- **Municipality of Greenstone**

2016, 2017 & 2018 Environmental Quality Monitoring Report Geraldton Landfill Municipality of Greenstone, Ontario

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1 Introduction

EXP Services Inc. (EXP) was commissioned by the Municipality of Greenstone to prepare the 2016, 2017 & 2018 Environmental Quality Monitoring Report for the Geraldton Landfill Site (the "site") located in Part of Mining Claim T.B. 14031, Township of Ashmore, District of Thunder Bay (see Figure 1 in Appendix A). The site is governed by an Amended Environmental Compliance Approval (ECA) No. A7004401, dated August 7, 2014 issued by the Ontario Ministry of Environment, Conservation and Parks (MECP, then known as the Ministry of the Environment or MOE). Although the site has exceeded its approved capacity (i.e., 273,000 m^3), the amended ECA allowed the site to continue to receive waste until December 31, 2015. Subsequently, additional amendments have been issued, the most recent of which (Notice No. 3, dated December 14, 2018) allows the site to continue accepting waste until December 31, 2019. Prior to the current ECA, an Amended Provisional Certificate of Approval (C of A) No. A7004401, was issued on November 24, 2008, and an amendment to the Provisional C of A was later issued on March 7, 2011, indicating receipt of groundwater trigger values as presented in a letter report dated November 23, 2009 by EXP (then known as Trow Associates Inc.).

The ECA currently in force indicates that the first monitoring report was due March 31, 2017, then every three years thereafter. However, it appears that the due date for the first report under the current ECA should have been stated as 2016 rather than 2017, since the previous report, covering the years 2010, 2011 and 2012, was issued in early 2013. Therefore, a report for the years 2013, 2014 and 2015 was issued in early 2016, while the present report covers the years 2016, 2017 and 2018. Copies of the ECA and C of A, including amendments, are provided in Appendix B of this document. A copy of the most recent MECP Inspection Report for the site in EXP's possession, dated March 2012, is also found in Appendix B.

The environmental quality monitoring was carried out primarily for the purpose of assessing the landfill site's compliance with the MECP's Guideline B-7 (Reasonable Use Policy or RUP) with respect to groundwater flow and impact, in accordance with Trigger Values previously developed and provided to MECP, as required by the ECA. However, considering that Kenogamisis Lake is downgradient of the site, the report also compares results with criteria designed to protect surface water quality.

As specified in the ECA, the following items are required to be included in a report to the MECP:

i. the results and an interpretive analysis of the results of environmental monitoring program, including an assessment of the need to amend the monitoring program;

ii. an assessment with regards to compliance of the groundwater quality at the property boundary and compliance point with regards to Guideline B-7 – Reasonable Use Concept;

iii. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the site, and the adequacy of and need to implement the contingency plans;

iv. an assessment of the efficiency of the leachate management at the site;

v. site plans showing the existing contours of the site*;*

vi. areas of landfilling operation during the reporting period;

vii. areas of intended operation during the next reporting period;

viii. areas of excavation during the reporting period;

ix. the progress of final cover, vegetative cover, and any intermediate cover application;

x. previously existing site facilities;

xi. facilities installed during the reporting period;

xii. site preparations and facilities planned for installation during the next reporting period;

xiii. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the site during the reporting period and a calculation of the total volume of site capacity used during the reporting period;

xiv. a summary of the quantity of any leachate or pre-treated leachate removed from the site during each operating week;

xv. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the site.

xvi. a summary of any complaints received and the responses made;

xvii. a discussion of any operational problems encountered at the site and corrective action taken;

xviii. a summary of the amount of wastes refused for acceptance at the site, the reasons for refusal and the carrier who brought the waste to the site;

xix. a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;

xx. any other information with respect to the site which the District Manager or Regional Director may require from time to time*;*

xxi. a statement of compliance with all conditions of this ECA and other relevant Ministry groundwater and surface water requirements;

xxii. a confirmation that the site inspection program as required by this ECA has been complied with by the *Owner*;

xxiii. any changes in operations, equipment or procedures employed at the site; and

xxiv. recommendations regarding any proposed changes in operations of the site.

Details on landfill maintenance/operation and closure can be found in the Updated Design and Operations Plan with Closure Plan[1] and Updated Closure Plan[2] previously prepared by EXP.

Additionally, in 2013, an Environmental Screening Report (ESR)[3] was prepared by EXP in support of a formal expansion of the site, which was approved. However, as noted, the approved site capacity has been exceeded and the Municipality of Greenstone is pursuing other available waste management options.

It is EXP's understanding that any operational information required to be reported to the MECP under the terms of the ECA and not included in the present monitoring report would be provided directly by the Municipality.

[1] EXP Services Inc. (2012). *Updated Design and Operations Plan with Closure Plan, Geraldton Landfill, Municipality of Greenstone*. Ref. No. THB-0006189-THB-200. October 16, 2012.
[2] EXP Services Inc. (2016). *Updated Closure Plan, Geraldton Landfill, Municipality of Greenstone*. Ref. No. THB-0006189-ME-THB-400. December 2, 2016.
[3] EXP Services Inc. (2013). *Environmental Screening Report, Expansion of Geraldton Waste Disposal Site, Municipality of Greenstone (Final Draft).* Ref. No. THB-0006189-THB-400. January 25, 2013.

2 Site Description

The subject property is located on the north side of Highway 11, approximately 3.2 km east of the junction with Highway 584 and about 4 km southeast of the Town of Geraldton in the Municipality of Greenstone, as shown on Figure 1 (Appendix A). The original legal description is: Part of Mining Claim TB14031, Township of Ashmore, District of Thunder Bay. However, as described in previously-cited reports, the site has been expanded, with additional buffer lands having been expropriated and additional attenuation lands having been transferred from the Crown/MNRF. Access to the site is provided by a gravel road off Highway 11 and is controlled by a lockable gate and chain-link fencing.

Based on a review of geological mapping, the site is situated in an area with glaciofluvial outwash plain with occasional bedrock and valley landforms, and the soil consists mainly of sand deposits (see Figure 2). The topography is generally knobby, hummocky, kettled and/or pitted with mainly moderate local relief and generally dry surface conditions. The active landfill area encompasses a portion of an abandoned earth borrow pit. The current landfill area is located in a relatively flat, low-lying area; however, the surrounding land to the north and east is elevated relative to the site. The high ground north and east of the site is about 12 m higher than the bottom of the landfill area. An updated topographic survey was conducted in late August of 2018 by Delta Survey Inc. (Delta), and a copy of the survey plan is provided on Figure 4 in Appendix A (all elevations geodetic), and in Appendix J.

The property currently functions as a landfill for the Municipality of Greenstone. The approved landfilling/recycling area is irregularly shaped and covers an area of some 4.3 hectares, although waste has historically been deposited over an area of about 4.65 ha. The site generally consists of a historical borrow pit. According to the locals, it was subsequently used for several years as a stock car racetrack (probably some 50 years ago). Over the last three to four decades, the site has been used as a landfill site.

The surrounding land tenure, as well as the lands recently acquired for the purposes of site expansion, are shown on Figure 8. In addition to obtaining outright ownership of the actual 4.3 ha waste disposal site (Location HM215) from the Crown (MNR), the Municipality acquired Crown lands adjacent to the site to the east and west to provide the necessary buffer/attenuation zone. The strip of buffer land immediately north of the waste footprint (identified as “Buffer Lands [Recently Acquired]” on Figure 8) was expropriated from a private owner on November 12, 2013. Also, municipally-owned property to the south and west was approved for incorporation in an expanded leachate attenuation zone. The approved total site area is some 30.65 ha (includes recently acquired buffer lands).

South of Highway 11 (southeast of the landfill) is MacLeod Provincial Park. West of the attenuation zone boundary (i.e., to Kenogamisis Lake) is land owned by Premier Gold.

3 Operational Information

3.1 Landfill Capacity

Historical calculations of landfill capacity and remaining lifespan were based on an estimated waste footprint (from site observations) of 4.65 ha. Waste has apparently been placed slightly beyond the limits of the expanded Land Use Permit (LUP) issued by MNR, which encompasses an area of 4.3 ha. Based on information presented/discussed in the Environmental Screening report (previously cited), the current ECA indicates/approves a 4.3 ha landfilling/recycling site within a total site area of about 30.65 ha. As discussed above, the Municipality has acquired the strip of buffer land immediately north of the site from a private owner through expropriation. This allows for the required minimum 30 m buffer beyond the limits of historical waste placement

The maximum approved waste/interim cover volume, excluding final cover, is 273,000 m^3. As previously discussed, the site has exceeded the approved capacity (an updated volume estimate is provided below) but has received approval to continue to operate and accept additional waste until December 31, 2019 (see Amendments to ECA in Appendix B).

The refuse has typically been placed in the landfill area using a bench/area fill method. A volume survey conducted in October 2009 determined that some 234,500 m^3 of waste and interim cover were present on the site. A subsequent survey conducted on May 29, 2012 determined that the volume was about 256,420 m^3, representing an increase of some 21,920 m^3 during that period (2 years and 7 months). The survey was repeated on May 14, 2014 and determined that the volume was some 273,828 m^3 (slightly in excess of the approved capacity), representing an increase of some 17,408 m^3 during that period (2 years). The survey was updated on August 18, 2015 and determined that the volume was about 277,902 m^3, representing an increase of about 4,074 m^3 during that period (1 year and 3 months). Two additional surveys have been conducted, showing volume increases of 4,978 m^3 (period of August 2015 to August 2016) and 3,277 m^3 (period of August 2016 to August 2018); resulting in total volume on site of 286,157 m^3, as of August 2018. The most recent survey results show an apparent marked reduction in the waste deposition rate, continuing a general trend.

Based on the Municipality's estimates, the volumes deposited on site during each year of the current reporting period were as follows:

- 2016 = 4,272 m^3
- 2017 = 4,361.5 m^3
- 2018 = 4,129.5 m^3.

However, based on the most recent survey, the actual average annual volume increase during the previous two years has only been about 1,635 m^3, or about 135 m^3/month. This rate of increase is considerably below historical rates and can be attributed to the Municipality directing waste, such as construction debris, to the Longlac Landfill. The surveyed volume is

also much lower than the deposited waste volume estimates provided by the Municipality. This discrepancy is possibly attributable to the Municipality overestimating actual volumes (e.g., due to both voids within delivered loads and undersized loads), as well as to on-site compaction and survey imprecision.

