



- **Municipality of Greenstone**

**Environmental Screening Report
Expansion of Geraldton Waste Disposal Site
Municipality of Greenstone, Ontario**

Type of Document
Final

Project Number
THB-00006189-THB-400

Prepared By:
exp Services Inc.
1142 Roland Street
Thunder Bay, ON P7B 5M4
Canada

Date Submitted
May 1, 2013

LEGAL NOTIFICATION

This report was prepared by **exp** Services Inc. for the account of the Municipality of Greenstone.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **Exp** Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

TABLE OF CONTENTS

LEGAL NOTIFICATION	i
1.0 BACKGROUND AND DESCRIPTION OF ENVIRONMENTAL SCREENING PROCESS.....	1
2.0 SITE DESCRIPTION	4
3.0 EVALUATION OF POTENTIAL NEGATIVE ENVIRONMENTAL EFFECTS.....	6
3.1 SURFACE AND GROUND WATER	6
3.1.1 Effects on Surface Water Quality, Quantities or Flow.....	6
3.1.2 Effects on Ground Water Quality, Quantity or Movement.....	7
3.1.3 Effects on Surface or Ground Water from Accidental Spills or Releases (e.g., Leachate) to the Environment.....	10
3.2 LAND.....	10
3.2.1 Effects on Residential, Commercial, Institutional or Other Sensitive Land Uses within 500 m from the Site Boundary	10
3.2.2 Inconsistencies with Provincial Policy Statement, Provincial Land Use or Resource Management Plans	11
3.2.3 Inconsistencies with Municipal Land Use Policies, Plans and Zoning Bylaws (including Municipal Setbacks).....	11
3.2.4 Use of Lands not Zoned as Industrial, Heavy Industrial or Waste Disposal.....	12
3.3 AIR AND NOISE	12
3.3.1 Effects from the Emission of Greenhouse Gasses (e.g., Carbon Dioxide, Carbon Monoxide, Methane).....	12
3.3.2 Effects from the Emission of Dust or Odour.....	12
3.3.3 Effects from the Emission of Noise	13
3.4 NATURAL ENVIRONMENT.....	13

3.4.1	Effects on Rare (Vulnerable) Threatened or Endangered Species of Flora or Fauna or Their Habitat	13
3.4.2	Effects on Protected Natural Areas such as ANSIs, ESAs or Other Significant Natural Areas.....	13
3.4.3	Effects on Designated Wetlands	14
3.4.4	Effects on Wildlife Habitat, Populations, Corridors or Movement.....	14
3.4.5	Effects on Fish or Their Habitat, Spawning, Movement or Environmental Condition.....	15
3.4.6	Effects on Locally Important or Valued Ecosystems or Vegetation	16
3.5	RESOURCES	16
3.5.1	Practices Inconsistent with Waste Studies and/or Waste Diversion Targets (e.g., Disposal of Materials Subject to Diversion Programs)	16
3.5.2	Generation of Energy that Cannot Be Captured and Utilized	17
3.6	SOCIO-ECONOMIC.....	17
3.6.1	Negative Effects on Neighbourhood or Community Character	17
3.6.2	Aesthetic Impacts (e.g., Visual and Litter).....	18
3.6.3	Negative Effects on Local Businesses, Institutions or Public Facilities	18
3.6.4	Negative Effects on Recreation, Cottaging or Tourism	19
3.6.5	Negative Effects on the Economic Base of a Municipality or Community	19
3.6.6	Negative Effects Related to Traffic.....	20
3.6.7	Negative Effects on Public Health and Safety	20
3.7	HERITAGE AND CULTURE	21
3.7.1	Negative Effects on Heritage Buildings, Structures or Sites, Archaeological Sites or Areas of Archaeological Importance, or Cultural Heritage Landscapes	21
3.7.2	Negative Effects on Scenic or Aesthetically Pleasing Landscapes or Views.....	22
3.8	ABORIGINAL	22
3.8.1	Negative Effects on Land, Resources, Traditional Activities or Other Interests of Aboriginal Communities	22
4.0	SUMMARY AND CONCLUSION.....	24
5.0	CLOSING COMMENTS	25

APPENDICES

Appendix A	Notice of Commencement of Environmental Screening Process MOE Environmental Screening Criteria Checklist MTCS Screening for Impacts to Built Heritage and Cultural Heritage Landscapes Notice of Completion of Draft ESR Second Notice - Completion of Draft ESR Notice of Completion of Final Draft ESR Notice of Completion of ESR
Appendix B	Updated Design and Operations Plan with Closure Plan
Appendix C	Description of Consultation Activities (with Mailing List and Comments / Responses)
Appendix D	Evaluation of Potential Ecological Effects on Wetland

1.0 BACKGROUND AND DESCRIPTION OF ENVIRONMENTAL SCREENING PROCESS

Exp Services Inc. (formerly Trow Associates Inc.) was commissioned by the Municipality of Greenstone to conduct an Environmental Assessment Screening and prepare an Environmental Screening Report (ESR) in connection with an application to expand the Geraldton Waste Disposal Site (WDS).

As indicated in the project *Notice of Commencement* in Appendix A (distributed to potentially concerned parties in November 2008), the Ministry of the Environment (MOE) informed the Municipality that the Geraldton WDS is not in compliance with its Certificate of Approval (C of A – now called an Environmental Compliance Approval or ECA). In order to bring the site into compliance, the Municipality engaged **exp** (then Trow) to undertake the Environmental Screening Process (ESP) in accordance with O. Reg. 101/07. Although the site currently occupies a footprint (4.3 ha) that is essentially in accordance with a revised Land Use Permit (L.U.P.) issued by the Ministry of Natural Resources (MNR) in 1977, it has been operating out of compliance with the C of A (issued for the original 1.9 ha site in 1972) for some 20 years. This situation arose because an application to increase the approved area of the site to correspond with the area authorized by the revised L.U.P. (which would have resulted in a theoretical maximum approved waste capacity of some 400,000 m³) was never submitted to MOE, even though a legal survey of the site commissioned in 1983 shows the site occupying the currently-used 4.3 ha parcel. Subsequently, regulations were revised to require completion of an environmental assessment (EA) prior to obtaining approval for a site expansion.

The Municipality was advised by the MOE in 1993 that an EA would be required prior to submitting an application for an amended C of A (now ECA) to legally recognize the current situation of the expanded waste disposal site authorized by the revised L.U.P. However, due to an oversight, the additional lands began to be used for waste disposal without the required EA and C of A amendment. As of this writing, the quantity of waste and interim cover (est. 259,000 m³, extrapolated from results of May 2012 survey) at the site (including the original MOE-approved area of 1.9 ha and the additional L.U.P. area of 2.4 ha) is some 86,000 m³ greater than the approved volume of 173,000 m³ (based on calculations of theoretical maximum capacity of the originally-approved area). O. Reg. 101/07 allows for a volume increase of up to 100,000 m³ (for a maximum of 273,000 m³ for this site) to be approved through an ESP. This means that successful completion of the ESP for this site will allow for placement of an estimated additional 14,000 m³ of waste. Based on estimated annual waste volumes (including interim cover) of 8,500 m³, this would allow the site to continue to operate until about end-May 2014. The process of obtaining approval for alternative waste disposal option(s) is the subject of a separate undertaking. It should be noted that although closure of the site appears to be imminent, evaluation of alternative waste management options (being undertaken by others) will include continued use of the current site (subject to obtaining the necessary additional approvals).

