-NOV-20		
Toluene	101		0.40	%	19-NOV-20		*0.0000024
1,1,1-Trichloroethane	98.7		0.50	%	19-NOV-20		
1,1,2-Trichloroethane	113		0.50	%	19-NOV-20		
Trichloroethylene	96.0		0.50	%	19-NOV-20		
Trichlorofluoromethane	87.3		1.0	%	19-NOV-20		
Vinyl chloride	91.3		0.50	%	19-NOV-20		
o-Xylene	100		0.30	%	19-NOV-20		
m+p-Xylenes	92.2		0.40	%	19-NOV-20		
Xylenes (Total)	192		0.50	%	19-NOV-20		*0.00003
Surrogate: 4-Bromofluorobenzene	99.2		70-130	%	19-NOV-20		
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%	19-NOV-20		
Trihalomethanes							
Total THMs	420		2.0	%	19-NOV-20		
L2528521-18 SW Sampled By: JS on 11-NOV-20 @ 11:57 Matrix: Surface water						#1	#2
Physical Tests							
Conductivity (EC)	793		1.0	uS/cm	14-NOV-20		
pH	7.72		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	9.5		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	444		20	mg/L	16-NOV-20		500

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-18 SW							
Sampled By: JS on 11-NOV-20 @ 11:57							
Matrix: Surface water							
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	353		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	353		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	9.27		0.25	mg/L	19-NOV-20		
Chloride (Cl)	46.8		0.20	mg/L	18-NOV-20		250
Nitrate (as N)	0.527		0.040	mg/L	18-NOV-20	10	
Nitrite (as N)	0.022		0.020	mg/L	18-NOV-20	1	
Total Kjeldahl Nitrogen	11.5		0.25	mg/L	18-NOV-20		
Phosphorus (P)-Total	0.0532		0.0030	mg/L	19-NOV-20		
Sulfate (SO4)	4.62		0.60	mg/L	18-NOV-20		500
Anion Sum	8.51			meq/L	23-NOV-20		
Cation Sum	8.28			meq/L	23-NOV-20		
Cation - Anion Balance	-1.4			%	23-NOV-20		
Total Metals							
Arsenic (As)-Total	0.00048		0.00010	mg/L	17-NOV-20	0.0100	
Barium (Ba)-Total	0.0602		0.00010	mg/L	17-NOV-20	1	
Boron (B)-Total	0.393		0.010	mg/L	17-NOV-20	5	
Cadmium (Cd)-Total	0.0000071		0.0000050	mg/L	17-NOV-20	0.005	
Chromium (Cr)-Total	0.00067		0.00010	mg/L	17-NOV-20	0.05	
Copper (Cu)-Total	0.00066		0.00050	mg/L	17-NOV-20		1
Iron (Fe)-Total	3.19		0.010	mg/L	17-NOV-20		*0.3
Lead (Pb)-Total	0.000084		0.000050	mg/L	17-NOV-20	0.01	
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	16-NOV-20	0.001	
Zinc (Zn)-Total	0.0051		0.0030	mg/L	17-NOV-20		5
Aggregate Organics							
Biochemical Oxygen Demand	3.2		2.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	59		20	mg/L	18-NOV-20		
Phenols (4AAP)	<0.0010		0.0010	mg/L	13-NOV-20		
L2528521-19 SW2							
Sampled By: JS on 11-NOV-20 @ 14:44							
Matrix: Surface water							
Physical Tests							
Conductivity (EC)	252		1.0	uS/cm	14-NOV-20		
pH	7.61		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	6.7		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	168		20	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	121		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	121						

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-19 SW2							
Sampled By: JS on 11-NOV-20 @ 14:44							
Matrix: Surface water							
Anions and Nutrients							
			2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.0171		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	9.64		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	<0.020		0.020	mg/L	18-NOV-20	10	
Nitrite (as N)	<0.010		0.010	mg/L	18-NOV-20	1	
Total Kjeldahl Nitrogen	0.801		0.050	mg/L	18-NOV-20		
Phosphorus (P)-Total	0.0383		0.0030	mg/L	19-NOV-20		
Sulfate (SO4)	<0.30		0.30	mg/L	18-NOV-20		500
Anion Sum	2.69			meq/L	23-NOV-20		
Cation Sum	2.63			meq/L	23-NOV-20		
Cation - Anion Balance	-1.2			%	23-NOV-20		
Total Metals							
Arsenic (As)-Total	0.00049		0.00010	mg/L	17-NOV-20	0.0100	
Barium (Ba)-Total	0.0220		0.00010	mg/L	17-NOV-20	1	
Boron (B)-Total	0.097		0.010	mg/L	17-NOV-20	5	
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	17-NOV-20	0.005	
Chromium (Cr)-Total	0.00060		0.00010	mg/L	17-NOV-20	0.05	
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-NOV-20		1
Iron (Fe)-Total	1.02		0.010	mg/L	17-NOV-20		*0.3
Lead (Pb)-Total	0.000070		0.000050	mg/L	17-NOV-20	0.01	
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	16-NOV-20	0.001	
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	17-NOV-20		5
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	13-NOV-20		
Chemical Oxygen Demand	48		20	mg/L	18-NOV-20		
Phenols (4AAP)	<0.0010		0.0010	mg/L	13-NOV-20		
L2528521-20 SW3							
Sampled By: JS on 11-NOV-20 @ 14:50							
Matrix: Surface water							
Physical Tests							
Conductivity (EC)	83.6		1.0	uS/cm	14-NOV-20		
pH	6.97		0.10	pH	14-NOV-20		6.5-8.5
Total Suspended Solids	14.7		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	80		13	mg/L	16-NOV-20		500
Anions and Nutrients							
Acceptable % Difference	FAIL	BL:INT		No Unit	23-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	30.5		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	30.5		2.0	mg/L	14-NOV-20		30-500
Ammonia, Total (as N)	0.260		0.0050	mg/L	17-NOV-20		
Chloride (Cl)	7.34		0.10	mg/L	18-NOV-20		250
Nitrate (as N)	0.032		0.020	mg/L	18-NOV-20	10	

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-20 SW3							
Sampled By: JS on 11-NOV-20 @ 14:50							
Matrix: Surface water							
Anions and Nutrients							
Nitrite (as N)	<0.010		0.010	mg/L	18-NOV-20	1	
Total Kjeldahl Nitrogen	0.942		0.050	mg/L	18-NOV-20		
Phosphorus (P)-Total	0.0317		0.0030	mg/L	19-NOV-20		
Sulfate (SO4)	1.16		0.30	mg/L	18-NOV-20		500
Anion Sum	0.84			meq/L	23-NOV-20		
Cation Sum	1.36			meq/L	23-NOV-20		
Cation - Anion Balance	23.5	BL:INT		%	23-NOV-20		
Total Metals							
Arsenic (As)-Total	0.00068		0.00010	mg/L	17-NOV-20	0.0100	
Barium (Ba)-Total	0.0127		0.00010	mg/L	17-NOV-20	1	
Boron (B)-Total	<0.010		0.010	mg/L	17-NOV-20	5	
Cadmium (Cd)-Total	0.0000244		0.0000050	mg/L	17-NOV-20	0.005	
Chromium (Cr)-Total	0.00151		0.00010	mg/L	17-NOV-20	0.05	
Copper (Cu)-Total	0.00226		0.00050	mg/L	17-NOV-20		1
Iron (Fe)-Total	5.83		0.010	mg/L	17-NOV-20		*0.3
Lead (Pb)-Total	0.000220		0.000050	mg/L	17-NOV-20	0.01	
Mercury (Hg)-Total	0.0000085		0.0000050	mg/L	16-NOV-20	0.001	
Zinc (Zn)-Total	0.0202		0.0030	mg/L	17-NOV-20		5
Aggregate Organics							
Biochemical Oxygen Demand	<2.0		2.0	mg/L	13-NOV-20		
Chemical Oxygen Demand	62		20	mg/L	18-NOV-20		
Phenols (4AAP)	<0.0010		0.0010	mg/L	13-NOV-20		
L2528521-21 MW2-02							
Sampled By: JS on 11-NOV-20 @ 10:24							
Matrix: Groundwater							
Physical Tests							
Conductivity (EC)	3550		1.0	uS/cm	12-NOV-20		
pH	7.29		0.10	pH	12-NOV-20		6.5-8.5
Total Suspended Solids	168		3.0	mg/L	16-NOV-20		
Total Dissolved Solids	1720		40	mg/L	16-NOV-20		*500
Anions and Nutrients							
Acceptable % Difference	PASS			No Unit	20-NOV-20		
Alkalinity, Bicarbonate (as CaCO3)	1650		2.0	mg/L	12-NOV-20		
Alkalinity, Carbonate (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Hydroxide (as CaCO3)	<2.0		2.0	mg/L	12-NOV-20		
Alkalinity, Total (as CaCO3)	1650		2.0	mg/L	12-NOV-20		*30-500
Ammonia, Total (as N)	130		2.5	mg/L	17-NOV-20		
Chloride (Cl)	255		1.0	mg/L	13-NOV-20		*250
Nitrate (as N)	<0.20	DLDS	0.20	mg/L	13-NOV-20	10	
Nitrite (as N)	<0.10	DLDS	0.10	mg/L	13-NOV-20	1	
Total Kjeldahl Nitrogen	145		2.0	mg/L	18-NOV-20		
Phosphorus (P)-Total	0.242		0.030	mg/L	19-NOV-20		
Sulfate (SO4)	<3.0	DLDS	3.0	mg/L	13-NOV-20		500

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Ontario Drinking Water Regulation (ODWQS) JAN.1,2020 = [Suite] - ON-DW-STANDARD+GUIDELINES

#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L2528521-21 MW2-02							
Sampled By: JS on 11-NOV-20 @ 10:24							
Matrix: Groundwater							
Anions and Nutrients							
Anion Sum	40.2			meq/L	20-NOV-20		
Cation Sum	44.4			meq/L	20-NOV-20		
Cation - Anion Balance	5.0			%	20-NOV-20		
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD			No Unit	13-NOV-20		
Dissolved Organic Carbon	91.1	DLM	5.0	mg/L	19-NOV-20		*5
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD			No Unit	16-NOV-20		
Dissolved Metals Filtration Location	FIELD			No Unit	18-NOV-20		
Arsenic (As)-Dissolved	0.0010		0.0010	mg/L	18-NOV-20	0.0100	
Barium (Ba)-Dissolved	0.454		0.0010	mg/L	18-NOV-20	1	
Boron (B)-Dissolved	1.91		0.10	mg/L	18-NOV-20	5	
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	18-NOV-20	0.005	
Calcium (Ca)-Dissolved	195		0.50	mg/L	18-NOV-20		
Chromium (Cr)-Dissolved	0.0037		0.0010	mg/L	18-NOV-20	0.05	
Copper (Cu)-Dissolved	<0.0020		0.0020	mg/L	18-NOV-20		1
Iron (Fe)-Dissolved	65.8		0.10	mg/L	18-NOV-20		*0.3
Lead (Pb)-Dissolved	<0.00050		0.00050	mg/L	18-NOV-20	0.01	
Magnesium (Mg)-Dissolved	76.4		0.050	mg/L	18-NOV-20		
Manganese (Mn)-Dissolved	0.406		0.0010	mg/L	18-NOV-20		*0.05
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	16-NOV-20	0.001	
Potassium (K)-Dissolved	193		0.50	mg/L	18-NOV-20		
Sodium (Na)-Dissolved	245		0.50	mg/L	18-NOV-20	*20	*200
Zinc (Zn)-Dissolved	<0.010		0.010	mg/L	18-NOV-20		5
Aggregate Organics							
Biochemical Oxygen Demand	12.0		5.0	mg/L	12-NOV-20		
Chemical Oxygen Demand	229		20	mg/L	18-NOV-20		
Phenols (4AAP)	0.0025		0.0010	mg/L	13-NOV-20		
Volatile Organic Compounds							
Benzene	2.63		0.50	ug/L	19-NOV-20	*1	
1,4-Dichlorobenzene	1.10		0.50	ug/L	19-NOV-20	5	*1
Dichloromethane	<5.0		5.0	ug/L	19-NOV-20	50	
Toluene	<0.50		0.50	ug/L	19-NOV-20	60	24
Vinyl chloride	<0.50		0.50	ug/L	19-NOV-20	1	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%	19-NOV-20		
Surrogate: 1,4-Difluorobenzene	100.1		70-130	%	19-NOV-20		

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#1: Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020) **#2: Ontario DW Aesthetic and Operational Guidelines (June, 2006)**

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
HSED	High sediment content in submitted water sample. Analysis could only proceed using aqueous fraction after decanting. Results may be biased low and may be inappropriate for regulatory or compliance purposes.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
BL:INT	Balance Reviewed: Interference Or Non-Measured Component
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
ALK-CO3-TITR-CALC-TB	Water	Alkalinity, Carbonate (as CaCO3)	CALCULATION
ALK-HCO3TITR-CALC-TB	Water	Alkalinity, Bicarbonate (as CaCO3)	CALCULATION
ALK-OH-TITR-CALC-TB	Water	Alkalinity, Hydroxide (as CaCO3)	CALCULATION
ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BOD-TB	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COD-TB	Water	Chemical Oxygen Demand	APHA 5220D

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

EC-TITR-TB	Water	Conductivity	APHA 2510 B

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HG-D-CVAA-WT	Water	Dissolved Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

IONBALANCE-TB	Water	Ion Balance Calculation	APHA 1030 E - CALCULATION

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

Reference Information

MET-D-CCMS-TB	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020B (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-TB	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-F-TB	Water	Ammonia, Total (as N)	catnr 157/158 062217/99321057 (modified)

Ammonia is determined by Flow-injection analysis with fluorescence detection

NO2-IC-N-TB	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-TB	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

PH-TITR-TB	Water	pH	APHA 4500-H

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-TB	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-F-TB	Water	TKN in Water by Fluorescence	catnr 157/158, 062818/99334821

Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection

TSS-TB	Water	Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry

VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260

Aqueous samples are analyzed by headspace-GC/MS.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA	WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA		

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Quality Control Report

Workorder: L2528521 Report Date: 30-NOV-20

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-TB	**Water**							
Batch R5284767								
WG3443816-3 DUP		**L2528493-3**						
Alkalinity, Total (as CaCO3)		563	560		mg/L	0.7	20	12-NOV-20
WG3443816-2 LCS								
Alkalinity, Total (as CaCO3)			105.5		%		85-115	12-NOV-20
WG3443816-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-NOV-20
Batch R5285713								
WG3444698-2 LCS								
Alkalinity, Total (as CaCO3)			103.8		%		85-115	14-NOV-20
WG3444698-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-NOV-20
BOD-TB	**Water**							
Batch R5286833								
WG3443431-6 LCS								
Biochemical Oxygen Demand			91.9		%		85-115	12-NOV-20
WG3443431-5 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	12-NOV-20
Batch R5287764								
WG3444371-2 LCS								
Biochemical Oxygen Demand			87.0		%		85-115	13-NOV-20
WG3444371-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	13-NOV-20
CL-L-IC-N-TB	**Water**							
Batch R5285222								
WG3443825-3 DUP		**L2528536-1**						
Chloride (Cl)		5.34	5.04		mg/L	5.6	20	13-NOV-20
WG3443825-2 LCS								
Chloride (Cl)			97.6		%		90-110	13-NOV-20
WG3443825-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	13-NOV-20
CL-L-IC-N-WP	**Water**							
Batch R5293367								
WG3447441-11 DUP		**L2526002-4**						
Chloride (Cl)		11.2	11.5		mg/L	2.8	20	18-NOV-20
WG3447441-15 DUP		**L2526002-5**						
Chloride (Cl)		11.8	11.8		mg/L	0.0	20	18-NOV-20
WG3447441-10 LCS								

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP	**Water**							
Batch R5293367								
WG3447441-10 LCS								
Chloride (Cl)			101.7		%		90-110	18-NOV-20
WG3447441-14 LCS								
Chloride (Cl)			100.3		%		90-110	18-NOV-20
WG3447441-13 MB								
Chloride (Cl)			<0.10		mg/L		0.1	18-NOV-20
WG3447441-9 MB								
Chloride (Cl)			<0.10		mg/L		0.1	18-NOV-20
WG3447441-12 MS		**L2526002-4**						
Chloride (Cl)			105.8		%		75-125	18-NOV-20
WG3447441-16 MS		**L2526002-5**						
Chloride (Cl)			105.6		%		75-125	18-NOV-20
COD-TB	**Water**							
Batch R5287004								
WG3445259-3 DUP		**L2528493-2**						
Chemical Oxygen Demand		54	50		mg/L	7.7	20	17-NOV-20
WG3445259-2 LCS								
Chemical Oxygen Demand			108.0		%		85-115	17-NOV-20
WG3445259-1 MB								
Chemical Oxygen Demand			<20		mg/L		20	17-NOV-20
WG3445259-4 MS		**L2528493-1**						
Chemical Oxygen Demand			90.9		%		75-125	17-NOV-20
Batch R5287490								
WG3445194-3 DUP		**L2528331-1**						
Chemical Oxygen Demand		299	289		mg/L	3.3	20	18-NOV-20
WG3445194-2 LCS								
Chemical Oxygen Demand			105.2		%		85-115	18-NOV-20
WG3445194-1 MB								
Chemical Oxygen Demand			<20		mg/L		20	18-NOV-20
WG3445194-4 MS		**L2528331-2**						
Chemical Oxygen Demand			N/A	MS-B	%		-	18-NOV-20
Batch R5289044								
WG3445261-3 DUP		**L2528521-12**						
Chemical Oxygen Demand		128	125		mg/L	2.8	20	19-NOV-20
WG3445261-2 LCS								
Chemical Oxygen Demand			108.5		%		85-115	19-NOV-20
WG3445261-1 MB								
Chemical Oxygen Demand			<20		mg/L		20	19-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
COD-TB	**Water**							
Batch R5289044								
WG3445261-4 MS		**L2528521-11**						
Chemical Oxygen Demand			88.0		%		75-125	19-NOV-20
DOC-WT	**Water**							
Batch R5288323								
WG3444958-3 DUP		**L2528331-1**						
Dissolved Organic Carbon		71.6	68.5		mg/L	4.4	20	18-NOV-20
WG3444958-2 LCS								
Dissolved Organic Carbon			97.1		%		80-120	18-NOV-20
WG3444958-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	18-NOV-20
WG3444958-4 MS		**L2528331-1**						
Dissolved Organic Carbon			N/A	MS-B	%		-	18-NOV-20
Batch R5291270								
WG3444959-3 DUP		**L2528521-4**						
Dissolved Organic Carbon		2.03	2.12		mg/L	4.6	20	19-NOV-20
WG3444959-2 LCS								
Dissolved Organic Carbon			100.9		%		80-120	19-NOV-20
WG3444959-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	19-NOV-20
WG3444959-4 MS		**L2528521-4**						
Dissolved Organic Carbon			100.2		%		70-130	19-NOV-20
EC-TITR-TB	**Water**							
Batch R5284767								
WG3443816-3 DUP		**L2528493-3**						
Conductivity (EC)		911	913		uS/cm	0.2	10	12-NOV-20
WG3443816-2 LCS								
Conductivity (EC)			98.9		%		90-110	12-NOV-20
WG3443816-1 MB								
Conductivity (EC)			<1.0		uS/cm		2	12-NOV-20
Batch R5285713								
WG3444698-2 LCS								
Conductivity (EC)			98.7		%		90-110	14-NOV-20
WG3444698-1 MB								
Conductivity (EC)			<1.0		uS/cm		2	14-NOV-20
HG-D-CVAA-WT	**Water**							

Quality Control Report

Workorder: L2528521 Report Date: 30-NOV-20

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-CVAA-WT	**Water**							
Batch R5286212								
WG3445534-4 DUP		**WG3445534-3**						
Mercury (Hg)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	16-NOV-20
WG3445534-2 LCS								
Mercury (Hg)-Dissolved			97.7		%		80-120	16-NOV-20
WG3445534-1 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	16-NOV-20
WG3445534-6 MS		**WG3445534-5**						
Mercury (Hg)-Dissolved			81.5		%		70-130	16-NOV-20
HG-T-CVAA-WT	**Water**							
Batch R5286149								
WG3445528-4 DUP		**WG3445528-3**						
Mercury (Hg)-Total		0.0000104	0.0000099		mg/L	4.9	20	16-NOV-20
WG3445528-2 LCS								
Mercury (Hg)-Total			87.8		%		80-120	16-NOV-20
WG3445528-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	16-NOV-20
WG3445528-6 MS		**WG3445528-5**						
Mercury (Hg)-Total			96.7		%		70-130	16-NOV-20
MET-D-CCMS-TB	**Water**							
Batch R5286710								
WG3444592-11 DUP		**L2528521-6**						
Barium (Ba)-Dissolved		0.470	0.469		mg/L	0.2	20	16-NOV-20
Boron (B)-Dissolved		0.287	0.287		mg/L	0.0	20	16-NOV-20
Calcium (Ca)-Dissolved		64.2	63.5		mg/L	1.2	20	16-NOV-20
Chromium (Cr)-Dissolved		0.00178	0.00180		mg/L	1.6	20	16-NOV-20
Iron (Fe)-Dissolved		15.6	15.9		mg/L	1.9	20	16-NOV-20
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-NOV-20
Magnesium (Mg)-Dissolved		26.6	26.8		mg/L	0.8	20	16-NOV-20
Manganese (Mn)-Dissolved		0.580	0.573		mg/L	1.3	20	16-NOV-20
Potassium (K)-Dissolved		50.5	50.8		mg/L	0.5	20	16-NOV-20
Sodium (Na)-Dissolved		278	278		mg/L	0.3	20	16-NOV-20
WG3444592-10 LCS								
Barium (Ba)-Dissolved			103.0		%		80-120	16-NOV-20
Boron (B)-Dissolved			95.0		%		80-120	16-NOV-20
Calcium (Ca)-Dissolved			100.1		%		80-120	16-NOV-20
Chromium (Cr)-Dissolved			102.1		%		80-120	16-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R5286710								
WG3444592-10 LCS								
Iron (Fe)-Dissolved			119.1		%		80-120	16-NOV-20
Lead (Pb)-Dissolved			99.4		%		80-120	16-NOV-20
Magnesium (Mg)-Dissolved			106.2		%		80-120	16-NOV-20
Manganese (Mn)-Dissolved			101.4		%		80-120	16-NOV-20
Potassium (K)-Dissolved			104.2		%		80-120	16-NOV-20
Sodium (Na)-Dissolved			103.2		%		80-120	16-NOV-20
WG3444592-9 MB								
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	16-NOV-20
Boron (B)-Dissolved			<0.010		mg/L		0.01	16-NOV-20
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	16-NOV-20
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	16-NOV-20
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	16-NOV-20
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	16-NOV-20
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	16-NOV-20
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	16-NOV-20
Potassium (K)-Dissolved			<0.050		mg/L		0.05	16-NOV-20
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	16-NOV-20
WG3444592-12 MS		**L2528521-7**						
Barium (Ba)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Chromium (Cr)-Dissolved			116.6		%		70-130	16-NOV-20
Iron (Fe)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Lead (Pb)-Dissolved			111.8		%		70-130	16-NOV-20
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Potassium (K)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Sodium (Na)-Dissolved			N/A	MS-B	%		-	16-NOV-20
Batch R5288640								
WG3447385-2 LCS								
Arsenic (As)-Dissolved			105.6		%		80-120	18-NOV-20
Barium (Ba)-Dissolved			102.6		%		80-120	18-NOV-20
Boron (B)-Dissolved			96.3		%		80-120	18-NOV-20
Cadmium (Cd)-Dissolved			100.5		%		80-120	18-NOV-20
Calcium (Ca)-Dissolved			99.7		%		80-120	18-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R5288640								
WG3447385-2 LCS								
Chromium (Cr)-Dissolved			101.8		%		80-120	18-NOV-20
Copper (Cu)-Dissolved			101.0		%		80-120	18-NOV-20
Iron (Fe)-Dissolved			124.5	MES	%		80-120	18-NOV-20
Lead (Pb)-Dissolved			99.4		%		80-120	18-NOV-20
Magnesium (Mg)-Dissolved			104.4		%		80-120	18-NOV-20
Manganese (Mn)-Dissolved			101.6		%		80-120	18-NOV-20
Potassium (K)-Dissolved			104.8		%		80-120	18-NOV-20
Sodium (Na)-Dissolved			101.2		%		80-120	18-NOV-20
Zinc (Zn)-Dissolved			103.2		%		80-120	18-NOV-20
WG3447385-1 MB								
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	18-NOV-20
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	18-NOV-20
Boron (B)-Dissolved			<0.010		mg/L		0.01	18-NOV-20
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	18-NOV-20
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	18-NOV-20
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	18-NOV-20
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	18-NOV-20
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	18-NOV-20
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	18-NOV-20
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	18-NOV-20
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	18-NOV-20
Potassium (K)-Dissolved			<0.050		mg/L		0.05	18-NOV-20
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	18-NOV-20
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	18-NOV-20
MET-T-CCMS-TB	**Water**							
Batch R5287329								
WG3446267-7 DUP		**L2528521-19**						
Arsenic (As)-Total		0.00049	0.00049		mg/L	1.9	20	17-NOV-20
Barium (Ba)-Total		0.0220	0.0216		mg/L	1.6	20	17-NOV-20
Boron (B)-Total		0.097	0.096		mg/L	1.6	20	17-NOV-20
Cadmium (Cd)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	17-NOV-20
Chromium (Cr)-Total		0.00060	0.00061		mg/L	1.3	20	17-NOV-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-NOV-20
Iron (Fe)-Total		1.02	1.05		mg/L	2.7	20	17-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R5287329								
WG3446267-7 DUP		**L2528521-19**						
Lead (Pb)-Total		0.000070	0.000069		mg/L	1.5	20	17-NOV-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	17-NOV-20
WG3446267-6 LCS								
Arsenic (As)-Total			104.3		%		80-120	17-NOV-20
Barium (Ba)-Total			103.0		%		80-120	17-NOV-20
Boron (B)-Total			89.4		%		80-120	17-NOV-20
Cadmium (Cd)-Total			103.9		%		80-120	17-NOV-20
Chromium (Cr)-Total			101.5		%		80-120	17-NOV-20
Copper (Cu)-Total			99.7		%		80-120	17-NOV-20
Iron (Fe)-Total			124.1	MES	%		80-120	17-NOV-20
Lead (Pb)-Total			102.9		%		80-120	17-NOV-20
Zinc (Zn)-Total			96.4		%		80-120	17-NOV-20
WG3446267-5 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	17-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	17-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	17-NOV-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	17-NOV-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	17-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	17-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	17-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	17-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	17-NOV-20
WG3446267-8 MS		**L2528521-20**						
Arsenic (As)-Total			107.4		%		70-130	17-NOV-20
Barium (Ba)-Total			109.6		%		70-130	17-NOV-20
Boron (B)-Total			92.7		%		70-130	17-NOV-20
Cadmium (Cd)-Total			109.5		%		70-120	17-NOV-20
Chromium (Cr)-Total			106.6		%		70-130	17-NOV-20
Copper (Cu)-Total			104.1		%		70-130	17-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	17-NOV-20
Lead (Pb)-Total			107.3		%		70-130	17-NOV-20
Zinc (Zn)-Total			104.6		%		70-130	17-NOV-20
NH3-F-TB	**Water**							

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-TB	**Water**							
Batch R5287218								
WG3445173-3 DUP		**L2528333-1**						
Ammonia, Total (as N)		0.0165	0.0176		mg/L	6.5	20	17-NOV-20
WG3445249-3 DUP		**L2528521-4**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	17-NOV-20
WG3445173-2 LCS								
Ammonia, Total (as N)			97.1		%		85-115	17-NOV-20
WG3445249-2 LCS								
Ammonia, Total (as N)			96.4		%		85-115	17-NOV-20
WG3445173-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	17-NOV-20
WG3445249-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	17-NOV-20
WG3445173-4 MS		**L2528334-2**						
Ammonia, Total (as N)			96.5		%		75-125	17-NOV-20
Batch R5289379								
WG3445248-3 DUP		**L2528373-2**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	19-NOV-20
WG3447239-3 DUP		**L2528273-1**						
Ammonia, Total (as N)		0.649	0.659		mg/L	1.5	20	19-NOV-20
WG3445248-2 LCS								
Ammonia, Total (as N)			99.9		%		85-115	19-NOV-20
WG3447239-2 LCS								
Ammonia, Total (as N)			101.5		%		85-115	19-NOV-20
WG3445248-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	19-NOV-20
WG3447239-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	19-NOV-20
WG3447239-4 MS		**L2528329-3**						
Ammonia, Total (as N)			N/A	MS-B	%		-	19-NOV-20
NO2-IC-N-TB	**Water**							
Batch R5285222								
WG3443825-2 LCS								
Nitrite (as N)			99.96		%		90-110	13-NOV-20
WG3443825-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	13-NOV-20
NO2-IC-N-WP	**Water**							