As indicated above, the total surveyed volume on site as of August 2018 is 286,157 m^3. Using an average rate from the surveyed results from August 2015 to August 2018 (volume increase of 8,255 m^3 in three years, or 2,750 m^3 per year, or 230 m^3 per month), the total volume of waste and interim cover present at the site, as of December 31, 2018, is estimated to be about 287,000 m^3. This is 14,000 m^3 more than the approved capacity.

3.2 Waste Types and Waste Diversion

Based on information provided by the client, the landfill currently only accepts solid, non-hazardous municipal waste. To minimize the volume of waste deposited at the Geraldton Landfill site, the Municipality has accepted no construction debris since May 31, 2014. All construction debris is being deposited at the Longlac Landfill.

The site has designated areas for batteries, concrete with rebar, electrical equipment and appliances, fluorescent bulbs, tires, and refrigeration equipment. For the past several years, the landfill has accepted various materials for recycling, including electronic waste, tires and metal (includes appliances [refrigerant was removed appropriately]).

Currently, there is no recycling depot to handle blue box type domestic recyclables (e.g., paper, cardboard, cans, plastics, glass bottles) at the site.

From July 11 to August 27, 2016, July 10 to September 9, 2017 and June 15 to August 25, 2018, household hazardous wastes (HHW) were accepted at the Geraldton Landfill Site, in accordance with MECP requirements. The following wastes were collected:

- Antifreeze
- Oil containers and oil filters
- Paints and coatings
- Fertilizers and pesticides
- Pressurized containers (e.g., propane, aerosol cans, fire extinguishers)
- Single-use dry cell batteries and rechargeable batteries
- Solvents (e.g., paint thinners)
- Fluorescent light bulbs.

The HHW materials were stored at the depot until collection by GFL Environmental. Also, residents were invited to bring household hazardous wastes not included in the above list for collection by GFL Environmental during the final day of the HHW collection periods. HHW manifests are available for review upon request.

3.3 Operational Problems

Municipality of Greenstone personnel did not advise of the existence of any operational problems (other than occasional mechanical equipment issues) at the site during the monitoring period.

3.4 Complaints

Municipality of Greenstone personnel did not receive any complaints regarding the operation of the landfill site in 2016 or 2018. However, a complaint that the “turn around area was too small for a pickup with trailer” was received on September 23, 2017. This was resolved through expansion of the turn-around area.

4 Methodology

4.1 Initial Site Reconnaissance

On May 26, 2003, prior to installation of any monitoring wells, EXP (then Trow) visited the subject property along with representatives from the Municipality of Greenstone and the MECP.

As shown on Figure 1, 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 low-lying and in some cases are low-lying with some swampy areas. No surface discharge from the swampy areas was apparent. A small hill was also observed at the northwest corner of the site.

Beyond the cleared area of the landfill, generally dense vegetation with mature trees was noted toward the north, south and west, while long grass and minor brush was observed 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 were observed 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.

During the site visit, the property limits and extents of waste were observed, and adjacent land uses were discussed. It was noted that the waste extends beyond the property line to the north, south and east. Efforts were previously made to push the garbage back onto the landfill site from the eastern adjacent property; however, some garbage still remains slightly beyond the property line.

During the preliminary site visit, no clear groundwater direction could be deduced from the topographical features observed. The MECP therefore recommended that an initial investigation of the groundwater flow patterns at the site be undertaken prior to the installation of groundwater monitoring wells. The information would better assist in the strategic planning of monitoring well locations.

4.2 Historical Investigation of Groundwater Flow Patterns

Based on the MECP recommendation during the initial site reconnaissance, the client approved a preliminary investigation of the groundwater flow patterns. This was accomplished by the installation of nine (9) observation wells, OB1 to OB9, located as shown on Figure C-1 in Appendix C.

The nine observation wells were installed in June 2003 using a CME 45B truck-mounted drill rig equipped with both solid and hollow stem continuous flight augers, soil testing and sampling equipment. Depths of the boreholes ranged from 3.1 m to 10.7 m below ground surface.

While the soils encountered within these boreholes were not sampled, a general log of soil characteristics was maintained. All fieldwork was conducted under the continuous supervision of experienced EXP (then Trow) geotechnical engineering staff.

To facilitate the measurement of stabilized groundwater elevations, temporary 19 mm (¾") hand-slotted PVC standpipes were installed in each of the boreholes upon completion of drilling. Elevations of the ground surface and 'top-of-pipe' were measured, and referenced to a benchmark located near the southeast corner of the site (see Figure C-1).

Upon installation of the monitoring wells during the subsequent field program, the temporary standpipes were removed. The boreholes were backfilled with the native sand soil.

No buried refuse was encountered below the groundwater table at any of the observation well locations.

4.3 Historical Monitoring Well Installations (2003)

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 Figure 3 through Figure 6 as MW1 to MW6, inclusive. This included a nested pair of wells at MW3. The monitoring wells' locations were selected based on the groundwater flow patterns deduced during the initial investigation, and were agreed upon by the MECP.

In general, MW1 to MW4 are downgradient monitors, while MW5 is a source monitor located near the centre of the landfill. MW6 is a background monitor located northeast of the landfill. In order to access the MW1 and MW2 locations, a roadway was cleared using a bulldozer. Arrangements for the road clearing were made by the Municipality of Greenstone.

The monitoring wells were installed between June 24 and June 27, 2003, using a CME 45B truck-mounted drill rig equipped with both solid and hollow stem continuous flight augers, soil testing and sampling equipment. Borehole depths ranged from 3.8 m to 12.2 m. All fieldwork was conducted under the continuous supervision of EXP (then Trow) geotechnical engineering staff.

Soil samples from the top 1.5 m of the boreholes were taken from the auger cuttings. Below this depth, standard penetration tests (SPTs) were generally performed in the soil strata in order to assess the compactness or consistency of the underlying soils and to obtain representative samples. The recovered soil samples and stratigraphy were examined and logged in the field by EXP (then Trow) geotechnical engineering personnel.

Following the drilling of the boreholes, monitoring wells were installed. Details of the monitoring well installations are given on the Borehole Logs in Appendix D. Monitoring wells consisted of industry standard 50 mm PVC; screen sections were wrapped in filtersock and backfilled with silica sand and native sand soil (auger cuttings). The well annulus above the screen was sealed with bentonite to prevent infiltration of surface water. Following the

installation, steel well protectors were installed. All installations were conducted by an EXP (then Trow) MECP-licensed well technician.

Following installation, the monitoring wells were developed by pumping. Following the recovery of the wells, an attempt was made to estimate the *in situ* hydraulic conductivity of the screened zones using falling head permeability testing (slug testing). However, the generally high field permeability at the monitoring well locations precluded accurate measurements of changing groundwater levels versus time following the addition of the slug to the monitoring well. Therefore, it was decided to base determinations of groundwater flow velocities at the site on hydraulic conductivity estimated from the results of grain size distributions for selected samples recovered from screened sections of the monitoring wells.

Representative samples of the various soil strata encountered were taken to EXP's (then Trow's) laboratory in Thunder Bay for further examination by a geotechnical engineer.

It should be noted that no quantities of buried refuse were noted below the groundwater table at any of the monitoring well locations. At MW5 (source well), garbage was present to a depth of about 4.6 m; however, the groundwater table was at about 6.5 m depth.

4.4 Additional Monitoring Well Installations (2006)

To better investigate the orientation and chemical character of the contaminant plume originating from the subject landfill, four (4) additional monitoring wells were installed at the locations shown on Figure 3 through Figure 6 as MW8, MW9, MW10A and MW10B. The general monitoring wells locations were approved by MECP, but were modified as required based on site conditions.

The drilling and well installations were undertaken by Landcore Drilling on July 25 and July 26, 2006, using a track-mounted drill rig equipped with hollow stem continuous flight augers, soil testing and sampling equipment. Borehole depths ranged from 4.6 m to 18.3 m. All fieldwork was conducted under the continuous supervision of experienced EXP (then Trow) environmental staff.

Soil samples from the top 1.5 m of the boreholes were generally taken from the auger cuttings. Below this depth, standard penetration tests (SPTs) were performed in the soil strata in order to assess the compactness or consistency of the underlying soils and to obtain representative samples. The recovered soil samples and stratigraphy were examined and logged.

Following the drilling of the boreholes, monitoring wells were installed. Details of the well installations are given on the Borehole Logs in Appendix D and are summarized below:

- 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).

Monitoring wells consisted of industry standard 50 mm PVC; screened sections were backfilled with silica sand and native sand (auger cuttings). The well annulus above the screen was sealed with bentonite to prevent infiltration of surface water. Above-ground steel well protectors were installed and fitted with locks.

Elevations of the ground surface and 'top-of-well' at each monitoring well were surveyed by Delta Survey Inc., and referenced to the base station having a geodetic elevation of 349.94 m. Ground surface elevations (updated based on most recent survey) are shown on Figures 5 and 6 (Appendix A). 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 downgradient or cross-gradient monitors potentially impacted by landfill leachate.

Representative samples of the various soil strata encountered were taken to EXP's (then Trow's) laboratory in Thunder Bay for further examination by a geotechnical engineer. Recovered samples will be stored for three months beyond the date of this report at which time they may be discarded unless we are otherwise requested. Grain size analyses were conducted on selected soil samples from screened sections in order to estimate hydraulic conductivity, to enable calculation of groundwater flow velocity.

4.5 Additional Monitoring Well Installations (2008 and 2009)

To further investigate the orientation and chemical character of the contaminant plume originating from the subject landfill, and as required by the former C of A, two (2) additional monitoring wells were installed at the locations shown on Figure 3 through Figure 6 as MW7 (June 27, 2008) and MW11 (Sept. 23, 2009). Also, since the original MW5 was either buried or destroyed, a replacement monitoring well was installed at MW5 (Sept. 22, 2009). The general monitoring well locations were approved by MECP, but were modified as required based on site conditions.

The drilling and well installations were undertaken using a subcontracted Speedstar SD100E all-terrain drill rig (MW7) and a CME750 rubber tire mounted drill rig (MW5 and MW11). Both rigs were equipped with hollow stem continuous flight augers, soil testing and sampling equipment. The borehole depths ranged between about 5.2 m and 9.8 m below ground surface. All fieldwork was conducted under the continuous supervision of experienced EXP (then Trow) environmental staff.

Soil samples collected in the upper 0.8 m of the boreholes were generally taken from the auger cuttings. Below this depth, standard penetration tests (SPTs) were performed in the soil strata in order to assess the compactness or consistency of the underlying soils and to obtain representative samples. The recovered soil samples and stratigraphy were examined and logged.