The current site is the subject of an ongoing annual surface and ground water monitoring program (established in 2003) that was developed in consultation with the MOE. The amended C of A issued in

November 2008 (copy in Appendix B) requires submission of a written report every three years, starting in 2009. The most recent report, entitled *2010, 2011 and 2012 Environmental Quality Monitoring Report, Geraldton Landfill* (due April 30, 2013) has recently been completed. It presents the results of water quality monitoring conducted through 2012, and is posted on the Municipality's website (www.greenstone.ca) and referenced subsequently in this report. A draft *Updated Design and Operations Plan with Closure Plan* for the landfill was also prepared and submitted to the MOE, and is posted on the Municipality's website. In addition to downgradient attenuation lands currently approved, the updated D&O Plan incorporates buffer lands necessary to provide for a minimum 30 m buffer zone around the waste footprint, as required by the MOE's *Landfill Standards Guideline*. However, not all of the necessary buffer lands have been acquired as of this writing. Negotiations with a private landowner north of the current site have been unsuccessful, and it is understood that the Municipality is now proceeding with expropriation.

The MOE has developed a *Screening Criteria Checklist* that must be completed to identify if the project has any potential environmental effects. A draft Checklist was completed and submitted to the MOE for review, and recommended additions were made. A copy of the revised Checklist, completed as if the expansion of the site is proposed rather than largely a "fait accompli", is found in Appendix A. Criteria that were identified as requiring follow-up are addressed in the present ESR. The focus of the ESR is primarily on those criteria (e.g., surface and ground water quality) that have the potential for deterioration due to continued operation of the facility over its projected (limited) remaining lifespan.

In accordance with O. Reg. 101/07, the Environmental Screening Process (ESP) must be conducted as described in the *Guide to Environmental Assessment Requirements for Waste Management Projects* ("the Guide", March 2007). The Guide requires the completion of four mandatory public consultation points. As described in greater detail in Appendix C, an initial discussion document, termed a Draft ESR, was completed and posted on the Municipality's website in November 2009. A hard copy of the document was also provided to the MOE for review. However, due largely to delays associated with attempts to obtain the surrounding buffer lands required for the expansion, availability of the Draft ESR for review by the public and aboriginal communities was not formally publicised (including local newspaper) until July 2012. No comments or concerns from the public or aboriginal communities were received regarding the Draft ESR during a 60-day review period which expired on September 15, 2012. However, a formal response letter, dated October 22, 2012, was subsequently received from the Ministry of Tourism, Culture and Sport (MTCS). A copy of this letter, and **exp**'s response, is found in Appendix C, and appropriate revisions were made to the ESR. In addition, the MOE provided four comment letters (see Appendix C), dated October 27, 2009, September 19, 2012, November 6, 2012 and March 13, 2013. The second letter expressed the view that the second mandatory consultation to solicit public feedback for the purposes of identifying any issues or concerns was not adequate. Therefore, an additional notice was distributed to the mailing list, and was also published (October 31, 2012) and placed on the Municipality's website, requesting that all interested/concerned parties review the information previously provided (i.e., Notice of Commencement, Screening Criteria Checklist, and Draft ESR) and advise **exp** of any issues or concerns they may have. A 30-day response window was provided. Again, no comments from the public or aboriginal communities were received. In addition, in response to a recommendation reiterated by the MOE in their November 2012 letter, the Municipality attempted

to contact representatives of all potentially concerned aboriginal communities by telephone during late 2012 to inquire as to whether they would like to meet with the Municipality to discuss the proposed landfill expansion. This additional information was included in the Final Draft ESR made available for public review in January 2013, with an additional 30-day response window. As noted in the MOE's third review letter, the Guide also requires that a description of all phases and components of the project must be made available in the ESR. To meet this requirement, a draft *Updated Design and Operations Plan with Closure Plan* for the Geraldton WDS (**exp**, October 2012) was included as Appendix B to the Final Draft ESR.

The MOE's most recent review letter (March 13, 2013) regarding the Final Draft ESR requested that additional details regarding aboriginal consultation be included in the ESR. The Municipality subsequently clarified the specific nature of the telephone conversations (not all community representatives had been successfully contacted regarding their potential interest in a meeting). During late March 2013, the Municipality again attempted to contact by telephone those aboriginal representatives (generally the Chiefs) who had not been reached in late 2012. Leaders of three aboriginal communities on the original mailing list still could not be reached, and therefore letters were mailed to these individuals, as well as to the Red Sky Metis Independent Nation which had more recently expressed interest in the project. The present report has been revised to include the additional information requested, to the extent possible. No concerns or interest in a meeting were expressed by any of the aboriginal communities contacted. Additional details of the aboriginal consultation are given in Appendix C.

The present final ESR updates the Final Draft ESR to reflect current conditions and all comments received to date. A Notice of Completion of the ESR will be distributed and published to inform potentially-interested parties that the mandatory 60-day final review period has commenced. If no elevation requests are received during the 60-day review period, a Statement of Completion will be prepared and submitted to the MOE.

2.0 SITE DESCRIPTION

The Geraldton WDS is located along the north side of Highway 11, about 3 km southeast of Geraldton, Ontario. The location of the property is shown on Figure 1 of Appendix B.

According to the Ontario Ministry of Natural Resources (MNR), Map 5078, the regional geology in the area consists predominately of a glaciofluvial outwash plain with occasional bedrock knobs. The topography is generally knobby, hummocky, kettled and/or pitted with mainly moderate local relief and generally dry surface conditions.

The property currently functions as a landfill for the Municipality of Greenstone. It is irregularly shaped and covers an area of some 4.3 hectares (versus the currently-approved area of 1.9 hectares). The site generally occupies a historical borrow pit, which is understood to have later been used for several years as a stock car racetrack (probably some 40 to 50 years ago). For about the past 35 years, the site has been used as a landfill site.

As shown on Figures 2 and 3 of Appendix B, the disposal site and adjacent properties are hilly, with local relief of up to 20 metres. In general, areas to the south and east are elevated, while areas to the north and west are generally low-lying with some swampy conditions. No surface discharge from the swampy areas is apparent. A small hill is present at the northwest corner of the site.

Beyond the cleared area of the landfill, generally dense vegetation with mature trees is found toward the north, south and west, while long grass and minor brush are noted toward the east. Drainage at the site is controlled largely by site grading to low-lying areas near the north, east and west sides of the landfill. No streams are present on or in the immediate vicinity of the landfill. The nearest surface water body is Kenogamisis Lake, located about 400 m south of the landfill, but also extends to the east and west, though at greater distance from the landfill. Figures 1 and 3 (Appendix B) illustrate the general topography and surface water features surrounding the landfill site.

As of this writing, about 259,000 cubic metres of waste and interim cover (at an updated estimated average of 8,500 m³ per year) have been deposited in the landfill. As discussed in the *Updated Design and Operations Plan with Closure Plan* report (October 2012), the waste has apparently been deposited slightly beyond the existing approved property lines in nearly all directions (see Figure 2 of Appendix B). Efforts have been made in recent years to move the waste back within the property boundary, particularly along the east side.