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-WP	**Water**							
Batch R5293367								
WG3447441-14 LCS								
Nitrite (as N)			98.5		%		90-110	18-NOV-20
WG3447441-13 MB								
Nitrite (as N)			<0.010		mg/L		0.01	18-NOV-20
NO3-IC-N-TB	**Water**							
Batch R5285222								
WG3443825-2 LCS								
Nitrate (as N)			96.9		%		90-110	13-NOV-20
WG3443825-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	13-NOV-20
NO3-IC-N-WP	**Water**							
Batch R5293367								
WG3447441-10 LCS								
Nitrate (as N)			102.0		%		90-110	18-NOV-20
WG3447441-14 LCS								
Nitrate (as N)			100.9		%		90-110	18-NOV-20
WG3447441-13 MB								
Nitrate (as N)			<0.020		mg/L		0.02	18-NOV-20
WG3447441-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	18-NOV-20
P-T-COL-TB	**Water**							
Batch R5290816								
WG3445190-3 DUP		**L2528453-2**						
Phosphorus (P)-Total		5.87	6.00		mg/L	2.3	20	19-NOV-20
WG3445190-2 LCS								
Phosphorus (P)-Total			103.4		%		80-120	19-NOV-20
WG3445190-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	19-NOV-20
WG3445190-4 MS		**L2528521-18**						
Phosphorus (P)-Total			80.4		%		70-130	19-NOV-20
PH-TITR-TB	**Water**							
Batch R5284767								
WG3443816-3 DUP		**L2528493-3**						
pH		7.36	7.32	J	pH	0.04	0.2	12-NOV-20
WG3443816-2 LCS								
pH			7.01		pH		6.9-7.1	12-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-TITR-TB	**Water**							
Batch R5285713								
WG3444698-2 LCS								
pH			6.99		pH		6.9-7.1	14-NOV-20
PHENOLS-4AAP-WT	**Water**							
Batch R5286174								
WG3444956-3 DUP		**L2528521-19**						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444956-2 LCS								
Phenols (4AAP)			98.8		%		85-115	13-NOV-20
WG3444956-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	13-NOV-20
WG3444956-4 MS		**L2528521-19**						
Phenols (4AAP)			100.7		%		75-125	13-NOV-20
SO4-IC-N-TB	**Water**							
Batch R5285222								
WG3443825-2 LCS								
Sulfate (SO4)			97.2		%		90-110	13-NOV-20
WG3443825-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	13-NOV-20
SO4-IC-N-WP	**Water**							
Batch R5293367								
WG3447441-11 DUP		**L2526002-4**						
Sulfate (SO4)		1.89	1.95		mg/L	3.3	20	18-NOV-20
WG3447441-15 DUP		**L2526002-5**						
Sulfate (SO4)		1.98	2.00		mg/L	0.8	20	18-NOV-20
WG3447441-10 LCS								
Sulfate (SO4)			102.6		%		90-110	18-NOV-20
WG3447441-14 LCS								
Sulfate (SO4)			102.3		%		90-110	18-NOV-20
WG3447441-13 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	18-NOV-20
WG3447441-9 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	18-NOV-20
WG3447441-12 MS		**L2526002-4**						
Sulfate (SO4)			105.4		%		75-125	18-NOV-20
WG3447441-16 MS		**L2526002-5**						
Sulfate (SO4)			105.7		%		75-125	18-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TDS-TB	**Water**							
Batch R5285808								
WG3444812-2 LCS								
Total Dissolved Solids			99.4		%		85-115	14-NOV-20
WG3444812-1 MB								
Total Dissolved Solids			10	B	mg/L		10	14-NOV-20
Batch R5286735								
WG3445484-3 DUP		**L2528521-2**						
Total Dissolved Solids		390	410		mg/L	5.1	20	16-NOV-20
WG3445484-2 LCS								
Total Dissolved Solids			96.3		%		85-115	16-NOV-20
WG3445484-1 MB								
Total Dissolved Solids			<10		mg/L		10	16-NOV-20
TKN-F-TB	**Water**							
Batch R5287683								
WG3445182-3 DUP		**L2528438-6**						
Total Kjeldahl Nitrogen		1.56	1.49		mg/L	4.7	20	18-NOV-20
WG3445182-2 LCS								
Total Kjeldahl Nitrogen			108.3		%		75-125	18-NOV-20
WG3445182-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	18-NOV-20
WG3445182-4 MS		**L2528438-7**						
Total Kjeldahl Nitrogen			115.5		%		70-130	18-NOV-20
TSS-TB	**Water**							
Batch R5285783								
WG3444821-2 LCS								
Total Suspended Solids			91.8		%		85-115	14-NOV-20
WG3444821-1 MB								
Total Suspended Solids			<3.0		mg/L		3	14-NOV-20
Batch R5286607								
WG3445485-3 DUP		**L2528521-2**						
Total Suspended Solids		13.9	13.9		mg/L	0.0	20	16-NOV-20
WG3445485-2 LCS								
Total Suspended Solids			93.5		%		85-115	16-NOV-20
WG3445485-1 MB								
Total Suspended Solids			<3.0		mg/L		3	16-NOV-20
VOC-ROU-HS-WT	**Water**							

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-4 DUP		**WG3447013-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	19-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	19-NOV-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	19-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	19-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-NOV-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	19-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	19-NOV-20
Methyl Isobutyl Ketone		<20	<20		ug/L			19-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-4 DUP		**WG3447013-3**						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	19-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Toluene		<0.40	<0.40	RPD-NA	ug/L	N/A	30	19-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-NOV-20
WG3447013-1 LCS								
1,1,1,2-Tetrachloroethane			102.5		%		70-130	19-NOV-20
1,1,2,2-Tetrachloroethane			101.7		%		70-130	19-NOV-20
1,1,1-Trichloroethane			98.0		%		70-130	19-NOV-20
1,1,2-Trichloroethane			108.3		%		70-130	19-NOV-20
1,2-Dibromoethane			112.5		%		70-130	19-NOV-20
1,1-Dichloroethane			94.5		%		70-130	19-NOV-20
1,1-Dichloroethylene			92.8		%		70-130	19-NOV-20
1,2-Dichlorobenzene			99.9		%		70-130	19-NOV-20
1,2-Dichloroethane			100.0		%		70-130	19-NOV-20
1,2-Dichloropropane			98.8		%		70-130	19-NOV-20
1,3-Dichlorobenzene			94.9		%		70-130	19-NOV-20
1,4-Dichlorobenzene			95.0		%		70-130	19-NOV-20
2-Hexanone			93.9		%		60-140	19-NOV-20
Acetone			111.7		%		60-140	19-NOV-20
Benzene			96.4		%		70-130	19-NOV-20
Bromodichloromethane			103.6		%		70-130	19-NOV-20
Bromoform			112.3		%		70-130	19-NOV-20
Bromomethane			91.0		%		60-140	19-NOV-20
Carbon Disulfide			85.8		%		70-130	19-NOV-20
Carbon tetrachloride			98.3		%		70-130	19-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-1 LCS								
Chlorobenzene			97.6		%		70-130	19-NOV-20
Chloroethane			107.3		%		70-130	19-NOV-20
Chloroform			103.6		%		70-130	19-NOV-20
Chloromethane			92.6		%		60-140	19-NOV-20
cis-1,2-Dichloroethylene			101.6		%		70-130	19-NOV-20
cis-1,3-Dichloropropene			91.8		%		70-130	19-NOV-20
Dibromochloromethane			105.6		%		70-130	19-NOV-20
Dichlorodifluoromethane			80.5		%		50-140	19-NOV-20
Dichloromethane			99.6		%		70-130	19-NOV-20
Ethylbenzene			94.7		%		70-130	19-NOV-20
m+p-Xylenes			92.8		%		70-130	19-NOV-20
Methyl Ethyl Ketone			114.5		%		60-140	19-NOV-20
Methyl Isobutyl Ketone			90.7		%		50-150	19-NOV-20
n-Hexane			86.9		%		70-130	19-NOV-20
MTBE			100.6		%		70-130	19-NOV-20
o-Xylene			101.9		%		70-130	19-NOV-20
Styrene			94.0		%		70-130	19-NOV-20
Tetrachloroethylene			91.3		%		70-130	19-NOV-20
Toluene			96.1		%		70-130	19-NOV-20
trans-1,2-Dichloroethylene			90.4		%		70-130	19-NOV-20
trans-1,3-Dichloropropene			103.0		%		70-130	19-NOV-20
Trichloroethylene			95.6		%		70-130	19-NOV-20
Trichlorofluoromethane			94.8		%		60-140	19-NOV-20
Vinyl chloride			92.6		%		60-140	19-NOV-20
WG3447013-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	19-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	19-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	19-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	19-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	19-NOV-20
1,1-Dichloroethane			<0.50		ug/L		0.5	19-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	19-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	19-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	19-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	19-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	19-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	19-NOV-20
2-Hexanone			<20		ug/L		20	19-NOV-20
Acetone			<20		ug/L		20	19-NOV-20
Benzene			<0.50		ug/L		0.5	19-NOV-20
Bromodichloromethane			<1.0		ug/L		1	19-NOV-20
Bromoform			<1.0		ug/L		1	19-NOV-20
Bromomethane			<0.50		ug/L		0.5	19-NOV-20
Carbon Disulfide			<1.0		ug/L		1	19-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	19-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	19-NOV-20
Chloroethane			<1.0		ug/L		1	19-NOV-20
Chloroform			<1.0		ug/L		1	19-NOV-20
Chloromethane			<1.0		ug/L		1	19-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	19-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	19-NOV-20
Dibromochloromethane			<1.0		ug/L		1	19-NOV-20
Dichlorodifluoromethane			<1.0		ug/L		1	19-NOV-20
Dichloromethane			<2.0		ug/L		2	19-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	19-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	19-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	19-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	19-NOV-20
n-Hexane			<0.50		ug/L		0.5	19-NOV-20
MTBE			<0.50		ug/L		0.5	19-NOV-20
o-Xylene			<0.30		ug/L		0.3	19-NOV-20
Styrene			<0.50		ug/L		0.5	19-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	19-NOV-20
Toluene			<0.40		ug/L		0.4	19-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	19-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	19-NOV-20
Trichloroethylene			<0.50		ug/L		0.5	19-NOV-20

Quality Control Report

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536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	19-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	19-NOV-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	19-NOV-20
Surrogate: 4-Bromofluorobenzene			98.0		%		70-130	19-NOV-20
WG3447013-5 MS		**WG3447013-3**						
1,1,1,2-Tetrachloroethane			99.5		%		50-150	19-NOV-20
1,1,2,2-Tetrachloroethane			90.7		%		50-150	19-NOV-20
1,1,1-Trichloroethane			98.8		%		50-150	19-NOV-20
1,1,2-Trichloroethane			105.6		%		50-150	19-NOV-20
1,2-Dibromoethane			104.0		%		50-150	19-NOV-20
1,1-Dichloroethane			137.3		%		50-150	19-NOV-20
1,1-Dichloroethylene			93.6		%		50-150	19-NOV-20
1,2-Dichlorobenzene			100.0		%		50-150	19-NOV-20
1,2-Dichloroethane			94.9		%		50-150	19-NOV-20
1,2-Dichloropropane			96.0		%		50-150	19-NOV-20
1,3-Dichlorobenzene			99.7		%		50-150	19-NOV-20
1,4-Dichlorobenzene			99.4		%		50-150	19-NOV-20
2-Hexanone			81.3		%		50-150	19-NOV-20
Acetone			103.5		%		50-150	19-NOV-20
Benzene			95.6		%		50-150	19-NOV-20
Bromodichloromethane			102.1		%		50-150	19-NOV-20
Bromoform			102.4		%		50-150	19-NOV-20
Bromomethane			88.2		%		50-150	19-NOV-20
Carbon Disulfide			88.7		%		50-150	19-NOV-20
Carbon tetrachloride			100.1		%		50-150	19-NOV-20
Chlorobenzene			97.0		%		50-150	19-NOV-20
Chloroethane			104.7		%		50-150	19-NOV-20
Chloroform			103.1		%		50-150	19-NOV-20
Chloromethane			87.5		%		50-150	19-NOV-20
cis-1,2-Dichloroethylene			99.7		%		50-150	19-NOV-20
cis-1,3-Dichloropropene			89.0		%		50-150	19-NOV-20
Dibromochloromethane			100.2		%		50-150	19-NOV-20
Dichlorodifluoromethane			74.9		%		50-150	19-NOV-20
Dichloromethane			98.2		%		50-150	19-NOV-20

Quality Control Report

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5288138								
WG3447013-5 MS		**WG3447013-3**						
Ethylbenzene			94.9		%		50-150	19-NOV-20
m+p-Xylenes			94.1		%		50-150	19-NOV-20
Methyl Ethyl Ketone			96.6		%		50-150	19-NOV-20
Methyl Isobutyl Ketone			78.5		%		50-150	19-NOV-20
n-Hexane			86.7		%		50-150	19-NOV-20
MTBE			100.3		%		50-150	19-NOV-20
o-Xylene			100.8		%		50-150	19-NOV-20
Styrene			91.0		%		50-150	19-NOV-20
Tetrachloroethylene			99.8		%		50-150	19-NOV-20
Toluene			99.2		%		50-150	19-NOV-20
trans-1,2-Dichloroethylene			93.8		%		50-150	19-NOV-20
trans-1,3-Dichloropropene			100.8		%		50-150	19-NOV-20
Trichloroethylene			98.5		%		50-150	19-NOV-20
Trichlorofluoromethane			96.8		%		50-150	19-NOV-20
Vinyl chloride			90.3		%		50-150	19-NOV-20

Quality Control Report

Workorder: L2528521 Report Date: 30-NOV-20

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
J	Duplicate results and limits are expressed in terms of absolute difference.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2528521 Report Date: 30-NOV-20

Client: KRESIN ENGINEERING CORP.
536 Fourth Line East
Sault Ste Marie ON P6A 5K8
Contact: Jennifer Sharpe

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrate in Water by IC							
	2	11-NOV-20 13:05	18-NOV-20 12:15	3	7	days	EHT
	3	11-NOV-20 12:34	18-NOV-20 12:15	3	7	days	EHT
	5	11-NOV-20 12:51	18-NOV-20 12:15	3	7	days	EHT
	6	11-NOV-20 13:17	18-NOV-20 12:15	3	7	days	EHT
	12	11-NOV-20 11:31	18-NOV-20 12:15	3	7	days	EHT
	13	11-NOV-20 13:51	18-NOV-20 12:15	3	7	days	EHT
	15	11-NOV-20	18-NOV-20 12:15	3	7	days	EHT
	16	11-NOV-20	18-NOV-20 12:15	3	7	days	EHT
	18	11-NOV-20 11:57	18-NOV-20 12:15	3	7	days	EHT
	19	11-NOV-20 14:44	18-NOV-20 12:15	3	7	days	EHT
	20	11-NOV-20 14:50	18-NOV-20 12:15	3	7	days	EHT
Nitrite in Water by IC							
	18	11-NOV-20 11:57	18-NOV-20 12:15	3	7	days	EHT
	19	11-NOV-20 14:44	18-NOV-20 12:15	3	7	days	EHT
	20	11-NOV-20 14:50	18-NOV-20 12:15	3	7	days	EHT

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2528521 were received on 12-NOV-20 10:58.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2528521-COFC

COC Number: 17 - y

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days):
- 4 day [P4-20%] ☐
- 3 day [P3-25%] ☐
- 2 day [P2-50%] ☐

EMERGENCY:
- 1 Business day [E - 100%] ☐
- Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	11353 / Q78965
Job #:	Blind River Landfill
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2528521

ALS Contact: C. Paradis

Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 2 :	(Alkalinity, BOD, Chloride, COD, DOC,	EC, Dissolved B, Ba, Ca, Fe, Mg, Na	NH3, NO3, pH, SO4, TDS, TSS)	Dissolved Cr, Pb, Mn, K	CO3, HCO3, OH	Ion Balnce	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW1-02	11-Nov-20	8:47	Groundwater	5	x				x	x	x		
	MW3-02		1:05	Groundwater	5	x				x	x	x		
	MW4-02		12:34	Groundwater	5	x				x	x	x		
	MW5-02		9:09	Groundwater	5	x				x	x	x		
	MW6-02		12:51	Groundwater	5	x				x	x	x		
	MW1-03		1:17	Groundwater	5	x				x	x	x		
	MW1-15		9:49	Groundwater	5	x				x	x	x		
	MW2-15		11:47	Groundwater	5	x				x	x	x		
	MW3-15		11:14	Groundwater	5	x				x	x	x		
	MW4-15		9:32	Groundwater	5	x				x	x	x		
	MW1-17		10:56	Groundwater	5	x				x	x	x		
	MW2-17		11:31	Groundwater	5	x				x	x	x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please compare to ODWS
Samples field filtered

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
15.6	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Nov. 1, 2020	

INITIAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:
y	2020 11 12	1058

FINAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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DCI 2016 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2528521-COFC

COC Number: 17 - 4 Page 2 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Sault Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information	
ALS Account # / Quote #:	11353 / Q78965
Job #:	Blind River Landfill
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: C. Prandis

Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 2 :	(Alkalinity, BOD, Chloride, COD, DOC,	EC, Dissolved B, Ba, Ca, Fe, Mg, Na	NH3, NO3, pH, SO4,TDS, TSS)	Dissolved Cr, Pb, Mn, K	CO3, HCO3, OH	Ion Balnce	VOC Spike	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW1-20	11-Nov-20	1:51	Groundwater	5	x				x	x	x			
	Duplicate		9:40	Groundwater	5	x				x	x	x			
	Field Blank		2:30	Water	5	x				x	x	x			
	Travel Blank			Water		x				x	x	x			
	Travel Spike			Water									x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

MW1-02 Filtered.
Please compare to ODWS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
15.6					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Nov. 2020	Time:	Received by:	Date: 2020 11.12	Time: 1058	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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OCT 2018 FRONT

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2528521-COFC

COC Number: 17 - 4 Page 3 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jennifer@kresinengineering.ca

Email 2:

Email 3:

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: annette@kresinengineering.ca

Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: 11353 / Q78965

Job #: Blind River Landfill

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#:

Major/Minor Code: | Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only):

ALS Contact: C. Paradis

Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 6, Coloumn 3	(Alkalinity, BOD, Cl, COD, Total Mercury	Conductivity, Total Metals (With Reportables)	NH3,NO2, NO3, Total Phosphorus, pH,	Phenols 4AAP, SO4, TDS, TKN, TSS)	CO3, HCO3, OH	Ion Balance	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	SW	11-Nov.-20	11:57	Surface Water	6	x					x	x		
	SW2	↓	2:41	Surface Water	6	x					x	x		
	SW3	↓	2:50	Surface Water	6	x					x	x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please compare to PWQO

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
15.6					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Nov. 21	Time:	Received by:	Date: 2020 11 12	Time: 1058	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCT 2019 FRONT

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Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2528521-COFC

COC Number: 17 - 4 Page 4 of 4

Report To	Contact and company name below will appear on the final report
Company:	Kresin Engineering Corporation
Contact:	Jennifer Sharpe
Phone:	705-949-4900
	Company address below will appear on the final report
Street:	536 Fourth Line East
City/Province:	Saulte Ste. Marie, ON
Postal Code:	P6A 5K8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☐ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☐ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jennifer@kresinengineering.ca
Email 2:
Email 3:

Invoice Distribution

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: annette@kresinengineering.ca
Email 2:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐
EMERGENCY: 1 Business day [E - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: 11353 / Q78965
Job #: Blind River Landfill
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#:
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only):

ALS Contact: C. Paradis Sampler: Jenn Sharpe

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Schedule 5 Column 1:	(Alk, BOD, Chloride, COD, DOC, EC,	Dissolved Hg; Dissolved As, B, Ba, Ca,	Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Pb, Zn,	NH3, NO2, NO3, Total Phosph, pH,	Phenols, SO4, TDS, TKN, TSS, VOC's)	CO3, HCO3, OH	Ion Balnce	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW2-02	11-Nov-20	10:24	Groundwater	8	x						x	x		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Please compare to ODWS
Filtered

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
15.6	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				2020 11.12	1058			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCT 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

L2528521-COFC

Client: Kresin Engineering

Sample Layout Verification:	Verified By	Date	Time	Sample Integrity Issues Enter information on back page
	Y	2020 11.12	NA	
Labels Verification:	**Verified By**			**Do any samples require prep?**
				NO P F/P

		Sample #:																
1L	Plastic																	
500mL	Plastic																	
250mL	Plastic																	
145mL	Plastic																	
60mL	Plastic																	
Micro																		
Toxicity Pail																		
1L	Glass																	
500mL	Glass																	
250mL	Glass																	
120mL	Glass																	
60mL	Glass																	
40mL	Vial (Glass)																	
40mL	Methanol Vials																	
Soil Jar (120, 250 or 500mL)																		
Other:																		
Other:																		
Total Number of Bottles																		

Trip/Travel/Field Blank Information

Solids Batch#: 459	Metals Batch#:	T:	D: 502
Routine Batch#: 459	Mercury Batch#:	T:	D:
BOD Batch#: 105528 · hand mode	Cyanide Batch#:	T:	D:
Nutrients Batch#: 500	OGG Batch#:		
DOC/Carbon Batch#: 501	Phenols Batch#:		
VOC Batch#: Spike: 361 AK5.			
Other:			

COOLER TRACKING

EPP		Coleman	
Small		Micro (5QT)	
Med		Sm(9QT)	
Lrg		Med(16QT)	
Micro Box		Lrg(28QT)	
		Lrg(48QT)	

APPENDIX D:

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT

BLIND RIVER MUNICIPAL WASTE SITE EXPANSION

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT
BLIND RIVER MUNICIPAL WASTE SITE EXPANSION
PART OF LOT 7, CONCESSION 1
(FORMER TOWNSHIP OF STRIKER)
TOWN OF BLIND RIVER
ALGOMA DISTRICT, ONTARIO

ORIGINAL REPORT

Prepared for:

Kresin Engineering Corporation
536 Fourth Line East
Sault Ste. Marie, Ontario
P6A 6J8

Archaeological Licence #P094 (Merritt)
Ministry of Tourism, Culture and Sport PIF# P094-0244-2017
ASI File: 17EA-120

19 September 2017

ASI
Providing Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 F 416-966-9723 asiheritage.ca

Stage 1 and 2 Archaeological Assessment
Blind River Municipal Waste Site Expansion
Part of Lot 7, Concession 1
(Former Township of Striker)
Town of Blind River
Algoma District, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc. (ASI) was contracted by Kresin Engineering Corporation to conduct a Stage 1 and 2 Archaeological Assessment (Background Research and Property Assessment) as part of the Blind River Municipal Waste Site Expansion. The Study Area is approximately 5.5 hectares around the existing landfill on the north side of the Trans-Canada Highway 17 approximately three kilometres east of the Town of Blind River, Ontario.

The Stage 1 background study determined that no previously registered archaeological sites are located within ten kilometres of the Study Area, but that the property could retain archaeological potential. The Stage 2 property survey identified that the entire Study Area did not have archaeological potential. The Stage 2 property survey was undertaken following *Standards and Guidelines for Consultant Archaeologist* (S & G), specifically Section 2.1.5, that provide Stage 2 strategies for northern Ontario and Canadian Shield terrain.

In light of these results, the following recommendations are made:

1. Parts of the Study Area are located beyond 150 metres from water sources and therefore do not require Stage 2 test pit survey, as per S & G Section 2.1.5 Standard 2c;

2. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and/or steep slopes in excess of 20 degrees. These lands do not require further archaeological assessment; and,

3. Should the proposed work extend beyond the current Study Area, further Stage 1 and/or 2 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

ASI

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner | Director* *Environmental Assessment Division*
Project Coordinator:	Sarah Jagelewski, Hon. BA (R405) *Archaeologist | Assistant Manager* *Environmental Assessment Division*
Project Director (Licensee):	Lisa Merritt
Project Manager:	Eliza Brandy, MA (R1109) *Archaeologist | Project Manager* *Environmental Assessment Division*
Field Director:	Eliza Brandy Martin Cooper MA (P380) *Senior Associate*
Report Preparation:	Eliza Brandy
Graphics:	Blake Williams, MLitt (P383) *Archaeologist | Geomatics Specialist* *Operations Division*
Report Reviewer:	Lisa Merritt

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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by Kresin Engineering Corporation to conduct a Stage 1 and 2 Archaeological Assessment (Background Research and Property Assessment) as part of the Blind River Municipal Waste Site Expansion Municipal Class Environmental Assessment. The Study Area is approximately 5.5 hectares around the existing landfill on the north side of the Trans-Canada Highway 17 approximately three kilometres east of the Town of Blind River, Ontario (Figure 1).

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2009) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Tourism, Culture and Sport (MTCS).

In the S & G, Section 1, the objectives of a Stage 1 archaeological assessment are discussed as follows:

- To provide information about the history, current land conditions, geography, and previous archaeological fieldwork of the Study Area;
- To evaluate in detail the archaeological potential of the Study Area that can be used, if necessary, to support recommendations for Stage 2 archaeological assessment for all or parts of the Study Area; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment, if necessary.

This report describes the Stage 1 archaeological assessment that was conducted for this project and is organized as follows: Section 1.0 summarizes the background study that was conducted to provide the historical and archaeological contexts for the project Study Area; Section 2.0 addresses the field methods used for the property survey that was undertaken to document its general environment, current land use history and conditions of the Study Area; Section 3.0 describes any archaeological resources recovered during the property survey; Section 4.0 analyses the characteristics of the project Study Area and evaluates its archaeological potential; Section 5.0 provides recommendations; and the remaining sections contain other report information that is required by the S & G, e.g., advice on compliance with legislation, works cited, mapping and photo-documentation.

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act,* RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (2000 as amended in 2007 and 2011).

Authorization to carry out the activities necessary for the completion of the Stage 1 and 2 archaeological assessment was granted by Kresin Engineering Corporation on July 24, 2017.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Northern Ontario was colonized by human populations much later than the south. The Laurentide glacier would have retreated above the study area by approximately 10,500-10,000 BP (Karrow and Warner 1990: Fig. 2.9, 2.11). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed and populations now occupied less extensive territories (Ellis and Deller 1990:62–63).

The ice margin had retreated northward from Georgian Bay by 10,000 BP and the pro-glacial Lake Algonquin drained through the North Bay outlet (Karrow and Warner 1990: Fig. 2.9). From approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites that would have been located on those former shorelines are now submerged. From approximately 10,000-8,000 BP, northern Ontario was occupied by populations whose subsistence was focussed within the boreal forest environment (Wright 2001:101, 105, 106). Groups may have had seasonal prolonged residency at fords to take advantage of migrating animal herds, made vulnerable by the crossing, but otherwise likely subsisted at large in the forest environment (Wright 2001:112–113).

By approximately 8,000 BP, subsistence shifted to an increased reliance on aquatic resources, likely anadromous fish. This is suggested by evidence from isotopic analysis of bone samples from the Wapekeka Burial site (dated to approximately 7,000 BP) (Wright 2001:125). Comparative evidence from the O.S.A Lake site near Georgian Bay suggests that contact existed between populations in north-central Ontario and those in southern Ontario (Wright 2001:123). Such communication networks certainly extended into northern Ontario as well.

By approximately 3,500 BP, copper implements become common in the areas surrounding Lake Superior, and there is evidence of the exchange of copper into southern Ontario (Wright 2001:261, 262).

By approximately 2,200 BP, populations focussed their habitation at rivers and lakes, while subsistence involved a variety of resources drawn from a wide territory. At this time, the earliest evidence exists for occupation located near prime fishing grounds. Soon after, burial mounds appear in the archaeological record, and the exotic nature of the grave offerings found associated with these burial mounds expands on the prior evidence for extensive exchange networks (Wright 2001:288, 291-293). Burial practise should be seen as deliberate and reflective of the cosmology of these people (Parker Pearson 1999:141).

All these new cultural features suggest new concepts of social organization, investment of labour and territorialism (Brown 1995:13; MacDonald et al. 1994:7–8). The prevalence of mound burial around the Upper Great Lakes reflects likely cultural connections with populations from Ohio and Illinois. There are differences in some burial mound practices in the Shield versus elsewhere in the Great Lakes basin in terms of stone cairn construction versus earthen mound construction. The apparent similarities in ceremonialism, however, as well as the material evidence for extensive cultural contacts across regions

may be part of a world-view which spanned the entire Great Lakes basin and likely beyond. Macro-band social organization and subsistence focussed on the seasonal exploitation of resources such as fish and wild rice (where available), though evidence from the Wabinosh River site west of Lake Nipigon may indicate year-round occupation (Wright 1999: 749, 756, 765-776).

Historical documentation provides some information on the populations which lived in northern Ontario during the seventeenth century. The extensive mobility of these populations reflects a different sense of territoriality than the settled agricultural or even itinerant horticultural groups living to the south and data is often insufficient to accurately map the ranges of individual groups.

The Odawa were an Algonquian Nation who occupied Bruce County, Grey County and Manitoulin Island, and consisted of several groups. The Odawa subsisted primarily from fishing but also practiced horticulture and were extensively involved in trade. They were known to co-reside with Iroquoian populations (Thwaites 1901:21: 125). The Odawa moved throughout what are now the States of Michigan and Wisconsin until one of the Odawa groups, the Kiskakon, came to settle at Bawating (Sault Ste. Marie) in 1670/1671 (ASI 2011). In 1676 the Kiskakon moved subsequently to the Saint Ignace Mission at Mackinac (Feest and Feest 1978:772–773).

Information on Ojibway lifeways along the north shore of Lake Huron during the eighteenth century into the early nineteenth century is limited. Some horticulture was still practised and hunting was focused on deer and fur-bearing quarry such as raccoon, beaver and marten. At Bawating, the whitefish fishery was of particular importance, as well as the collection of maple sugar during the spring. As the nineteenth century progressed, agriculture became more important to Ojibway economy, however, traditional produce such as wild rice, maple sugar and fishing remained important. Despite the maintenance of many traditional lifeways, throughout the nineteenth century pressure from Euro-Canadian culture affected many aspects of First Nations culture (Rogers 1978:762–765).

The eighteenth century saw the ethnogenesis in Ontario of the Métis, when Métis people began to identify as a separate group, rather than as extensions of their typically maternal First Nations and paternal European ancestry (Métis National Council n.d.). Living in both Euro-Canadian and Indigenous societies, the Métis acted as agents and subagents in the fur trade but also as surveyors and interpreters. Métis populations were predominantly located north and west of Lake Superior, however, communities were located throughout Ontario (MNC n.d.; Stone and Chaput 1978:607,608). During the early nineteenth century, many Métis families moved towards locales around southern Lake Huron and Georgian Bay, including Kincardine, Owen Sound, Penetanguishene, and Parry Sound (MNC n.d.). By the mid-twentieth century, Indigenous communities, including the Métis, began to advance their rights within Ontario and across Canada, and in 1982, the Métis were federally recognized as one of the distinct Indigenous peoples in Canada. Recent decisions by the Supreme Court of Canada (Supreme Court of Canada 2003, 2016) have reaffirmed that Métis people have full rights as one of the Indigenous people of Canada under subsection 91(24) of the Constitution Act, 1867.

The Métis have been present in the Sault Ste. Marie area as early as the 1600's, particularly since the establishment of the first mission (Prefontaine 2003; Leffler 2006). The Métis typically settled in close proximity to rivers, “occupying strips of land perpendicular to and along the river” (Lytwyn 1998:1). This was the settlement pattern at Sault Ste. Marie in 1846 when Vidal surveyed the area, documenting each household and including a list of the head of each household. These included prominent Métis including Joseph Boissoneau, Joseph Boissoneau Jr., and Charles Oakes Ermatinger, a fur trader who had built the Old Stone House. At the time of the survey, amongst the 500 population of Sault Ste. Marie, Vidal specifically noted that there were Métis living near the mission (Osborne and Swainson1986:22). Prior to

1846, the Métis community was documented to be comprised of one household in 1761 owned by Jean Baptiste Cadotte and 80 buildings in 1826 (Prefontaine 2003). In 1845, the Métis community was described as having a population of 250 people and 50 houses (Lytwyn 1998:1).