Following the drilling of the boreholes, monitoring wells were installed. Details of the well installations are given on the Borehole Logs in Appendix D and are summarized below:

- MW5 – well installed to 9.1 m depth, generally screened in lower sand from 5.8 m to bottom.
- MW7 – well installed to 7.0 m depth, screened in silty sand and sand from 3.9 m to bottom.
- MW11 – well installed to 4.6 m depth, screened in silt beneath peat and silty sand from 1.5 m to bottom.

Monitoring wells consisted of industry standard 50 mm PVC; screened sections were backfilled with silica sand and native sand (auger cuttings). The well annulus above the screen was sealed with bentonite to prevent infiltration of surface water. An above-ground steel well protector was installed at MW5.

Elevations of the ground surface and 'top-of-well' were initially surveyed by Delta Survey Inc. at MW7 and EXP (then Trow) at replacement well MW5 and MW11. Ground surface elevations (updated by Delta Survey in 2018) are shown on Figures 5 and 6. Well MW7 and MW11 are considered to represent downgradient monitors potentially impacted by landfill leachate.

Representative samples of the various soil strata encountered were taken to EXP's (then Trow's) laboratory in Thunder Bay for further examination by a geotechnical engineer. Grain size analyses were conducted on selected soil samples from screened sections in order to estimate hydraulic conductivity and enable calculation of groundwater flow velocity.

4.6 Groundwater and Surface Water Sampling

In accordance with the ECA and C of A, two sampling events were conducted annually in 2016, 2017 and 2018. Water samples were collected by EXP personnel on the following dates:

- 2016 – May 25 & 26 and October 4 & 5
- 2017 – May 16 & 17 and September 26
- 2018 – May 14 & 15 and October 17

During the most recent monitoring event (October 2018), all wells were confirmed to be in good condition and in compliance with O.Reg. 903.

During each event, static water levels were first measured in each well using an electric water level indicator. Field measurements of electrical conductivity, temperature and pH were made. The wells were then purged of at least 3 well volumes and allowed to recover to at least 80% of the static water level. Groundwater samples were then collected directly from the dedicated Waterra sampling equipment into bottles provided precleaned and with appropriate preservatives by the laboratory. Surface water samples were collected directly from the water body using the unpreserved bottles supplied by the laboratory. Sample bottles containing preservatives were then filled from unpreserved sampling bottles.

Groundwater samples for metals only were filtered in the field at the time of sample collection using in-line 0.45-micron filter cartridges. In accordance with standard MECP protocol, no field filtering was conducted on the surface water samples.

The filled sample bottles were placed in chilled coolers and delivered under chain-of-custody to Maxxam Analytics Inc., a CALA-certified and accredited laboratory in Mississauga, Ontario.

4.7 Topographic Survey

As previously indicated, the topographic survey of the landfill site was most recently updated by Delta Survey Inc. on August 23, 2018. A copy of the survey plan is found in Appendix J. Top of pipe and ground surface elevations were re-surveyed at all monitoring well locations, and are shown on the plan. Ground surface elevations are also shown on Figures 5 and 6.

5 Observations

5.1 Subsurface Conditions

Details of the subsurface conditions encountered at the preliminary observation well locations are presented in Appendix C; details of the conditions encountered at the monitoring well locations are presented on the Borehole Logs in Appendix D. Note that the borehole logs and related information depict subsurface conditions only at the specific locations and times indicated. Subsurface conditions at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes in the conditions interpreted to exist at the locations where sampling was conducted in response to various natural processes or human interventions.

5.1.1 Soil Conditions

The MW4 well location was surfaced with grass and shrubs, and encountered silty sand and organics to a depth of about 1.5 m.

The source well, MW5, was placed directly on the landfill. A stratum of garbage was encountered to a depth of about 4.5 m. Garbage was also encountered at OB1, OB2, OB8 and OB9, extending to depths ranging between about 1.5 m and 4.6 m. The garbage generally consisted of a mixture of plastics, steel and wood fragments and fabrics (carpet, clothes, etc.). Odours were also noted at these locations. The observations at replacement well MW5, installed in September 2009, were generally similar.

At MW7 and MW11 in the newly acquired attenuation zone, the well locations were surfaced with a thin stratum of organics and peat, respectively.

The native mineral soil encountered beneath the fill and organics at the locations noted above, and from the surface of the remaining boreholes, generally included a silty sand to gravelly sand glaciofluvial outwash stratum. The stratum was generally described as compact, brown to grey and moist (becoming wet with depth). Cobbles and possibly small boulders were also encountered at MW3 and MW4.

As an exception to the above, the native mineral soil encountered at OB4 (from 1.5 m depth), MW6 and MW9 (from 3.0 m depth) included sandy silt, described as compact, brown to grey and moist to wet. Also, underlying the silty sand layer at MW11, a silt stratum was encountered at a depth of about 1.5 m. The silt was described as loose to compact, brown to grey, wet and with traces of sand and clay.

Refusal to the auger was encountered at MW6 at a depth of about 3.8 m and at MW10B at a depth of about 8.5 m. While the refusal may be due to bedrock, the presence of bedrock was not proven by coring.

5.1.2 Groundwater Conditions

The soils encountered at the borehole locations were generally moist, becoming wet at or near groundwater depths. Current and historical static groundwater elevations are summarized in Table 2 in Appendix G, and groundwater levels encountered during the monitoring well installations are shown on the Borehole Logs in Appendix D. Based on recently re-surveyed top of pipe and ground surface elevations (as noted on Figure 6 in Appendix A and Table 2 in Appendix G), and depths to groundwater measured on October 17, 2018, groundwater elevations were obtained and are shown on Figure 6 and Table 2. Interpolated groundwater contours were then generated, and are also presented on Figure 6.

Lateral groundwater flow is interpreted to be generally west-southwestward across the landfill at a gradient of about 0.005 m/m (MW6 to MW4). However, the groundwater elevation at MW9 (south of west end of landfill) is relatively high (lower only than the background well MW6). Also, the groundwater elevation at MW8 is similar to wells located further north (MW1, MW2 and MW5). Current and historical elevations suggest that groundwater may be mounded south of the landfill, which should help prevent off-site migration of leachate impacted groundwater to the south. In subsequent discussion, wells MW8 and MW9 will be referred to as “cross-gradient”, although it should be noted that they are apparently hydraulically upgradient of the adjacent landfill. Newer well MW11, about 270 m southwest of MW4, has the lowest groundwater elevation, generally consistent with a predominant west/southwest flow direction from the landfill.

Based on relative elevations in the nested wells (MW3A/3B near the southwest corner of the fill area and MW10A/10B near the downgradient boundary of the attenuation zone), vertical gradients were generally interpreted to be slightly upward near the fill area (since 2012) and also slightly upward in the attenuation zone further downgradient (since 2006). During the current monitoring period, a slight upward gradient continued to be generally apparent at MW3A/3B (although a vertical gradient was not noted in fall 2018). However, while a very slight upward gradient was noted at MW10A/10B in the spring, a very slight downward gradient was generally noted in the fall (but again no vertical gradient was apparent in fall 2018). An upward gradient should serve to minimize downward plume migration and help protect the deeper aquifer from contamination.

It is noted that localized flow patterns may vary in response to subcropping features of low permeability material (i.e., dense till and/or bedrock). In addition, depending upon the weather and/or time of year, groundwater conditions may vary from those encountered during this investigation.

5.1.3 Stratigraphic Prolife

Information from the historical and newer boreholes was combined with available information concerning surface topography to produce the stratigraphic profiles (geological cross-sections) shown in Figures 7A to 7E.

5.1.4 Grain Size Analyses

As discussed in the previous monitoring report, representative samples were selected for laboratory grain size analyses in order to estimate the hydraulic conductivity of native soils in the screened zones of the monitoring wells. Results of the grain size analyses are presented on Figures E-1, E-2 and E-3 in Appendix E.

Estimates of the saturated coefficient of hydraulic conductivity based on the grain size analyses were calculated using the method of Hazen, and are shown in Table 1 below:

Table 1: Saturated Coefficient of Permeability (*k*) Estimated from Grain Size Analysis

Well No.	Sample No.	Depth (m)	Soil Classification	*K* (cm/s)
MW1	S5	5.63	Fine Sand, trace silt	$6.9x10^{-3}$
MW3A	S4	4.88	Sand & Gravel, some silt	$9.0x10^{-4}$
MW3A	S6	7.92	Sand, some gravel, trace to some silt	$5.6x10^{-3}$
MW4	S5	3.35	Sand, trace silt	$7.0x10^{-3}$
MW5	S2	7.31	Sand & Gravel	$2.7x10^{-1}$
MW5 repl.	S3	7.90	Sand, trace gravel, trace silt	$2.3x10^{-3}$
MW8	S12	15.55	Silt & Sand, trace clay	$8.1x10^{-5}$
MW9	S8	9.45	Silt, some sand, trace clay	$6.4x10^{-5}$
MW10B	S3	7.93	Sand	$4.9x10^{-3}$
MW11	S4	3.30	Silt, trace sand, trace clay	$2.1x10^{-7}$

The geometric mean hydraulic conductivity based on the results of the grain size analyses is about $9.8x10^{-4}$ cm/s or 0.85 meters per day. Based on a hydraulic gradient of 0.005 and an assumed soil porosity of 0.3, the average groundwater flow velocity across the site is estimated to be about 0.014 m/day. This is lower than initial estimates of 0.05 m/day.

However, as pointed out in an MECP review memorandum dated March 10, 2017 (copy in Appendix A) dealing with the previous monitoring report for 2013, 2014 and 2015, the subsurface investigations and borehole logs reveal the presence of an apparent corridor of coarse subsurface soil material (sand to sand/gravel) running generally southwestward

(transect E-E illustrated on Figure 7E) and downgradient from the site, as illustrated on Figure 5. This “high K corridor” could facilitate downgradient transport of a contaminant plume at a relatively high velocity of up to perhaps 1.4 m/day (as suggested in the MECP’s review memorandum). At this velocity, leachate-impacted groundwater could travel from the centre of the landfill to Kenogamisis Lake in about a year, although plume strength would be reduced through natural attenuation processes.