The property is generally surrounded by Crown land to the east, private property to the north (including a Sludge Drying Bed operated under its own Certificate of Approval), and municipally owned property to the south and west. In addition to obtaining outright ownership of the actual 4.3 ha waste disposal site from the Crown (MNR), with the concomitant cancellation of the Land Use Permit, the Municipality recently acquired Crown lands adjacent to the site to the east and west to provide the necessary buffer zone as per the requirements of the MOE *Landfill Standards Guideline* (May 1998). A legal survey

(Location CL 16400) of the landfill site and buffer lands acquired from the Crown is included in Appendix B. Additional buffer lands immediately north of the site remain to be acquired from a private owner (see Figure 4 of Appendix B).

South of Highway 11 (southeast of the landfill) is MacLeod Provincial Park. West of the downgradient municipal property (attenuation zone) boundary (i.e., to Kenogamisis Lake) is land owned by Premier Gold. Surrounding features and land tenure are illustrated on Figure 4 (Appendix B).

3.0 EVALUATION OF POTENTIAL NEGATIVE ENVIRONMENTAL EFFECTS

The following evaluation addresses the various criteria identified in the Environmental Screening Criteria Checklist (Appendix A), in the order presented on the checklist.

3.1 Surface and Ground Water

3.1.1 Effects on Surface Water Quality, Quantities or Flow

The potential for the expansion of the Geraldton Landfill Site to cause negative effects on surface water has been recognized by both the MOE and the Municipality for several years.

The main concern in this regard is the potential for leachate-impacted ground water (see below) to discharge to Kenogamisis Lake. Although water monitoring requirements had not yet been incorporated into the C of A (they have since), to address the potential for water quality degradation, in 2003 the MOE requested that a surface water and ground water sampling program be instituted for the landfill. The Municipality commissioned **exp** (then Trow) for this work. As discussed below, in consultation with the MOE, several monitoring wells were installed on and near the site, to determine groundwater flow direction and locations of potential off-site receptors (e.g., Kenogamisis Lake). It was determined that the principal ground water flow direction from the landfill site was generally to the west-southwest (see Figure 8 in Appendix B). Therefore, to monitor surface water impact, two downgradient sampling locations were established in Kenogamisis Lake southwest of the landfill (see Figure 3 of Appendix B). In accordance with the amended C of A (dated November 2008), an additional surface water monitoring location was established in Kenogamisis Lake (Barton Bay). The amended C of A requires twice-annual (spring and fall) surface and groundwater monitoring for some 50 parameters. The monitoring results for 2003 and 2006 through 2012 are found in the report entitled *2010, 2011 and 2012 Environmental Quality Monitoring Report, Geraldton Landfill* (April 2013), which is posted on the Municipality's website.

In general, as discussed in the above-referenced monitoring report, available surface water quality results do not indicate the presence of unacceptable leachate impact to Kenogamisis Lake. In addition, calculations of the required size of a downgradient attenuation zone necessary to prevent exceedances of Provincial Water Quality Objectives in the lake suggest that there is sufficient land between the landfill and the lake to adequately attenuate leachate.

The surface water monitoring program will continue throughout the remaining life of the landfill (i.e., 2013 and early 2014) and following closure (subject to modification). In accordance with the Contingency Plan for the site (refer to **exp's** *Updated Design and Operations Plan with Closure Plan* in Appendix B), which has been reviewed and accepted by MOE, if unacceptable impacts to the lake become apparent or are predicted, appropriate corrective measures will be taken.

3.1.2 Effects on Ground Water Quality, Quantity or Movement

In 2003, **exp** (then Trow) was commissioned by the Municipality to initiate an investigation of potential negative effects on ground water quality due to landfill leachate. This was not required by the C of A in effect at the time. However, twice annual ground water monitoring for some 50 parameters is now required by an amended C of A issued in November 2008.

Based on an MOE recommendation during an initial site reconnaissance conducted in early 2003, a preliminary investigation of ground water flow patterns beneath the Geraldton Landfill Site was undertaken in June 2003. This was accomplished by the installation of nine (9) temporary observation wells (OB1 to OB9) across the site. Depths of the boreholes ranged from 3.1 m to 10.7 m. Elevations of the ground surface and 'top-of-pipe' were measured, and referenced to a benchmark located near the southeast corner of the site. Ground water elevations indicated a ground water flow direction to the west-southwest.

To investigate the orientation and chemical character of the contaminant plume originating from the subject landfill, seven (7) monitoring wells were installed at the locations shown on Figures 2 and 4 (Appendix B) as MW1 to MW6, inclusive. This included a nested pair of wells at MW3. The monitoring wells locations were selected based on the ground water flow patterns deduced during the initial investigation, and were agreed upon by the MOE. Upon installation of the monitoring wells, the temporary standpipes were removed. Well depths ranged from 3.8 m to 12.2 m.

Determinations of ground water flow velocities at the site were based on hydraulic conductivity estimated from the results of grain size distributions for selected samples recovered from screened sections of the monitoring wells.

No quantities of buried refuse were noted below the ground water table at any of the standpipe or monitoring well locations. At MW5 (source well), garbage was present to a depth of about 4.6 m; however, the ground water table was at about 6.5 m depth.

To better investigate the orientation and chemical character of the contaminant plume originating from the subject landfill, four (4) additional monitoring wells were installed in 2006 at the locations shown on Figures 2 and 4 (Appendix B) as MW8, MW9, MW10A and MW10B. The general monitoring well locations were approved by MOE, but were modified based on site conditions. Well depths ranged from 4.6 m to 18.3 m.

In addition, in 2009, "alert" well MW7 was installed immediately downgradient (west) of well MW3A/3B (as shown on Figure 3 of Appendix B), to provide data for comparison with "trigger levels" indicative of potential future exceedances of MOE criteria (Reasonable Use or PWQO criteria, as appropriate) at the downgradient attenuation zone boundaries. Further, in accordance with the new C of A, an additional monitoring well (MW11) was installed near the attenuation zone boundary downgradient of well MW7 and due north of existing well MW10.

Details of the well installations are given on the Borehole Logs in the 2009 monitoring report and are summarized below:

- MW7 – well installed to 7 m depth, screened in silty sand and sand from 3.6 m to bottom.
- MW8 – well installed to 18.3 m depth, screened in lower sand from 13.8 m to bottom.
- MW9 – well installed to 10.7 m depth (refusal on presumed bedrock), screened in sand/silt and silt from 6.1 m to bottom.
- MW10A – well installed to 4.6 m depth, screened in lower sand beneath muskeg from 2.8 m to bottom.
- MW10B – well installed to 6.1 m depth (hole drilled to 8.5 m depth), screened in lower sand layer from 4.0 m to 6.1 m (heaving sand prevented the well installation to bottom of hole).
- MW11 – well installed to 4.6 m depth, screened in silt from 1.5 m to bottom.