The Study Area is within the Robinson-Huron Treaty land. In 1850, the treaty was signed by the Ojibway ceding the vast majority of land in northern Ontario for resource extraction and settlement. While settlement was restricted to the established reserves, "the full and free privilege to hunt over the territory [then] ceded by them and to fish in the waters thereof as they have heretofore been in the habit of doing" was retained in the Treaty (Surtees 1986, 1971). During the negotiations of the Robinson Treaty, the Métis lost much of their rights, particularly regarding their land, despite having strong support from Chief Shingwaukonse from Garden River. However, regardless of the Crown's treatment of the Métis, the Ojibway continued to regard the Métis as having the same rights as them (Lytwyn 1998; Préfontaine 2003). It was also generally assumed that in spite of the Robinson Treaty, the Métis would continue to have the right to hunt and fish. This was evident in the nineteenth century census data which showed the occupation of many Métis as hunters, fishermen, trappers and traders. Although mostly removed from the core due to the inability to own land, the Métis continued to live on the outskirts of Sault Ste. Marie (Lytwyn 1998). The Robinson Treaty remains a contentious document.

1.2.2 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the study area is located in the former Striker Township, District of Algoma, in part of Lot 7 Concession 1.

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI, (Archaeological Services Inc.) 2006).

Algoma District

The 1850 Robinson Treaty opened up the surrounding land for European settler occupation, moving the Indigenous population onto reserves. Subsequent government jurisdiction and infrastructure expanded in

the district, allowing for an increase in settler population. The initial survey of the Algoma District commenced in the 1850s after negotiations had been concluded with the Indigenous peoples of the area to surrender the land north of Lakes Huron and Superior (Gentilcore and Head 1983:106). The area was surveyed using the United States section survey method, resulting in townships that were 36 miles square, which were further divided into sections of one square mile each. At the time of its initial survey, the Algoma District was relatively isolated since rail lines and roads had yet to be established. In 1869 the District was temporarily divided into the West (First) and East (Second) Algoma Districts. These were reorganized in 1871 into, once again, the Algoma District with the creation of the District of Thunder Bay (Ministry of Government and Consumer Services 2015). The Canadian Pacific Railway reached the Algoma District in 1883, which opened the area to settlement and the establishment of the logging industry (Andreae 1997). The eastern part of the Algoma District was reorganized into the Sudbury District in 1907 and by 1912 the modern boundaries of the Sudbury District had been determined.

Blind River

Lake Huron and the North Channel were well travelled by Indigenous and European people during the voyageur period, and a fur trading post was established by the Northwest Company in 1789 at the mouth of the Mississagi River (Town of Blind River 2017). Settlement began to increase around the rivers flowing into the North Channel. One of these rivers east of the Mississagi was known as Penewobecong (Smooth Rock or Sloping) and was later called Blind River by the voyageurs because the mouth was not visible as they followed along the canoe route. The area around the town of Blind River was heavily influenced by the logging and mining industry which began in the 1870s around the Mississagi River Valley (Town of Blind River 2017). The first industry in the region was a copper mine, and so a sawmill was built beside the mouth of the Blind River to provide timber and planks for the mine. The industry was supported by the Mississagi River, the Blind River and tributaries, and an abundance of white pine, and was the major employer of the North Channel region. Nineteenth-century mills included those operated by the Dyment Lumber Company, Saginaw Salt and Lumber Company, the Hope Lumber Company and the Crane Lumber Company, and several JJ McFadden lumber companies, including Blind River. By 1906 Blind River had been incorporated as a town and another large sawmill was built on the west arm of the Blind River . In 1929 the Carpenter Hixon Company built a state-of-the-art pine sawmill producing 89 million board feet of lumber in its first year. Through boom and bust the mill survived under the name 'McFadden Lumber Company' for over forty years as the largest white pine sawmill east of the Rocky Mountains. In 1919, the Trans Canada Highway 17 was constructed in 1919 connecting Blind River to Spanish. After the Great Mississauga Forest fire in 1948 led to the eventual decline of the logging industry, but in 1955, Uranium was discovered near Blind River which led to the development of the Blind River-Elliot Lake Uranium mining industry and in 1983, a refinery was built just west of Blind River now owned and operated by the Cameco Corporation which processes uranium concentrates from all over the world into uranium trioxide (Town of Blind River 2017).

1.2.3 Historical Map Review

The 1800 Map of the Province of Upper Canada (Smyth 1800), Arrowsmith's 1837 map of Upper Canada (Arrowsmith 1837), and the Rand, McNally, & Co.'s 1889 No. 1 map (Rand, McNally & Co. 1889) were examined to determine the presence of historic features within the Study Area during the nineteenth century (Figures 2-5).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given

preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

The maps show that the north shoreline of the North Channel of Lake Huron had been mapped since at least 1800, and that the Thessalon and Mississauga Rivers were illustrated as significant in the landscape. This coast of Lake Huron is described as rocky and barren. Numerous place names for islands and rivers had been assigned in the early nineteenth century, however not until the construction of the railroad does Blind River appear as a town on the 1889 map.

1.2.4 Twentieth-Century Mapping Review

The 1882-1927 Plan of the Township of Striker (Johnson 1882), the 1901 Map of Northern Ontario (Department of Crown Lands and Geological Department of Canada 1901), and the 1994 National Topographic System Blind River Sheet (Department of Energy, Mines and Resources 1994) were examined to determine the extent and nature of development and land uses within the Study Area (Figures 6-7). The patent plan for the township indicates that the township was surveyed for lots and concessions in 1882, however most revisions for development appear to have occurred in the twentieth century. Figure 6 does not illustrate any names associated with Lot 7, Concession 1, though it does illustrate the proposed CPR alignment, and later revisions illustrate some structures and the Highway 17 corridor. The 1901 map illustrated the boundaries of the township of Striker and other townships within the District of Algoma, as well as the CPR, and the Towns of Blind River and Algoma Mills. By 1994, the Study Area is shown to include the municipal waste site, Highway 17, CPR, and the Town of Blind River.

A review of available Google satellite imagery since 2005 shows that the Study Area has been in continuous use as the Town of Blind River Municipal Waste site, with an access road and two off-shot roads to other work areas, located on the north side of Highway 17, east of the Town of Blind River.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MTCS through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

A Stage 2 property survey was conducted on August 21, 2017 that noted the Study Area is located within the existing municipal east of the Town of Blind River on the north side of the Trans-Canada Highway 17. The locked gated access road leads to a clearing surrounded by forest and a steep access road leads out of the east side of the Study Area up a slope. The west side of the Study Area is surrounded by scrubby wetland area, while the southern part of the Study Area has been partially cleared of vegetation.

1.3.2 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The Study Area is within a physiographic region roughly divided by a line from the area west of the western part of Basswood Lake, north of Thessalon, east to the Town of Blind River. North of this line is characterized by large bedrock uplands with pockets of sandy alluvial lowlands, with a high water table at or near the ground surface of the lowlands. South of the boundary line is an extensive area of thick drift – consisting of glaciolacustrine silt and silty fine sand through areas of till and ice-contact stratified sediment – with smaller areas of exposed bedrock, and even farther south, near the shoreline of Lake Huron, the terrain is dominated by low-relief bedrock with areas of thin lacustrine beach and nearshore sand and gravel with organic materials (Ministry of Northern Development and Mines and Dames & Moore:9).

The surficial geology resulted from glaciations of the Late Wisconsinan sub-stage during the Pleistocene where the bedrock was scoured and abraded, leaving smooth upglacier faces as well as till (Ministry of Northern Development and Mines and Dames & Moore:9). Overburden in the Study Area is predominantly morainal, glaciofluvial and glaciolacustrine sediments, generally grading from sand to fine sand, silt and clay at depth, varying in thickness depending on the configuration of the bedrock surface, but can have depths exceeding 30 metres in depressed areas, while glaciofluvial outwash deposits are located along the Blind River, primarily composed of gravelly sand and having low relief (Kresin Engineering Corporation 2009:2). Figure 8 illustrates the Study Area quaternary geology.

Soils in the study area include the well-drained Monteagle soil, an orthic humo-ferric podzol noncalcareous very stony sand and/or sandy loam glacial till, as well as poorly-drained Ouellette, an orthic gleysol noncalcareous clay loam, silty clay, and/or clay lacustrine soil with drainage (Figure 9) (Gillespie et al. 1983).

The Study Area is on the north shore of the North Channel of Lake Huron, west of Georgian Bay, and near the Blind River, which runs roughly north-south from numerous tributaries and lakes including Lake Duborne, Cataract Lake, Canoe Lake, High Lake, Chiblow Lake and Matinenda Lake to empty into the North Channel at the Town of Blind River. The Study Area is also in proximity to Lauzon Lake, approximately 2000 hectares in size, with permanent and seasonal homes as well as campgrounds and recreational lodges (Kresin Engineering Corporation 2009:3).

1.3.3 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *CbHr*.

According to the OASD, no previously registered archaeological sites are located within ten kilometres of the study area (Ministry of Tourism, Culture and Sport 2016).

According to the background research, no previous reports detail fieldwork within 50 m of the study area.

2.0 FIELD METHODS

The Stage 2 property survey was conducted under the field direction of Eliza Brandy (R1066) and Martin Cooper (P380) both of ASI, on August 21, 2017, in order to gain first-hand knowledge of the geography, topography, and current conditions to evaluate and map archaeological potential of the Study Area and to determine if the property contained archaeological resources. It was determined after a detailed survey of the property that no Stage 2 test pit survey was required. Fieldwork was only conducted when weather conditions were deemed suitable, per S & G Section 2.

The Stage 2 property survey adhered to the standards of a Stage 1 property inspection as per the S & G, Section 1.2, Standards 1-6, which are discussed below. The entire property and its periphery must be inspected. The inspection may be either systematic or random. Coverage must be sufficient to identify

the presence or absence of any features of archaeological potential. The inspection must be conducted when weather conditions permit good visibility of land features. Natural landforms and watercourses are to be confirmed if previously identified. Additional features such as elevated topography, relic water channels, glacial shorelines, well-drained soils within heavy soils and slightly elevated areas within low and wet areas should be identified and documented, if present. Features affecting assessment strategies should be identified and documented such as woodlots, bogs or other permanently wet areas, areas of steeper grade than indicated on topographic mapping, areas of overgrown vegetation, areas of heavy soil, and recent land disturbance such as grading, fill deposits and vegetation clearing. The inspection should also identify and document structures and built features that will affect assessment strategies, such as heritage structures or landscapes, cairns, monuments or plaques, and cemeteries. Previously identified features of archaeological potential were examined; additional features of archaeological potential not visible on mapping were identified and documented as well as any features that will affect assessment strategies.

The Stage 2 property survey was undertaken following S & G Section 2.1. Standard 2 a, b that states when Stage 2 survey is not required based on the identification of lands not having archaeological potential; and S & G Section 2.1.5, that provides Stage 2 strategies for Northern Ontario and Canadian Shield terrain. 1. Parts of the Study Area are located beyond 150 metres from water sources and therefore did not require Stage 2 assessment.

Field observations are compiled onto the existing conditions of the Study Area in Section 8.0 (Figure 10) and associated photographic plates are presented in Section 9.0 (Plates 1-10).

3.0 RECORD OF FINDS

The Stage 2 survey did not result in the recovery of any archaeological resources.

4.0 ANALYSIS AND CONCLUSIONS

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the Study Area. These data are presented below in Section 4.1. Results of the analysis of the Study Area property survey are presented in Section 4.2.

4.1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Early historic transportation routes (Canadian Pacific Railroad);
- Proximity to early settlements (Town of Blind River); and
- Well-drained soils (Monteagle sandy loam)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. No Municipal Heritage Register for the Town of Blind River could be found.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

4.2 Analysis of Stage 2 Property Survey Results

The property survey assessed an area of approximately 5.5 hectares. The Study Area is located on Canadian Shield terrain, and parts of the Study Area are greater than 150 metres from a modern water source or other feature of archaeological potential. According to the S & G Section 2.1.5 Standard 1, survey is not required in these areas (Plate 6; Figure 10: areas highlighted in orange).

The remainder of the Study Area has been subjected to deep soil disturbance events and according to the S & G Section 1.3.2 do not retain archaeological potential (Plates 1-10; Figure 10: areas highlighted in yellow). The property survey determined that some of lands within the Study Area are sloped in excess of 20 degrees, and according to the S& G Section 2.1 do not retain potential (Plate 9; Figure 10: areas highlighted in pink). These areas do not require further survey.

4.3 Conclusions

The Stage 1 background study determined that no previously registered archaeological sites are located within ten kilometres of the Study Area. The Stage 2 property survey determined that Study Area does not retain archaeological potential and did not require Stage 2 test pit survey.

5.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. Parts of the Study Area are located beyond 150 metres from water sources and therefore do not require Stage 2 test pit survey, as per S & G Section 2.1.5 Standard 2c;

2. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance and/or steep slopes in excess of 20 degrees. These lands do not require further archaeological assessment; and,

3. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

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8.0 MAPS

Study Area

BASE:

0 1.5

Kilometres

ASI PROJECT NO.: 17EA-120
DATE: 28-Jul-17

DRAWN BY: BW
FILE: 17EA120_Fig1

Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
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Figure 1: Blind River Municipal Waste Site Expansion - Location of the Study Area

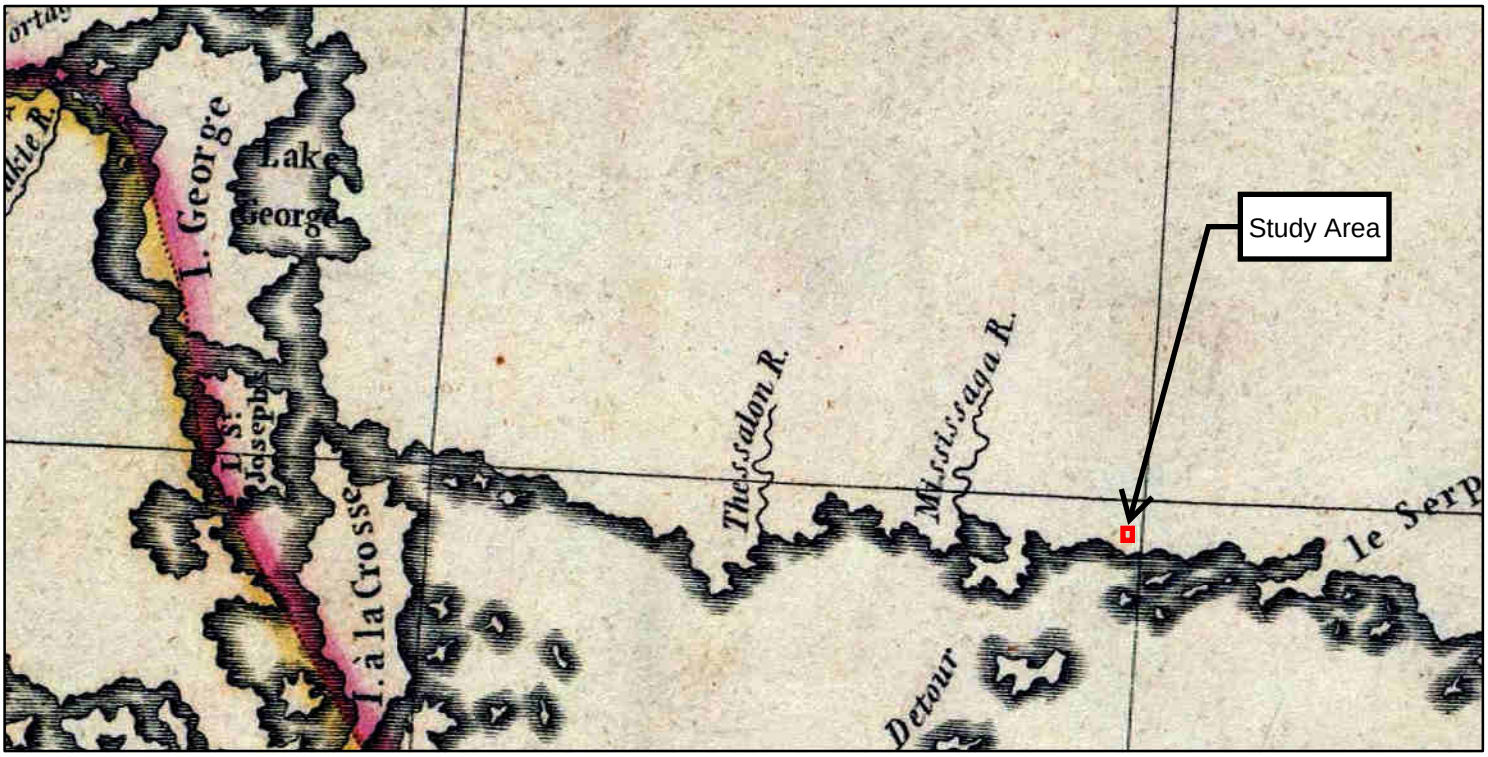

Figure 2: Blind River Municipal Waste Site Expansion Study Area (Approximate Location) Overlaid on the 1800 Map of the Province of Upper Canada

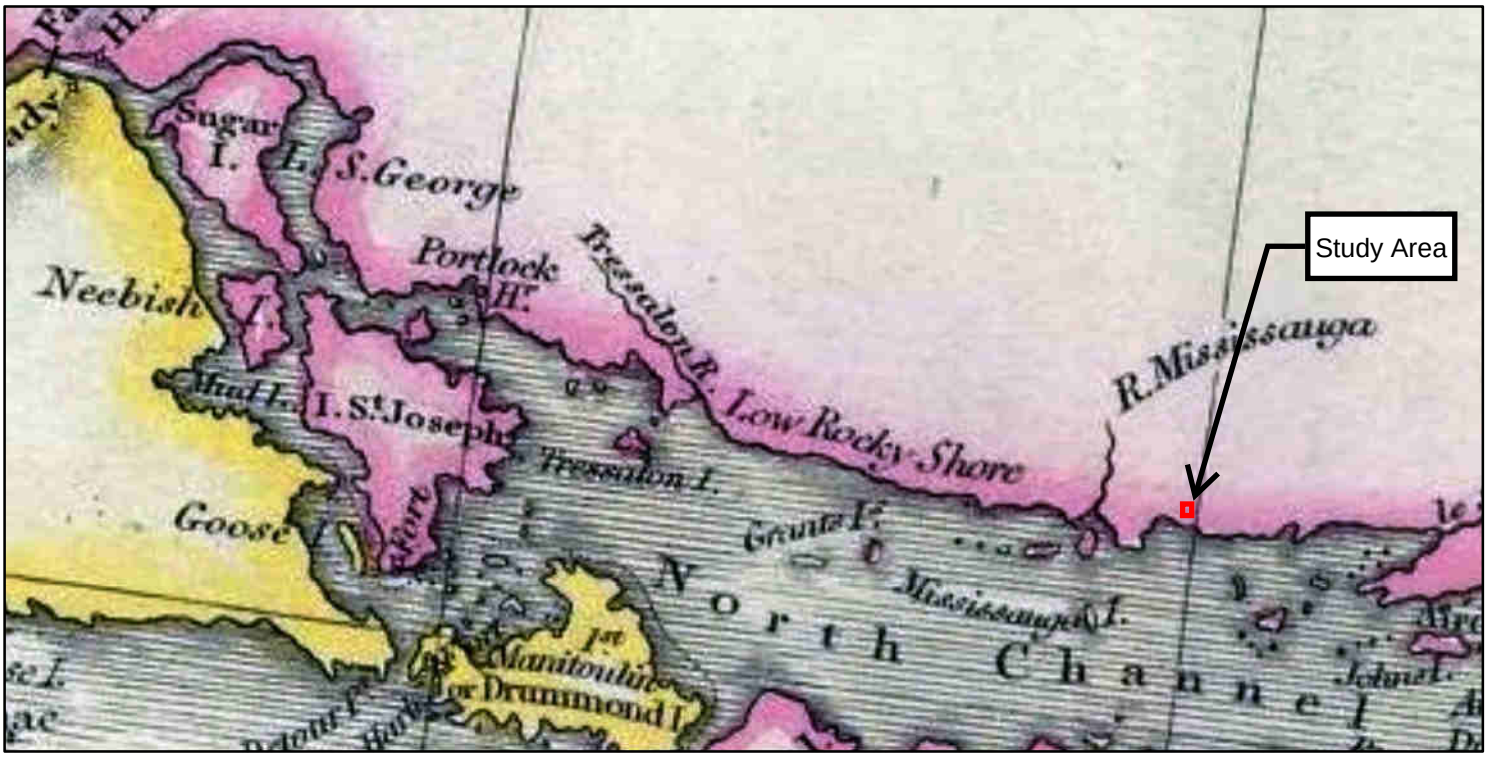

Figure 3: Blind River Municipal Waste Site Expansion Study Area (Approximate Location) Overlaid on the 1837 Map of Upper Canada

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Study Area

NOT TO SCALE

ASI PROJECT NO.: 17EA-120
DATE: 30-Aug-17

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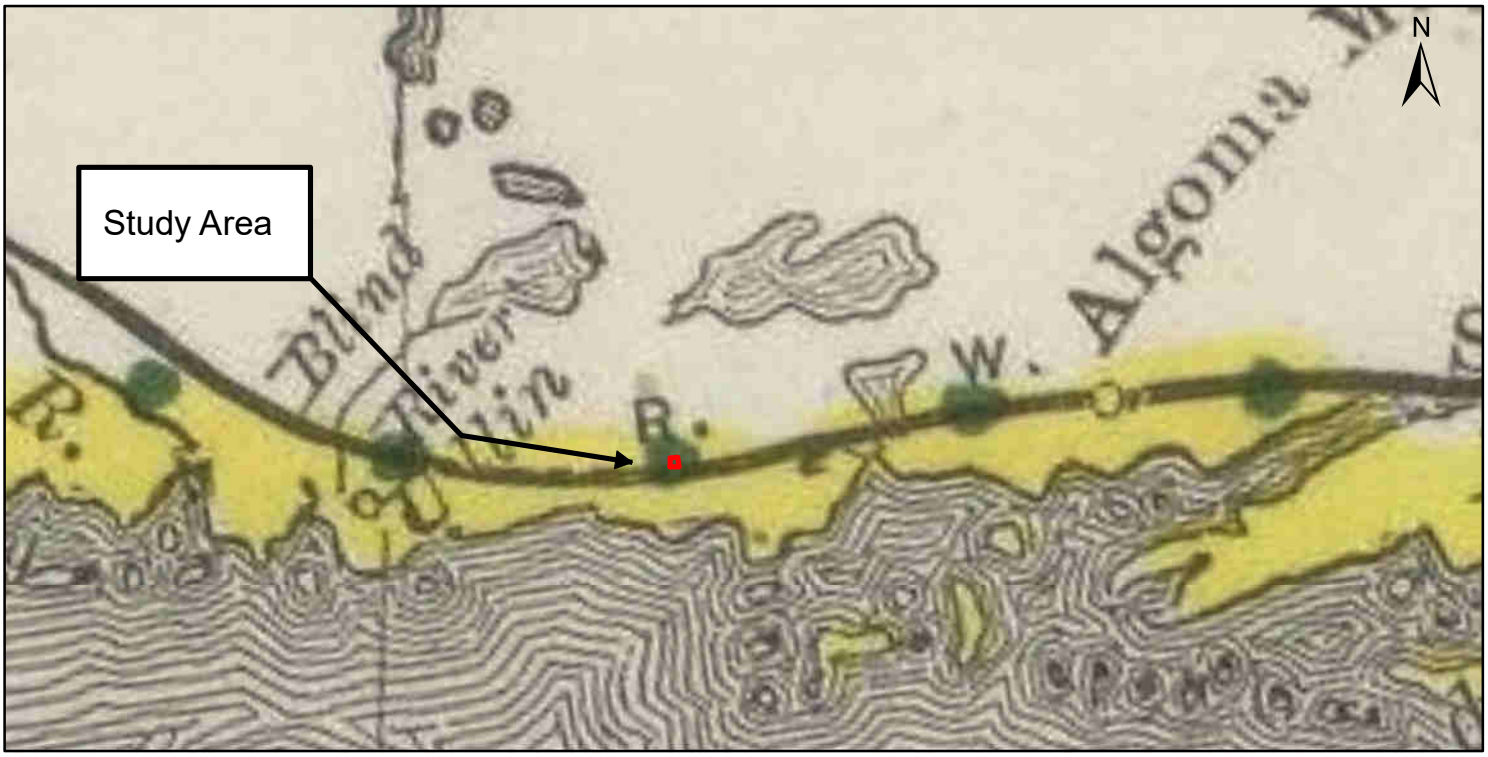

Figure 4: Blind River Municipal Waste Site Expansion Study Area (Approximate Location) Overlaid on the 1889 Rand, McNally & Co.'s Ontario No. 1

Figure 5: Blind River Municipal Waste Site Expansion Study Area (Approximate Location) Overlaid on the 1901 Map of Part of Northern Ontario

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Study Area

0 6,500
Metres

ASI PROJECT NO.: 17EA-120
DATE: 30-Aug-17
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FILE: 17EA120_Fig4_5

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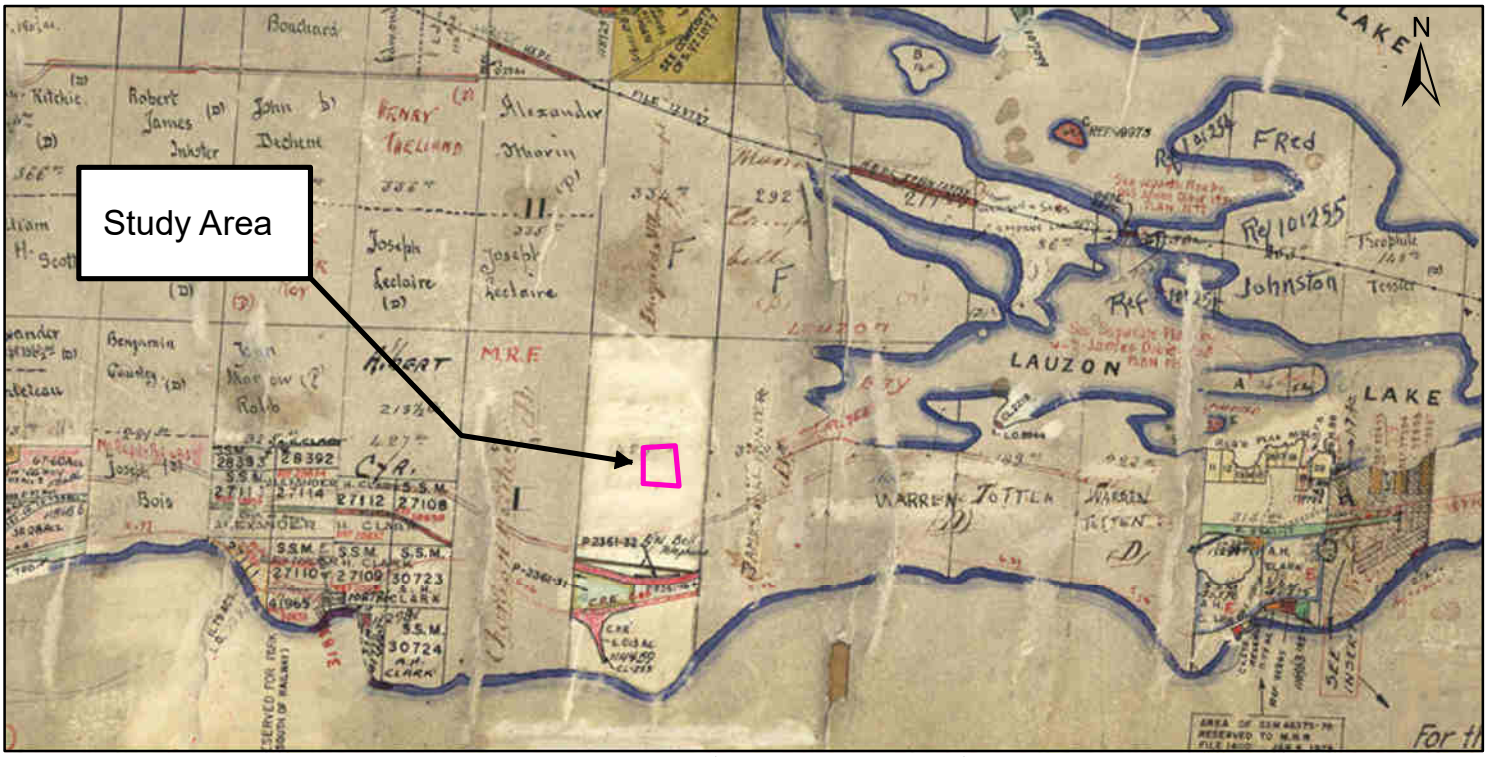

Figure 6: Blind River Municipal Waste Site Expansion Overlaid (Approximate Location) on the 1882-1927 Plan of the Township of Striker

Figure 7: Blind River Municipal Waste Site Expansion Overlaid (Approximate Location) on the 1994 National TopographicSystem Blind River Sheet