6 Chemical Analysis Results

Copies of laboratory Certificates of Analysis are given in Appendix F. Summary tables of analytical results are presented in Appendix G. Groundwater results were compared to the MECP Ontario Drinking Water Standards (ODWS, rev. January 2001), which can be either true standards (**Maximum Acceptable Concentrations** and **Interim Maximum Acceptable Concentrations**) or objectives (**Aesthetic Objectives** and **Operational Guidelines**). Because groundwater flowing though the waste disposal site likely eventually discharges to Kenogamisis Lake about 500 m west-southwest of the site, groundwater results for the nested monitoring wells furthest downgradient (MW10A/10B) were also compared to **Provincial Water Quality Objectives** (PWQOs) and to the MECP's **Aquatic Protection Values** (APVs), as recommended in the previously-cited review memorandum prepared by the MECP's regional hydrogeologist. Surface water results were compared to the PWQOs. Analytical results in excess of both criteria are highlighted in the summary tables. Graphs of concentrations versus time for selected parameters are found in Appendix I.

6.1.1 Groundwater Quality Results

Groundwater samples taken from each monitoring well were submitted for chemical analyses. Current and historical results are summarized on Table 3 in Appendix G. The results for the background well (MW6), the source wells (mainly MW5, but also potentially including MW1, MW2, MW3A, MW3B and MW4), additional downgradient monitors (MW7, MW10A/10B and MW11) and cross-gradient monitors (MW8, MW9) are discussed in the context of MECP (mainly ODWS) criteria, with emphasis on the most recent (2018) results.

Elevated levels of **phenols** were historically reported in the primary source well MW5. However, since the spring 2010 event, a generally decreasing trend was apparent at MW5, and since the fall of 2012, phenol concentrations have been at or below detection limits (excluding May 2014). The maximum phenol level measured in 2018 was 0.001 mg/L, in potential source well MW3B. There is no ODWS criterion for phenols. The PWQO is 0.001 mg/L, while the Aquatic Protection Value (APV, which is a groundwater criterion established by MECP to be protective of nearby surface water) is 0.961 mg/L. The potential significance of exceedances of PWQOs and APVs is discussed in Section 6.1.2 below.

Historical and current values of laboratory **pH** were within ODWS (and PWQO) limits in all monitoring wells, and current results are similar to historical levels.

Similar to historical results, levels of **chloride** (generally considered a good indicator of municipal landfill leachate) in 2016 through 2018 were below the ODWS criterion of 250 mg/L in all of the potential source wells (2018 maximum of 150 mg/L in MW1, which is the source well nearest the highway). However, generally consistent with historical findings, markedly elevated chloride levels were again measured at MW8 (up to 1,400 mg/L), while somewhat elevated levels (although below the OWDS criterion), were again measured at MW9, MW10A and MW10B. Levels in MW10B slightly exceeded the APV of 180 mg/L. All four of these wells

are considered to be impacted by road salting. At the MW8 location, groundwater appears to flow in a generally northwestward direction.

In 2018, the **dissolved organic carbon (DOC)** levels in source wells MW1, MW2, MW3A, MW3B and MW5 exceeded the ODWS criterion of 5 mg/L, with a maximum source level of 9.1 mg/L in MW3B. However, the highest overall level of 16 mg/L was measured in attenuation zone boundary well MW10B, similar to historical results.

In 2018, the highest level of **total dissolved solids (TDS)** was again measured in MW8 (2,880 mg/L in May), likely attributable to road salt. Note that TDS is generally equal to about one-half of the electrical conductivity value (measured in µS/cm), for which there are no applicable criteria. Generally consistent with historical findings, TDS levels above the ODWS criterion of 500 mg/L were also measured in wells MW1 (with the highest source well TDS level of 955 mg/L), MW3A, MW3B, MW4, MW5, MW7, MW9 and MW10B.

Alkalinity levels in 2018 above the ODWS upper limit (500 mg/L) were noted at MW1 (with the highest overall level of 600 mg/L), MW3A, MW3B, MW4 and MW7.

Nitrate and **nitrite** levels continued to be below the ODWS criteria (10 mg/L and 1 mg/L, respectively) in all monitoring wells. No influence of the privately-owned Sludge Drying Bed to the northwest of the landfill is apparent.

In 2018, levels of **organic nitrogen** (obtained as the difference between TKN and ammonia-N) were generally lower than historical levels, with exceedances of the ODWS criterion of 0.15 mg/L in wells MW1, MW8, and MW10A and 10B. The highest level was 0.91 mg/L (MW8).

Generally similar to historical findings, levels of **manganese** in excess of the ODWS (0.05 mg/L) were measured at each monitoring well in 2018, with the exception of MW8 and MW9. Background well MW6 also exceeded the ODWS, with a historical high of 1.5 mg/L being reported during the monitoring period. In 2018, the highest overall manganese level was measured in MW1 (3.3 mg/L).

Also similar to historical findings, **iron** levels exceeded the ODWS criterion (0.3 mg/L) in several wells (excluding MW2, MW4, MW6, MW8, MW9 and MW11). The highest iron concentration was measured at MW1, with a historical high of 31 mg/L, with the next highest value at MW7 (23 mg/L).

Other ODWS exceedances in 2018 for metals include **arsenic** at MW7 (with the overall highest value of 0.043 mg/L, versus the ODWS criterion of 0.025 mg/L), MW10B and MW1, and **aluminum** at MW10A (maximum 0.14 mg/L, versus criterion of 0.1 mg/L) and MW10B.

Volatile organic compounds (VOCs) are required to be measured only at the source well MW5, once annually. There were no ODWS criteria exceedances in 2018. Results are summarized on Table 4 (Appendix G).

6.1.2 Potential Impact to Surface Water

In 2018, at MW10A and/or MW10B (the wells nearest Kenogamisis Lake), PWQO criteria exceedances were noted for the following:

- **Aluminum** - max. 0.14 mg/L versus interim PWQO of 0.075 mg/L
- **Arsenic** – max. 0.032 mg/L versus interim PWQO of 0.005 mg/L
- **Iron** – max. 4.5 mg/L versus PWQO of 0.3 mg/L
- **Phosphorus** – max. 0.98 mg/L versus interim PWQO (average value) of 0.02 mg/L

At these same wells in 2018, APV criteria exceedances were noted for the following:

- **Chloride** – max. 200 mg/L versus APV of 180 mg/L

Note that a reported copper level of 0.0064 mg/L in well MW10B in May 2018 exceeded the PWQO of 0.005 mg/L. However, the reported level is considered anomalous. In any event, the level did not exceed the APV of 0.0069 mg/L.

6.1.3 Durov Plots

Durov plots of the major ion chemistry that have been provided in previous reports were updated to include data for the current monitoring period. The diagrams (Appendix H) generally continue to indicate a typical calcium bicarbonate dominated water type for all wells except MW8. MW8 is dominated by sodium chloride, reflecting road salt impact. In addition, MW9, MW10B and to a lesser degree MW10A appear to be trending towards chloride anion dominance. The diagram for the primary source well MW5 appears to be trending towards magnesium cation dominance; the relatively high degree of scatter at MW5 is indicative of variable leachate impact.

6.1.4 Surface Water Quality Results

In 2016, 2017 and 2018, surface water samples were again collected from three locations in Kenogamisis Lake, west-southwest of the landfill. Location SW1 is approximately 115 m southeast of wells MW10A/10B, location SW2 is in Barton Bay approximately 35 m north of Highway 11, and SW3 is located about 330 m west of MW11, as shown on Figure 3. The analytical results are tabulated on Table 5 in Appendix G.

The following exceedances of PWQO criteria were reported in 2018:

- **Phenols** at SW2 – max. 0.0011 mg/L, versus criterion of 0.001 mg/L
- **Arsenic** at SW1, SW2 and SW3 – max. 0.1 mg/L at SW2, versus criterion of 0.1 mg/L and interim criterion of 0.005 mg/L
- **Cobalt** at SW2 and SW3 – max. 0.0017 mg/L versus criterion of 0.0009 mg/L

- **Copper** at SW2 and SW3 – max. 0.012 mg/L versus criterion of 0.005 mg/L
- **Iron** at SW2 and SW3 - max. 2.3 mg/L versus criterion of 0.3 mg/L
- **Phosphorus** at SW1, SW2 and SW3 – max. 0.12 mg/L versus interim criterion of 0.02 mg/L

In general, there are no evident trends in parameter concentrations in the surface water samples.

6.1.5 Quality Assurance / Quality Control

The in-house laboratory QA/QC results are shown on the Laboratory Certificates of Analysis in Appendix F. In general, all of the lab QA/QC data, including laboratory duplicates, blanks, spikes and surrogate standard recoveries, appear to be acceptable.

Ion balances of within ±10% are generally considered to indicate acceptable data quality for groundwater. Ion balances (reported for groundwater only) in 2018 were all well below this value.

In 2018, blind duplicate samples were collected from the primary source well MW5 in both the spring and fall, and during both occasions labelled as MW12 on the Chains of Custody. The relative percent difference (RPD) between the results for the sample and the field duplicate sample for each analysed parameter was calculated as the absolute value of the following:

$$RPD = \frac{(\text{Sample Result} - \text{Duplicate Result}) \times 100}{(\text{Sample Result} + \text{Duplicate Result}) / 2}$$

The RPD calculation is not considered valid for parameters reported to be present in very low concentrations (i.e., where the average of the two duplicates is <5 times the laboratory detection limit). The maximum RPD considered acceptable for most parameters in this study is 20%[4], with the notable exception of the following:

- Electrical conductivity – 10%
- pH – 0.3 pH units.

This exercise revealed generally good agreement between the duplicate samples. No differences exceeding the recommended limits were reported for the main parameters of concern. However, the differences for nitrogen compounds (TKN and ammonia-N) in the May duplicates were moderately high (up to 46%), but there are no ODWS criteria for these compounds. While there is an ODWS for organic nitrogen, which is calculated as the difference between TKN and ammonia-N, RPD performance criteria are not applicable to results obtained by subtraction. Also, one of the aluminum duplicates in May was 0.1 mg/L,

[4] MECP (2011). *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, July 1, 2011.

while the other duplicate sample result was <0.005 mg/L, which was in keeping with historical results. The elevated aluminum result is considered anomalous.

A review of the laboratory Quality Control information provided with the analytical reports did not suggest any significant discrepancies that might compromise the overall validity of the reported data.

In general, there are no implications regarding data validity from the QA/QC results that could affect the conclusions of this study.

7 Discussion

7.1 Estimated Leachate Generation Rates

From the Canadian Climate Normals (1971-2000), the Geraldton area receives an average of 790 mm of precipitation annually, including 546 mm of rain and 244 mm as snow.