Elevations of the ground surface and ‘top-of-well’ at each monitoring well were surveyed by Delta Survey Inc. Ground surface and ground water elevations (geodetic, as measured in October 2009) are illustrated on Figure 3 (Appendix B). Well MW6 is located upgradient at the north end of the landfill, and is considered to indicate background conditions not influenced by landfill leachate. The remaining wells are generally considered to represent “source” conditions (well MW5), cross-gradient conditions (wells with little potential for leachate impact) or downgradient conditions with potential landfill leachate impact. The cross-gradient and downgradient wells are located within the approved attenuation zone (Figure 3 of Appendix B). By definition, groundwater impact within the attenuation zone is expected, and use of groundwater is restricted (i.e., potable wells are not permitted). However, impact at and beyond the downgradient attenuation zone boundary that exceeds criteria for “reasonable use” established in accordance with MOE Guideline B-7 (Reasonable Use Policy) would be considered to be unacceptable and could require implementation of contingency measures (such as additional expansion of the attenuation zone).

Groundwater samples were collected in 2003, and 2006 through 2012. The results of the monitoring conducted in 2003, and 2006 through 2012 are found and discussed in the report entitled *2010, 2011 and 2012 Environmental Quality Monitoring Report, Geraldton Landfill* (April 2013), which is posted on the Municipality’s website.

In general, as discussed in the above-referenced monitoring report, available ground water quality results reveal leachate impact beneath and immediately down-gradient (west-southwest) of the landfill. Elevated levels (i.e., above background well results and even source well results for some parameters) of TDS, DOC, organic nitrogen, iron, manganese and arsenic in wells MW10A/10B near the proposed attenuation zone boundary could be due to natural conditions or other sources (e.g., road salting, historical mining-related activities). Impact from landfill leachate is not considered likely at this location. Regardless, results of groundwater and surface water monitoring conducted to date do not indicate the presence of unacceptable leachate impact to Kenogamisis Lake. In addition, calculations of the required size of a downgradient attenuation zone necessary to prevent exceedances of Provincial Water Quality Objectives in the lake suggest that there is sufficient land between the landfill and the lake to adequately attenuate leachate.

Due to the potential for exceedances of Reasonable Use policy criteria beyond the downgradient boundary of the current attenuation zone (as approved by the amended C of A dated November 2008), MOE's Regional Hydrogeologist recommended that the Municipality proceed with the acquisition of additional attenuation lands consisting of the 15.4 ha former Barrick Gold (now Premier Gold) parcel bordering Kenogamisis Lake (see Figure 4 of Appendix B). However, as discussed in the most recent monitoring report for the years 2010, 2011 and 2012 (April 2013), the results of monitoring at newer well MW11 do not suggest impact beyond the current attenuation zone boundary. Therefore, the Municipality does not propose to proceed with acquisition of the Premier Gold lands at this time.

The groundwater monitoring program will continue throughout the remaining life of the landfill and following closure (subject to modification based on ongoing results). Monitoring requirements will be stipulated in the ECA. As required by the current C of A, trigger values potentially indicative of unacceptable impact to groundwater (which could subsequently impact surface water) were developed and submitted to MOE in November 2009. The trigger values were acknowledged in a C of A amendment dated March 7, 2011 (copy in Appendix B). In accordance with the Contingency Plan for the site (refer to the *2009 Environmental Quality Monitoring Report*), which has been reviewed and accepted by MOE, if unacceptable impacts (i.e., to Kenogamisis Lake) become apparent or are predicted, appropriate corrective measures will be taken. These measures could include some or all of the following (in approximate order of implementation):

- Expansion of the attenuation zone (assuming agreement can be reached with the landowners)
- Excavation of any waste buried below ground water table
- Drainage improvements to lower ground water table beneath the waste footprint
- Increased amount and/or frequency of cover material
- Use of lower permeability cover material
- Early capping and closure of portion(s) of waste pile
- Restriction of volumes and types of waste deposited at the site

- Active leachate control (e.g., interception via a “French drain” system and redirection or capture for circulation or treatment)
- Excavation and hauling of waste to an alternative site
- Early capping/closure of entire landfill.

Due to the limited remaining lifespan of the landfill, it is unlikely that early capping and closure of the site will be required.

As described further in Section 3.2.1, Kenogamisis Provincial Park is located southeast of the Geraldton WDS on a peninsula of Kenogamisis Lake. The park sources potable water from a single well located near the park maintenance garage and warehouse area about 500 m south of Highway 11. The water is tested daily for free chlorine and weekly for bacteria. Historical results (for three weeks of testing in late May and June) provided to **exp** indicated detectable total coliform or *E. coli*. In any event, based on an apparent groundwater flow direction to the west-southwest from the waste disposal site, the water wells in the park are not directly hydraulically downgradient of the waste disposal site, and no impact to these wells would therefore be anticipated, regardless.

3.1.3 Effects on Surface or Ground Water from Accidental Spills or Releases (e.g., Leachate) to the Environment

Potential effects of landfill leachate on surface or ground water quality are addressed in the preceding two sections of this report.

3.2 Land

3.2.1 Effects on Residential, Commercial, Institutional or Other Sensitive Land Uses within 500 m from the Site Boundary

The currently-approved 21.7 ha attenuation zone for the landfill (with approximate boundaries as shown on Figure 3 of Appendix B) encompasses municipally-owned land south and west of the landfill, as well as the adjacent section of the Highway 11 right-of-way (MTO land). The attenuation zone extends some 300 m west of the landfill, and some 450 m southwest of the landfill. Kenogamisis Lake is located about 550 m west and 700 m west-southwest of the landfill. There are no sensitive land uses within 1 km in these directions. Similarly, there are no residences or other sensitive land uses within 500 m to the north or east of the landfill (crown land). MTO holds an aggregate permit for extraction of sand and gravel from a pit immediately northeast of the landfill site.

However, MacLeod Provincial Park is located to the southeast of the landfill, immediately south of Highway 11 (see Figures 1 and 4 of Appendix B). The park is classified as a “recreation park”, with the focus on family fun (swimming, camping, fishing, hiking, etc.). Services available include electricity, flush

toilets, and showers. The park is open seasonally (May to September) for camping and day use, and is also the site of the annual Geraldton Music Jamboree (August long weekend).

As described previously, available information indicates that groundwater flow from the landfill is primarily in a west-southwest direction, and leachate impact to the park as a result of southeasterly flow would not be anticipated (indeed, groundwater levels appear to rise immediately south of the landfill). Park drinking water (provided by a single potable well) is tested regularly, and no bacterial impact is apparent.

The landfill site is generally well managed with adequate cover being applied (see MOE Inspection Report [Dec. 22, 2008] included in Appendix B), and no concerns related to off-site effects of odour, vermin, dust or blowing garbage have been noted to date. There are, however, potential minor negative aesthetic effects to park users as a result of traffic along the adjacent highway bringing refuse to the site. On the other hand, the location of the landfill site close to the park is a convenience to the park operators in that garbage generated in the park only has to be hauled a short distance for disposal. Regardless, continued use of the park for an anticipated maximum two-year period should not result in any increase in negative aesthetic effects to park users beyond those present during the historical operation of the landfill to date. Although no requirements for additional mitigative measures in this regard are anticipated, the Municipality is prepared to address any future complaints or concerns that may arise.