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Study Area

0 1,500
Metres

ASI PROJECT NO.: 17EA-120
DATE: 30-Aug-17
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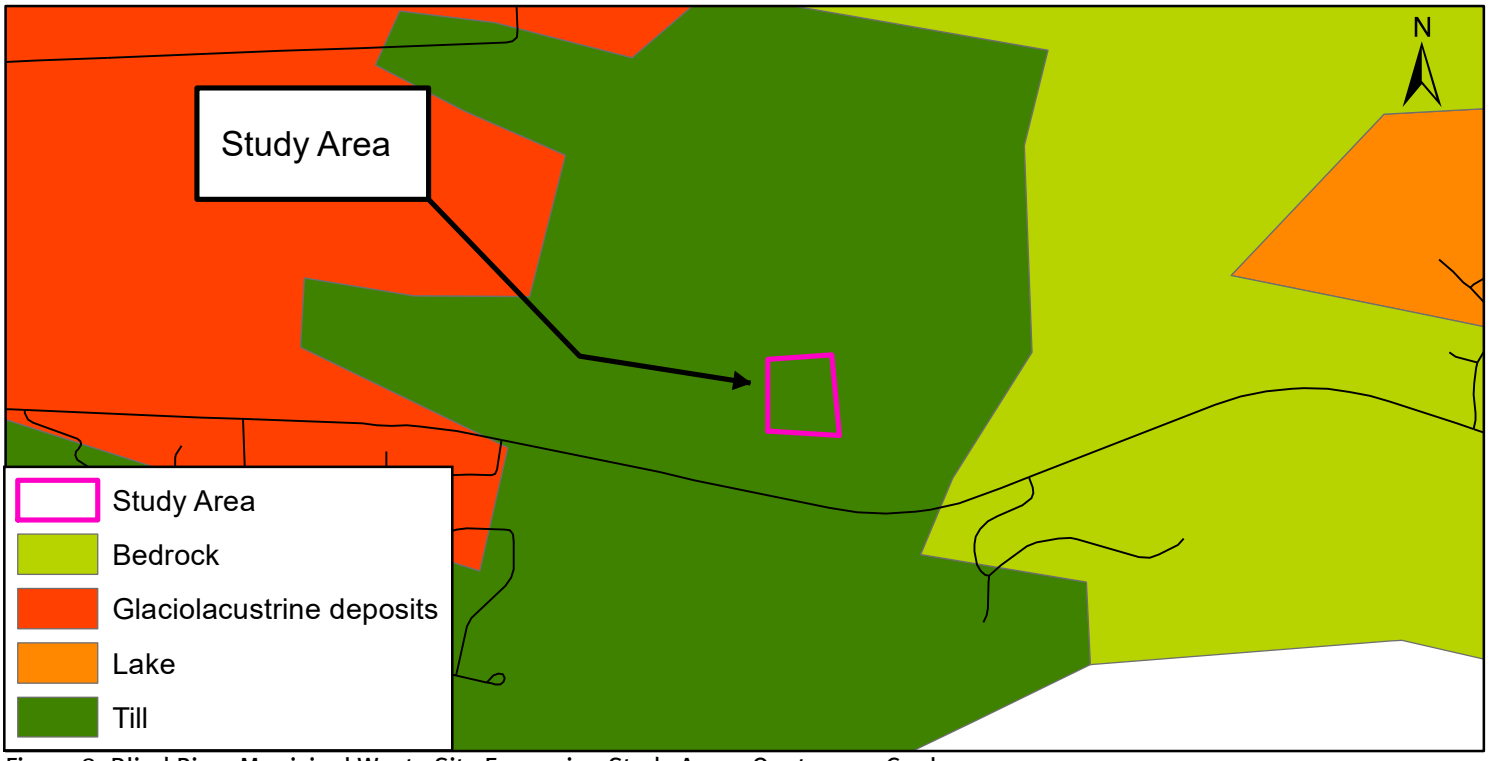

Figure 8: Blind River Municipal Waste Site Expansion Study Area - Quaternary Geology

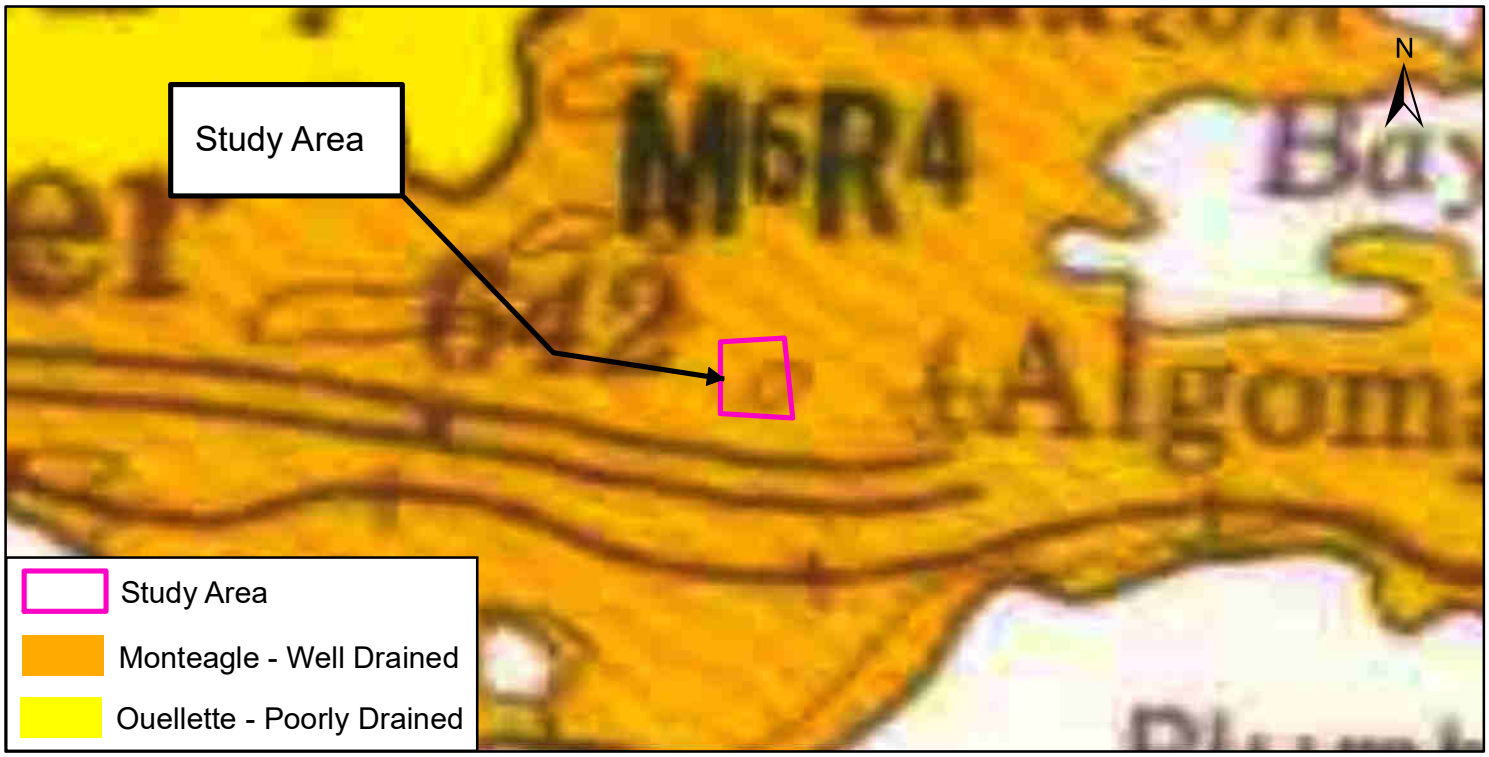

Figure 9: Blind River Municipal Waste Site Expansion Study Area - Soil Drainage

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0 800
Metres

ASI PROJECT NO.: 17EA-120
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Study Area
>150m from Modern Water Source - No Stage 2 Required
Disturbed - No Stage 2 Required
Sloped - No Stage 2 Required
Watebody
Roads

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 150
Metres

ASI PROJECT NO.: 17EA-120
DATE: 06-Sep-17
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FILE: 17EA120_Fig9_Stg1

Figure 10: Blind River Municipal Waste Site Expansion - Results of Stage 2 Survey

9.0 IMAGES

Plate 1: South view of landfill access road; Area is disturbed, no archaeological potential

Plate 2: North view of Study Area; Area is disturbed, no archaeological potential

Plate 3: West view of Study Area; Area is disturbed, no archaeological potential

Plate 4: West view of Study Area; Area is disturbed, no archaeological potential

Plate 5: South view of Study Area; Area is disturbed, no archaeological potential

Plate 6: Southwest view of Study Area; Area is disturbed or >150m from water, no potential

Plate 7: Northwest view of Study Area; Area is disturbed, no archaeological potential

Plate 8: North view of Study Area; Area is disturbed, no archaeological potential

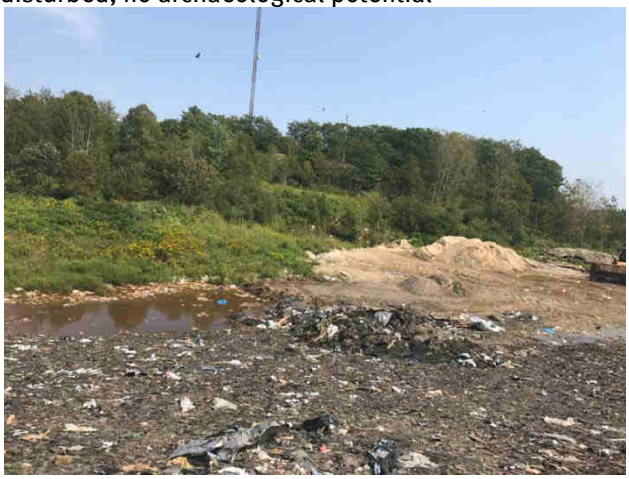

Plate 9: East view of Study Area; Area is disturbed and sloped, no archaeological potential

Plate 10: Southwest view of Study Area; Area is disturbed, no archaeological potential

APPENDIX E:

CHECKLISTS:

1) CRITERIA FOR EVALUATING POTENTIAL FOR BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES
2) CRITERIA FOR EVALUATING ARCHAEOLOGICAL POTENTIAL

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

Town of Blind River Waste Management Plan Environmental Assessment - 6 Alternative Landfill Locations

Project or Property Location (upper and lower or single tier municipality)

Town of Blind River, Ontario - Various locations within the Town boundaries - EA Study Area

Proponent Name

Town of Blind River

Proponent Contact Information

Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit or Standards and Guidelines for Conservation of Provincial Heritage Properties.

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i. designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note**: To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- Ontario Heritage Trust
- local land registry office (for a title search)

---

ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- Ontario Heritage Trust - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

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iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

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iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act*. **Note**: To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- Ontario Heritage Trust

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v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the National Historic Sites website.

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the Directory of Designated Heritage Railway Stations.

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the Heritage Lighthouses of Canada website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the Federal Heritage Buildings Review Office.

See a directory of all federal heritage designations.

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – World Heritage Site website.

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- municipal heritage committees or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's Heritage directory – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a list of plaques commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a list of plaques commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the Canadian Heritage River System.

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide Heritage Property Evaluation.

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- municipal heritage committees or local heritage organizations
- Ontario Historical Society's "Heritage Directory" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through Ontario Trails.

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 1

Project or Property Location (upper and lower or single tier municipality)

Existing Waste Disposal Site, Highway 17 East, Town of Blind River, Ontario

Proponent Name

Town of Blind River

Proponent Contact Information

Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☑	☐

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☐
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☐
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☐
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☐
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☐

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
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Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act.*

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 2

Project or Property Location (upper and lower or single tier municipality)

Industrial Park Lands, Highway 17 East, Town of Blind River, Ontario

Proponent Name

Town of Blind River

Proponent Contact Information

Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☑	☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name
Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 3

Project or Property Location (upper and lower or single tier municipality)
Industrial Lands and North of Industrial Lands, Highway 17 East, Town of Blind River, Ontario

Proponent Name
Town of Blind River

Proponent Contact Information
Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☑

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☑	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
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  Find out if your property or project areas has a distinctive land formation through:

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- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
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Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name
Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 4

Project or Property Location (upper and lower or single tier municipality)
North of Town Core and West of Woodward Ave. (Hwy 557) , Town of Blind River, Ontario

Proponent Name
Town of Blind River

Proponent Contact Information
Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☑

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☑

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☑	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 5

Project or Property Location (upper and lower or single tier municipality)

North of Town Core, North of Hwy 557 and West of Granary Lake Road , Town of Blind River, Ontario

Proponent Name

Town of Blind River

Proponent Contact Information

Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☑

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☑	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
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In this context, the following definitions apply:

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1. Is there a pre-approved screening checklist, methodology or process in place?

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- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

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  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

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MTCS maintains a database of archaeological sites reported to the ministry.

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4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

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In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
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  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
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- accessible or inaccessible shoreline, for example:
  - high bluffs
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  - marsh fields by the edge of a lake
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Water bodies not included:

- man-made water bodies, for example:
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  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
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  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
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  - mounds, etc.

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  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
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Ontario

Ministry of Tourism, Culture and Sport

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Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

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- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
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Processes covered under this checklist, such as:

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If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

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- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act.*

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Town of Blind River Waste Management Plan Environmental Assessment - Alternative Landfill Location 6

Project or Property Location (upper and lower or single tier municipality)

North of Highway 17 and East of Robb Road , Town of Blind River, Ontario

Proponent Name

Town of Blind River

Proponent Contact Information

Chris Kresin, P.Eng., Kresin Engineering Corporation

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☑

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☑	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

APPENDIX F:

NOISE IMPACT ASSESSMENT & ODOUR AND DUST MANGEMENT PLAN

The Corporation of the Town of Blind River
Municipal Waste Disposal Site Expansion

Noise Impact Assessment & Odour and Dust Management Plan

Rev. 1: May 2024
July 2022
KEC Ref: 0508.15

Prepared by:

KRESIN
Engineering Corporation

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Table 3: Noise Impact Modelling Results

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Figure 1: Blind River Marina Wind Rose

Figure 2: Blind River Marina Wind History

1.0 INTRODUCTION

The Town of Blind River (Town) municipal waste disposal site (Site) is accessed from Highway 17 and is situated approximately 2 kilometers east of the Town's core in the District of Algoma. The Site is depicted on Drawing A1 of Appendix A. In operation since about 1970, the Site is operating under the authority of the original Certificate of Approval (C of A) No. A7138701 dated November 1980.

The Town initiated the Environmental Assessment (EA) process to develop a Solid Waste Management Plan in response to the identified decline in available municipal waste disposal capacity. At completion of the Environmental Assessment, expanding the existing waste disposal site was confirmed to be the preferred alternative method to address the Town's future waste disposal needs.

This report has been prepared in support of the proposed expansion of the existing Site and to comply with Section 4 of the Ministry of Environment, Conservation and Parks (MECP) Landfill Standards which states that the design for a new or expanding landfilling site include "*an assessment of potential noise impacts due to operations at the site and to local trucking related to operations at the site, including an evaluation of any proposed noise control measures*". This report also identifies potential sources and receptors of odour and dust associated with the Site expansion and presents best management practices to mitigate potential impacts.

1.1 Proposed Site Expansion

The proposed expansion would be constructed on the east, south and west sides of the existing fill area, increasing the fill area by 2ha to a total of 4ha, as depicted on Drawing A2 of Appendix A. A 1m vertical expansion, increasing the height of the fill area, and trenching to a depth of 1.5m below grade beneath the expansion area, is also required. Development of the fill area will be staged, beginning with below grade excavation followed by the placement of fill material above grade.

1.2 Study Area

MECP publication "*D-4 Land Use On or Near Landfills and Dumps*" states that the most significant contaminant discharges and visual problems are considered to normally occur within 500 metres (m) of the perimeter of a fill area at a landfill.

Based on the nearest points of reception (described in section 1.3) being located approximately 1 kilometre (km) from the Site, the study area for this report was expanded to include the area within a distance of 1km of the proposed expanded fill area.

1.3 Points of Reception

MECP publication NPC-233 "*Information to be submitted for approval of stationary sources of sound"* includes the following under the definition of a 'Point of Reception':

- Permanent or seasonal residences;
- Hotels/motels;
- Nursing/retirement homes;
- Rental residences;

- Hospitals;
- Campgrounds; and,
- Noise sensitive buildings such as schools and places of worship.

1.3.1 Receptor Classification

MECP publication NPC-300 "*Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning"* includes definitions for the classes of acoustical environments. Due to the proximity of the Highway 17 right-of-way to the residential dwellings located within the study area, receptors within the study area are considered Class 2 areas.

1.3.2 Receptors

Thirteen (13) receptors (R1-R13) are identified within the study area. All 13 receptors are reportedly permanent residences and are shown on Drawing A2 of Appendix A with additional details provided in Table 1.

Table 1: Receptors

Receptor	Description	Location	Distance from Fill Area (m)	Northing	Easting
R1	Residential	Beech Drive	1,021	5116178	353690
R2	Residential	Lake Drive	1,018	5116142	353714
R3	Residential	Lake Drive	1,038	5116096	353717
R4	Residential	Lake Drive	1,060	5116069	353709
R5	Residential	Kennedy Road	995	5115837	355277
R6	Residential	Kennedy Road	967	5115881	355284
R7	Residential	Kennedy Road	936	5115914	355275
R8	Residential	Kennedy Road	925	5115956	355298
R9	Residential	Kennedy Road	929	5115985	355555
R10	Residential	Kennedy Road	953	5115996	355369
R11	Residential	Kennedy Road	948	5116029	355386
R12	Residential	Kennedy Road	996	5116041	355464
R13	Residential	Highway 17 (northeast of Site)	1,086	5116837	355689

1.4 Buffers

Permanent perimeter berms are not present at the Site and not anticipated to be required with the expansion as a result of visual and acoustical barrier effects afforded by the remote location and treed buffer at the edge of the 50m fire break area. The surrounding area at the Site is predominantly forested lands to the north, east and south (with the exception of the Highway 17 right-of-way).

2.0 NOISE IMPACT ASSESSMENT

2.1 Purpose

The purpose of this noise impact assessment is to identify noise sources and receptors associated with the Site expansion, develop a worst-case noise emission scenario, conduct noise impact modelling and evaluate the results to determine whether or not noise mitigation measures are required.

Applicable MECP noise publications and guidelines, existing Site conditions including service area, operating hours and equipment as well as both on-site and off-site roads are discussed in the following subsections.

2.2 Ministry Guidelines

MECP publication "*Noise Guidelines for Landfills*" states that three (3) components of the Site operation should be considered as detailed in the following subsections.

2.2.1 Landfilling Operation

MECP states that operation of the landfill site itself, including on-site movement of waste trucks and other vehicles and construction equipment should be considered when evaluating potential noise effects. MECP also provides sound level limits at receptors expressed in terms of one-hour equivalent sound levels (L_{eq}). During the daytime (7:00am – 7:00pm) a limit of 55 dBA is applied while the nighttime (7:00am – 7:00pm) limit is 45 dBA.

2.2.2 Ancillary Facilities

MECP considers stationary noise sources as those facilities or equipment being used at the landfill site, other than construction equipment or on-site vehicles. MECP publication NPC-300 provides applicable sound level limits for stationary sources.

There are no stationary sources present at the Site.

2.2.3 Off-Site Source Vehicles

MECP states that for off-site sources such as vehicles hauling waste or cover material to the site which are predominant components of background noise, an access route should be selected that results in minimal noise impact.

Highway 17 will continue to be used as the waste haul route during construction of the proposed expansion as there are no other route possibilities. The amount of waste hauled to Site is not expected to increase due to the proposed expansion. Also, any soil from excavations during construction of the proposed expansion will be stockpiled for on-site use (e.g., cover, berms and roads). Therefore, an increase in landfill-related traffic along Highway 17 due to the proposed expansion is not anticipated.

2.2.4 Summary

Considering this description of noise components, the noise impact assessment will assess the "Landfilling Operation" scenario.

2.3 Existing Site Conditions

The Site services a population of approximately 3,650 people along with the area industrial, commercial and institutional (ICI) Sectors. In addition to residential/commercial direct hauling of waste to the Site, a curb side waste collection program is also in place, providing weekly refuse pick-up and disposal. Following waste being deposited at the Site it is shaped, compacted and covered by the Site operations contractor.

2.3.1 Operating Hours

The current operating hours for the Site are as follows:

- Summer Hours (April 1 – October 31)
  Wednesday, Thursday and Friday: 10:00am to 6:00pm
  Saturdays from 9:00am to 5:00pm

- Winter Hours (November 1 – March 31)
  Wednesday, Thursday and Friday: 9:00am to 5:00pm
  Saturdays from 9:00am to 5:00pm

Due to the Site's operating hours falling within the daytime range provided by MECP, a sound level limit of (L_{eq}) of 55 dBA at noise receptors is considered in this assessment.

2.3.2 Site Equipment

Sources of noise at the Site during daily operations are dominated by the use of heavy equipment including a rubber-tire front-end loader and sheepsfoot landfill compactor. These two (2) pieces of equipment are used to carry out day-to-day operations at the Site, including:

1. waste compaction;
2. spreading and covering of waste;
3. site grading;
4. temporary or gravel haul road construction and maintenance; and,
5. snow clearing.

2.3.3 Site Roads

All access to the Site will be via the existing gated entrance off of Highway 17. Waste haulers are required to report to the Site attendant on arrival for screening and to receive direction identifying where to deposit waste material.

The primary on-site roadway allows for access to the active fill area from the southeast corner of the existing fill area and extends across the active section, its length varying to suit landfill development as it progresses. This road provides access for the contracted waste haulers and maintenance vehicles/equipment.

2.3.4 Complaint Record

There is no historical record of noise complaints regarding the operation of the Site.

2.4 NOISE IMPACT MODELLING

Kresin Engineering Corporation (KEC) selected dBmap Noise Mapping Tool (dBmap) to complete the noise impact modelling at the Site. dBmap is used for modelling sound levels using sources of noise as well as screening from barriers and is based on International Standard (ISO) 9613 "*Part 1: Calculation of the absorption of sound by the atmosphere, 1993*" and "*Part 2: General method of calculation, 1996*".

2.5 Modelling Scenario

MECP publication NPC-300 states that a noise impact assessment on receptors must address the predictable worse case noise impacts. As stated in 2.1.1, potential noise impacts from the operation of the Site should include construction equipment and on-site movement of waste trucks and other vehicles.

The worse-case scenario modelled for this assessment includes the simultaneous operation of the rubber-tire front-end loader and sheepsfoot landfill compactor within the existing fill area. The Site currently employs only one (1) operator but it was assumed that two (2) operators are available in this scenario. The Site equipment was deployed within the existing fill area due to its higher elevation compared to surrounding areas and the increased impact this has on predicted sound levels in the model. In order to account for construction of the proposed expansion, a tracked excavator and waste haul (dump) truck were deployed along the south toe of the existing fill area (direction of receptors). To represent waste haul traffic along the on-site roads, a line source was deployed during the simultaneous operation of the equipment noted above. The dBmap source library was used for all pieces of operational and construction equipment as well as waste haul trucks included in this modelled scenario.

2.6 Model Considerations and Assumptions

Primary considerations and assumptions are presented below:

Table 2: dBmap Considerations and Assumptions	
Scenario	Current operations including expansion construction
Residential Dwellings	Two-storey buildings
Site Operators	Two (2) in order to operate site equipment simultaneously
Air Temperature	10 °C
Average Humidity	70%
Ground Absorption Coefficient	0.5
Existing Barriers	Forested lands (treelines)
Topography	Historical topographic surveys and Ministry mapping tools
Predicted Sound Levels	A-weighted

2.7 Noise Modelling Results

The modelling results are presented in Table 2 which includes receptor sound levels (in dBA) for all noise receptors within the defined study area.

Table 3: Noise Impact Modelling Results

Receptor	Location	Predicted Sound Level	Guideline Limit
R1	Beech Drive	30	55
R2	Lake Drive	31	55
R3	Lake Drive	32	55
R4	Lake Drive	32	55
R5	Kennedy Road	18	55
R6	Kennedy Road	18	55
R7	Kennedy Road	19	55
R8	Kennedy Road	20	55
R9	Kennedy Road	19	55
R10	Kennedy Road	20	55
R11	Kennedy Road	19	55
R12	Kennedy Road	20	55
R13	Highway 17 (northeast of Site)	31	55

Predicted sound levels at residential dwellings to the southwest of the Site along Beech Drive and Lake Drive ranged from 30 to 32 dBA while levels ranged from 18 to 20 along Kennedy Road to the southeast of the Site. The highest predicted sound level was noted at residential dwellings on Lake Drive to the southwest of the Site at 32 dBA. The results in Table 2 do not take into account that R1-R12 are all located to the south of Highway 17 as well as a railway line and, as a result, are periodically exposed to greater sound levels under the current condition.

The results in Table 2 indicate that the predicted sound levels at all of the noise receptors are below the sound level daytime limit of 55 dBA and therefore, noise mitigation measures are not required to achieve compliance.

A noise mapping results report from dBmap is provided in Appendix B.

2.8 NOISE ASSESSMENT CONCLUSION

Sources of noise at the Site during daily operations are dominated by the use of heavy equipment including a rubber-tire front-end loader and sheepsfoot landfill compactor as well as waste haul traffic along the lone access road. Thirteen (13) noise receptors were identified within the study area. The assessment of potential noise impacts on these receptors was completed using the dBmap Noise Mapping Tool where one-hour equivalent sound levels were compared against applicable MECP limits. Conservative considerations and assumptions were incorporated into the model including the simultaneous use of operational equipment and construction of expansion works. The results indicate that for the worst-case modelling scenario, predicted sounds levels at the noise receptors are below the

daytime limit of 55 dBA. Therefore, no additional mitigation measures are required for the construction of the Site expansion.

Given the remote location of the Site, and considering the historical record of no noise complaints at the Site, no mitigation measures are anticipated for the future operation of the expanded Site due to the treed buffer remaining in place. Equipment noise will continue to be of minimal concern owing to the anticipated minimal handling required at the Site as well as regular inspection of equipment muffling devices. It is expected that noise from operations that does occur will be shielded by the surrounding forested areas. Should noise emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts shall be initiated (if required).

3.0 ODOUR AND DUST MANAGEMENT PLAN

An odour and dust management plan was developed considering the following MECP publications:

1. "Best management practices for industrial sources of odour" is a technical bulletin that provides information on best management practices at facilities that are identified as having potentially odorous activities and processes.

2. "Technical Bulletin: management approaches for industrial fugitive dust sources" provides an overview of best management practices for industrial sources of fugitive dust emissions.

3.1 Climate Data

Atmospheric information such as the most frequent wind direction is not available on the Environment Canada website for Blind River. The nearest location where this information is available is at the Sault Ste. Marie Airport Station which is approximately 160km to the northwest of the Site. Therefore, an alternate online source (Windy App) was used to obtain historical wind information at the Blind River Marina.

Figure 1 presents a ten-year wind rose at the Blind River Marina for the period between 2012 and 2021 and Figure 2 presents the wind class frequency distribution. The dominant wind directions, as shown on Figure 1, are from the northwest, west and southwest.

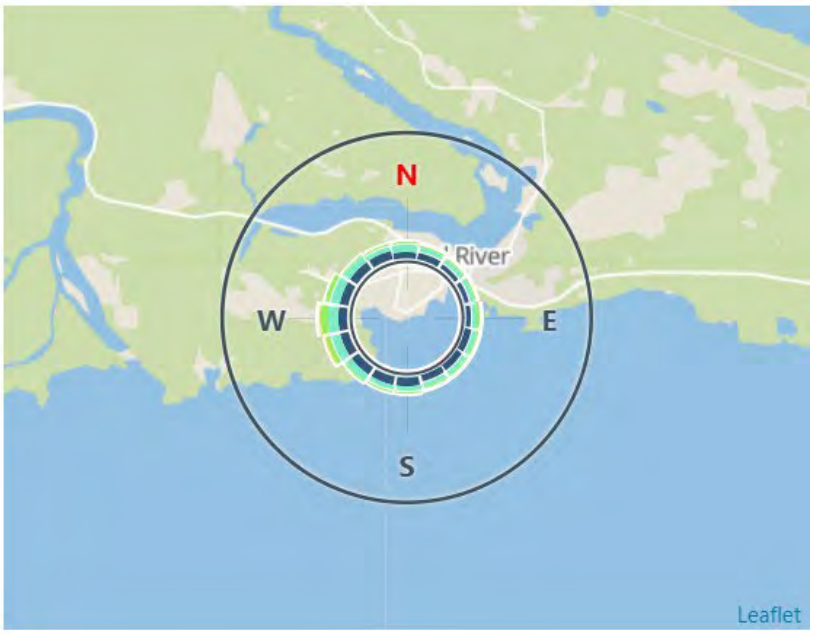

Figure 1: Blind River Marina Wind Rose (Source: Windy App)

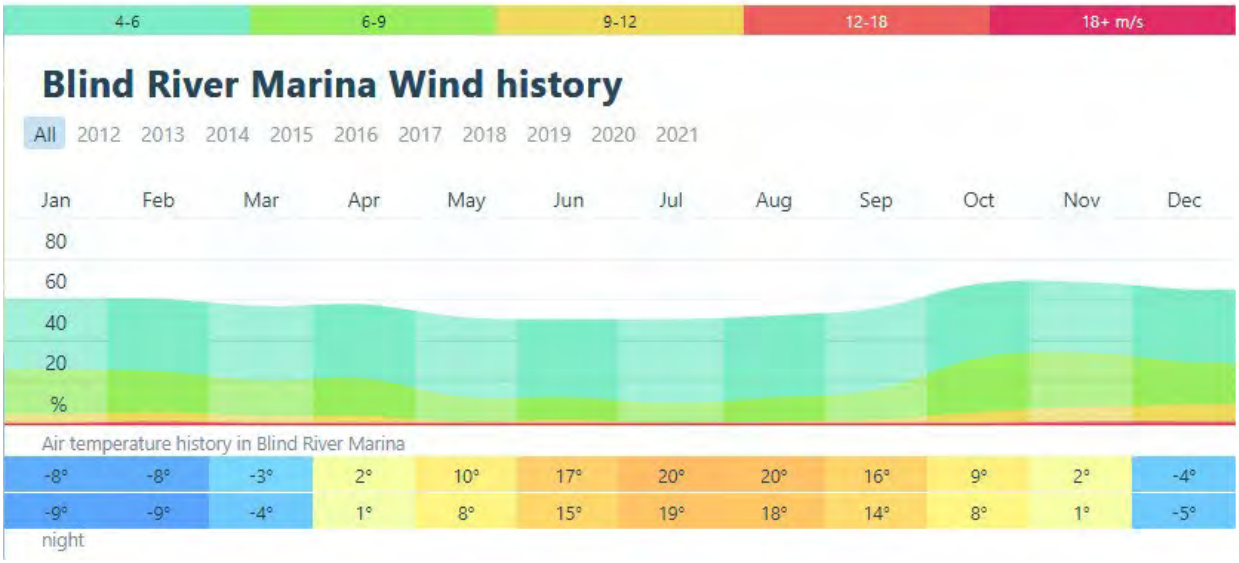

Figure 2: Blind River Marina Wind History (Source: Windy App)

3.2 Complaint Record

There is no historical record of complaints regarding odour or dust associated with the Site.

3.3 Odour Management

Landfill gas can have a distinctive odour which is generally regarded as unpleasant and it can, in some instances, cause a nuisance in the vicinity of the Site. Depending on weather conditions, these may create an odour problem if the landfill is releasing gas in sufficient quantities.

Potential sources and receptors of odour associated with the Site expansion as well as best management practices are discussed below.