The surveyed fill area is some 4.6 ha. This is slightly larger than the approved operating footprint of 4.3 ha (area of LUP parcel HM215 – see Figure 8). Based on a historical disposal area of 4.6 ha, a rate of precipitation of about 790 mm/yr., and an infiltration rate (based on current site conditions) estimated at 30% (i.e., about 237 mm/yr., as considered appropriate in previous consultation with MECP), the annual volume of leachate produced has previously been estimated (Trow 2004 report) to be about 10,420 m^3. Note, however, that EXP now considers the above method of leachate volume estimation to likely err on the high side. Other estimates we have encountered have incorporated an infiltration rate based on 30% (or less) of the water surplus (rather than total precipitation), with the remainder running off as stream flow or overland flow. Water surplus refers to the difference between total precipitation and evapotranspiration. For the Geraldton area, the water surplus is estimated to be about 40% of total precipitation.

7.2 Background and Reasonable Use Policy Criteria

MECP Guideline B-7, which incorporates the Reasonable Use Policy (RUP) into the MECP's groundwater management activities, allows off-site impacts from waste disposal sites within established guidelines based on the ODWSs in order to permit attenuation of impacts while protecting existing and potential downgradient groundwater users. The guideline allows for increases in concentrations up to 25 and 50 percent of the difference between background and ODWS concentrations for health-related and non-health-related ODWS parameters, respectively. The guideline applies only in groundwater at the property or attenuation zone boundary.

Guideline B-7 (RUP) criteria for all parameters were calculated using the arithmetic mean of the 2017 and 2018 results from the background monitor, MW6. Where the mean at MW6 exceeded ODWS criteria, the mean (background) is used as the B-7 criterion. The assessment is provided for all wells for reference purposes in the tables in Appendix G. The attenuation zone boundaries are indicated on Figure 5. Wells MW8, MW9, MW10A/10B and MW11 are located near the boundaries of the attenuation zone, and B-7 is therefore considered applicable only to these wells, which are the focus of the following discussion.

7.3 RUP Criteria Exceedances

Exceedances of RUP criteria during the current monitoring period were generally similar to historical exceedances. Significant exceptions are noted below.

7.3.1 General Parameters and Major Ions

The ODWS for **TDS** is 500 mg/L. Using a background value of 297 mg/L measured in upgradient well MW6, the B-7 criterion for 2018 has been calculated to be 398 mg/L (Table 6). In 2018, the B-7 criterion for TDS was exceeded in wells MW8, MW9, MW10A and MW10B. However, these wells have evidently been impacted by road salt, and the TDS criteria exceedances cannot be ascribed to leachate impact.

Similarly, exceedances of the B-7 criteria for **sodium** (104 mg/L) at MW8 and MW10B, and **chloride** (126 mg/L) at MW8, MW9 and MW10B are considered most likely due to road salt. The relatively high groundwater elevations (higher than in the adjacent landfill) at the MW8 location also would seem to preclude significant leachate impact.

Groundwater in the area is naturally hard (background well MW6 mean concentration = 293 mg/L, versus ODWS of 100 mg/L). Therefore, the B-7 criterion for **hardness** defaults to the average background concentration. In 2018, exceedances of the B-7 (background) criterion for hardness were measured in MW8, MW9, and MW10B. However, hardness can be influenced by road salting (generally calcium chloride), and a finding of elevated hardness at these locations does not necessarily indicate unacceptable leachate impact (especially considering the relatively high groundwater table at MW8).

7.3.2 Organics

The ODWS for **DOC** is 5 mg/L. The average concentration of DOC in upgradient well MW6 is 3.8 mg/L and the B-7 criterion for 2018 has been calculated to also be 4.4 mg/L. In 2018, exceedances of the B-7 criterion for DOC were measured in MW10A (13 mg/L) and MW10B (16 mg/L). The highest measured DOC level in any of the wells considered to be potentially indicative of source concentrations (i.e., MW1, MW2, MW3A, MW3B, MW4, MW5) in 2018 was 9.1 mg/L (MW3B). Because the maximum source concentration is lower than the levels measured in MW10A/B, landfill leachate cannot alone be responsible for the elevated DOC level in MW10A/B, unless plume strength beneath the landfill has recently decreased significantly. In general, available monitoring data do not show an appreciable reduction in source well contaminant concentrations (refer to time series graphs in Appendix I). Also, the DOC level in upgradient well MW7 (6.1 mg/L) was much lower than in MW10A/10B, further suggesting that landfill leachate is not responsible for the high levels in the latter wells.

Organic nitrogen has an ODWS of 0.15 mg/L. However, the B-7 criterion based on average levels in MW6 is 0.12 mg/L (considerably lower than historical values). In 2018, wells MW8 and MW10A/10B exceeded this criterion, with a maximum level of 0.91 mg/L (MW8). That this is a natural occurrence (or at least not likely related primarily to landfill leachate) is suggested by the generally variable but relatively low levels of organic nitrogen measured in the on-site (potential source) wells (e.g., <0.10 mg/L in well MW5; max. 0.36 mg/L in any of the other wells considered to be potentially indicative of source concentrations).

7.3.3 **Metals**

Similar to historical findings, wells MW10A and MW10B had exceedances of the B-7 criteria for **aluminum**, **arsenic**, **iron** and **manganese** in 2018.

Based on the relatively lower levels of **arsenic** measured in the six potential source wells in 2018 (maximum 0.026 mg/L in MW1), the elevated arsenic levels in MW10A/10B are not ascribable to leachate impact, unless the impact were due to migration of a historical plume with characteristics that are no longer evident beneath or adjacent to the waste pile. This seems highly unlikely, given that the landfill is still operating and no major changes in plume composition are apparent from the available monitoring data for the on-site wells. There is, however, a possible increasing trend for arsenic at downgradient well MW10B (see Figure I-7 in Appendix I), although levels have been quite variable.

Elevated **aluminum** also does not appear to be attributable to landfill leachate as the aluminum levels at the wells in the six potential source wells are also relatively low (maximum 0.1 mg/L in MW5).

However, based on elevated levels of **iron** in the potential source wells (notably MW1 [max. 31 mg/L], MW3A/3B and MW5) and also in downgradient well MW7, leachate impact from the landfill appears to be present at the downgradient MW10A/10B location. There is therefore a concern that leachate containing iron levels in excess of the PWQO may be impacting Kenogamisis Lake. However, there is no APV for iron.

With a maximum source concentration of 3.3 mg/L (MW1), and a relatively high level at MW7, concern for leachate impact to the lake also exists for **manganese**. However, there is neither a PWQO nor an APV for this element. Also, manganese levels in the area appear to be naturally elevated, with a level of 0.53 mg/L in the background well.

There is no ODWS criterion for **phosphorus** in groundwater. However, this parameter could be of significance where impacted groundwater discharges to surface water (due to the potential for this nutrient to foster undesirable plant growth). In 2018, similar to previous years, but in contrast with findings for the other potential leachate indicator parameters, the highest reported phosphorus level of 2.6 mg/L was found at MW11. This was actually low compared with historical results for this well. This level was considerably higher than the maximum measured in any of the potential source wells (0.16 mg/L at MW3A) and indicates that landfill leachate is a relatively minor contributor to phosphorus levels in groundwater in the area. The maximum 2018 phosphorus level in wells MW10A/10B was 0.98 mg/L, considerably higher than the maximum source level, but lower than in MW11, while the maximum level in well MW7 was only 0.048 mg/L. The conclusion is that landfill leachate has the potential to be only a relatively minor contributor to elevated phosphorus in wells MW10A/10B, and is not a significant concern for impact to Kenogamisis Lake.

7.4 Comparison of Paired Monitoring Well Results

The available data suggest that several parameters may be associated with the source (i.e., with concentrations elevated [relative to background well MW6] at MW5 and/or nearby wells MW1, MW2, MW3A/3B or MW4). These potential indicator parameters include: conductivity, TDS, hardness, DOC, chloride, alkalinity, barium, boron, iron and manganese.

A comparison of the results for MW3A (well screened from 6 m to 9 m depth) and MW3B (well screened from 4.5 to 6 m depth) reveals that concentrations of these potential indicator parameters are generally similar in both wells, although levels of iron are higher in the deeper well (possibly reflecting a natural condition). The plume impact at this location therefore appears to be fairly uniformly distributed throughout the depth of the aquifer profile investigated (i.e., there is no clear evidence of a sinking plume at this location).

At nested wells MW10A/10B, located further downgradient near the attenuation zone boundary, the deeper well (MW10B, screened from about 4 to 6 m depth) has appreciably higher levels of several potential parameters (notably conductivity, TDS, hardness, sodium, chloride, alkalinity and iron) than the shallow well (MW10A, screened from about 2.6 to 4.6 m depth). However, the levels of some of these parameters in the deeper well are higher than in upgradient wells, including even the source well. Therefore, although there are indications of a sinking plume, the plume itself appears to originate from a source other than the landfill (e.g., road salting). A notable exception is iron (discussed previously).

7.5 Trigger Values

Trigger values for implementation of one or more aspects of a groundwater and surface water contingency plan (see below) would consist of predicted or actual exceedances of applicable criteria at or beyond the attenuation zone boundaries. The currently applicable criteria for groundwater are those calculated according to Guideline B-7, while applicable criteria for surface water are the Provincial Water Quality Objectives.

Actual exceedances of B-7 criteria and PWQOs have been discussed above. Predicted exceedances of B-7 criteria have typically been based on concentrations of parameters in one or more upgradient monitoring wells (the “trigger wells”) that could indicate landfill leachate impact of sufficient strength to result in eventual exceedances of B-7 criteria at the attenuation zone boundary. Similarly, predicted exceedances of PWQOs can be based on concentrations in one or more trigger wells that could result in PWQO exceedances in surface water downgradient of the attenuation zone.

7.5.1 Groundwater

As required by the former C of A, recommended trigger values for groundwater, based on 2009 monitoring data, and using MW7 as the “trigger well”, were provided in a letter to MECP dated November 23, 2009. Reception of these trigger values was acknowledged in a C of A amendment dated March 7, 2011 (see Appendix B). The trigger values were calculated as

per the methodology described in previous monitoring reports prepared by Trow/EXP, which assumes a linear decrease in contaminant levels with distance from the source (landfill) through one or more selected trigger wells to the downgradient attenuation zone boundary. The trigger values represent the concentrations of indicator parameters in the trigger well(s) that could indicate a risk of exceedance of the B-7 criteria at the downgradient boundary. The theoretical calculated trigger values are compared with the actual values reported for the trigger well(s) to identify any exceedances that could indicate a need for follow-up.