3.2.2 Inconsistencies with Provincial Policy Statement, Provincial Land Use or Resource Management Plans

To the best of exp's knowledge, the proposed expansion of the Geraldton Landfill site, which is required to recognize the current waste footprint and allow the site to continue to operate until about the end of May 2014, is not inconsistent with the Provincial Policy Statement, provincial land use or resource management plans. The current approved area of the site is based on a Land Use Permit issued by the MNR in 1973, while the expansion area (subject of the current undertaking for approval) is based on a revised Land Use Permit (total area 4.3 ha or about 11 acres) issued in 1977. The Municipality recently purchased this land (and some adjacent buffer /attenuation lands) from the MNR, and the Land Use Permit has been cancelled.

3.2.3 Inconsistencies with Municipal Land Use Policies, Plans and Zoning Bylaws (including Municipal Setbacks)

The Municipality of Greenstone has not identified any inconsistencies of the proposed expansion of the landfill site with regard to municipal land use policies, plans or zoning bylaws (including municipal setbacks).

3.2.4 Use of Lands not Zoned as Industrial, Heavy Industrial or Waste Disposal

The Municipality of Greenstone has stated that there are no conflicts between the proposed expansion of the Geraldton Landfill and zoning regulations.

3.3 Air and Noise

3.3.1 Effects from the Emission of Greenhouse Gasses (e.g., Carbon Dioxide, Carbon Monoxide, Methane)

Decomposition of waste in landfills produces greenhouse gasses, primarily methane. More and more of the larger municipal landfills are incorporating a system of wells to allow the generated methane to be captured for use as fuel for heating or electrical generation purposes. However, this is impractical and not cost-effective for small facilities such as the Geraldton Landfill.

As indicated in the MOE's Inspection Report (found in Appendix B), there is no requirement for methane gas control systems at the Geraldton Landfill. Although methane gas generation rates have not been estimated (e.g., using the Scholl Canyon model), quantities of methane generated at the site would be relatively small compared with larger municipal landfills. Due to the predominantly coarse (sand and sand & gravel) soils at the site (former aggregate pit), methane would be expected to be readily released to the air. There are no enclosed structures on or in the immediate vicinity of the site that could accumulate methane to dangerous levels.

Although the release of methane from the site will contribute to global warming, this contribution is very small on a global scale. Also, the amount of methane released during the decomposition of the waste would be similar regardless of where the waste were placed (i.e., whether in an expanded Geraldton site or elsewhere). However, if the expansion were not approved, the waste would have to be hauled to an alternative location (e.g., Longlac landfill), and this would result in additional greenhouse gas emissions (carbon dioxide, carbon monoxide) due to emissions from combustion of fuel in vehicles used to haul the waste the extra distance. This is therefore an argument in favour of the proposed expansion.

Although vehicle traffic accessing the landfill site will generate greenhouse gas emissions, these are not a concern from a local impact perspective (i.e., quantities are small and dilution is great so that no measurable local increases in gas concentrations occur). From a global perspective, as stated above, the impact is less than if the garbage had to be hauled a greater distance to an alternative location.

3.3.2 Effects from the Emission of Dust or Odour

As discussed in Section 3.2.1 above, no off-site negative effects from the emission of dust or odour have been identified to date. Should complaints arise in future, they will be addressed in a responsible manner by the Municipality.

3.3.3 Effects from the Emission of Noise

As indicated in Section 3.2.1 above, there have been no noise concerns identified to date from the operation of the landfill. Hours of operation of the landfill site are noon to 5 p.m. (Tuesday, Wednesday, Thursday, Saturday), and vehicle traffic accessing the landfill site should not create any significant additional noise impact to park users, beyond that currently generated by routine traffic on Highway 11. Garbage trucks dump Monday through Friday at 3 p.m. A bulldozer applies daily cover between 5 and 6:30 p.m. (except Sunday). Considering the distance of the waste disposal site from the areas of the park used by the public (typically 500 m or more), and the intervening lands, no negative noise effects on users of the park (which is open to the public from May to September) are anticipated.

3.4 Natural Environment

3.4.1 Effects on Rare (Vulnerable) Threatened or Endangered Species of Flora or Fauna or Their Habitat

As previously indicated, the proposed waste disposal site expansion would permit the site to receive an additional 100,000 m³ of waste and interim cover beyond what it is currently approved to receive. However, this amount consists of some 86,000 m³ that have already been deposited, with an additional 14,000 m³ of waste capacity (including interim cover) remaining. The proposed expansion does not entail an expansion of the existing footprint, although it will formally approve the expansion of the footprint that occurred following the increase in area authorized by the amended Land Use Permit from MNR. Therefore, the expansion itself does not have the potential to result in any effects on rare, threatened or endangered species of flora or fauna or their habitat that could potentially be present at the site.

A wetland (Barton Bay Wetland) is present downgradient of the site, bordering the west side of Kenogamisis Lake, on lands currently owned by Premier Gold. It is understood that Premier Gold does not envisage any mineral resource development activity on these lands. However, there is a risk of some leachate impact to the lands.

Northern Bioscience of Thunder Bay was commissioned to assess the potential effects of the proposed landfill site expansion on the wetland. The evaluation report is found in Appendix D. The Northern Bioscience report concluded that the Barton Bay Wetland is not considered a provincially significant wetland. No species at risk or provincially rare species were noted.

3.4.2 Effects on Protected Natural Areas such as ANSIs, ESAs or Other Significant Natural Areas

As indicated, MacLeod Provincial Park, a 74-hectare Recreational Class park, is situated on a peninsula on Kenogamisis Lake, across Highway 11 southeast of the waste disposal site. Given that the Barton Bay Wetland is not ranked as “provincially significant” (see Appendix D), the park is the only significant

natural area identified in the vicinity of the Geraldton WDS that is potentially susceptible to negative effects from the proposed expansion of the landfill.

As previously described, based on available information concerning groundwater flow patterns, the park itself is not directly hydraulically downgradient of the Geraldton WDS. As a result, no significant leachate impacts to the park's ground water are anticipated. However, there are potential additional impacts of an aesthetic/nuisance nature, including:

- Noise impact – Noise from vehicles and equipment accessing and servicing the WDS could impact park users when both the park and WDS are open (see Section 3.3.3 above).
- Aesthetic impairment - Improper disposal or management of garbage could result in blowing litter along the south boundary of the WDS, near the highway, which could be unsightly to persons accessing the park and to other travellers on the highway. However, the MOE's most recent inspection report (December 22, 2008) noted that wastes are covered on a daily basis, and at the time of the inspection, the site was very well covered, with no visible wastes and no evidence of scavenging.
- Unpleasant odours – As indicated in Sections 3.2.1 and 3.3.2 above, the risk of nuisance odours impacting park users is negligible, due to the separation distance and the use of good management techniques at the park (as noted in the MOE's most recent inspection report referred to above).

The above effects, if any, have apparently been minor to date, as evidenced by the complete absence of related complaints (i.e., regarding noise, blowing garbage, etc.) from park users or the general public. Should complaints arise in future, they will be addressed in a responsible manner by the Municipality.

3.4.3 Effects on Designated Wetlands

As indicated above, Northern Bioscience concluded that the Barton Bay Wetland is not considered a provincially significant wetland. Their report further concluded that impacts from the landfill site expansion on wetland function and natural features are expected to be minimal as long as drainage patterns remain relatively intact, nutrient impact is not significantly increased, and there is little or no removal of vegetation, excavation or fill in the wetland area. The expansion of the landfill and further operation for a maximum of two years is not anticipated to result in a breach of any of the foregoing conditions.