3.3.1 Sources

Odour associated with the Site expansion may originate from the following sources:

1. waste (at the drop-off bins and working face);
2. landfill gas; and,
3. landfill leachate.

3.3.2 Receptors

Potential receptors of odour associated with the Site expansion are those listed in Table 1. Based on the prevailing wind directions shown on Figure 1, receptors 5-13 are located downwind of the Site.

3.3.3 Best Management Practices

Following a review of the Ministry document "Best management practices for industrial sources of odour" as well as existing Site conditions, best management practices to be incorporated into the Site expansion for potential odour sources are discussed below.

Waste

If waste with particularly strong odour is noted it will be placed to facilitate its immediate cover to minimize potential odour emissions the size of the working area should be kept to a minimum; waste should be covered following daily operations and the existing fill area should be capped with final cover as soon as it is closed.

The amount of time waste remains in the public drop-off bins at the expanded Site will be kept to a minimum and brought to the working face on a frequent basis. The drop-off bins should also be cleaned on occasion.

Landfill Gas

The site passively ventilates landfill gases through the waste mass and cover material, which is common to landfills of this size and nature (i.e. natural attenuating site). Should odour generation become a concern at the Site, methane gas monitoring may be carried out periodically at locations in the fill area buffer zone and/or monitoring wells to assess if mitigation is warranted.

Landfill Leachate

Surface water run-off may come into contact with waste material and become leachate impacted. Efforts will be made at all times during Site operation to avoid this from happening, through the application of cover material and construction of small berms, as required, to direct surface water flow away from and around active disposal operations.

Surface water flow will be directed into a perimeter swale system located around the toe of the above grade fill slope to the north and south. Water that does not infiltrate from within the swales will drain to an infiltration basin to be situated along the west limit of the proposed expansion fill area. The

infiltration basin is designed to promote retention and infiltration and is also constructed with a high-level spillway. In the event that surface water overflows from the infiltration basin, a ditch south of the spillway will direct overflow towards the adjacent low area to the southwest where it will infiltrate to the groundwater system.

Operations and maintenance requirements for the swales, ditches and infiltration basin are expected to be minor. Over time, sediment may clog soil pores at the base of the basin thereby reducing the effective infiltration rate, should it be noted that water elevation overtops the spillway, it will be necessary to scarify the base of the basin. Scarifying the base of the basin will help avoid stagnant water from sitting for lengthy periods of time potentially becoming an odour source.

3.3.4 Odour Management Conclusion

Given the remote location of the Site, and considering the historical record of no odour complaints at the Site, current mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded Site. The need for landfill gas mitigation is not anticipated at Location 1 owing to the expected volume of waste to be received, its sub-soil characteristics (course-grained sand and gravel), its relative size and there being no on-site buildings with basements. Odours from waste material will be addressed through the application of cover material and directing surface water flow to surface water management works surrounding the expanded fill area. It is expected that odour associated with the site will be shielded by the treed buffer and surrounding forested areas. Should odour emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

3.4 Dust Management

Dust is an inherent part of landfilling operations, particularly during long dry spells. Dust transmission from a landfill is considered a nuisance to adjacent properties.

Potential sources and receptors of dust associated with the Site expansion as well as best management practices are discussed below.

3.4.1 Sources

Dust associated with the Site expansion may originate from the following sources:

1. Vehicles using on-site access roads and equipment movement around the landfill working area;
2. Wind erosion from cover material storage piles; and,
3. Material handing (i.e., excavation, cover).

3.4.2 Receptors

Potential receptors of dust associated with the Site expansion are those listed in Table 1. Based on the prevailing wind directions shown on Figure 1, receptors 5-13 are located downwind of the Site.

3.4.3 Best Management Practices

Following a review of the Ministry document “Technical Bulletin: management approaches for industrial fugitive dust sources”, as well as existing Site conditions, best management practices to be incorporated into the Site expansion for potential dust sources are discussed below.

Vehicle and Equipment Movement
Existing on-site access roads are unpaved but generally have hard packed surfaces which help to minimize dust generation. Vehicles entering the Site will be restricted to a maximum speed of 30 km/h to avoid producing excess amounts of airborne dust or suspended particulate matter. Dust suppression activities such as applying water may be utilized during dry periods where elevated dust generation is probable. Chemical additives such as calcium chloride may be mixed with water if Site conditions deem it necessary, including during the construction of the waste drop-off and recyclables area access road. All efforts shall be made to minimize mud and dust track-out to Highway 17 from unpaved roads including cleaning of wheels prior to exiting the Site.

Storage Piles
Soil from trench excavations during construction of the Site expansion will be used for daily, intermediate, and final cover as well as for other on-site developments (i.e., berms and roads). Any excavated soil not utilized immediately will be stockpiled in either long-term cover stockpiles or in temporary stockpiles for use as daily cover.

Any topsoil, or soils suitable for revegetation, that is stripped from the fill and other areas will be placed in a designated topsoil stockpile area. The topsoil or overburden will be used to promote the growth of vegetation on final cover as the Site develops and at site closure.

All temporary and long-term cover and/or topsoil stock piles should adhere to the following in order to reduce wind effects at the Site:

- Minimize number of storage piles of similar material.
- Reduce wind erosion by limiting the storage pile height and slope.
- Keep height of storage piles below the level of the windbreak.
- Maintain storage piles so that the longitudinal axis is parallel with the prevailing wind.
- Located away from the prevailing downwind site boundaries.

Material Handling
Material excavated from trenches within the Site expansion area will be either loaded and transported to an appropriate storage pile or hauled off-site. Minimizing the speed of descent and drop height during loading will help reduce the potential of dust emissions. Any material that spills between the loading and unloading areas should be cleaned up prior to being disturbed by Site traffic or winds. When either loading or unloading at a temporary or long-term storage pile, this should occur on the downwind side of the pile, if feasible. In order to avoid spillage during transport, load size should be limited. Material that may spill off-site on Highway 17 should be cleaned up immediately and returned to the Site.

3.4.4 Dust Management Conclusion
Dust is not expected to be an issue at the Site owing to its remoteness and the controlled number of vehicles expected to be travelling to the working area during construction and operation of the expanded site. Considering that the haul and access routes associated with providing additional waste disposal capacity at Location 1 are established for operation of the existing landfill site, no routes will need to be constructed or capacity expanded. A minimal change in traffic volumes and vehicle type/use will result from constructing the expanded site with no notable changes expected during operation of future expanded site. Considering the historical record of no dust complaints at the Site, current

mitigation measures will remain in place with no additional measures anticipated for the future operation of the expanded Site. It is expected that any dust associated with the Site will be mitigated by the treed buffer and surrounding forested areas. Should dust emissions become excessive, or public complaints be received, a detailed review would be undertaken and remedial efforts initiated (if required).

4.0 INSPECTION DURING SITE OPERATION

Any significant operational or maintenance issues at the expanded Site, along with the corrective measures taken to mitigate the issues, will be recorded in an Inspection Log. Inspection tasks include consideration of potential issues that impact the levels of noise, odour and dust generated at the Site. The Inspection Log will be kept on file as required by the Site's ECA.

The list of inspection items below summarizes the operations and maintenance inspections proposed for the expanded Site. They include routine inspection responsibilities of the site attendant and other inspection requirements related to nuisance control issues. Inspection duties not covered by the site attendant are performed by Town staff and consultants.

The following summarizes the operations and maintenance inspections proposed for the Site:

1. site attendant's inspection duties;
2. access and on-site traffic control: inspection of fencing and lockable gates;
3. waste control: inspection and recording of incoming waste at the site attendant's shelter, drop-off bins and working face;
4. litter control: inspection of on-site areas (e.g., buffer zones, public drop-off area) and off-site roads and properties;
5. odour control: inspection of cover, cracks or fissures in the soil cover, odour at the public drop-off area and working face;
6. dust control: inspection of on-site roads, tracking of mud, vegetation on final cover, buffer zones and stockpiles;
7. erosion and sediment control: inspection of vegetation or siltation of swales, ditches, conditions of culverts, berms or infiltration basin;
8. leachate control: inspection for possible leachate seeps or uncontrolled discharges of potentially contaminated water; and,
9. noise control: inspection of landfill equipment (especially muffling devices).

5.0 COMPLAINT RESPONSE PROCEDURE

Complaints regarding operation of the expanded Site may occur from time to time and efforts will be made by the Town to resolve complaints as soon as possible after notification. The telephone number for complaints will be made available to the public and will be posted on a sign at the site entrance.

All complaints will be recorded on a standard form before being referred to the site attendant, or a person designated if the site attendant is absent, for review and response. The manner in which the complaint was resolved will also be documented on the form, which will be kept on file, along with copies of any correspondence or records of discussions with the complainant.

The form will include the following information:

1. date and time of day that the complaint was received;
2. date and time of day the incident occurred;
3. complainant's name, address, telephone number and location;
4. nature of complaint (noise, dust, odour, etc.);
5. receipt of complaint (by phone, letter, site visit, and staff who received the complaint);
6. weather conditions at the time of the complaint;
7. nature and result of any investigation or follow-up; and,
8. steps taken to address/resolve the complaint.

A summary of any complaints will be presented in the annual report.

6.0 CLOSURE

This Noise Impact Assessment & Odour and Dust Management Plan has been prepared based on the information available to KEC at the time of writing and in support of the Town's Waste Management Plan Environmental Assessment. The assessments presented do not identify any restrictions to the proposed expansion of the existing Site.

This report prepared by:
Kresin Engineering Corporation

Ryan Wilson, P. Eng.
Project Engineer

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Ontario Ministry of the Environment, Conservation and Parks. "*Information to be submitted for approval of stationary sources of sound (NPC – 233)".* Published: April 8, 2016. Updated: July 5, 2021.

Ontario Ministry of the Environment, Conservation and Parks. "*Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC – 300)".* Published: April 20, 2016. Updated: September 2, 2021.

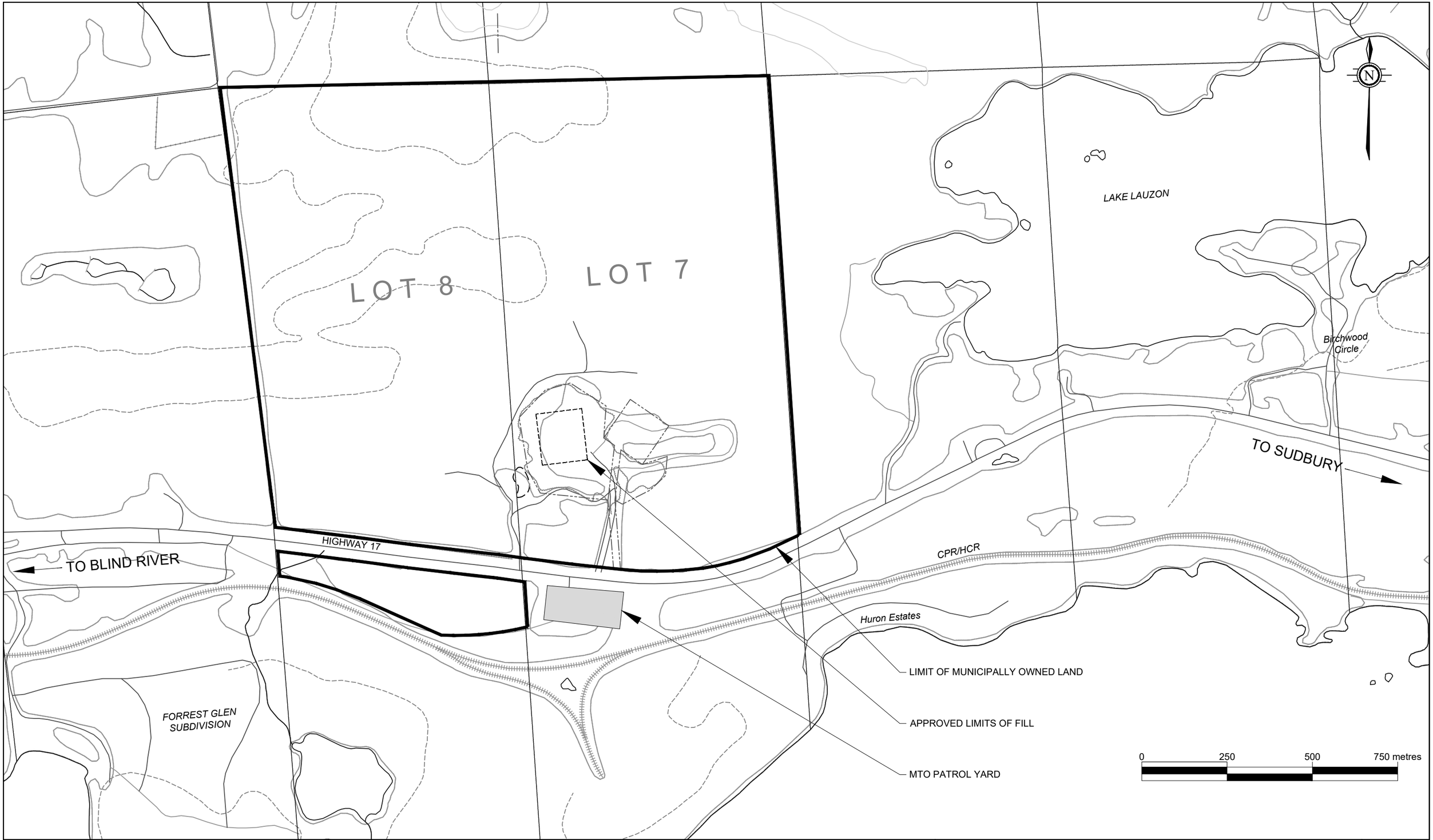
Ontario Ministry of the Environment, Conservation and Parks. "*D-4 Land Use On or Near Landfills and Dumps*". Published: March 2, 2016. Updated: July 13, 2021.

Ministry of the Environment. "*Draft Noise Guidelines for Landfills*". October 1998.

Ontario Ministry of the Environment, Conservation and Parks. "*Best management practices for industrial sources of odour".* Published: January 31, 2017. Updated: July 28, 2021.

Ontario Ministry of the Environment, Conservation and Parks. "Technical Bulletin: *management approaches for industrial fugitive dust sources".* Published: March 8, 2017. Updated: July 26, 2021.

APPENDIX A
REFERENCED DRAWINGS



KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	RW	05/22
DRAWN	RW	05/22
CHECKED		
PROJECT	0508.15	
FILENAME	0508.15 A1 A2	
SCALE	1:10,000	

TOWN OF BLIND RIVER LANDFILL EXPANSION
NOISE IMPACT ASSESSMENT

LOCATION PLAN

A1

Rev 0

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	RW	05/22
DRAWN	RW	05/22
CHECKED		
PROJECT	0508.15	
FILENAME	0508.15 receptor locations	
SCALE	1:10,000	

TOWN OF BLIND RIVER LANDFILL EXPANSION
NOISE IMPACT ASSESSMENT

NOISE RECEPTOR LOCATIONS

A2

Rev 0

APPENDIX B
dBmap.net – Noise Mapping Results Report

dBmap.net - Noise Mapping Results

Report

5/5/2022

Model Overview

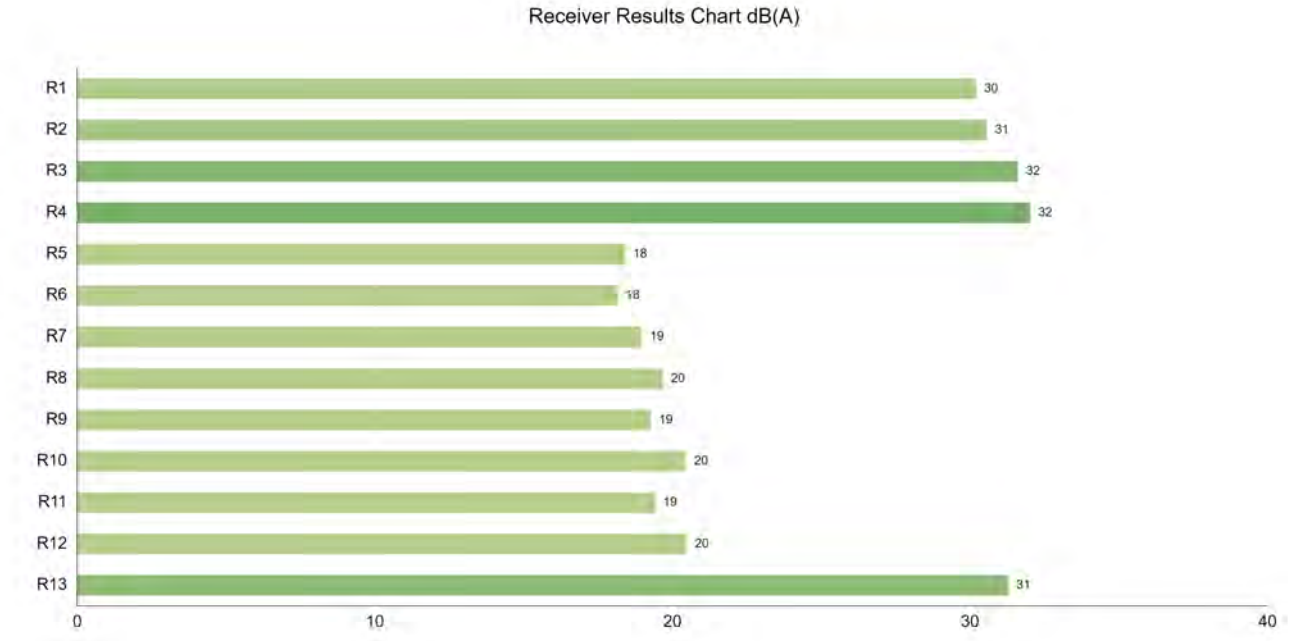
Receiver Results - Summary

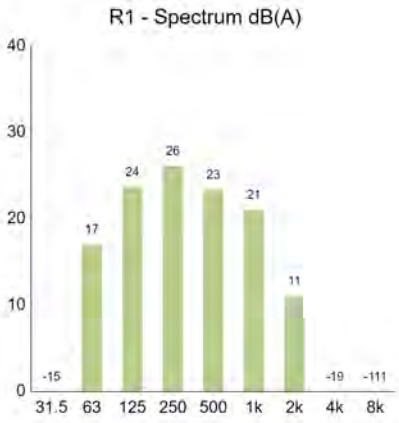
Receiver Name	Height (m)	Overall Level dB(A)	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
R1	6	30	-15	17	24	26	23	21	11	-19	-111
R2	6	31	-15	17	24	26	24	22	12	-18	-109
R3	6	32	-16	18	25	27	25	23	14	-16	-107
R4	6	32	-16	18	25	27	26	24	14	-15	-108
R5	6	18	-23	8	13	12	11	11	5	-18	-90
R6	6	18	-24	7	12	11	11	12	5	-17	-88
R7	6	19	-22	8	13	12	12	12	6	-16	-85
R8	6	20	-21	9	14	13	12	12	6	-15	-84
R9	6	19	-22	8	13	13	12	12	6	-16	-85
R10	6	20	-20	10	15	15	13	12	6	-17	-89
R11	6	19	-21	9	14	13	12	12	6	-17	-89
R12	6	20	-20	10	15	15	13	11	5	-19	-97
R13	5	31	-16	18	25	26	25	23	13	-17	-113

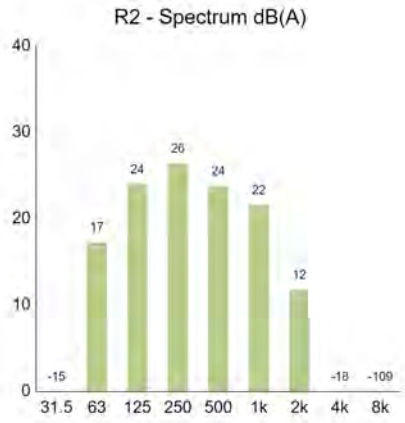
Sources

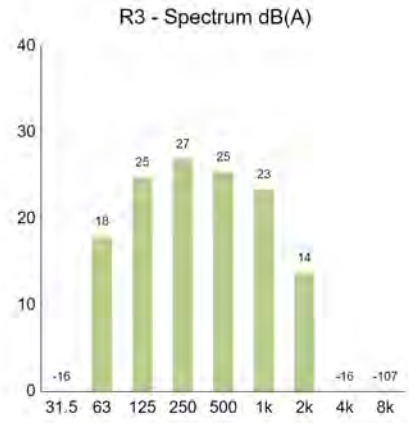
Source Name	Height (m)	Overall Level dB	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
DMPTRK	4	120.7		116	118	108	107	104	99	93	89
EXTR	4	112.1		104	107	103	103	104	101	98	93
HT	0	106.3		85.8	93.9	97.4	99.8	100	99.2	97	90.9
LDR	4	111.3	89.2	91.7	105.5	109.5	94	92.4	92.6	88.2	87.2
SHPFT	4	109.6	93.5	92.1	109	96	93.2	91	83.1	77.3	70.6

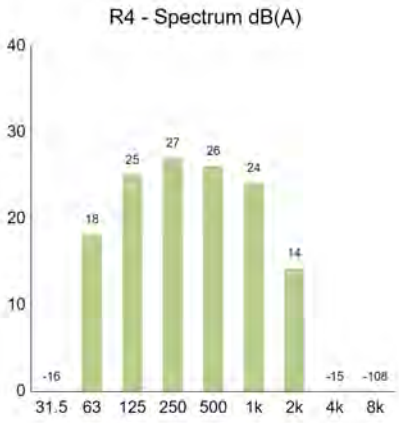
Receiver Charts

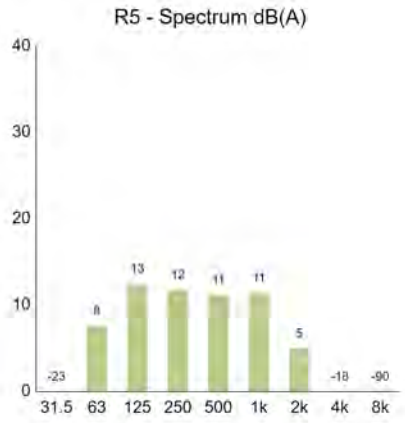


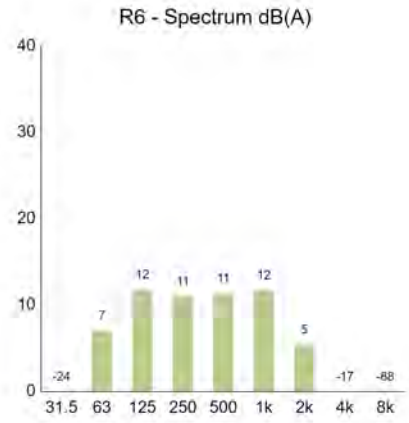


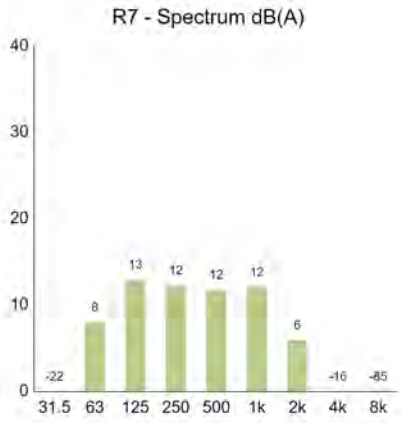


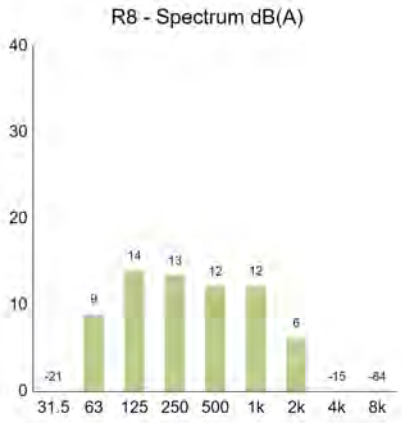


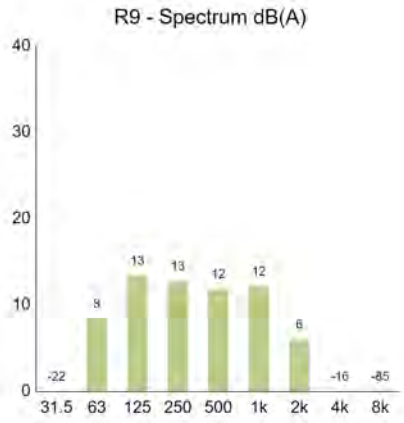







R7 - Spectrum dB(A)
40
30
20
10
0
-22
8
13
12
12
12
6
-16
-85
31.5 63 125 250 500 1k 2k 4k 8k


R8 - Spectrum dB(A)
40
30
20
10
0
-21
9
14
13
12
12
6
-15
-84
31.5 63 125 250 500 1k 2k 4k 8k


R9 - Spectrum dB(A)
40
30
20
10
0
-22
8
13
13
12
12
6
-16
-85
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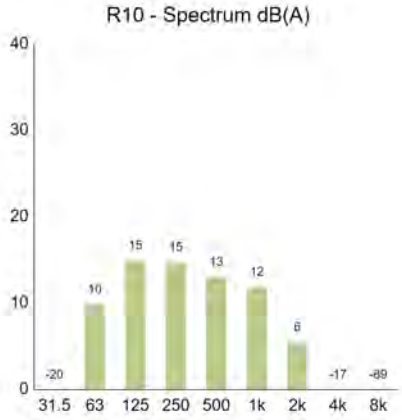
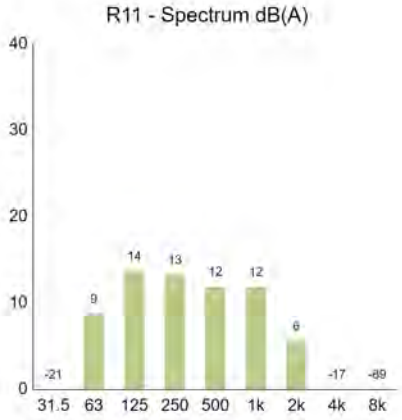

R10 - Spectrum dB(A)
40
30
20
10
0
-20
10
15
15
13
12
6
-17
-89
31.5 63 125 250 500 1k 2k 4k 8k


R11 - Spectrum dB(A)
40
30
20
10
0
-21
9
14
13
12
12
6
-17
-89
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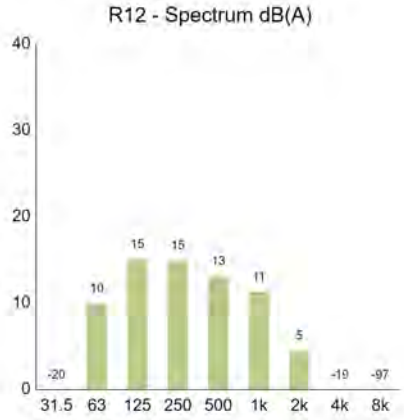
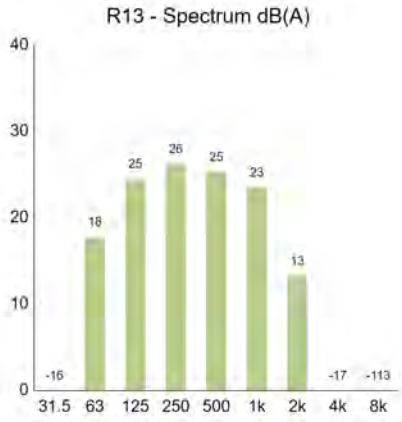

R12 - Spectrum dB(A)
40
30
20
10
0
-20
10
15
15
13
11
5
-19
-97
31.5 63 125 250 500 1k 2k 4k 8k


R13 - Spectrum dB(A)
40
30
20
10
0
-16
18
25
26
25
23
13
-17
-113
31.5 63 125 250 500 1k 2k 4k 8k

Configuration

Heights for all calculation results are relative to ground level
0.5G Ground Factor
10°C Temperature
70% Humidity
Results are A-weighted
Results are rounded to 0 decimal places
Second order reflections are included
Reflections are only considered at a distance of 1m or greater from a reflector (facade level)
ISO9613-2 barrier attenuation limit (20/25dB) is enabled
Vertical edges (lateral paths) are included using convex paths only (following ISO17534-3 recommendation 5.2)
Ground reflections are not screened (as recommended in ISO17534-3 5.3)

References

ISO 9613-1:1993 — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere
ISO 9613-2:1996 — Attenuation of sound during propagation outdoors — Part 2: General method of calculation
ISO/TR 17534-3:2015 — Acoustics — Software for the calculation of sound outdoors — Part 3: Recommendations for quality assured implementation of ISO 9613-2 in software according to ISO 17534-1. Quality Assurance and Test Cases: https://dbmap.net/iso17534results


30 dB(A)
35 dB(A)
40 dB(A)
45 dB(A)
50 dB(A)
55 dB(A)
60 dB(A)
65 dB(A)
70 dB(A)
75 dB(A)
80+ dB(A)
0m
500m

APPENDIX G:

ENVIRONMENTAL IMPACT STUDY

Blind River Landfill Expansion Environmental Impact Study

FOR

Kresin Engineering Corp.
Blind River Landfill

SUBMITTED TO:

Ryan Wilson, P. Eng.
Project Engineer

ryan@kresinengineering.ca

AUGUST 2023

Ref #: BH-22-PJ-2132

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ACRONYM LIST

Abbreviation	Meaning
cm	Centimetres
m	Metres
EIS	Environmental Impact Study
MMAH	Ministry of Municipal Affairs and Housing
SAR	Species at Risk
SWH	Significant Wildlife Habitat
ESA	*Endangered Species Act*
SARA	*Species at Risk Act*
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
PPS	Provincial Policy Statement
FA	*Fisheries Act*
FWCA	*Fish and Wildlife Conservation Act*
MBCA	*Migratory Birds Conservation Act*
NHIC	Natural Heritage Information Centre

1.0 INTRODUCTION

1.1 Project Overview

Blue Heron Solutions for Environmental Management (Blue Heron) was retained by Kresin Engineering Corporation (Kresin) to complete an Environmental Impact Study (EIS) to identify potential ecological sensitivities and recommend mitigation in support of the expansion of the Blind River Landfill (the Project) located at the south half of Lot 7, Concession 1 of Striker Township in the District of Algoma (the Site). Since the Site is under the jurisdiction of the Blind River Official Plan (Blind River 2015), it is subject to the natural heritage policies of the Provincial Policy Statement. The objective of the EIS is to identify significant natural heritage features/areas that may be present and to provide Kresin with options for mitigating potential Project-related impacts to these features and/or areas.