The calculated trigger values for groundwater have been updated for 2018 in Table 6. As indicated on the table, there were two exceedances of the trigger values at MW7 in 2018, as follows:

- Arsenic – average measured concentration 0.042 mg/L versus trigger value of 0.021 mg/L
- Iron – average measured concentration of 22 mg/L versus trigger value of 21.75 mg/L

As previously discussed, the measured arsenic levels at MW7 in 2018 were higher than in any of the potential source wells (including MW1, MW2, MW3A, MW3B, MW4 and MW5). Therefore, the exceedance of the trigger value at MW7 cannot reasonably be ascribed to landfill leachate impact, unless plume strength beneath the landfill has recently decreased. As previously noted, this does not appear to be the case.

The situation with iron is different. Exceedance of the trigger value, as well as elevated levels in MW10A/10B, indicates a need for further investigation (as a minimum) and/or implementation of contingency plan measures.

7.5.2 **Surface Water**

Trigger values for surface water are measured or predicted exceedances of PWQO criteria that cannot be ascribed to alternative sources (e.g., road salting, vehicle traffic) or natural or pre-existing conditions (e.g., former mine-related activities).

As reported previously, PWQO criteria exceedances in Kenogamisis Lake water samples were noted for the following parameters in 2018: phenols, arsenic, cobalt, copper, iron and phosphorus.

Based on the groundwater results discussed above, potential impact to the lake by iron in leachate is of concern. However, given the relatively small size of the landfill, the generally low leachate strength (based on results for potential source wells), the distance between the landfill site and the lake (> 500 m along the apparent groundwater flow path), and the size of the lake (surface area in excess of 25 km^2), it would appear to be unlikely that the elevated iron levels in the leachate would significantly impact the lake. This is notwithstanding the

shallowness of the lake (only about 1.5 m deep in Barton Bay and perhaps 3 m over the main part of the lake).

Previous calculations (presented in the 2007 monitoring report[5]), using iron as an indicator, suggested that there are adequate attenuation lands between the landfill and the lake to ensure that landfill leachate will not raise iron levels in groundwater to above the PWQO criterion at the point where groundwater discharges to the lake. However, the previous assessment did not consider the potential for preferential funneling of leachate along a high K corridor southwest of the landfill. Additional monitoring results, including those for the recommended new wells (see Section 7.6 below), should be incorporated in an updated assessment for inclusion in the next report, for possible incorporation in a formal risk assessment.

The MECP has historical monitoring data for Kenogamisis Lake which indicate that the lake has been impacted by historical gold mining and processing activities. Elevated arsenic levels, in particular, have been documented (average of 0.036 mg/L in Barton Bay samples and 0.025 mg/L in the lake south of the West Narrows, but typically <0.01 mg/L in the main part of the lake, based on unpublished MECP data generated between 1970 and 1981). Therefore, any additional arsenic loading to the lake would be undesirable. However, the arsenic concentrations in groundwater on and in the vicinity of the landfill (highest measured 2018 value in potential source wells = 0.026 mg/L [MW1], but mainly near or below the detection limit of 0.001 mg/L) could actually be dilutive.

7.5.3 **Attenuation Zone Requirements**

Trow's 2004 monitoring report stated that the minimum required attenuation zone size, based on worst-case leachate concentrations for TDS and DOC, would be about 18 ha. However, this estimate was significantly decreased in the 2007 calculations, which suggested that only 2.5 ha of attenuation lands should be necessary, based on iron as the indicator parameter of concern, but which, as previously discussed, did not consider potential leachate funneling. Municipal lands west and southwest of the site, totalling about 21.7 ha, have been included in the attenuation zone approved in the ECA. The Municipality of Greenstone also expropriated a strip of land along the north side of the historical waste footprint (to provide the required buffer), and obtained additional buffer/attenuation lands both east and west of the site from the Crown (MNRF). The total approved site area (waste footprint plus buffer/attenuation lands) now totals some 30.65 ha. Based on the elevated iron levels present in wells MW10A/10B, near the down-gradient limit of an apparent high K corridor, additional attenuation zone lands may be required between MW10A/10B and Kenogamisis Lake.

[5] Trow Associates Inc. (2008) *2007 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario.* Ref. No. F-06189-C/E. February 15, 2008.

7.6 Contingency Plan

The site has exceeded approved capacity and is due to close as soon as alternative facilities have been established (or sooner if required by MECP). In view of the concern regarding potentially-unacceptable iron impact to Kenogamisis Lake attributable to landfill leachate impact, EXP recommends the installation of a nested pair of monitoring wells between MW10A/10B and MW7. A finding of elevated iron levels at this location, consistent with a plume extending downgradient from the landfill to (and beyond) MW10A/10B would confirm the need for action to address off-site impact. As a minimum, expansion of the attenuation zone southwest of MW10A/10B would be indicated.

The risk posed by elevated iron in leachate would require further evaluation. As previously discussed, there is no APV for iron, but there is a PWQO. The basis for the establishment of the PWQO should be investigated. A formal risk assessment may be appropriate.

Should the existence of unacceptable iron impact to the lake be confirmed, the following measures to reduce leachate volumes and/or strength could be undertaken (either before or after closure, as applicable):

- Waste possibly buried below the groundwater table could be excavated and deposited above the water table, or alternatively moved to a different approved location.
- The groundwater table beneath the waste pile could be lowered through additional ditching to intercept upgradient surface water and possible shallow groundwater inflow and/or through other site drainage improvements.
- The amount and frequency of interim cover material applications could be increased.
- Lower permeability cover material (i.e., clay) could be used.
- Volumes of waste deposited in the landfill could be restricted.
- The site could be closed and capped immediately.
- If necessary, active leachate control (e.g., interception via a “French drain” system and redirection or capture for recirculation or treatment) could be implemented.

Contingency plans dealing with potential identified environmental impacts at the site have been further discussed in an Updated Design and Operations (D & O) Plan with Closure Plan (October 2012).

8 Summary and Recommendations

8.1 Waste Disposal and Buffer/Attenuation Lands

The Geraldton Landfill Site is operating under an Amended Environmental Compliance Approval (ECA) No. A7004401, dated August 7, 2014 issued by the MECP. The ECA approved a volume expansion of 100,000 m^3 (for a total approved capacity of 273,000 m^3), as well as an expanded site (landfill footprint) area of 4.3 ha within an expanded attenuation zone totaling 30.65 ha. However, almost all of the approved additional capacity had already been utilized, and the new capacity limit was reached in 2014. The ECA allowed for continued use of the site (i.e., beyond approved capacity) until December 31, 2015. An Amendment Notice to the ECA was issued on November 2, 2015, allowing the Geraldton Landfill to continue accepting waste beyond its approved capacity until December 31, 2016. The MECP has subsequently issued additional Amendment Notices, the most recent of which allows site operation until December 31, 2019.

Prior to the current ECA, an Amended Provisional Certificate of Approval (C of A) No. A7004401 had been issued on November 24, 2008, approving a landfill footprint of 1.9 ha within a total site area of 26.35 ha. An Amendment Notice to the Provisional C of A was later been issued on March 7, 2011, indicating receipt of groundwater trigger values as presented in a letter report dated November 23, 2009 by EXP (then known as Trow Associates Inc.).

As noted, the currently approved boundaries of the landfill site (Parcel HM215 on Figures 3 and 8) incorporate a *de facto* waste disposal area of about 4.3 ha, as approved by the current ECA. In actuality, waste has in some locations been deposited outside of the boundaries of Parcel HM215, so that the current toe of the landfill surrounds an area of about 4.6 ha.

The Municipality has acquired all the necessary lands for the expanded disposal/buffer/attenuation areas. However, the actual available site area, including an expropriated strip along the north edge of the waste footprint and another strip along the east edge (obtained from the Crown/MNRF), that provide the necessary minimum 30 m buffer in these directions, as well as additional attenuation lands to the west (also obtained from MNRF), will be somewhat larger than the approved 30.65 ha, and should be confirmed. This area is depicted on Figure 8.

8.2 Site Compliance

The MECP's review of the previous monitoring report (for the years 2013-2015) confirmed that the site was in compliance with the ECA.

In general, the 2018 monitoring results are similar to previous years. Parameters that exceeded B-7 criteria in 2018 at downgradient perimeter monitoring wells (MW8, MW9, MW10A/10B and MW11) again included TDS, sodium, chloride, hardness, DOC, organic nitrogen, aluminum, arsenic, iron and manganese.

However, many of these exceedances can potentially be attributed to other sources, such as road salting (TDS, sodium, chloride), naturally high and variable levels (DOC, aluminum, hardness, manganese, organic nitrogen), and historical gold mining activities (arsenic).

Iron levels are generally known to also be naturally high and variable in northern Ontario groundwater. However, iron has not been detected in the background well. The exceedances for iron at MW10A/10B appear to be attributable at least partially to leachate plume impact, which should be investigated further and appropriately addressed.

8.3 Monitoring and Reporting Program

Elevated iron levels downgradient of the site are a potential concern. In view of the MECP's comments regarding off-site plume migration and potential impact to Kenogamisis Lake, EXP recommends the installation of a new nested pair of wells along the high K corridor (sand to sand/gravel zone, as illustrated on Figure 5), approximately midway between MW10A/10B and MW7, in order to shed further light on whether landfill leachate is indeed responsible.

In compliance with the current ECA, the existing monitoring wells (total 13), the newly-installed wells (2), as well as surface water in Kenogamisis Lake (three locations), should be sampled twice annually (i.e., spring and fall) in 2019, 2020 and 2021. Groundwater and surface water parameters outlined in the ECA should be analyzed as indicated, including once-yearly VOCs at MW5. For QA/QC purposes, one blind duplicate sample should again be collected during each sampling event.

A formal re-evaluation of trigger levels, utilizing criteria protective of surface water (PWQO's and APV's) in place of, or in addition to, criteria protective of groundwater (i.e., ODWS's and Reasonable Use Policy) should be prepared and submitted for the MECP's review/approval.

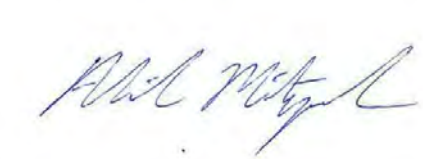
In addition to updating the time series graphs for groundwater, similar graphs should be prepared for arsenic, iron and phosphorus in surface water. Also, trends of concentrations with time should be statistically evaluated (e.g., Mann-Kendall analysis). The additional graphs and statistical analysis results should be presented in the next monitoring report (for the years 2019-2021) due March 31, 2022.