3.4.4 Effects on Wildlife Habitat, Populations, Corridors or Movement

Expansion of a landfill site located in a rural area will generally cause some unavoidable effects on wildlife habitat, populations, corridors and/or movement, because some land that was formerly available as habitat by local animal and bird species will no longer be available due to its use for refuse disposal. It is important to note, however, that such effects would generally occur regardless of the

actual location of the landfill. In the case of the Geraldton landfill, however, there are two additional factors that minimize/mitigate any actual additional negative effects in this regard. These are:

1. The Geraldton WDS is located in a former aggregate extraction area (sand and gravel pit). Disruption to animal and bird habitat had already occurred due to the previous activities in the area, prior to its use as a landfill.
2. The expansion being applied for will not increase the landfill footprint beyond what has existed for a number of years. The landfill has been operating on the additional six acres (about 2.4 ha) authorized by the revised Land Use Permit issued by the MNR in 1977. The purpose of the present application for expansion is to legally recognize this additional footprint in an amended MOE Environmental Compliance Approval (formerly called a Certificate of Approval), and to allow an additional 100,000 m³ of refuse placement within the existing footprint, of which about 86,000 m³ has already been placed. The remaining 14,000 m³ would be deposited between now and about the end of May 2014. It is anticipated that the landfill would be formally closed at the end of that period and revegetated to facilitate the return of the site to a natural habitat.

3.4.5 Effects on Fish or Their Habitat, Spawning, Movement or Environmental Condition

Kenogamisis Lake is an important local recreational fishery (walleye and northern pike). If leachate from the Geraldton WDS were to impact the lake, there is a potential for deleterious effects on the fish population (e.g., due to undesirable water chemistry [such as pH or metal concentration] changes that could affect viability of eggs and/or the survival of fry). Monitoring conducted by MOE has previously determined that the lake water and (presumably) sediments have been impacted by historical gold mining/refining activities (MacLeod Provincial Park is named after an abandoned gold mine). Levels of arsenic measured in Barton Bay have exceeded the Provincial Water Quality Objective. Considering this existing impact from other sources, additional impact from landfill leachate would be especially undesirable. Municipal landfill leachate is typically acidic, and the acidity has the potential to dissolve and mobilize metals (such as iron and manganese) into groundwater that can be discharged into a downgradient surface water receptor (i.e., Kenogamisis Lake, in this instance).

Monitoring of surface water in Kenogamisis Lake downgradient of the Geraldton WDS is included in the ongoing monitoring program for the landfill. Available results have not revealed any measurable impacts attributable to the landfill. Also, as described in the historical monitoring reports prepared for the site, dilution calculations indicate that the currently approved attenuation zone is sufficiently large to mitigate any potential effects beyond the boundaries of the attenuation zone. Nevertheless, the potential for future impacts to surface water cannot be entirely ruled out (e.g., there could be an undetected leachate pathway that facilitates the migration of relatively undiluted leachate to the lake), and the surface water monitoring program will continue for the foreseeable future. Should negative effects to surface water become apparent or predicted in future, the Contingency Plan for the landfill

would take effect. As previously described (Section 3.1.2), contingency measures could include interception and treatment/disposal of leachate, if necessary.

3.4.6 Effects on Locally Important or Valued Ecosystems or Vegetation

The reader is referred to Section 3.4.3 for a discussion of potential negative effects of the proposed waste disposal site expansion on a downgradient wetland (Barton Bay Wetland), and to Sections 3.1 and 3.4.2 for a discussion of potential negative effects on the flora, fauna and related resources of MacLeod Provincial Park (including quality of groundwater and of surface water in Kenogamisis Lake). No significant negative effects have been identified to date.

3.5 Resources

3.5.1 Practices Inconsistent with Waste Studies and/or Waste Diversion Targets (e.g., Disposal of Materials Subject to Diversion Programs)

A formal Waste Management Plan that would include identification and quantification of waste streams within the Municipality of Greenstone has not yet been conducted, although such an undertaking would be required in connection with the establishment of the new waste disposal site that the Municipality intends to have operational within two years (i.e., to approximately coincide with the closure of the Geraldton WDS that is the subject of the current environmental screening study).

The amended C of A for the current site (dated November 2008) contains various provisions to facilitate waste diversion. These include safe and environmentally responsible handling of refrigerated appliances, propane cylinders, scrap metal (with off-site transfer at least twice annually), tires, and other recyclable materials.

Notwithstanding the foregoing language in the amended C of A, however, currently recycling facilities at the site are limited. Although the Municipality is committed to the principle of waste minimization through recycling, as described in the draft *Updated Design and Operations Plan with Closure Plan* for the Geraldton WDS (October 2012), there is currently no formal recycling program for household wastes such as plastics, cardboard, steel cans and bottles. Distance from major markets and the current low prices for recycled materials make it difficult to justify spending monies on recycling programs. However, the Municipality continues to investigate options and costs with the aim of establishing a recycling depot for household wastes in future. It is possible that establishment of collection bins for cardboard would coincide with an outright ban on disposal of cardboard within the landfill (such as has been instituted in Marathon).

As requested in the MOE's Inspection Report for the site (December 2008), the Municipality will also investigate the option of holding regular Household Hazardous Waste Days (with concomitant public education) to divert potentially hazardous materials such as paints, solvents, batteries, etc. from the landfill. The amended C of A contains various requirements for handling, storage and disposal of

household hazardous wastes which must be complied with in the event such a facility is established. However, given the current economic climate, funds for these activities are scarce, and it is perhaps more realistic to include such recycling programs in conjunction with the establishment of the new landfill site which is required within two years.

The current site does, however, have designated drop-off locations for recycling of tires, metallic debris and white goods, including refrigeration equipment, in compliance with the C of A. These items are picked up on an as-needed basis by appropriately qualified and licensed recycling firms. The site accepts refrigeration equipment regardless of whether it has been tagged to verify CFC removal, but a drop-off tag must first be purchased to cover the cost of disposal. The Municipality has assumed the responsibility of ensuring that any CFCs in untagged equipment are removed by a licensed contractor prior to pick-up for recycling.

A licensed septic sludge disposal area is located immediately north of the Geraldton WDS (see Figure 3 of Appendix B), operating under a Certificate of Approval issued to the private landowner. There is also a licensed metal recycling depot about 5 km west of the landfill. Metals to be recycled are picked up from the Geraldton Landfill by the recycling depot operator (Mr. Sylvio Brousseau) on a regular basis.

3.5.2 Generation of Energy that Cannot Be Captured and Utilized

As previously discussed (Section 3.3.1), methane gas is generated during the decomposition of organic-based waste. Large, established landfill sites can produce sufficient volumes of methane to make capture of the gas for controlled combustion to generate usable heat, electrical power and/or pressurized steam a viable practice. Indeed, a facility for capture and use of methane has recently been constructed at the John Street Landfill operated by the City of Thunder Bay.

It is generally recognized that the cost/benefit ratio is not favourable to the establishment of methane gas capture/use facilities at smaller rural landfills such as the Geraldton WDS, however, and there are no plans to capture methane gas at the Geraldton site. The MOE Inspection Report (December 2008) notes that there is no requirement for methane gas control systems at the site.