1.2 Scope of Work

The scope of work included in the EIS consisted of:

- Species at Risk (SAR) and natural heritage features desktop records review;
- Submission of information requests to the Ministry of Environment, Conservation and Parks (MECP) and Ministry of Natural Resources and Forestry (MNRF); and
- Photographic review of the Site to examine signs of SAR or suitable SAR habitat with particular attention to habitat for the Eastern Meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorus*), and Blanding's Turtle (*Emydoidea blandingii*).

1.3 Study Area Description

The Study Area is located in the Georgian Bay Ecoregion (Ecoregion 5E) and the Site is defined as the south half of Lot 7, Concession 1 of Striker Township in the District of Algoma (Appendix A, Figure 1). For the purpose of the Blind River Landfill EIS, the Study Area is defined as the Site plus the 120 metres (m) of adjacent lands to account for wildlife movement (Appendix A, Figure 1).

2.0 ENVIRONMENTAL POLICY CONTEXT

In Ontario, ecological requirements for developments are derived from several pieces of legislation, including:

- *The Planning Act;*
- *The Endangered Species Act*; and
- *The Fish and Wildlife Conservation Act.*

Federal legislation that may also apply includes:

- The *Species at Risk Act;* and
- The *Migratory Bird Convention Act, and*
- *The Fisheries Act*.

A brief summary of the legislative requirements for each of these Acts is provided in Section 2.1 to Section 2.6 below.

2.1 The Planning Act, 1990

The *Planning Act* (Government of Ontario 1990) is the provincial legislation that regulates land use planning in Ontario. It provides the basis for the development of Official Plans for municipalities and planning policies that guide future development.

2.1.1 Provincial Policy Statement

The Provincial Policy Statement (PPS; Ministry of Municipal Affairs and Housing [MMAH] 2020) is a consolidated statement of the government's policies on land use planning. It gives provincial policy direction on key land use planning issues that affect communities, including the protection of the environment and resources including farmland, natural resources (e.g., wetlands and woodlands) and water. Natural heritage policies are addressed in Section 2.1 of the PPS and are summarized below:

- Development and Site alteration is prohibited in:
  - Fish habitat (except in accordance with provincial and federal requirements);
  - Habitat of endangered species and threatened species, and
  - Significant wetlands in Ecoregions 5E, 6E and 7E.
- Development and Site alternation shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features/areas or their functions of, and the adjacent lands that surround:
  - Significant wildlife habitat (SWH);
  - Significant woodlands in Ecoregions 5E, 6E, and 7E;
  - Significant valleylands in Ecoregions 5E, 6E, and 7E;
  - Significant areas of natural and scientific interest (ANSI); and
  - Significant wetlands north of Ecoregions 5E, 6E, and 7E.
- Natural features and areas shall be protected for the long term.
- Development and Site alteration shall not be permitted on adjacent lands to the natural heritage features unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

2.1.2 Official Plan

Official plans are developed in accordance with the *Planning Act* (Government of Ontario 1990), and must consider all aspects of the PPS in their development. Specifically, Section 4.17.2 of the Town of Blind River Official Plan (Official Plan; Blind River 2015), states that an EIS is required for any proposed development within:

- 120 m of significant habitat of endangered and threatened species;
- 120 m of SWH;
- 120 m of fish habitat;
- 120 m of life science ANSI; and

- 120 m significant wetlands.

According to Section 4.17 of the Official Plan, the EIS will identify the presence of significant natural heritage features in the Study Area and assess potential project-related impacts to the functioning of these features. Development and Site alterations are not permitted unless the EIS demonstrates that there will be no negative impacts on the natural features or their ecological functions.

2.2 Endangered Species Act, 2007

The Study Area is located on private lands and as such, is subject to the provincial *Endangered Species Act* (ESA; Government of Ontario 2007). The legislation prohibits the killing or harming of species designated as threatened, endangered, or extirpated under the ESA and provides immediate general habitat protection until regulations identifying species-specific habitat are developed. There are exceptions for newly listed species, whereby the existing prohibitions for endangered and threatened species may be suspended by means of an order by the minister. General habitat is defined as the areas on which a species depends, directly or indirectly, to carry out its life processes necessary to survive and reproduce (e.g., nesting, denning, courtship, mating, egg incubation, gestation, birthing and rearing young, pollination, and germination). Where a species defined habitat is available, the habitat will be classified into three categories based on their level of tolerance to alterations.

- Category 1 has the lowest tolerance to alteration and is considered to be highly sensitive habitat for the species;
- Category 2 has a moderate tolerance to alterations; and
- Category 3 has the highest tolerance to alterations.

2.3 *Fish and Wildlife Conservation Act, 1997*

Ontario's *Fish and Wildlife Conservation Act* (FWCA; Government of Ontario 1997) provides protection and management requirements applicable to wild fish and animals in the province. Under the provisions of the FWCA, it is prohibited to destroy, take, or possess the nest or eggs of a bird that belongs to most species that are wild by nature. The FWCA also prohibits the damage or destruction of dens or habitual dwellings of furbearing mammals, other than foxes or skunks without a valid license.

2.4 Species at Risk Act, 2002

On private or provincially owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under the Federal *Species at Risk Act* (SARA; Government of Canada 2002), unless ordered by the Governor in Council.

2.5 *Migratory Birds Convention Act*, 1994

The purpose of the *Migratory Birds Convention Act* (MBCA; Government of Canada 1994) is to protect migratory bird populations by regulating potentially harmful human activities to migratory birds and their nests. Under the provisions of the MBCA, taking, destroying, or possessing individuals, nests or eggs of many migratory birds is prohibited.

2.6 Fisheries Act, 1985

The *Fisheries Act* (FA; Government of Canada 1985) provides for the management and control of fisheries, the conservation and protection of fish, the protection of fish habitat and pollution prevention. The FA prohibits the deposition of harmful substances into waters frequented by fish. It also prohibits any work, undertaking or activity that results in the harmful alteration, disruption, or destruction of fish habitat.

3.0 METHODS

In accordance with the PPS, the purpose of the EIS is to determine the presence of significant natural heritage features and areas, including fish habitat, species at risk (SAR), and the habitat that supports SAR. In addition to identifying the presence of these features and areas, the EIS provides an assessment of potential project-related interactions with these features and provides recommendations to mitigate potential impacts. To this end, a desktop records review was completed to search for records of known element occurrences and to determine what sensitive species and/or features may be present in the Study Area. A desktop habitat assessment was then completed for the Study Area to confirm the presence of suitable habitat for supporting sensitive features/areas identified through the desktop records review. If suitable habitat was identified, an assessment of significance was made using the significance threshold criteria provided in the *Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E* (herein referred to as the Criteria Schedule; MNRF 2015).

Project activities were considered when assessing the potential project-related interactions with the significant natural features and areas thought to be in the Study Area. Guidance documents such as the *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement*, 2005 (Ministry of Natural Resources [MNR] 2010), *the Significant Wildlife Habitat Technical Guide* (MNR 2000), the Criteria Schedule (MNRF 2015) and, the *Significant Wildlife Habitat Mitigation Support Tool* (MNRF 2014) were used to provide appropriate mitigation recommendations to minimize impacts to the local ecology from the project.

3.1 Desktop Records Review

A thorough review of background information was performed for the Study Area to identify the potential for SAR, SAR habitat, and other significant natural heritage features (e.g., Provincially Significant Wetlands [PSWs], Significant Areas of Natural and Scientific Interest [ANSIs], Parks and Protected Areas, and Significant Wildlife Habitat (SWH [Appendix B, Table B.1]). Information sources include reviewed during the desktop screening exercise include, but are not limited to:

- Natural Heritage Information Centre (NHIC);
- Land Information Ontario (LIO);
- Make-a-Map Natural Heritage webpage application (MNRF 2023a);
- Ontario Breeding Bird Atlas data square occurrences (Bird Studies Canada 2023);
- iNaturalist Webpage Application (iNaturalist 2023);
- Fish On-Line Webpage Application (MNRF 2023b);
- Ontario Butterfly Atlas (Macnaughton 2019);
- eBird Webpage Application (eBird 2023);

- Bird Conservation Strategy for Bird Conservation Region 12 in Ontario and Manitoba: Boreal Hardwood Transition (Environment Canada 2014).
- Bat Conservation International (BCI) range maps (Bat Conservation International 2023);
- Species at Risk in Ontario (SARO) range maps (MECP 2023);
- Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (MNRF 2015);
- Northshore Forest 2020-2030 Forest Management Plan (NorthshoreForest Inc 2019);
- Town of Blind River Official Plan (Blind River 2015);
- Species at Risk Public Registry range maps (Environment and Climate Change Canada 2023);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) range maps (COSEWIC 2023);
- Fisheries and Oceans Canada SAR maps (Fisheries and Oceans Canada 2023);
- *Endangered Species Act* (Government of Ontario 2007);
- *Species at Risk Act* (Government of Canada 2002)*;*
- District Ministry of Natural Resources and Forestry;
- Google Earth aerial photos and other GIS applications; and
- Literature and/or studies on or adjacent to the Study Area.

The results from the desktop records review were submitted to both the Ministry of Environment, Conservation and Parks (MECP) Species at Risk Branch, and the Ministry of Natural Resources (MNRF) local district biologist to identify additional known occurrences of natural heritage constraints on the 13th of December 2022 (Appendix C). At the time of authoring this report, a response from the MNRF has not been received but we have been in communication with the MECP.

In addition to the desktop records review, Kresin has conducted a minimum of two site visits per year for the past 15+ years. Photographs of the site visits were provided to Blue Heron to review for sign of SAR that are likely to inhabit the areas or for signs of suitable wildlife habitat (Appendix C).

3.1.1 Species at Risk Screening

Identification of SAR (i.e., species listed in the ESA and Schedule 1 of the SARA) with ranges that overlap the Study Area was completed as a desktop exercise, using the sources listed in Section 3.1. The first step in the SAR screening was to compare the habitat requirements for SAR with ranges overlapping the Study Area with the available habitat in the Study Area, based on available aerial imagery. The potential for the species to occur was determined through a probability of occurrence, based on the following definitions:

Low: There is no suitable habitat available in the Study Area and no occurrence of the species has been recorded in the Study Area

Moderate: Habitat is likely present in the Study Area, but no occurrence of the species has been documented in the Study Area

High: There is a known species record in or adjacent to the Study Area that was identified through the background data review and suitable habitat is likely present.

3.1.2 Significant Wildlife Habitat Screening and Determination of Significance

Ecosite types listed in the Criteria Schedule (MNRF 2015) as being associated with SWH features were compared with the existing habitat in the Study Area to determine the potential for them to be present within it. The assessment of potential was based on the following definitions:

Low: The ecosite types listed in the Criteria Schedule are not present in the Study Area and there are no confirmed records the SWH in the Study Area

Moderate: The ecosite types listed in the Criteria Schedule are present in the Study Area, but there are no confirmed records of the SWH in the Study Area

High: There are confirmed records of the SWH within the Study Area

While a natural heritage feature or area may be present in the Study Area, only the ones that are deemed significant are subject to the PPS provisions, unless otherwise stated in the Official Plan. The determination of significance was completed by comparing the feature or area observed with the criteria for significance provided in the *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement* (MNR 2010), the *Significant Wildlife Habitat Technical Guide* (MNR 2000), and the Criteria Schedule (MNRF 2015). Where insufficient data were available to determine significance, the habitat was identified as "candidate habitat" for that particular significant wildlife habitat features.

3.2 Impact Assessment

For each of the significant natural features either confirmed or likely to occur in the Study Area, an assessment of the Project activities on that feature was completed. Where Project-related interactions with the features were thought to occur, mitigation recommendations were provided to minimize negative interactions.

4.0 RESULTS

4.1 Desktop Records Review

4.1.1 SAR Screening

There is moderate and high potential for 18 SAR to inhabit the Study Area, based on range information and habitat availability. Of these, 11 are protected SAR (i.e., provincially designated as threatened or endangered under the ESA). Table 1 provides a summary of these species. A complete SAR screening is provided in Appendix I (Table I.2).

Table 1 – Summary of Protected Species at Risk with Moderate Potential to Occur in the Study Area[1)]

Common Name	Scientific Name	ESA[2)] Designation
Birds		
Bank Swallow	*Riparia riparia*	Threatened
Bobolink	*Dolichonyx oryzivorus*	Threatened

Common Name	Scientific Name	ESA[2] Designation
Cerulean Warbler	*Setophaga cerulea*	Threatened
Eastern Meadowlark	*Sturnella magna*	Threatened
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Endangered
Mammals		
Eastern Small-footed Myotis	*Myotis leibii*	Endangered
Little Brown Myotis	*Myotis lucifugus*	Endangered
Northern Long-eared Myotis	*Myotis septentrionalis*	Endangered
Tri-coloured Bat	*Perimyotis subflavus*	Endangered
Reptiles		
Blanding's Turtle	*Emydoidea blandingii*	Threatened

1) Species in the summarized list are limited to those with moderate or high potential to occur in the Study Area based on a desktop screening and the May and September 2022 site visit.
2) *Endangered Species Act* (Government of Ontario 2007).

Based on the photographs taken during the site visits by Kresin, suitable habitat may be present for Blanding's Turtles and grassland birds including Bobolink (Appendix C). No SAR individuals were observed during the site visit.

4.1.2 Natural Heritage Features Screening and Determination of Significance

Significant wildlife habitat (SWH) is one of the more complicated natural heritage features to identify and evaluate. The MNRF designates "significant" or critical habitat that is necessary for the maintenance, survival, and/or recovery of naturally occurring or reintroduced populations of endangered and threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of their life cycles (MNRF 2015). Significant wildlife habitat should be evaluated in the context of the entire planning authority's jurisdiction, and only the best examples are considered significant.

There are six categories of SWH:

- Seasonal concentration areas of animals;
- Rare vegetation communities;
- Specialized habitat for wildlife;
- Habitat for species of special concern;
- Animal movement corridors, and
- Exceptions for EcoRegion 5E.

Under each of these broad categories exist several subcategories of SWH. Table 2 provides a summary of the types of SWH that were assessed as having moderate or high potential to be present in the Study Area. Detailed descriptions of these SWH types, including the rationale for assessing them as potentially present are provided in the sections below. The full assessment of SWH presence is provided in Appendix B (Table B.1).

Table 2 – Significant Wildlife Habitat Assessment Summary for the Study Area[1)2)]

Significant Wildlife Habitat Category	Significant Wildlife Habitat Name
Seasonal Concentration Areas	Raptor Wintering Areas
	Bat Maternity Colonies
	Reptile Hibernacula
	Deer Yarding Areas
Specialized Habitat	Woodland Raptor Nesting Habitat
	Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf
	Amphibian Breeding Habitat (Woodland)
Habitat for Species of Conservation Concern	Special Concern and Rare Wildlife
Animal Movement Corridors	Amphibian Movement Corridors
	Cervid Movement Corridors
	Furbearer Movement Corridors

[1)] SWH is limited to those with moderate or high potential to occur in the Study Area.
[2)] Assessment is based on desktop information, site visits completed by Kresin, and photographic review.

4.1.3 Seasonal Concentration Areas

Of the 11 possible types of seasonal concentration areas listed in the Criteria Schedule (MNRF 2015), five have potential to occur in the Study Area. Of the five, one type of significant Seasonal Concentration Areas was confirmed present in the Study Area (Turtle Wintering Areas), while candidate habitat was present for the remaining four (Raptor Wintering Areas, Bat Maternity Colonies, Reptile Hibernacula, and Deer Yarding Areas).

Raptor Wintering Areas provide a combination of fields and woodlands that provide roosting, foraging and resting habitat for wintering raptors. Ecosites B055, B058, and B059 were identified in the Study Area (historic FRI data), which is associated with Raptor Wintering Area habitat.

Bat Maternity Colonies occur in treed areas (i.e., cavities of trees), vegetation and often buildings. Ecosite B055, B058, and B059 were identified during the desktop records review, suggesting that bat maternity colonies may occur in the Study Area.

Turtle Wintering Areas often include permanent waterbodies with water that is deep enough not to freeze and have soft mud substrates suitable for overwintering. Records indicate the presence of Snapping Turtles (*Chelydra serpentina*) and Midland Painted Turtles (*Chysemys picta*) within the Study Area (Make A Map 2022). Blanding's Turtle (*Emydoidea blandingii*) has been reported in the Study Area based on client communication with the MECP (Appendix D).

Reptile Hibernacula typically occurs in sites located below frost lines in burrows, rock crevices, and other natural locations. Rock piles or slopes, old stone fences, and abandoned crumbling foundations may also provide SWH (MNRF 2015). Ecosites B058 and B059 are present in the Study Area based on historic FRI data, which are associated with Reptile Hibernacula.

Deer yarding areas are places where deer congregate in yards to survive severe winter conditions normally encountered. Sites typically have a long history of annual use by deer. Ecosite B129 is historically present in the Study Area and could provide suitable habitat for Deer Yarding Areas.

4.1.4 Specialized Habitat

Eleven types of specialized habitat were identified in the desktop records review as having potential to occur in the Study Area. Of the 11, four types of significant Specialized Habitat appeared to have candidate habitat present in the Study Area:

- Woodland Raptor Nesting Habitat;
- Amphibian Breeding Habitat (woodlands), and
- Mast Producing Areas.

Woodland Raptor Nesting Habitat is used annually by some species and are typically found in all woodland/forest stands. Mixed forest is present in the Study Area, which suggests owls and other woodland raptors may nest in this area. The Ontario Breeding Bird Atlas (OBBA; 2021) and eBird (2022) have reports of Great Horned Owls (*Bobo viriginanus*), Merlins (*Falco columbarius*), and Red-tailed Hawks (*Buteo jamaicensis*) being present in the Blind River area.

Amphibian Breeding Habitat (woodlands) are important for local populations of amphibians to reproduce. These areas include wetlands, lakes, or ponds adjacent (within 120 m) to a woodland. Typically, textured moist ecosites are associated with this type of habitat. Ecosite B129 is historically present in the Study Area and could provide suitable habitat for breeding amphibians.

Mast Producing Areas provide important food sources for wildlife, especially Black Bears (*Ursus americanus*) and Ruffed Grouse (*Bonasa umbellus*). All treed ecosites can produce mast, and species associated with mast such as Raspberry (*Rubus idaeus*) and Strawberry (*Fragaria virginiana*) are likely present in the Study Area since the Site is disturbed.

4.1.5 Habitat for Species of Conservation Concern

Species of conservation concern (SOCC) include species designated as special concern under the ESA, federally designated SAR on private and provincial lands, and species with provincial conservation ranks (i.e., S Ranks) of S1, S2 or S3. Additionally, priority bird species identified in Bird Conservation Region 12 (Environment Canada 2014) are also considered SOCC. Since surveys for SOCC were not completed due to constraints on sensitive timing windows, a cautionary approach has been applied to consider all SOCC species that may occur in the area. Specific habitats associated with SOCC include Special Concern and Rare Wildlife SWH. SAR including bats and birds may occur in the Study Area based on the SAR screening (Appendix B, Table B.2).

Special Concern and Rare Wildlife Species habitat includes habitat of provincially rare or species that have experienced a population decline in Ontario. This habitat was confirmed present in the Study Area with the presence of two SAR (Bank Swallow [*Riparia riparia*] and Bobolink [*Dolichonyx oryzivorus*]).

4.1.6 Animal Movement Corridors

Animal Movement Corridors provide a critical link between habitats that are regularly used by wildlife. Amphibian Movement Corridors allow amphibians to move from their terrestrial habitat to breeding

habitat, whereas Cervid Movement Corridors allow moose and deer to move between feeding areas. Furbearer Movement Corridors include habitat related to denning sites (i.e., allows movement to and from a denning site) as well as movement between areas for hunting and breeding. Since Movement Corridors could not be confirmed significant through field surveys and there is potential for Deer Wintering Habitat, Amphibian Breeding habitat (woodland), and Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf to occur in the Study Area, a conservative approach was applied in assuming the candidate habitat is significant.

5.0 ASSESSMENT OF NATURAL HERITAGE FEATURES

5.1 Significant Wetlands

No provincially significant wetlands were identified in the Study Area during the desktop records review.

5.2 Significant Woodlands in Ecoregions 6E and 7E

The Study Area is located in Ecoregion 5E.

5.3 Significant Valleylands in Ecoregions 6E and 7E

The Study Area is located in Ecoregion 5E.

5.4 Significant Wildlife Habitat

Significant wildlife habitat was identified as having potential to occur in the Study Area. Although sufficient data to assess the threshold for significance were lacking, candidate habitat to support the following types of SWH was confirmed present.

- Seasonal Concentration Area
- Specialized Habitat
- Habitat for Species of Conservation Concern
- Animal Movement Corridor

5.5 Significant Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSIs) are designated by the province according to standardized evaluation procedures. No ANSIs were identified in the Study Area.

5.6 Coastal Wetlands in Ecoregions 5E, 6E, and 7E

The Study Area is located inland. No costal wetlands were identified in the Study Area.

5.7 Fish Habitat

Fish habitat, as defined in the *Fisheries Act*, means spawning grounds and any other areas, including nursery, rearing, food supply, and migration areas in which fish depend directly or indirectly in order to carry out their life processes. A proactive approach will be used to assess fish habitat in the Study Area, since fish community sampling and fish habitat mapping was not completed.

5.8 Habitat of Endangered and Threatened Species

Habitat suitable for supporting the 11 SAR listed in Table 1 appears to be present within the Study Area.

6.0 IMPACT ASSESSMENT AND RECOMMENDATIONS

Based on the results of the desktop records review and the photographic record review, there is potential for significant features identified in the Study Area to be impacted by the Project. The impact assessment and recommendations for mitigation are presented in Section 6.1 to Section 6.3 below.

6.1 Significant Wildlife Habitat

Seasonal Concentration Areas and Habitat for SOCC were confirmed present in the Study Area. Meanwhile, suitable candidate habitat to support Specialized Habitat and Animal Movement Corridors was present. However, the targeted surveys required to confirm whether the significance threshold criteria were met were not completed. As a cautionary approach, potential project-related interactions with candidate SWH have been considered in this assessment.

6.1.1 Seasonal Concentration Areas

Turtle Wintering Areas were confirmed present in the Study Area. Additionally, candidate Raptor Wintering Areas, Bat Maternity Colonies, Reptile Hibernacula, and Deer Yarding Areas were identified in the Study Area. A brief assessment of possible Project-related impacts to these features is presented in the paragraphs below. Recommendations for mitigation, where applicable, are presented in Section 7.2, below.

Raptor Wintering Areas

No endangered or threatened raptors have been identified as being potentially present during the desktop records review. Furthermore, the habitat in which Raptor Wintering Areas are found is not limited within the region. Consequently, Project activities are not expected to negatively impact the regional availability of Raptor Wintering Areas.

Bat Maternity Colonies

While habitat containing large diameter trees suitable for bat maternity roosts is plentiful on the landscape, three endangered bat species were identified as being potentially present through the desktop

records review. Since these bats and their habitat are protected, the following actions are recommended to mitigate against potential impacts to Bat Maternity Colony Habitat:

- Species specific surveys should be completed to confirm the presence of bat maternity roosting habitat;
- If bat surveys cannot be completed within the Project schedule, tree clearing will take place outside of the bat active season (May 1st to August 31st in Northern Ontario); and
- Kresin should consult with the MECP to confirm clearing trees outside of the roosting period will not be considered as destroying SAR habitat, which is a prohibited under the ESA.

Deer Yarding Areas

The habitat in which Deer Yarding Areas are found is not limited within the region. Consequently, Project activities are not expected to negatively impact the regional availability of Deer Yarding Areas.

6.1.2 Specialized Habitat

Woodland Raptor Nesting Habitat, Amphibian Breeding Habitat (Woodlands), and Mast Producing Areas as were identified as candidate SWH. No threatened or endangered SAR associated with these habitat types were identified during the desktop records review. Since habitat to support the specialized habitat identified as potentially present is not limited in this region, Site clearing, recontouring and grading, and excavation for the Project is not anticipated to limit the specialized habitat required by these species.

6.1.3 Habitat for Species of Conservation Concern

The desktop review indicated that SAR bats and birds may be present in the Study Area, because of the presence of candidate supporting habitat. Project activities, including tree and shrub clearing, could result in a loss of habitat for these species. Since habitat to support the SOCC is not limited in the region, impacts that could result from Project activities on the Site is not expected to have a negative impact to SOCC populations in the area.

6.1.4 Animal Movement Corridors

Since Amphibian Breeding Habitat (woodlands) was assessed as having a moderate occurrence potential within the Study Area, Candidate Amphibian Movement Corridors, required to provide a pathway for amphibians to move to and from breeding habitat is also likely present within the Study Area. Project activities including clearing of forest and alternation of riparian habitat could affect movement corridors. However, loss or alteration of habitat in the Study Area to support amphibian movement throughout their life cycle is not anticipated to have a negative impact to local populations. Furthermore, no threatened or endangered amphibian species were identified as being potentially present in the Study Area through the desktop records review.

While no sign of cervid or furbearers was apparent through the Photographic Review, a cautionary approach was made when assigning a moderate occurrence potential to Candidate Cervid Movement Corridors and Furbearer Movement Corridors within the Study Area. Project activities including clearing of forest habitat could affect movement corridors. However, loss or alteration of cervid and furbearer movement corridors is not anticipated to have a negative impact to local populations since this habitat is not limited in the region. Furthermore, no threatened or endangered cervid species and furbearer species were identified as being potentially present in the Study Area through the desktop records review.

6.1.5 Fish Habitat

Open water, required to support fish communities is absent from the Study Area.

6.1.6 Habitat of Endangered and Threatened Species

Habitat to support the following SAR was assessed as having either moderate or high occurrence potential in the Study Area:

- Bank Swallow (*Riparia riparia*);
- Bobolink (*Dolichonyx oryzivorus);*
- Cerulean Warbler (*Setophaga cerulea*);
- Eastern Meadowlark (*Sturnella magna*);
- Eastern Whip-poor-will (*Antrostomus vociferus*);
- Red-headed Woodpecker (*Melanerpes erythrocephalus*);
- Northern Long-eared Myotis (*Myotis septentrionalisi*);
- Little Brown Myotis (*Myotis lucifugus*);
- Eastern Small-footed Myotis (*Myotis leibii*);
- Tri-coloured Bat (*Perimyotis subflavus*); and
- Blanding's Turtle (*Emydoidea blandingii*).

SAR bat habitat was limited to maternity roosting habitat since there is no suitable hibernacula habitat in the Study Area. Project activities may result in the clearing of habitat for nesting birds and SAR bat maternity roosts. Additionally, increased traffic and work taking place near water has the potential to cause mortality to these SAR, particularly Blanding's Turtles that risk being run over by equipment should they be travelling through the Study Area.

7.0 RECOMMENDATIONS FOR MITIGATION

7.1 Project-specific Recommendations

7.1.1 Bank Swallow

Since habitat for Bank Swallow is protected under the ESA, the following recommendations have been made:

- If there is an area of nesting habitat that may have been previously used by Bank Swallows, it will be avoided during the breeding season;
- Disturbances that could result in the collapse of nest burrows (e.g., strong vibrations) will be avoided near creek banks and other suitable habitat; and
- Mitigation measures to prevent potential impacts to Bank Swallows will follow the recommendations listed in the Letter of Assurance provided by the MECP, Species at Risk Branch on June 30, 2023 (Appendix D):

- Fill piles will be maintained to a slope of 70 degrees or less at the end of each day during the Bank Swallow nesting period (April 15th to August 31st) to mitigate the potential for Bank Swallows to colonize fill piles that are stockpiled on the Site.

7.1.2 Bobolink, Cerulean Warbler, Eastern Meadowlark, and Red-headed Woodpecker

Since habitat for Bank Swallow is protected under the ESA, the following recommendations have been made:

- Species-specific surveys should be completed to confirm the presence of SAR birds in the Study Area;
- If the appropriate surveys cannot be completed within the Project schedule, vegetation clearing and grubbing activities related to the development of the Site will occur outside of the migratory bird breeding season (April 15th to August 30th).

7.1.3 Eastern Whip-poor-will

The clearing of existing trees or shrubs and excavation for project activities could result in the loss of habitat protected for these species. The following actions are recommended to mitigate against potential impacts to Eastern Whip-poor-will habitat:

- Species-specific surveys should be completed to confirm the presence of Eastern Whip-poor-will in the Study Area;
- If the appropriate surveys cannot be completed within the Project schedule, vegetation clearing and grubbing activities related to the development of the Site will occur outside of the migratory bird breeding season (April 15th to August 30th).

7.1.4 Little Brown Myotis, Eastern Small-footed Myotis, and the Northern Myotis

Since habitat for SAR bats is protected under the ESA, the following recommendations have been made:

- Species specific surveys should be completed to confirm the presence of SAR bats;
- If bat surveys cannot be completed within the Project schedule, tree clearing will take place outside of the bat active season (May 1st to August 31st in Northern Ontario); and
- Kresin should consult with the MECP to confirm clearing trees outside of the roosting period will not be considered as destroying SAR habitat, which is prohibited under the ESA.

7.1.5 Blanding's Turtle

Since habitat for Blanding's Turtle is protected under the ESA, the following recommendations have been made:

- Exclusion fencing will be highway fencing (OPSD 971.101) with hardware cloth fence (1/2" mesh size) installed along the bottom on the species side;
- Hardware cloth fencing will be installed to a height of 60 cm as recommended in Table 1 of the Ministry's guidance document Reptile and amphibian exclusion fencing (MNRF 2020).

- Hardware cloth fencing will be installed to a depth of 10 cm including a 10 cm horizonal lip extending outward as recommended in Table 1 of the Ministry's guidance document Reptile and amphibian exclusion fencing (MNRF 2020).
- Mitigation measures to prevent potential impacts to Blanding's Turtle will follow the recommendations listed in the Letter of Assurance provided by the MECP, Species at Risk Branch on June 30, 2023 (Appendix D)
    - Permanent exclusion fencing will be installed around the parameter of the expanded site (Appendix E), per the MNRF reptile and amphibian exclusion fencing guidelines (MNRF 2020);
    - Exclusion fencing will be installed outside of the active season for turtle (April 15th to October 15th), so that individuals do not become trapped within the Site;
    - A site access gate will be installed flush with the ground to prevent turtle access;
    - Surveys will be completed to ensure that no individuals are trapped within the Site; and
    - Any fill piles that are stockpiled on Site will only be located within the fenced exclusion area to prevent the use of these piles by the turtles.
- Mitigation measures to prevent potential impacts to Bank Swallows will follow the recommendations listed in the Letter of Assurance provided by the MECP, Species at Risk Branch on June 30, 2023 (Appendix D):
    - Fill piles will be maintained to a slope of 70 degrees or less at the end of each day during the Bank Swallow nesting period (April 15th to August 31st) to mitigate the potential for Bank Swallows to colonize fill piles that are stockpiled on the Site.