It is anticipated that the next report will cover a period of post-closure. Results should be interpreted in the context of the revised trigger levels, and any appropriate recommendations for mitigation measures such as an expanded CAZ or leachate collection should be provided, along with recommendations for any appropriate changes to the monitoring program.

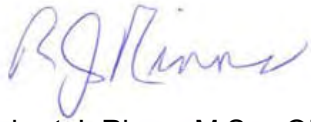
Should you have any questions regarding this report, please contact our office at your convenience.

Yours truly,

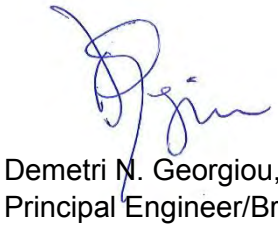
EXP Services Inc.



Ahileas Mitsopoulos, P.Eng.
Project Engineer



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



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

APPENDIX A-

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Figure 7-C: Section C-C

Figure 7-D: Section D-D

Figure 7-E: Section E-E

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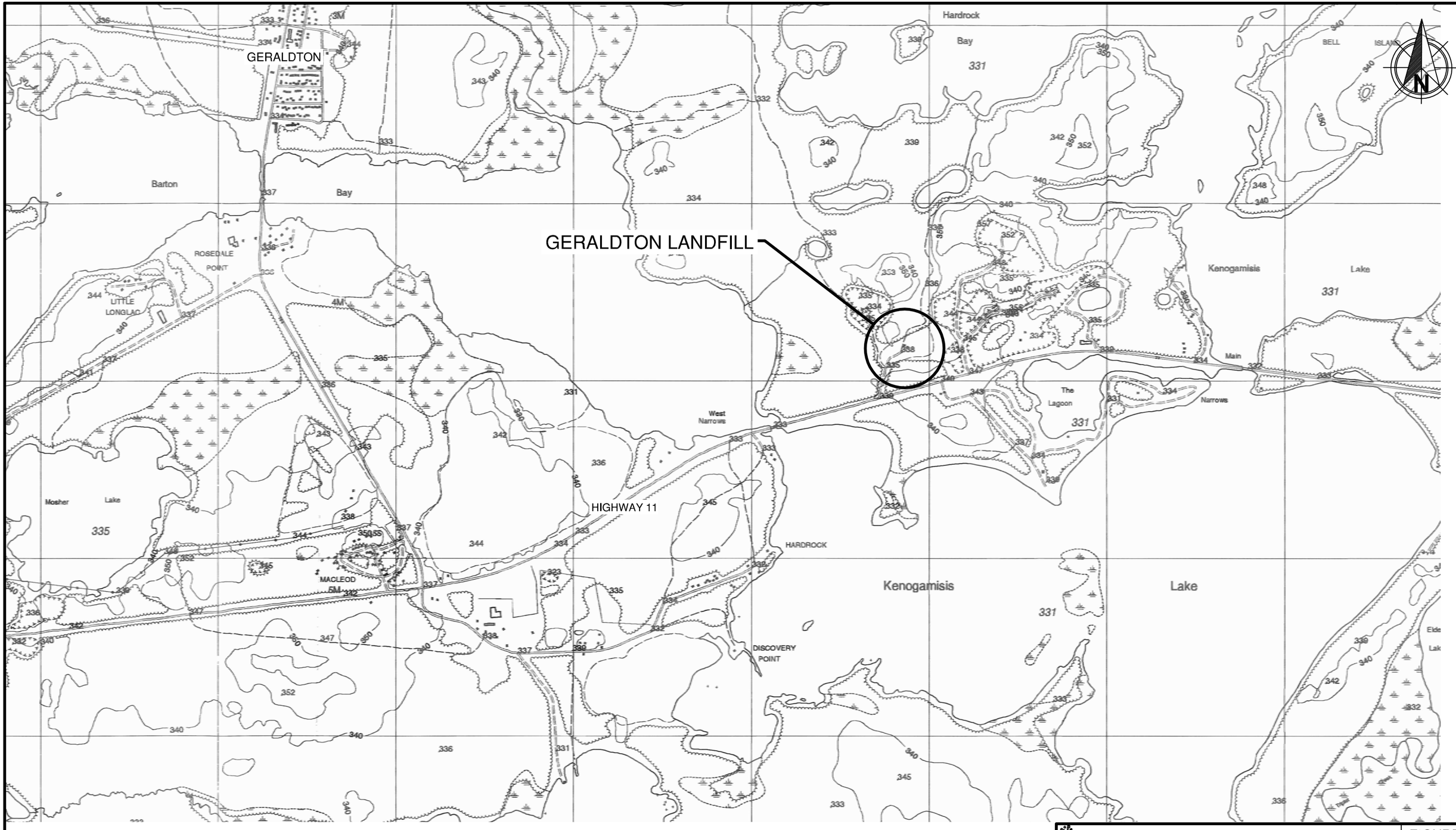


Notes:

1) Reference: Ministry of Natural Resources 1:20,000 OBM Sheet No. 20 16 5000 55000

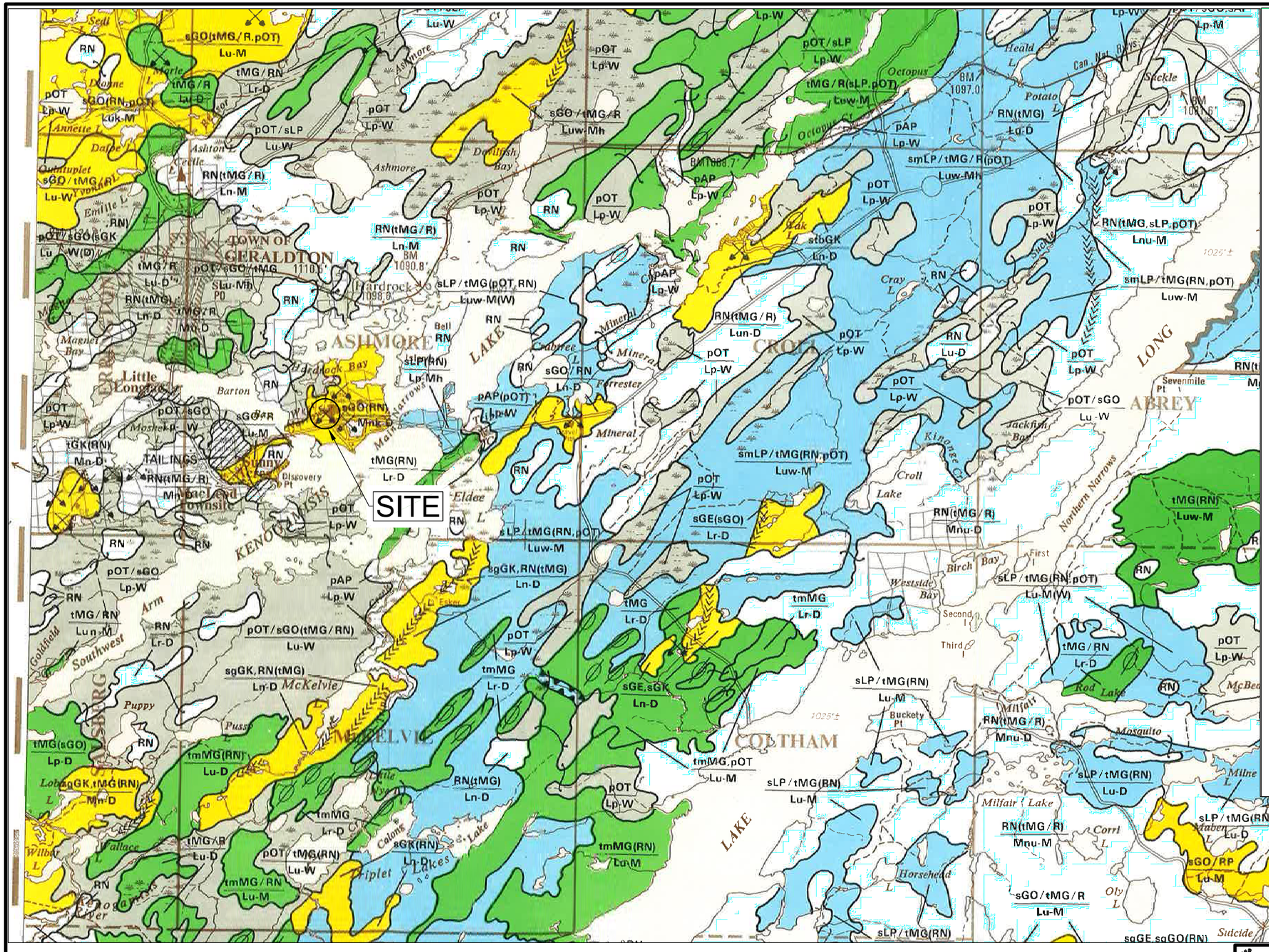
exp. Thunder Bay, Ontario

FIGURE 1

SITE LOCATION PLAN

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:20,000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	January 28, 2019



LEGEND

LANDFORM

MORAINAL
- **ME** *End moraine*
- **MG** *Ground moraine*
- **MH** *Hummocky moraine*

GLACIOFLUVIAL
- **GD** *Ice contact delta, esker delta, kame delta, delta moraine*
- **GE** *Esker, esker complex, crevasse filling*
- **GK** *Kame, kame field, kame terrace, kame moraine*
- **GO** *Outwash plain, valley train*

GLACIOLACUSTRINE
- **LB** *Raised (abandoned) beach form*
- **LD** *Glaciolacustrine delta*
- **LP** *Glaciolacustrine plain*

ALLUVIAL
- **AP** *Alluvial plain*

COLLUVIAL
- **CS** *Slope failure*
- **CT** *Talus pile*
- **CW** *Slopewash and debris creep sheet; minor talus*

EOLIAN
- **ED** *Sand dunes*

ORGANIC
- **OT** *Organic terrain*

BEDROCK
- **RL** *Bedrock plateau*
- **RN** *Bedrock knob*
- **RP** *Bedrock plain*
- **RR** *Bedrock ridge*
- **IR** *Bedrock below a drift veneer*

MATERIAL
- **b** *boulders, bouldery*
- **c** *clay, clayey*
- **g** *gravel, gravelly*
- **p** *peat, muck*
- **r** *rubble*
- **s** *sand, sandy*
- **m** *silt, silty*
- **t** *till*

TOPOGRAPHY

LOCAL RELIEF
- **H** *Mainly high local relief*
- **M** *Mainly moderate local relief*
- **L** *Mainly low local relief*

VARIETY
- **c** *channelled*
- **d** *dissected, gullied*
- **j** *jagged, rugged, cliffed*
- **j°** *cliffed volcanic rock signature*
- **k** *kettled, pitted*
- **n** *knobby, hummocky*
- **p** *plain*
- **r** *ridged*
- **s** *sloping*
- **t** *terraced*
- **u** *undulating to rolling*
- **w** *washed, reworked*

DRAINAGE

SURFACE CONDITION
- **W** *Wet*
- **D** *Dry*
- **M** *Mixed wet and dry*
- **h** *Suspected high water table*

The letter codes describing the terrain units are made up of four components arranged as follows:–

MATERIAL	LANDFORM
TOPOGRAPHY	DRAINAGE

Examples:

1. material: **tMG(RN)**; landform: subordinate landform; drainage: **Mu(Hj)-D**; local relief: relief of subordinate landform; topographic variety of dominant landform: dominant landform

2. **pOT/sGO** (**Lp-W**): slash indicates a veneer of one landform overlying a second landform

Note:
1) Reference: Northern Ontario Engineering Geology Terrain Study, Ontario Geological Survey Map (5078 - Longlac).