3.6 Socio-economic

3.6.1 Negative Effects on Neighbourhood or Community Character

It is well recognized and understood that establishment of a landfill site can have a detrimental effect on the surroundings. Indeed, it is precisely due to opposition from various parties, including nearby residents, recreational users, business owners, etc., who are largely concerned about negative effects on property values, and/or who may have concerns about environmental degradation, that it is generally difficult to obtain approval for a new landfill site.

However, in the case of the proposed formal expansion of the Geraldton WDS, any additional negative effects (as discussed elsewhere in this report) would appear to be minimal. This is largely because the site has been operating since the early 1970's, and has been utilizing the current (and proposed) waste disposal footprint for the past 25 or so years. As previously explained, the purpose of the expansion application is mainly to legally recognize the existing situation. The application would allow the site to continue to operate, but only until approximately mid-2014, after which time the site would be closed in accordance with the requirements of the closure plan found in Appendix B (in draft form but not yet approved).

As previously noted, a *Notice of Commencement of the Environmental Screening Process for Expansion of the Geraldton Waste Disposal Site*, dated November 12, 2008, was published in the local newspaper (two occasions – November 12 and November 19, 2008). The Notice, along with an explanatory cover letter and copy of the *Environmental Screening Criteria Checklist* (which the current document is addressing) was also mailed to potentially-interested parties, including aboriginal groups. It was also made available online (www.greenstone.ca). More recently, a *Notice of Completion of the Draft Environmental Screening Report* was published (local newspaper) and distributed (originally on July 18, 2012, with a Second Notice dated October 31, 2012). MOE and MTCS provided review comments, which have been incorporated into the present document, as considered appropriate. The reader is referred to Appendix C for a complete description of public consultation activities and comments/inquiries received.

To date, there have been no concerns of note expressed by any other party in connection with the proposed undertaking. This would appear to reflect the fact that potentially affected parties understand that what is being proposed does not entail significant negative effects beyond any that may already be associated with the historical operations at the site.

3.6.2 Aesthetic Impacts (e.g., Visual and Litter)

There is a treed buffer zone between the site and the highway, and the landfilling area is not visible to persons travelling along the highway.

Other potential aesthetic impacts (i.e., litter, odour) have been addressed previously (e.g., Section 3.4.2).

3.6.3 Negative Effects on Local Businesses, Institutions or Public Facilities

No nearby businesses or institutions have been identified that could be negatively impacted by the expansion of the Geraldton WDS.

Potential negative effects on the nearby MacLeod Provincial Park have been addressed previously (Section 3.4.2).

3.6.4 Negative Effects on Recreation, Cottaging or Tourism

Potential negative effects to MacLeod Provincial Park (recreational class park) have been previously addressed in this report. The park is open seasonally (May to September) for camping and day use, and is also the site of the annual Geraldton Music Jamboree (August long weekend).

The Geraldton Walleye Classic (fishing tournament) is held annually at Kenogamisis Lake over three days in June. An article that was published in the *Thunder Bay Chronicle-Journal* newspaper praised the tournament organizers and contained no criticism related to the presence of the nearby landfill site or other matters.

There are private residences, cottages, a motel, a Fish and Game Club and a resort (Kenogamisis Lake Resort) within a few kilometres of the WDS, but none are close enough (i.e., within 500 m) to the waste disposal site to be potentially directly impacted by the site. There is an 18-hole golf course (Kenogamisis Golf Club) on Highway 584, on the outskirts of the Town of Geraldton, but again this facility is several kilometres from the waste disposal site, and no negative impacts from the proposed legalization of the waste disposal site expansion would be anticipated.

Although there are potential negative effects to recreation and cottaging associated with the proximity to a waste disposal site (e.g., odour, noise, litter, impacts to ground water and/or surface water quality, as previously discussed), the proposed site expansion would have minimal additional impact over that which currently exists due to the presence of the landfill site. The landfill footprint is not increasing from that which has existed for the past 20 or so years. Site operating conditions (hours, wastes allowed, method of filling, etc.) would not change over those currently approved. The proposed expansion would simply recognize the existing waste footprint and allow the site to continue to accept domestic waste for up to a further two years.

There is a potential positive effect on recreation and cottaging that should not be overlooked. A landfill site can be considered to be a “necessary evil”. Having a landfill site situated close to where garbage is generated (e.g., cottages and campgrounds) facilitates the controlled and approved disposal of garbage that might otherwise be burned (with possible undesirable consequences including air pollution and forest fires) or improperly disposed of (e.g., left at the roadside or tossed into the forest).

3.6.5 Negative Effects on the Economic Base of a Municipality or Community

The proposed expansion of the Geraldton WDS, which would recognize the current waste footprint and allow the site to continue to receive municipal waste for up to a further two years, is not expected to entail any significant negative effects on the economic base of the Municipality of Greenstone (including the Town of Geraldton). Certainly, operating a waste disposal site does require significant expenditure of funds, but as previously noted, it is a necessary expenditure in our society. In actual fact, were the proposed expansion not to proceed, the Municipality of Greenstone’s total waste disposal costs would almost certainly increase, because waste currently disposed of at the Geraldton WDS would have to be hauled a greater distance to an alternate approved site (e.g., Longlac WDS). The additional waste loading would also reduce the remaining lifespan of the alternate site(s). These additional costs (both to

the Municipality and to private users of the Geraldton site) would more than outweigh the cost of an operator at the Geraldton WDS. There would also be significant funds required to close the Geraldton site (recognizing that closure costs will be incurred eventually, regardless), while monitoring and reporting costs would remain essentially unchanged (at least for the short term).

As discussed, the adjacent MacLeod Provincial Park is operated by the Municipality. Revenue from user fees in 2008 was some \$76,000. Although the proximity of a waste disposal site to a recreational park does not promote use of the park, **exp** is not aware of any data that might suggest that park use would significantly increase were the waste site to close.

3.6.6 Negative Effects Related to Traffic

The Geraldton WDS is open to the public on Tuesday, Wednesday, Thursday and Saturday from noon to 5 p.m. Being a small landfill, volumes of traffic travelling on Highway 11 to access the landfill would be relatively low. The Municipality has estimated that between 50 and 100 private vehicles access the site each day it is open; in addition, a single garbage truck dumps refuse (about 25 m³ compacted) Monday to Friday at around 3 p.m. A bulldozer operates from about 5 p.m. to 6:30 p.m. Monday to Saturday to place daily cover on the refuse.

As previously stated, the purpose of the present EA is to bring the site into compliance with MOE regulations and formally recognize the existing landfill footprint and allow the site to continue to operate for up to two years. However, the service area and population using the waste disposal site will remain relatively unchanged over the projected additional lifespan of the site. Operating conditions, including hours of operation, are also anticipated to remain essentially unchanged. To date, there have been no complaints due to traffic using the site, and no future complaints are anticipated.

3.6.7 Negative Effects on Public Health and Safety

The health and safety of public users of the waste disposal site is of concern to the Municipality. Operation of heavy equipment (bulldozer) to cover refuse does not occur while the site is open to the public. An attendant is on duty to monitor use and activity at the site. Any unsafe practices (e.g., driving across the site at excessive speeds, unsafe waste disposal practices) are noted and users are cautioned. No reports of injury to the public have been noted during the history of operation of the site.