7.2 General Best Management Practices

- Any clearing, grubbing or construction activities that result in tree clearing should be completed outside of the breeding bird period (i.e., April 15th to August 30th) to avoid contravention of the ESA or MBCA;
- Any clearing, grubbing or construction activities that result in tree clearing should be completed outside of the bat active season (May 1st to August 31st in Northern Ontario) to avoid contravention of the ESA;
- If there is an area of nesting habitat that may have been previously used by Bank Swallows, it will be avoided during the breeding season;
- Disturbances that could result in the collapse of Bank Swallow nest burrows (e.g., strong vibrations) will be avoided near creek banks and other suitable habitat; and
- If SAR species are encountered on Site, work must stop immediately and the Ministry of Environment, Conservation, and Parks must be contacted.

8.0 SUMMARY AND CONCLUSION

Several types of Significant Wildlife Habitat were presumed present in the absence of species-specific surveys to confirm whether they meet the thresholds for significance as described in the guidance document (MNR 2010). However, the habitat that supports these features is not limited on the landscape and while Project related activities may have a small, local effect, the ability of the species to persevere as self-sustaining populations in the region is anticipated.

Significant Wildlife Habitat was confirmed present in the Study Area (Table 3). Specifically, habitat to support endangered bats, Bank Swallow, and Blanding's Turtle were confirmed present in the Study Area. Once mitigation measures recommended are implemented, no effects to these features from Project activities are expected.

Fish habitat was assumed to be present as a cautionary approach (Table 3).

Table 3 – Summary of Candidate Significant Natural Heritage Features and Areas Potentially Present within the Study Area

Natural Heritage Feature/Area Type	Occurrence Potential[1)]	Residual Effects After Mitigation
Significant Wetlands	Low	NA
Significant Woodlands in Ecoregions 5E, 6E, and 7E	Low	NA
Significant Valleylands in Ecoregions 5E, 6E, and 7E	Low	NA
Significant Wildlife Habitat	Moderate	None
Significant Areas of Natural and Scientific Interest	Low	NA
Coastal Wetlands in Ecoregions 5E, 6E, and 7E	Low	NA
Fish Habitat	Low	NA

[1)] Assessment is based on desktop information and photographic records review by Kresin.

Through the desktop screening, including the photographic record review, 11 protected SAR were identified as having moderate potential to occur within the Study Area.

9.0 CLOSURE

This information presented in this report is confidential and has been prepared for the exclusive use of Kresin to provide a summary of the EIS conducted for the expansion of the Blind River Landfill. Blue Heron accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that the information presented in this report meets your needs and expectations. Should you have any questions, comments or concerns, please do not hesitate to contact the undersigned.

Sincerely,

BLUE HERON SOLUTIONS FOR ENVIRONMENTAL MANAGEMENT INC.

Josie-Ann Tessier, EP
Intermediate Biologist / Project Manager

Jennifer Braun, M.Sc.
Senior Biologist / Biophysical Division Lead

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Appendix A

Site Map & Figures

Legend

- Municipalities
- Project Location

Roads

0 5 10 15 km

Notes:
Satellite imagery does not necessarily represent the current site conditions.

Kresin Engineering Corp.

Drawn By	D.S.
Checked By	J.B.
Last Modified:	2024-04-24
Projection	NAD83 / UTM zone 17N

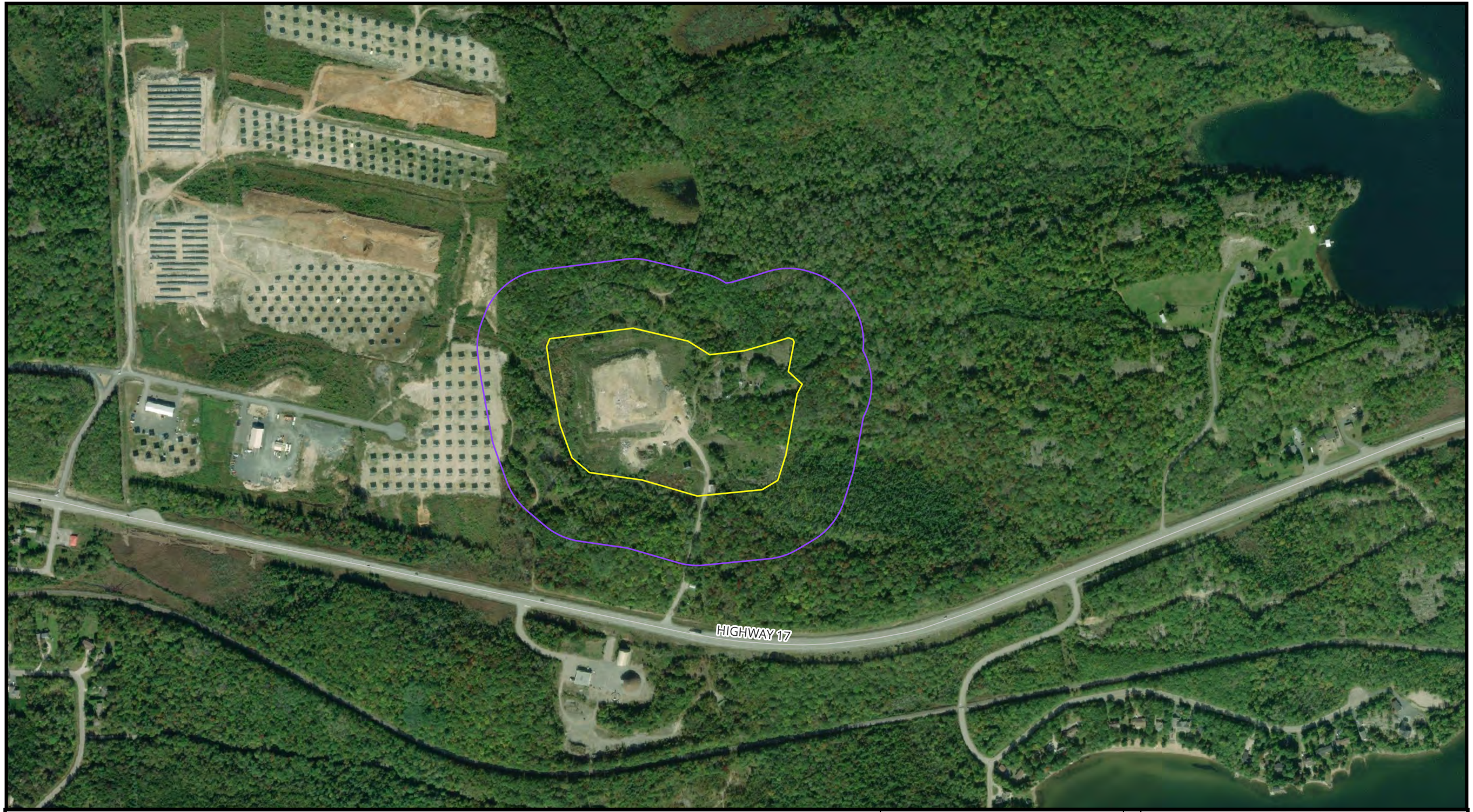
Project Location

Blind River Landfill

Blind River Landfill Expansion

Figure 1

BH-22-PJ-2132



Legend

Site

120 m Study Area Buffer

50 0 50 100 150 200 250 m

Notes:
Satellite imagery does not necessarily represent the current site conditions.

Kresin Engineering Corp.

Drawn By	D.S.
Checked By	J.B.
Last Modified:	2023-08-04
Projection	NAD83 / UTM zone 17N

Study Area

Blind River Landfill

Blind River Landfill Expansion

Figure 2

BH-22-PJ-2132

Appendix B

Desktop Records Review Summary

Appendix B.1 – Species at Risk Screening Summary

Appendix B.2 – Significant Wildlife Habitat Screening Summary

Appendix B.1 – Significant Wildlife Habitat Screening Results for Lot 7 Concession 1 of Striker Township in the District of Algoma, Ontario [1)]

Candidate Significant Wildlife Habitat		Potential to Occur in Study Area	Rationale[3)]
Seasonal Concentration Areas	Waterfowl Stopover and Staging Areas (Terrestrial)	Low	No ecosites associated with Waterfowl Stopover and Staging Areas (Terrestrial) are present in the Study Area (MNRF 2021). The Study Area did not meet the threshold of significance (i.e., support at least 100 or more of the listed species).
	Waterfowl Stopover and Staging Areas (Aquatic)	Low	The Study Area did not meet the threshold of significance (i.e., support at least 100 or more of the listed species). Additionally, there are no waterbodies in the Study Area.
	Shorebird Migratory Stopover Area	Low	No shorelines or waterbodies are present within the Study Area and does not contain the candidate ecosite types (MNRF 2021).
	Raptor Wintering Area	Moderate	The mixed forest surrounding the Study Area may provide suitable Raptor Wintering Areas. Ecosites B055, B058, and B059 are historically present in the Study Area (MNRF 2011).
	Bat Hibernacula	Low	No structures that provide hibernacula (e.g., mine shafts, underground caves) are present in the Study Area.
	Bat Maternity Colonies	Moderate	Tree cavities, vegetation, and buildings may provide suitable maternity roosts for bats. Ecosite codes B055, B058, and B059 are present in the Study Area (MNRF 2021).
	Turtle Wintering Areas	Low	While waterbodies surrounding the Study Area may provide suitable Turtle Wintering Habitats, no suitable wetlands for turtle overwintering are in the Study Area.
	Reptile Hibernacula	Moderate	Ecosites B057, B058 and B059 are present in the Study Area (MNRF 2021) which are associated with Reptile Hibernacula.
	Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	Low	No suitable sandy hills or burrow pits appear to be present in the Study Area and it does not contain the candidate ecosite types (MNRF 2021).
	Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs)	Low	The Study Area does not contain the candidate ecosite types (MNRF 2021).
	Colonially-Nesting Bird Breeding Habitat (Ground)	Low	No large open water features are present within the Study Area that can sustain at least 25 active nests.
	Deer Yarding Areas	Moderate	Ecosite B129 is present within the Study Area and the mixed forest that is present could provide suitable habitat for Deer Yarding Areas.
Rare Vegetation Communities	Beach/Beach Ridge/Bar/Sand Dunes	Low	No sand dunes or beaches are present in the Study Area. This feature is uncommon in ecoregion 5E.
	Shallow Atlantic Coastal	Low	No shallow marshes are present within the Study Area.
	Cliffs and Talus Slopes	Low	No cliffs or talus slopes appear to be present within the Study Area. This feature is uncommon in ecoregion 5E.
	Rock Barren	Low	No rock barrens with an area greater than 1 hectare appears to be present in the Study Area.
	Sand Barren	Low	No sand barrens appear to be present within the Study Area. This feature is uncommon in ecoregion 5E.
	Alvar	Low	No alvars appear to be present within the Study Area. This feature is uncommon in ecoregion 5E.
	Old Growth Forest	Low	Based on historic ecosite information (MNRF 2021) and the photographic records review, the Study Area does not contain trees over 140 years old.
	Bog	Low	No ecosites associated with bogs are present in the Study Area (MNRF 2021). This feature is rare community in ecoregion 5E.
	Tallgrass Prairie	Low	Indicator and characteristic grass species (i.e., *Andropogon gerardii* and *Bromus kalmia*) are unlikely to be found in the Study Area. This is also a rare community in ecoregion 5E.
	Savannah	Low	The Study Area does not contain a tallgrass prairie and does not contain the candidate ecosite types (MNRF 2021).
	Rare Forest Type: Red Spruce	Low	This is a rare community in ecoregion 5E. It is unlikely to be present in the Study Area based on historic ecosite information (MNRF 2021) and the Study Area does not contain the candidate ecosite types (MNRF 2021).

Candidate Significant Wildlife Habitat		Potential to Occur in Study Area	Rationale[3)]
	Rare Forest Type: White Oak	Low	This is a rare community in ecoregion 5E. It is unlikely to be present in the Study Area based on historic ecosite information (MNRF 2021) and the Study Area does not contain the candidate ecosite types (MNRF 2021).
Specialized Habitat	Waterfowl Nesting Areas	Low	Even though ecosite G129 is present in the Study Area (MNRF 2021)., the Study Area did not meet the threshold of significance (i.e., wetlands greater than 0.5 hectares).
	Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Low	There are larger bodies of water surrounding the Study Area which may contain suitable habitat for Bald Eagles (*Haliaeetus leucocephalus*) and Ospreys (*Pandion haliaetus*).
	Woodland Raptor Nesting Habitat	Moderate	The mixed forest within the Study Area may provide suitable habitat for nesting. Ecosite B129 is present within the Study Area (MNRF 2021).
	Turtle and Lizard Nesting Areas	Low	No waterbodies or suitable substrates appear present within the Study Area and it does not contain the candidate ecosite types (MNRF 2021).
	Seeps and Springs	Low	There are no water features in the Study Area.
	Aquatic Feeding Habitat	Low	No aquatic feeding habitat was identified on the Forest Management Wildlife and Forestry Map for the Northshore Forest (NorthshoreForest Inc 2019)[6)]
	Mineral Licks	Low	No mineral licks seem to be present in the Study Area.
	Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf	Moderate	There are no wetlands in the Study Area but candidate habitat are available.
	Amphibian Breeding Habitat (Wetland)	Low	There are no wetlands in the Study Area.
	Amphibian Breeding Habitat (Woodlands)	Moderate	The forest present within the Study Area reaches other waterbodies outside of the Study Area which may make this forest suitable for Amphibian Breeding Habitat (Wetlands).
	Mast Producing Areas	High	An ecosite associated with Mast Producing Areas (B059) is present within the Study Area. The Study Area is also disturbed suggesting there could be mast-producing early successional species present.
Habitat for Species of Conservation Concern	Marsh Bird Breeding Habitat	Low	Although ecosite G129 is present on the Site, there is no wetland on the Site.
	Open Country Bird Breeding Habitat	Low	The Study Area does not contain large grasslands or the associated ecosite types (MNRF 2021).
	Shrub/Early Successional Bird Breeding Habitat	Low	No large fields or associated ecosite types (MNRF 2021) are present within the Study Area.
	Special Concern and Rare Wildlife	Moderate	Species at Risk (SAR) bats and birds may occur in the Study Area based on a previous SAR screening.
Animal Movement Corridors	Amphibian Movement Corridors	Moderate	Since there is moderate potential for amphibian breeding habitat (woodland), it is assumed there is amphibian movement corridors to and from the breeding habitats.
	Cervid Movement Corridors	Moderate	There is potential for Deer Wintering Habitat to occur in the forest within the Study Area, giving this area potential to also provide suitable Cervid Movement Corridors.
	Furbearer Movement Corridors	Moderate	Ecosite G129 in the Study Area is approximately 115 years old (MNRF 2021), which is considered suitable habitat for some furbearing animals.
Exceptions	Rare Forest Type: Jack Pine	Low	No associated ecosite types are present in the Study Area (MNRF 2021) and Jack Pine are uncommon in Ecoregion 5E.
	Late Winter Moose Habitat	Low	No dense conifer cover is present within the Study Area.

[1)] Assessment is based on desktop information only.
[2)] The assessment of significance for candidate significant wildlife habitat types with moderate and high potential to occur within the Study Area will be completed following a site visit.
[3)] Ecosite presence is based on available Forest Resource Inventory (FRI) polygon data from the MNRF (2021).
[4)] Qualifying ecosites are based on the Candidate Significant Wildlife Habitat descriptions provided in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (MNRF 2015).
[5)] Qualifying species are based on the species listed in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (MNRF 2015).
[6)] Northshore Forest 2020-2030 Forest Management Plan (NorthshoreForest Inc 2019)

Appendix B.2 – Species at Risk Desktop Screening Results for Lot 7 Concession 1 of Striker Township in the District of Algoma, Ontario [1)]

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
ANTHROPODS								
Monarch	*Danaus plexippus*	Special Concern	Special Concern	Endangered	S2N,S4B	Monarchs in Canada exist primarily wherever milkweed (*Asclepius* spp.) and wildflowers (such as Goldenrod, asters, and Purple Loosestrife) exist. This includes abandoned farmland, along roadsides, and other open spaces where these plants grow (SARA 2010).	Moderate	Wildflowers may be present in the Study Area, which could provide a food source to Monarchs.
Transverse Lady Beetle	*Coccinella transversoguttata*	Endangered	Special Concern	Special Concern	SH	Transverse Lady Beetles are habitat generalists, primarily feeding on aphids and occurring across a wide range of habitats. This lady beetle inhabits agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and other natural areas. This broad habitat range reflects their ability to exploit seasonal changes in prey availability across different vegetation types (COSEWIC 2016).	Low	This species is unlikely to be detected because species occurrences are low (COSEWIC 2016). All occurrences are considered historical and have not been reported since 1990 (SARO 2022).
BIRDS								
American White Pelican	*Pelecanus erythrorhynchos*	Threatened	-	Not at Risk	S3B, S4M	American White Pelicans nest in groups on remote islands that are barren or sparsely treed located in lakes, reservoirs, or on large rivers. Pelicans nest in slight depressions in the ground with sticks and vegetation piled up around them. Ontario has about 10% of the world's population of American White Pelicans (Ontario 2019).	Low	No large lakes or rivers with remote islands are present in the Study Area.
Bald Eagle	*Haliaeetus leucocephalus*	Special Concern	-	Not at Risk	S4	In Ontario, Bald Eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies. Adults are in this territory from late winter to late summer. In Southern Ontario many pairs are on territory year-round (Cadman et al. 2007).	Low	The Study Area does not contain any large rivers or lakes which provide suitable habitat for Bald Eagles.
Bank Swallow	*Riparia riparia*	Threatened	Threatened	Threatened	S4B	The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stockpiles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods (Updated by COSEWIC 2013).	High	Bank Swallows have been reported in the Study Area (eBird 2022) and the nearby waterbodies outside of the Study Area may provide suitable bank habitat.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Barn Swallow	*Hirundo rustica*	Threatened	Threatened	Special Concern	S4B	Originally nesting primarily incaves, the Barn Swallow has almost completely converted to breeding under the eaves of buildings or inside artificial structures such as bridges and culverts (Brown & Brown 2019).	Moderate	Structures (sea can)in the Study Area may provide suitable nesting habitat for Barn Swallows.
Black Tern	*Chlidonias niger*	Special Concern	-	Not at Risk	S3B,S4M	The Black Tern prefers shallow freshwater marshes with emergent vegetation, including prairie sloughs, margins of lakes, and occasionally river or island edges; sometimes cultivated rice fields. Most nests are in semi-permanent ponds. Nest marshes are found in open or forested country up to 1,540 m elevation. Species prefers marshes or marsh complexes over 20 ha in size (Heath et al. 2009).	Low	There are no wetlands in the Study Area.
Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened	Threatened	S4B	The Bobolink originally nested in the tall-grass prairie of the mid-western U.S. and south-central Canada. Since the conversion of the prairie to cropland and the clearing of the eastern forests, the Bobolink has nested in forage crops (e.g., hayfields and pastures dominated by a variety of species, such as clover, Timothy, Kentucky Bluegrass, and broadleaved plants). The Bobolink also occurs in various grassland habitats including wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie (tall-grass prairie), no-till cropland, small-grain fields, restored surface mining sites and irrigated fields in arid regions. It is generally not abundant in short-grass prairie, Alfalfa fields, or in row crop monocultures (e.g., corn, soybean, wheat), although its use of Alfalfa may vary with region (COSEWIC 2010).	High	Bobolink has been reported in the Study Area (eBird 2022). Since the Study Area is disturbed, the vegetation present may provide suitable habitat for this species.
Canada Warbler	*Cardellina canadensis*	Special Concern	Threatened	Special Concern	S5B	The Canada Warbler uses a wide range of deciduous, coniferous, and mixed forests, with a well-developed shrub layer and a structurally complex forest floor. It is most abundant in moist, mixed forests. It also occurs in riparian shrub forest on slopes and in ravines, in stands regenerating after natural and anthropogenic disturbances and in old-growth forests with canopy openings and a well-developed shrub layer (COSEWIC 2008).	Moderate	The Study Area is disturbed and contains a mixed forest.
Cerulean Warbler	*Setophaga cerulea*	Threatened	Endangered	Endangered	S2B	The Canada Warbler uses a wide range of deciduous, coniferous, and mixed forests, with a well-developed shrub layer and a structurally complex forest floor. It is most abundant in moist, mixed forests. It also occurs in riparian shrub forest on slopes and in ravines, in stands regenerating after natural and anthropogenic disturbances and in old-growth forests with canopy openings and a well-developed shrub layer (COSEWIC 2008).	Moderate	This species lives in mixed forest which is present in the Study Area.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	Threatened	S3B	Chimney Swifts are aerial foragers, often concentrating near water where insects are abundant. The Chimney Swift is now mainly associated with urban and rural areas where chimneys are available for nesting and roosting. In their northern breeding range, Chimney Swifts look for sites with a relatively constant ambient temperature. Winter habitat extends from river-edge forest and edge of tropical lowland evergreen forest to farmland and suburban and central city zones (COSEWIC 2007).	Low	No chimneys appear to be present in the Study Area and no winter habitat is present in the Study Area.
Common Nighthawk	*Chordeiles minor*	Special Concern	Threatened	Special Concern	S4B	Common Nighthawk breeds in a range of open and partially open habitats, including forest openings and post-fire habitats, prairies, bogs, and rocky or sandy natural habitats, as well as disturbed areas. It is also found in settled areas that meet its habitat needs, those with open areas for foraging and bare or short-cropped surfaces for nesting. The species' use of a wide range of habitats makes it difficult to estimate trends in habitat availability, except in urban habitats, where their main nesting sites – flat graveled roofs – are disappearing (COSEWIC 2018).	Moderate	The Study Area is disturbed and contains open areas which provides suitable nesting habitat for Common Nighthawks.
Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened	Threatened	S4B,S3N	Eastern Meadowlarks prefer grassland habitats, including native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows, and airfields (COSEWIC 2011).	Moderate	No sightings of this species have been reported in the Study Area (eBird 2022; iNaturalist 2022), however the disturbed Study Area may contain grasslands that may provide suitable habitat.
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened	Threatened	S4B	Whip-poor-will breeding habitat is dependent upon forest structure rather than composition, although common tree associations in both summer and winter are pine (Pinus sp.) and oak (Quercus sp.). The species avoids both wide-open spaces and closed-canopy forests. Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred as nesting habitat. Areas with little ground cover are also preferred. In winter, Whip-poor-wills occupy primarily mixed woods, commonly in broadleaf evergreen forests near open areas (COSEWIC 2009).	Moderate	The Study Area is disturbed and contains open areas which provides suitable habitat for Eastern Whip-poor-wills.
Eastern Wood-pewee	*Contopus virens*	Special Concern	Special Concern	Special Concern	S4B	In Canada, the Eastern Wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation (COSEWIC 2012).	Moderate	Mixed forest surrounds the Study Area and may provide suitable habitat for this species.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern	Special Concern	Special Concern	S4	Optimal Evening Grosbeak breeding habitat generally includes open, mature mixed wood forests, where fir species (*Abies* sp.) and/or White Spruce (*Picea glauca*) are dominant, and Spruce Budworm (*Choristoneura* sp.) is abundant. Outside the breeding season, the species seems to depend largely on seed crops from various trees such as firs and spruces (*Picea* sp.) in the boreal forest but is also attracted to ornamental trees that produce seeds or fruit, and bird feeders stocked with sunflower seeds (COSEWIC 2016).	Moderate	Mast producing plant species are likely present in the Study Area which this species uses as a food source.
Golden Eagle	*Aquila chrysaetos*	Endangered	-	Not At Risk	S1B,S4N	Golden Eagles nest in remote, undisturbed areas, usually building their nests on ledges on a steep cliff or riverbank, but they will also use large trees if needed. Most hunting is done near open areas such as large bogs or tundra. During migration they could be encountered anywhere but are most frequently seen migrating west along the shore of Lake Ontario and Erie in November. Small numbers also winter in the south half of Ontario, most often near large deer wintering areas where carcasses might be found. There are currently believed to be 10 to 20 nesting pairs in the province (Ontario 2019).	Low	The Study Area is disturbed and does not contain large bogs or tundra which this species requires for habitat.
Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern	Threatened	Threatened	S3B	On the breeding grounds, Golden-winged Warblers are found in areas of early successional scrub surrounded by mature forests. They are found in dry uplands, swamp forests and marshes. Examples of some preferred habitat areas include hydro/utility rights-of-way, field edges, recently logged areas, beaver marshes, and areas that are burned or intermittently farmed. On the wintering grounds Golden-winged Warblers may be found at high elevations (1,500-3,000 m) in various types of open woodland habitats, pine-oak and scrub. However, they have also been described as lowland dwellers by some. Within the preferred habitat types, the species is found primarily in canopies, within gaps or along edges of forests, and in tall second growth (COSEWIC 2006) .	Moderate	This species has been reported near the Study Area (eBird 2022; iNaturalist 2022).
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	Special Concern	Special Concern	S4B	In Canada, the Eastern Grasshopper Sparrow typically breeds in large human created grasslands (≥ 5 ha), such as pastures and hayfields, and natural prairies, such as alvars, characterized by well-drained, often poor soil dominated by relatively low, sparse perennial herbaceous vegetation. The habitat used by the Grasshopper Sparrow in its wintering range is generally similar to that used in the breeding range (COSEWIC 2013).	Low	The Study Area does not contain grasslands greater than 5 hectares in size.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Horned Grebe	*Podiceps auritus*	Special Concern	Special Concern	Special Concern	S1B,S3N,S4M	The Horned Grebe breeds primarily in temperate zones such as the Prairies and Parkland Canada but can also be found in more boreal and subarctic zones. It generally breeds in freshwater and occasionally in brackish water on small semi-permanent or permanent ponds, but it also uses marshes and shallow bays on lake borders. Breeding areas require open water rich in emerging vegetation, which provides nest materials, concealment and anchorage, and protection for the young (COSEWIC 2009)	Low	The waterbody in the Study Area does not contain rich emerging vegetation.
Kirtland's Warbler	*Setophaga kirtlandii*	Endangered	Endangered	Endangered	S1B	During the breeding season, the Kirtland's Warbler is restricted to extensive stands of young, even-aged, dense jack pine, with small openings. The Kirtland's Warbler is also area sensitive, generally occurring in patches greater than 30 ha, with breeding success highest in contiguous stands of 80 ha or more (COSEWIC 2008).	Low	The Study Area contains no water features.
Least Bittern	*Ixobrychus exilis*	Threatened	Threatened	Threatened	S4B	The Least Bittern breeds strictly in marshes dominated by emergent vegetation surrounded by areas of open water. Most breeding grounds in Canada are dominated by cattails but breeding also occurs in areas with other robust emergent plants and in shrubby swamps. The presence of stands of dense vegetation is essential for nesting because the nests of Least Bittern sit on platforms of stiff stems. The nests are almost always within 10 m of open water. Open water is also needed for foraging because Least Bitterns forage by ambushing their prey in shallow water near marsh edges, often from platforms that they construct out of bent vegetation. Access to clear water is essential for the birds to see their prey. This small heron prefers large marshes that have relatively stable water levels throughout the nesting period (COSEWIC 2009).	Low	There are no wetlands in the Study Area.
Loggerhead Shrike	*Lanius ludovicianus*	Endangered	Endangered	Endangered	S1B	Loggerhead Shrike breeding habitat is characterized by open areas dominated by grasses and/or forbs, interspersed with scattered shrubs or trees and bare ground. Suitable habitat includes pasture, old fields, prairie, savannah, pinyon-juniper woodland, shrub-steppe and alvar. Territory size ranges from 2.7 to 47.0 ha and correlates with the abundance of trees and shrubs – increasing perch density will decrease territory size. Tree and shrub species that are relatively dense and extensively branched are preferred as nest sites (COSEWIC 2014).	Low	The Study Area does not contain the required habitat for the Loggerhead Shrikes (i.e., no pastures, old fields).
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Threatened	Special Concern	S4B	Olive-sided Flycatcher is most often associated with edges of coniferous or mixed forests with tall trees or snags for perching, alongside open areas, or in burned forest with standing trees and snags. In natural conditions, these habitats may include open to semi-open mature forest stands, as well as mature stands with edges near wet areas (such as rivers, muskeg, bogs or swamps),	Moderate	Mixed forest surrounds the Study Area and may provide suitable habitat for this species.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
						burned forest, openings created by insect outbreaks, barrens, or other gaps. The species also uses forest stands adjacent to human-created openings (such as clearcuts, thinned stands, and prescribed burns (COSEWIC 2018).		
Peregrine Falcon	*Falco peregrinus*	Special Concern	Special Concern	Not at Risk	S4	The Peregrine Falcon nests on cliff ledges or crevices, but some will also use tall buildings and bridges near good foraging areas. At the landscape level, suitable nest sites are patchily distributed, but can be common locally in some areas. Extensive areas of Canada, where Peregrine Falcons are absent, appear to lack suitable nest sites and/or sufficient prey. Natural nesting habitat has not changed significantly since populations crashed and is still largely available, as are additional sites on human-made structures and in urban areas (COSEWIC 2007).	Low	No tall ledges or tall anthropogenic structures appear present in the Study Area.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Endangered	Endangered	Endangered	S3	Red-headed Woodpecker can be found in a variety of treed habitats, including deciduous woodlands, open woodlots, parks, golf courses, cemeteries, treed agricultural and urban areas, savannah-like grasslands with scattered trees, riparian forests, wetlands, beaver ponds, burned areas, and along forest edges and roadsides. During the breeding period, dead limbs or snags are required for nesting, and an open canopy is preferred (COSEWIC 2018)	Moderate	Mixed forest surrounds the Study Area and may provide suitable habitat for this species.
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Special Concern	Special Concern	S4B,S3N	The breeding range of the Rusty Blackbird in Canada is almost entirely within the boreal forest. Breeding habitat there is characterized by coniferous-dominated forests adjacent to wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps, and beaver ponds. On migration, the Rusty Blackbird is primarily associated with wooded wetlands. Suitable habitat for the species appears to be decreasing on its breeding range and wintering grounds, due mainly to the loss and degradation of wetlands by human activities (COSEWIC 2017).	Moderate	Rusty Blackbirds have been reported near the Study Area (eBird 2022) and the forest adjacent to the Study Area may provide suitable habitat.
Short-eared Owl	*Asio flammeus*	Special Concern	Special Concern	Threatened	S4?B,S2S3N	A wide variety of unforested habitats are used, including arctic tundra, grasslands, sand-sage, fallow pastures, and occasionally fields planted with row-crops. Although Short-eared Owls clearly prefer open habitats, it is thought that the primary factor influencing local habitat choice (in summer and winter) is food abundance (COSEWIC 2008).	Low	The Study Area does not contain suitable habitat for this species (i.e., no tundra, grasslands, or sand-sage is present).
Wood Thrush	*Hylocichla mustelina*	Special Concern	Threatened	Threatened	S4B	In Canada, the Wood Thrush nests mainly in second growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. This species prefers large forest mosaics but may also nest in small forest fragments. Wintering habitat is characterized primarily by undisturbed to moderately disturbed wet primary lowland forests (COSEWIC 2012).	Low	No second growth or mature deciduous forests are present within the Study Area.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Yellow Rail	*Coturnicops noveboracensis*	Special Concern	Special Concern	Special Concern	S3B	Nesting Yellow Rails are typically found in marshes dominated by sedges, true grasses, and rushes, where there is little or no standing water (generally 0-12 cm water depth), and where the substrate remains saturated throughout the summer. They can be found in damp fields and meadows, on the floodplains of rivers and streams, in the herbaceous vegetation of bogs, and at the upper levels (drier margins) of estuarine and salt marshes. Nesting habitats usually have a dry mat of dead vegetation from previous growing seasons. A greater diversity of habitat types is used during migration and winter than during the breeding season (COSEWIC 2001).	Low	The Study Area does not provide suitable habitat for this species (i.e., little or no standing water of 0-12 cm water depth.).
FISH								
American Eel	*Anguilla rostrata*	Endangered	-	Threatened	S1S2	The American Eel uses a variety of marine and freshwater habitats over the course of its life history. Habitat requirements during the overwintering period are poorly known, in both fresh and saltwater habitats. In fresh water, preferred habitat can be found in lakes and rivers including all waters extending from the high-water mark down to at least 10 m depth. Growing eels are primarily benthic, using substrate (rock, sand, mud), and woody debris and submerged vegetation for protection and cover. American Eels commonly overwinter in mud bottoms in both bay and estuary habitats. Eelgrass and interstitial spaces are important to American Eel as cover, particularly during daylight hours (COSEWIC 2012)	Low	No large lakes or rivers are present within the Study Area.
MAMMALS								
Eastern Cougar	*Puma concolor couguar*	Endangered	-	Data Deficient	SU	Habitat is essentially the same as that of their primary prey; within this habitat, prefers rocky cliffs, ledges, vegetated ridgetops, or other areas that provide cover for undetected surveillance of prey; stream courses and ridgetops are frequently used as travel corridors; riparian vegetation along streams provides cover for cougars traveling in open areas (United States Department of Agriculture Forest Service, 2007).	Low	The Study Area is not suitable for the Eastern Cougar (i.e., no rocky cliffs, ledges, or vegetated ridgetops are present).
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	-	-	S2S3	In the spring and summer, Eastern Small-footed Bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year (Humphrey 2017).	Moderate	Buildings in the Study Area may provide suitable roosting habitat.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Endangered	S3	Little Brown Myotis overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. Females establish summer maternity colonies, often in buildings or large-diameter trees. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter (COSEWIC 2013).	Moderate	Mixed forest in the Study Area may provide suitable maternity roost habitat.
Northern Long-eared Myotis	*Myotis septentrionalis*	Endangered	Endangered	Endangered	S3	Northern Long-eared Myotis overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. Foraging occurs over waterways, forest edges, and in gaps in the forest). Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter (COSEWIC 2013).	Moderate	Mixed forest surrounding the Study Area may provide suitable maternity roost habitat.
Tri-coloured Bat	*Perimyotis subflavus*	Endangered	Endangered	Endangered	S3?	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer, they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.	Moderate	Mixed forest surrounding the Study Area may provide suitable maternity roost habitat.
REPTILES								
Blanding's Turtle	*Emydoidea blandingii*	Threatened	Endangered	Endangered	SNR	In the Great Lakes/St. Lawrence population, however, Blanding's Turtles are often observed using clear water eutrophic wetlands. Blanding's Turtles have strong site fidelity but may use several connected water bodies throughout the active season. Turtles of all ages occur primarily in shallow water habitats. Females nest in a variety of substrates including sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. Adults and juveniles overwinter in a variety of water bodies that maintain pools averaging about 1 m in depth; however, hatchling turtles	High	Blanding's Turtles have been reported in the Study Area based on client communication from the MECP.

Common Name	Scientific Name	ESA[2)]	SARA[3)]	COSEWIC[4)]	S Rank[5)]	Habitat Descriptions	Potential to Occur in the Study Area	Rationale
						have been observed hibernating terrestrially during their first winter (COSEWIC 2016).		
Midland Painted Turtle	*Chrysemys picta marginata*	-	Special Concern	Special Concern	S4	Painted turtles inhabit waterbodies, such as ponds, marshes, lakes, and slow-moving creeks, that have a soft bottom and provide abundant basking sites and aquatic vegetation. These turtles often bask on shorelines or on logs and rocks that protrude from the water. The midland painted turtle hibernates on the bottom of waterbodies.	Low	There are no wetlands in the Study Area.
Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern	Special Concern	S3	The preferred habitat for the Snapping Turtle is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats. Although individual turtles will persist in developed areas (e.g. golf course ponds, irrigation canals), it is unlikely that populations persist in such habitats. Snapping Turtles can occur in highly polluted waterways, but environmental contamination is known to limit reproductive success. Snapping Turtle habitat is diminishing in both quantity and quality in Canada with losses primarily due to conversion of wetlands to agriculture and urban development (COSEWIC 2008).	Low	There are no wetlands in the Study Area.

1) Assessment is based on desktop information and targeted field surveys.
2) ESA – *Endangered Species Act,* 2007, S.O. 2007, c. 6 (last amendment 2019, c. 9, Sched. 5);
3) SARA – *Species at Risk Act*, 2002, c. 29;
4) COSEWIC – Committee on the Status of Endangered Wildlife in Canada;
5) S Rank – Subnational Conservation Rank, whereby: S1 – Critically imperiled in Ontario, S2 – Species is imperiled in Ontario, S3 – Species is vulnerable in Ontario, S4 – Species is apparently secure in Ontario, SH – Possibly extirpated, SNR – Unranked species, N – non-breeding population in Ontario, B – breeding populations in Ontario.

Appendix C

Photographic Records by Kresin

Photo 1 – Looking north from recycling area located south of the landfill fill area

Photo 2 – Looking south from recycling area located south of the landfill fill area

Photo 3 – Looking southeast towards landfill entrance

Photo 4 – Looking southeast from toe of landfill fill area

Photo 5 – Looking northeast from toe of landfill fill area

Photo 6 – Looking west from top of landfill fill area

Photo 7 – Looking northwest from top of landfill fill area

Photo 8 – Looking north from top of landfill fill area

Photo 9 – Looking northeast from top of landfill fill area

Photo 10 – Looking west from recycling area to the south of landfill fill area

Photo 11 – Looking east from recycling area to the south of landfill fill area

Photo 12 – Looking west from recycling area to the south of landfill fill area

Photo 13 – Looking southeast

KRESIN Engineering Corporation
Sault Ste. Marie, Ontario
(705) 949-4900

NOTES

DESIGN	RW	01/23
DRAWN	RW	01/23
CHECKED		
PROJECT	0508.16	
FILENAME	0508.16 site photos for Blue Heron	
SCALE	1:2,000	

TOWN OF BLIND RIVER LANDFILL EXPANSION ENVIRONMENTAL IMPACT ASSESSMENT

SITE PHOTOS FOR BLUE HERON

1

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Appendix D

MECP Letter of Assurance

Ontario

Ministry of the Environment, Conservation and Parks

Species at Risk Branch

40 St. Clair Avenue West
14th Floor
Toronto ON M4V 1M2

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

Direction des espèces en péril

40, avenue St. Clair Ouest
14e étage
Toronto ON M4V 1M2

June 30, 2023

Dear Mr. Wilson,

The Ministry of the Environment, Conservation and Parks (MECP) has reviewed the SAR Species Screening Information concerning the Blind River Municipal waste disposal site expansion submitted by Blue Heron Environmental and Kresin Engineering Corporation on behalf of the Proponent, the Town of Blind River on October 24, 2022, to assess the potential impacts of the proposal on Blanding's Turtle and Bank Swallow protected under the *Endangered Species Act, 2007* (ESA).

Based on the Ministry's review of the project documentation and information that has been provided, the proponent's conclusions that that neither sections 9 nor 10 of the ESA will be contravened for species identified above appear reasonable and valid and therefore authorization is not required. We acknowledge that the Town of Blind River has committed to avoidance and mitigation measures by installing permanent exclusion fencing, as per the Ministry's reptile and amphibian exclusion fencing guidelines, around the perimeter of the expanded site, including a site access gate that will be installed flush to the ground. We acknowledge that the exclusion fencing will be installed outside of the active season for turtles (April 15th – October 15th), so that individuals do not become trapped within the site. Once the fence has been installed, a survey will be completed to ensure that no individuals are trapped within the site.

We acknowledge that the proponent has agreed that any fill piles that are stockpiled on site will only be located within the fenced exclusion area to prevent the use of these fill piles for turtle nesting.

We also acknowledge that the proponent has agreed to maintain a graded slope of 70 degrees or less on fill piles at the end of each day during the Bank swallow nesting period (April 15th – August 31st) to mitigate the potential for Bank Swallows to colonize fill piles that are stockpiled on site as per the Ministry's Best Management Practices for

the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario document.

Should any of the project activities change, please notify MECP immediately to obtain advice on whether the changes require authorization under the ESA. Failure to carry out these activities as described could potentially result in contravention of the ESA. Further, it is recommended that the Proponent continue to monitor for SAR, e.g., Blanding's Turtle and Bank Swallow, while carrying out the activities to document changes, in the event that there should be any. The proponent remains responsible for ensuring compliance with the ESA and may be subject to prosecution or other enforcement action if activities result in any harm to an at-risk species or habitat.

The Ministry's position here is based on the information that has been provided to MECP by the Town of Blind River and/or its project team. Should information not have been made available and considered in MECP's review or new information come to light that changes the conclusions made, or if on-site conditions and circumstances change so as to alter the basis for the conclusions, please contact the Species at Risk Branch as soon as possible to discuss next steps.

We also note that while it does not appear that an ESA authorization will be required, the proposed activities may be subject to other approvals, such as those issued by local municipalities and conservation authorities. Please be advised that it is the responsibility of the Proponent to be aware of and comply with all other relevant provincial or federal requirements, municipal by-laws or required approvals from other agencies. It is also the responsibility of the Proponent to ensure that all required approvals are obtained, and relevant policies adhered to.

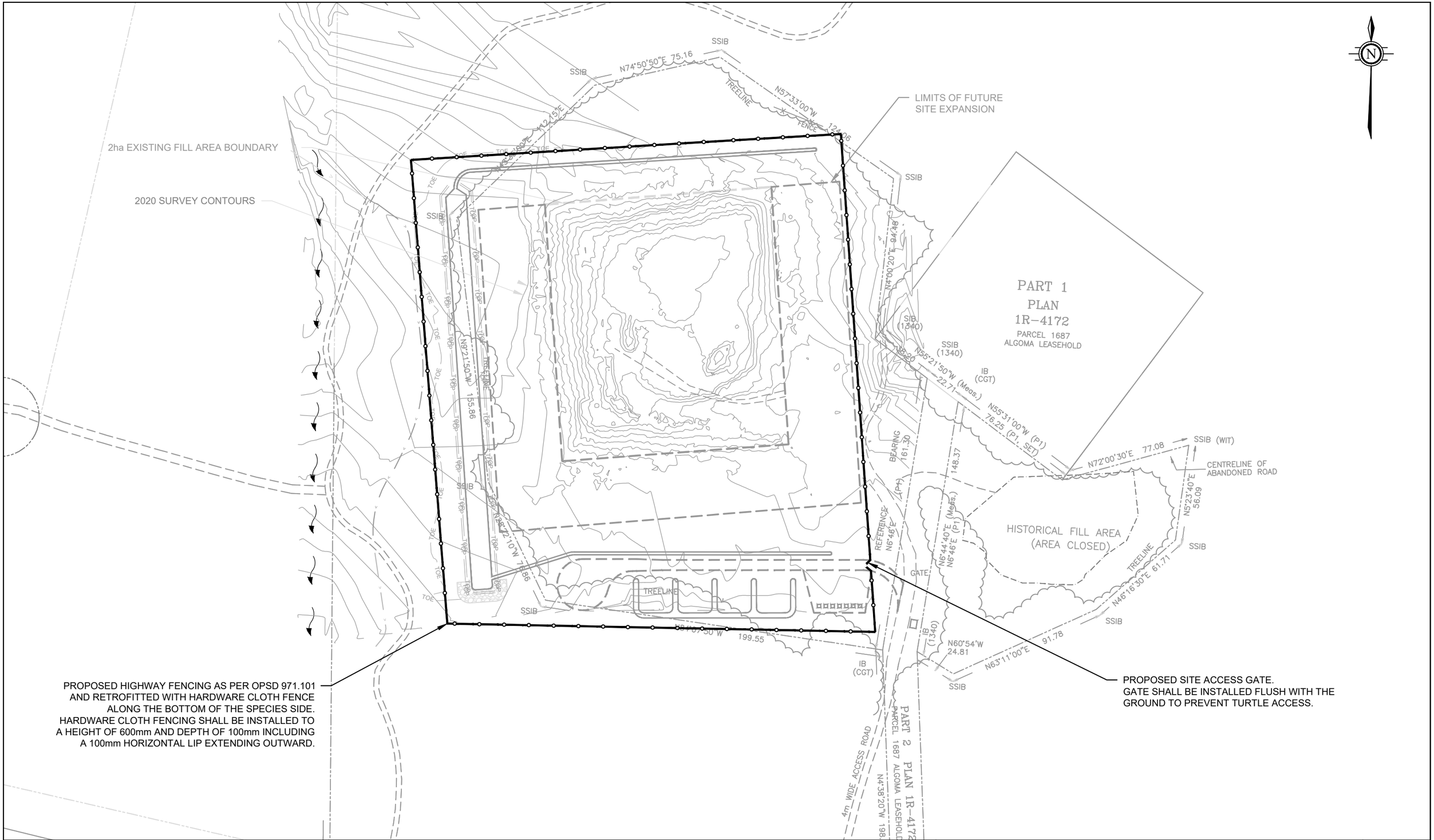
We would like to thank the Town of Blind River and their team for their cooperation in ensuring the protection of species at risk. At this time, nothing further is required from MECP Permissions and Compliance Section with respect to the municipal waste disposal site expansion concerning Blanding's Turtle and Bank Swallow. Good luck with your project.

Sincerely,

Jackson Bellamy
Policy Intern
Landscape Species Recovery Section
Species at Risk Branch
Ministry of the Environment Conservation and Parks

Appendix E

Turtle Exclusion Fencing Drawing



KRESIN Engineering Corporation	Sault Ste. Marie, Ontario (705) 949-4900

NOTES

DESIGN	RW	04/23
DRAWN	RW	04/23
CHECKED	CK	04/23
PROJECT	0508.16	
FILENAME	0508.16 exclusion fencing	
SCALE	1:2000	

CORPORATION OF THE TOWN OF BLIND RIVER
WASTE MANAGEMENT PLAN EA

PROPOSED EXCLUSION FENCING

1

Rev 1

Appendix F

Ministry Correspondence

From:	Josie-Ann Tessier
To:	Jenn Braun
Subject:	FW: Blind River Municipal Waste Disposal Site Expansion
Date:	May 29, 2023 1:50:00 PM
Attachments:	image001.png RE Blind River Municipal Waste Disposal Site Expansion .msg

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If you click on the email correspondence attached..MECP goes int o detail about the turtle fencing criterias

---

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: Monday, May 29, 2023 1:37 PM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good Afternoon Josie,

Attached please find the latest correspondence between our office and the MECP SAR branch. Are the comments provided by MECP on May 18th enough for Blue Heron to finalize their EIS report?

Thank you,

_____
Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Sent: April 18, 2023 9:20 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

My work hours are form Tuesday to Friday 7AM to 5PM. Sorry I missed your call.

I am available today from 9Am to 10AM and 11Am to 5PM.

Josie

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: Monday, April 17, 2023 9:00 AM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>

Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good Morning Josie,

Are you available for a quick phone call this morning? We have a response ready for MECP and I just have a question regarding turtle gates.

Thank you,

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Sent: March 29, 2023 8:42 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: Re: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan, I am available this afternoon from 2:30pm to 4:30pm. You can call me anytime in that timeframe to discuss.

Josie

Sent from my iPhone

> On Mar 29, 2023, at 8:14 AM, Ryan Wilson <ryan@kresinengineering.ca> wrote:
>
> Good Morning Josie,
>
> How does your schedule look this afternoon? If there is a time that works best for you, please let me know and I will call you.
>
> Thank you,
>
> Ryan Wilson, P. Eng.
> Project Engineer
>
> Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Sent: March 22, 2023 12:43 PM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

I apologize for the late response. Things got very busy at my end.

I would be happy to have a call with you to discuss the correspondence we had with MECP and the exclusion fencing.

I am available all week from 9AM to 4:30PM.

I am available next week from Wednesday to Friday 9AM to 4:30 PM.

Josie

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: March 21, 2023 1:34 PM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good Afternoon Josie,

I am following up on my email below to ask when you may be available to discuss your correspondence with MECP as well as the exclusion fencing?

Thank you,

_____
Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Ryan Wilson
Sent: February 28, 2023 11:18 AM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Josie,

Thank you for passing along your notes from the meeting with MECP. Are you available for a call this week to discuss your email below?

Attached please find the base drawing we plan on marking up with our fencing layout which we can discuss during our call.

Thank you,

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Sent: February 16, 2023 10:10 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

- Good morning Ryan. We spoke with MECP and below is what we were able to identify.

For the Blanding's Turtle, MECP will require a formal email with the following information

1. Installation plan (map) showing where the fencing will be installed and any other turtle exclusions measures (turtle gats at entrances);
2. The type of fencing to be used (temporary, permanent) and material to be used; and
3. Work schedule.

- For this comment : Several bird species and monarch were also flagged in the desktop screening by the consultant. To determine whether habitat for these species is present at the site, we need to know the height of the grass in the cleared area, and whether this height is maintained. Is there any other vegetation, such as shrubs, present in the cleared area? We also need to know if there is any aggregate or fill stockpiled on the site (or that is regularly stockpiled at the site).

1. Grass Height: long grass is favored by meadowlark. Need to understand if the area is going to be maintained (i.e., mowed), and if

it was mowed last fall (making it unsuitable for this species). If it is not maintained/mowed, there are concerns that this could be meadowlark habitat. Especially interested about the edge habitat, near the borders of the grassed area.

2. Stockpiles: potential for bank swallow. If there are stockpiles on site, we will need to agree to the BMPs for Bank Swallow (i.e., sloping/tarping to prevent them from coming in this spring)
3. Aggregates: could be suitable for turtles, but this concern disappears if suitable exclusion fencing is installed.

Hope this helps clarify the questions you had. We can help you formalize a response letter to MECP for bullet A and for bullet B.

Jose

From: Josie-Ann Tessier
Sent: February 9, 2023 11:51 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan, I have call scheduled with Jackson for next week to discuss his comments about the grasses present in the cleared area. During that meeting, would you like for me to advise him on the decision about agreeing to the installation of exclusion fencing (which would still need to be followed-up with an email confirmation to advise them our the decision.)

Josie

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: February 9, 2023 9:56 AM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good Morning Josie,

I am following up on my email below asking if you've had a chance to discuss the grass height comment from Jackson Bellamy (MECP)?

Thank you,

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-

9965

From: Ryan Wilson
Sent: February 1, 2023 11:55 AM
To: 'Josie-Ann Tessier' <jtessier@BLUEHERONENV.COM>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Josie,

We have confirmed with the Town of Blind River that they agree to the installation of exclusion fencing as a component of the landfill expansion project. Have you had a chance to speak with Jackson Bellamy again regarding the "height of the grass in the cleared area" comment?

Thank you,

_____

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Sent: January 24, 2023 9:26 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good morning Ryan.

I have discussed with our senior team about the email you received from MECP. When you have a chance, give me a call and we can discuss.

Josie

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: January 18, 2023 11:38 AM
To: Josie-Ann Tessier <jtessier@BLUEHERONENV.COM>
Subject: FW: Blind River Municipal Waste Disposal Site Expansion

Hi Josie,

Thank you once again for the call this morning. Please see MECP's latest email below. Please let us know if Blue Heron feels that exclusion fencing will likely be recommended following additional surveys or habitat mapping. Once we send our site photos, we can discuss MECP's questions at the end of the email below.

Regards,

_____

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Sent: January 16, 2023 2:55 PM
To: Ryan Wilson <ryan@kresinengineering.ca>
Cc: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

I have reviewed the desktop screening from the consultant that was sent to us. It has flagged several species at risk that might be of concern at the site, including Blanding's Turtle. Our records show that there are multiple Blanding's Turtle occurrences in the wetlands and lakes north and east of the site. Since these wetlands are continuous, we would assume that Blanding's Turtles are found throughout this continuous wetland complex, including areas immediately adjacent to the site, in the absence of surveys. Therefore, we suggest that you use exclusion fencing, consistent with the *Reptile and Amphibian Exclusion Fencing: Best Practices* document (which I have linked and can be found along with other resources at https://www.ontario.ca/page/species-risk-guides-and-resources).

For the exclusion of Blanding's Turtle, 60cm is the recommended fence height with a buried depth of 10-20cm, and made out of an appropriate material (e.g., geotextile, fine wire mesh, wood lath snow fence, concrete, sheet metal, or vinyl). If the plan is to fence the site anyways, I would suggest incorporating the above-mentioned elements into the design so that it is effective in excluding Blanding's Turtles from the site. The fence should be erected outside the turtle active season (April 15th to October 15th) to avoid trapping any individuals within the site.

By agreeing to adhere to these mitigation measures, we would not require

any additional surveys or habitat mapping to make a more informed assessment, and your project would likely not be required to go through the permit process (pending any issues with other SAR). We would instead issue a letter of assurance which would allow you to proceed with the project, based on the advice we've given. If fencing the site, in a manner that is consistent with excluding Blanding's Turtles from the site, is not possible, we would require additional information, in the form of surveys and habitat mapping to assess potential impacts, and a permit may be required.

We believe that given the multiple occurrences of Blanding's Turtle in the wetland immediately adjacent to the site, and based on the biology of this particular species of turtle which regularly travels 500m overland between wetlands, that it would be in your best interest to prevent Blanding's Turtle from entering the site because it would reduce the likelihood that you would contravene the ESA (2007) by killing, harming, or harassing a Blanding's Turtle during the expansion and regular operation of the site.

Several bird species and monarch were also flagged in the desktop screening by the consultant. To determine whether habitat for these species is present at the site, we need to know the height of the grass in the cleared area, and whether this height is maintained. Is there any other vegetation, such as shrubs, present in the cleared area? We also need to know if there is any aggregate or fill stockpiled on the site (or that is regularly stockpiled at the site).

Thanks,

Jackson Bellamy
Policy Intern
Landscape Species Recovery Section
Species at Risk Branch
Ministry of Environment Conservation and Parks
jackson.bellamy2@ontario.ca
7057728341

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: November 7, 2022 10:13 AM
To: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Cc: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Good Morning Jackson,

If the Town requires additional waste disposal capacity in the future, they will undergo

another Environmental Assessment (EA) process to determine the preferred solution.

The existing site is not fenced but a perimeter fence will be proposed as part of the site expansion. Please see the attached OPSD drawing for the fence detail.

We will proceed with completing habitat mapping for Blanding's Turtle as well as determining whether Bobolink and Eastern Meadowlark habitat is present at the site.

Thank you,

_____
Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Sent: November 7, 2022 9:21 AM
To: Ryan Wilson <ryan@kresinengineering.ca>
Cc: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

Thanks for sending those shape files. We have reviewed what you sent us, and we a few questions about the site:

Will the site be expanded further, beyond what the shape files show, in the future?

Is the site currently fenced or will it be fenced, after the expansion is complete, and what kind of fence is it?

We have flagged a few Species at Risk in the area that need further assessment at the site: Blanding's Turtle, Bobolink, and Eastern Meadowlark. We are requesting that you complete habitat mapping for Blanding's Turtle and determine whether Bobolink and Eastern Meadowlark habitat is present at the site.

Let me know if you have any questions.

Thanks,

Jackson Bellamy

Policy Intern
Landscape Species Recovery Section
Species at Risk Branch
Ministry of Environment Conservation and Parks
jackson.bellamy2@ontario.ca
7057728341

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: November 1, 2022 4:36 PM
To: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Cc: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Jackson,

Please find the attached shape files for the proposed Blind River Landfill Expansion project.

Regards,

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Sent: November 1, 2022 3:59 PM
To: Ryan Wilson <ryan@kresinengineering.ca>
Cc: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

Thanks for submitting your preliminary screening. Could you please send us a shapefile of the proposed project footprint?

Thanks,

Jackson Bellamy
Policy Intern

Landscape Species Recovery Section
Species at Risk Branch
Ministry of Environment Conservation and Parks
jackson.bellamy2@ontario.ca
7057728341

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: October 24, 2022 4:57 PM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Cc: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>; Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hello,

Attached please find our preliminary screening form for the Blind River municipal waste disposal site (Site) expansion project as well as our responses to check-list items below:

List local Indigenous communities you contacted:
The following are the Indigenous communities consulted during the project's Environmental Assessment (EA) process:

- Metis Nation of Ontario
- Thessalon First Nation
- Bar River Metis Community
- Serpent River First Nation
- Mississauga First Nation
- Sagamok Anishnawbek First Nation
- Zhiibaahaasing First Nation
- Wikwemikong Unceded Territory
- Batchewana First Nation
- Garden River First Nation

List and field studies that were conducted to identify species at risk, or their habitat, likely to be present or absent at or near the site:
The Ministry of Natural Resources (Blind River Area Office) published a document titled "Blind River Water Management Plan, March 2007) wherein species at risk (SAR) are discussed (Section 3.2.8) within the planning area which includes the Site. Also, the online publication titled "Environmental Protection Review Report: Blind River Refinery" also discusses the Blanding's turtle as a SAR (Section 3.2.2). The Blind River Refinery is located approximately 10km to the west of the Site. This report can be found at the following link:
http://nuclearsafety.gc.ca/eng/resources/publications/reports/brr/index.cfm#sec3-2

During the EA process, KEC compiled the following SAR inventory using the previously available MNRF Species at Risk list:

1. Wood Turtle
2. Eastern Whip-Poor-Will
3. Blanding's Turtle
4. Bobolink
5. Bald Eagle
6. Black Tern
7. Peregrine Falcon
8. Lake Sturgeon
9. Milksnake
10. Snapping Turtle

Kresin Engineering Corporation (KEC) is currently retained by the Town of Blind River (Town) to complete the annual monitoring and operations report for the Site to be submitted to MECP. KEC has conducted a minimum of two (2) site visits per year at the Site for the past 15+ years. Groundwater and surface water sampling locations allow KEC to observe a large area during each site visit and therefore are able to note incidental observations of individual SAR or their habitat.

List what you think the likely impacts of your activity are on species at risk and their habitat (e.g. damage or destruction of habitat, killing, harming or harassing species at risk):

No impacts to SAR and their habitats are expected due to the expansion of the Blind River municipal waste disposal site. The proposed expansion areas are located immediately to the east, south and west of the existing fill area limits that have been previously cleared. KEC has not observed any individual SAR or indication of presence within the proposed expansion areas. There are no bodies of water and no tree removal required within the proposed expansion areas.

Thank you,

_____

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

From: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Sent: October 19, 2022 1:57 PM
To: Ryan Wilson <ryan@kresinengineering.ca>

Cc: Bellamy, Jackson (MECP) <Jackson.Bellamy2@ontario.ca>
Subject: RE: Blind River Municipal Waste Disposal Site Expansion

Hi Ryan,

Thank you for your email regarding the proposed expansion of the Blind River Municipal Disposal site. The assessment of impacts to species at risk (SAR) that may contravene the Endangered Species Act (2007) is a proponent driven process where it is the responsibility of the proponent to provide MECP SARB with a preliminary screening (PLS) of SAR in the area. I have attached the *Proponents Guide to Preliminary Screening* and a link to our website. Once completed, please forward the PLS to SARontario@ontario.ca.

Once the PLS has been received, my colleague Jackson Bellamy will be in touch with you regarding the project and any impacts to SAR, should any be identified.

Regards,
Mike

Mike R. Allan, MSc.
A/Management Biologist
Landscape Species Recovery Section
Species at Risk Branch
Ministry of Environment Conservation and Parks
705-313-0894
Mike.Allan@ontario.ca

From: Ryan Wilson <ryan@kresinengineering.ca>
Sent: October 13, 2022 9:44 AM
To: Allan, Mike (MECP) <Mike.Allan@ontario.ca>
Cc: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Blind River Municipal Waste Disposal Site Expansion

Good Morning Mike,

We are currently working on a Biological Impact Assessment for the expansion of the Blind River Municipal Waste Disposal Site (E 354621m, N 5116606m).

We were hoping that you could confirm if there are any species at risk in the area of the existing landfill and proposed expansion shown in the image below.

image001.png

Thank you,

_____

Ryan Wilson, P. Eng.
Project Engineer

Kresin Engineering Corporation - 536 Fourth Line East, Sault Ste. Marie, ON, P6A 6J8 - tel: 705-949-4900, fax: 705-949-9965

Blue Heron Environmental is committed to the highest quality of professionalism in assisting organizations in fulfilling their regulatory needs and stewardship goals.

Our clients and partners share in the success that comes from our years of practical experience in managing the risks associated with resource industry activities.

Timmins:	**705.264.4342**
Thunder Bay:	**807.251.9727**
Sudbury:	**705.929.9751**
Ottawa:	**613.617.2482**
Red Lake	**807.335.0038** **807.335.0224**

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