The potential for unsafe levels of contaminants to develop in drinking water accessed from wells on the MacLeod Park property has been previously discussed (Section 3.1.2). Water quality is monitored regularly. No degradation of drinking water quality has been noted to date. Based on apparent groundwater mounding south of the waste disposal site and northwest of the park, no detrimental effects on quality of the park drinking water supply are anticipated in future.

3.7 Heritage and Culture

3.7.1 Negative Effects on Heritage Buildings, Structures or Sites, Archaeological Sites or Areas of Archaeological Importance, or Cultural Heritage Landscapes

Exp is not aware of any negative effects (actual or potential) on culture or archaeology related to the operation of the Geraldton WDS, and no public or aboriginal concerns in this regard have been raised through the consultation process conducted to date. Formal archaeological, cultural heritage or other related technical studies have not been undertaken, nor are any considered necessary at this time. This is because the Geraldton WDS is located in a former aggregate extraction area (sand and gravel pit), and impacts to any cultural or archaeological features that may have previously existed on the site would be expected to have occurred due to the historical gravel extraction operations, prior to its use as a landfill. In addition, waste placement within the current landfill footprint has been ongoing for a number of years. Therefore, the present application to formally recognize an expansion to the landfill site (allowing for up to two additional years of waste placement within the existing established [although not yet formally approved] footprint) is not considered to have the potential for negative impacts to any cultural or archaeological heritage features.

The Ministry of Tourism and Culture (now MTCS) developed a checklist entitled *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes*. A copy of the checklist completed for this project is found in Appendix A. No recognized cultural heritage values were identified for the WDS itself. However, regarding built heritage resources, there is road access through a corner of the site to staked mining claims north of the site. A 2010 decision by the Mining and Land Commissioner permitted the MNR to sell additional lands abutting the landfill footprint to the Municipality to provide buffer lands in accordance with requirements of the MOE's *Landfill Standards Guideline*. In his ruling (copy in Appendix B), the Mining and Land Commissioner has ordered that a road access right-of-way is to be surveyed to ensure that future access to these mining claims is maintained, with the survey to be paid for by the owner of the mining claims. Also, regarding cultural heritage landscapes, as noted above, the WDS occupies a former gravel pit, and aggregate extraction is ongoing in the vicinity of the site. No other potential effects on built heritage resources or cultural heritage landscapes, including potential effects on natural features with cultural associations (such as specimen trees or plantings) were identified.

In view of the above, no formal archaeological or cultural heritage-related impact studies are considered necessary in connection with the current landfill site expansion. However, should additional expansion of the landfill footprint be proposed in future, a formal archaeological assessment would be commissioned. In addition, the expansion area will be screened for other cultural heritage resources prior to any further site expansion.

3.7.2 Negative Effects on Scenic or Aesthetically Pleasing Landscapes or Views

The visible presence of wind-blown debris along the highway south of the landfill site would be aesthetically undesirable. In the past, windblown white plastic bags originating from the landfill site could be observed in this area, including the north part of MacLeod Park. However, since the inception of regular (generally daily) interim cover application at the landfill, this problem no longer exists. This reflects the municipality's successful efforts to manage the landfill site in an environmentally responsible manner. It also indicates that the landfill site is being used as intended by a responsible public and no significant amounts of garbage are being left outside of the site (e.g., improper after-hours disposal).

Potential effects on landscapes or views within the context of cultural heritage have been discussed in Section 3.7.1 above.

3.8 Aboriginal

3.8.1 Negative Effects on Land, Resources, Traditional Activities or Other Interests of Aboriginal Communities

There are no First Nations located within the immediate area (i.e., Geraldton ward) serviced by the landfill. No negative effects on the land, resources or traditional activities or other interests of aboriginal communities were identified by either **exp** or the Municipality during the preparation of this document. However, to ensure that any potential interests and concerns of aboriginal communities were properly addressed, six (6) First Nations within the general area of the Greenstone municipal boundaries, as well as the Metis Nation of Ontario, were placed on the project mailing list. A seventh aboriginal group (Red Sky Metis Independent Nation) later expressed interest in obtaining information regarding the project, and was added to the mailing list.

In addition to receiving the various project notices by mail, the Municipality attempted to contact all of the aboriginal communities on the consultation list by telephone prior to the preparation and posting of the final ESR (mandatory fourth consultation point) to enquire as to whether they might be interested in attending a meeting to discuss the project and provide an opportunity for direct consultation and expression of any concerns. During the telephone calls, the following information was provided to the First Nations:

- Purpose of call – to discuss the current Geraldton landfill site.
- Current status of site – not in compliance with current Certificate of Approval, with regard to volumes of waste and waste footprint.
- Current action – Municipality is in the process of obtaining MOE approval to expand the site and bring it back into compliance.

- Invitation to attend a meeting – The aboriginal community representatives were asked if they would like to meet to discuss the landfill situation. None expressed such an interest.
- Concluding question – The aboriginal community representatives were asked if they had any concerns regarding the landfill expansion. No concerns were expressed.

At the conclusion of the telephone conversation, the EA Terms of Reference for the proposed new landfill site were briefly discussed (subject of separate undertaking).

The Municipality was not able to reach all of the aboriginal community representatives by telephone; those representatives (generally the Chiefs) who were not spoken with directly were mailed a letter (copy in see Appendix C).

With the exception of the representative from Ginoogaming First Nation, who indicated a desire to see a formal recycling program instituted, none of the aboriginal communities expressed any concerns regarding the landfill expansion, and none felt that a meeting was required.

Details of the various stages of the consultation process, and related documentation, are given in Appendix C.

4.0 SUMMARY AND CONCLUSION

An Environmental Screening has been conducted to support a proposed formal expansion of the Geraldton Waste Disposal Site, to recognize the existing site conditions (landfill footprint and waste volumes) and allow for up to two more years (i.e., until about end-May, 2014) of waste placement while a new site is located and approved. The screening process did not produce any significant negative findings that would suggest that the site expansion (largely a fait accompli) should not be formally approved. Operational procedures and monitoring programs that are currently in place will be maintained to ensure that significant negative effects do not go undetected in future. Should such negative effects become apparent, appropriate contingency plans are in place.

5.0 CLOSING COMMENTS

This report has been prepared for and is intended for the use of the client (Municipality of Greenstone). The contents of this report may not be reproduced in whole or in part, or used or relied upon in whole or in part by any other party for any purpose whatsoever without the expressed written consent of **exp**. Any use which a third party makes of this report, or any reliance on or decision made based on it, is the sole responsibility of such third party and **exp** accepts no responsibility for any damages of any kind or nature whatsoever, suffered by any other third party as a result of decisions made or actions based upon this report.

Exp has conducted the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practising in the same locality and under similar conditions as this project. No other representation, expressed or implied, is included or intended in this document.

We trust that this report is satisfactory to your present requirements. Should you have any questions, please contact the undersigned at your convenience.

Yours truly,

exp Services Inc.

Robert J. Rinne, M.Sc., QEP
Senior Scientist

Ahileas Mitsopoulos, P.Eng.
Project Engineer

Demetri N. Georgiou, M.ASc., P.Eng.
Principal Engineer/Branch Manager