1000 0 1000 2000
IN METRES

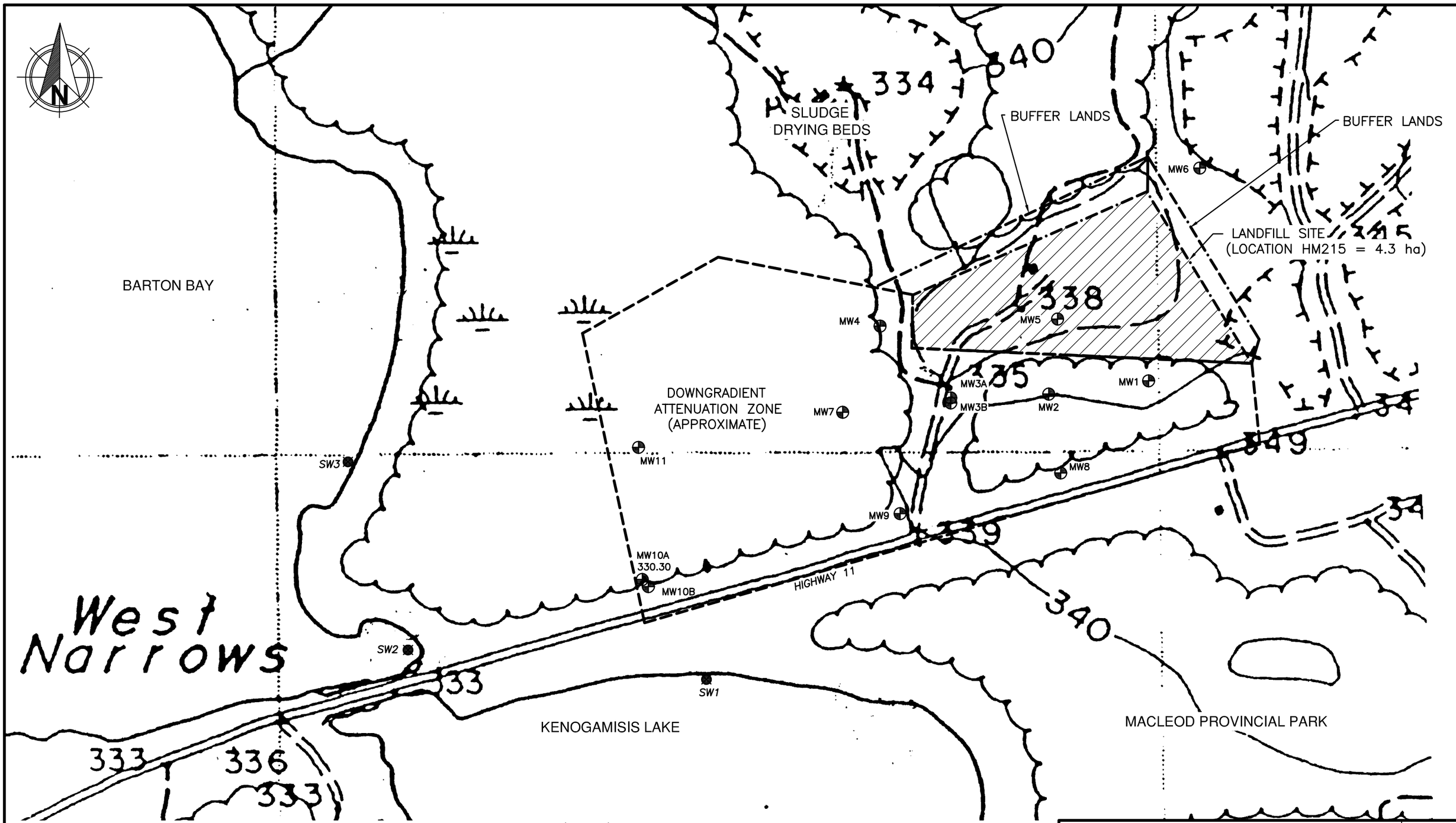
exp. Thunder Bay, Ontario

FIGURE 2

LANDFORMS, TOPOGRAPHY & DRAINAGE

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:100,000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 7, 2019



Note:

1) Drawing based on 1:20,000 Ontario Base Map

Legend:

MW1	Monitoring Well Location
SW1	Surface water sampling location

40 0 40 80
IN METRES

exp. Thunder Bay, Ontario

FIGURE 3

SURROUNDING FEATURES AND SAMPLING LOCATIONS

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	~1:4000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 6, 2019

Legend

- **MW4** - Monitoring Well Location
- ■ - Denotes Found Monument
- ◉ - Denotes Utility Pole
- —··— - Denotes Overhead Wire
- ~~~ - Denotes Treeline
- —·—·— - Denotes Approximate Property Line
- ⊡ - Denotes Test Pit

Notes:

1) Coordinates are metric, low order UTM control.
2) Elevations are referred to the base station having a geodetic elevation of 337.80 m.
3) Topographic survey completed by Delta Survey Inc. on August 23, 2018. Survey conducted within fenced area only.
4) Volume Increase of Waste Pile:
   - 2009 - 2012 = 21,920 m3
   - 2012 - 2014 = 17,408 m3
   - 2014 - 2015 = 4,074 m3
   - 2015 - 2016 = 4,978 m3
   - 2016 - 2018 = 3,277 m3
5) Contour Interval = 1 m

Road
Sand Pile
50M OFFSET LINE
EXCAVATED AREA
Covered Waste Limit
APPROX. ELECTRIC FENCE LOCATION
NEW LANDFILL AREA
30m Offset
30M OFFSET LINE
50M OFFSET
Access Road
Shred-Pile
GPS BASE 337.80M FD 1B
WASTE DISPOSAL LANDFILL PILE
4.3 ha (~ 10.6 ACRES)
APPROVED SITE AREA
(2014 AMENDED ECA)
Steep Bank
Electronic waste drop-off
Metal drop-off
Appliance drop-off
Fluorescent bulb drop-off
Tires
CAN
Shed
METAL PILE
Gate
Iron Bar
Elev=349.53
APPROVED WASTE FOOTPRINT (4.3 ha)
ESTIMATED HISTORICAL EXTENT OF BURIED WASTE
AZ 227°43'27" 402.62m ±
Section line E continued
see Figure 5
Access Road

MW1, MW2, MW3A, MW3B, MW4, MW5, MW6, MW7, MW8, MW9, MW10A, MW10B, MW11

A, B, C, D, E

5 504 600 N
5 504 500 N
5 504 400 N
5 504 300 N
5 504 200 N
5 504 100 N
506 500 E
506 600 E
506 700 E
506 800 E
506 900 E
507 000 E
507 100 E
507 200 E

20 0 20 40
IN METRES

exp. Thunder Bay, Ontario

FIGURE 4

SITE AND SURVEY PLAN

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:2,000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 6, 2019

Notes:

1) Drawing based on 1:20,000 Ontario Base Map
2) Historical observation wells (OB1 to OB9) were superimposed based on the 2003 investigation. The ground surface elevations were converted referencing the 2018 survey.
3) The approximated soil zones are based on the findings of the limited borehole logs, and are based on the "main" soils at and/or below the groundwater table. Relatively thin soil layers below the groundwater table were not considered as "main" soils.
4) Kenogamisis Lake water elevation was obtained from the Northern Ontario Engineering Geology Terrain Study, Ontario Geological Survey Map (5078 - Longlac), dated 1980. The water elevation is approximate.

BARTON BAY

West Narrows

SLUDGE DRYING BEDS

BUFFER LANDS

BUFFER LANDS

DOWNGRADIENT ATTENUATION ZONE BOUNDARY (APPROXIMATE)

LANDFILL SITE (LOCATION HM215 = 4.3 ha)

MW6 336.53 (333.27)

OB9 337.03 (330.15)

OB4 333.29 (331.89)

OB5 339.07 (331.61)

MW4 332.22 (331.12)

MW5 338.29 (331.36)

OB7 332.25 (331.25)

MW3A 335.44 (331.03)

OB8 337.75 (331.39)

OB1 336.63 (331.69)

OB3 334.96 (331.86)

OB2 336.56 (331.72)

OB6 335.35 (331.18)

MW1 335.53 (331.46)

MW7 334.08 (330.82)

MW3B 335.40 (331.03)

MW2 337.62 (331.31)

MW11 330.25 (330.15)

MW8 346.37 (331.43)

MW9 341.11 (332.05)

MW10A 330.47 (330.30)

MW10B 330.45 (330.30)

HIGHWAY 11

SW3

SW2

SW1

KENOGAMISIS LAKE
water elevation = 329.5 m

MACLEOD PROVINCIAL PARK

334 340 338 339 340 333 336 333

40 0 40 80
IN METRES

Legend:

- MW1 — Monitoring Well Location
- 335.53 — Ground Surface Elevation in metres (measured October 2018)
- (331.46) — Groundwater Elevation in metres (measured October 2018)
- OB1 — Historical Observation Well Location (Removed)
- 336.63 — Ground Surface Elevation in metres (measured June 13, 2003)
- (331.69) — Groundwater Elevation in metres (measured June 13, 2003)
- SW1 — Surface water sampling location
- Sand to Sand/Gravel Zone
- Silt to Silt/Sand Zone

exp. Thunder Bay, Ontario

FIGURE 5

APPROXIMATE SUBSURFACE SOIL BOUNDARIES

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

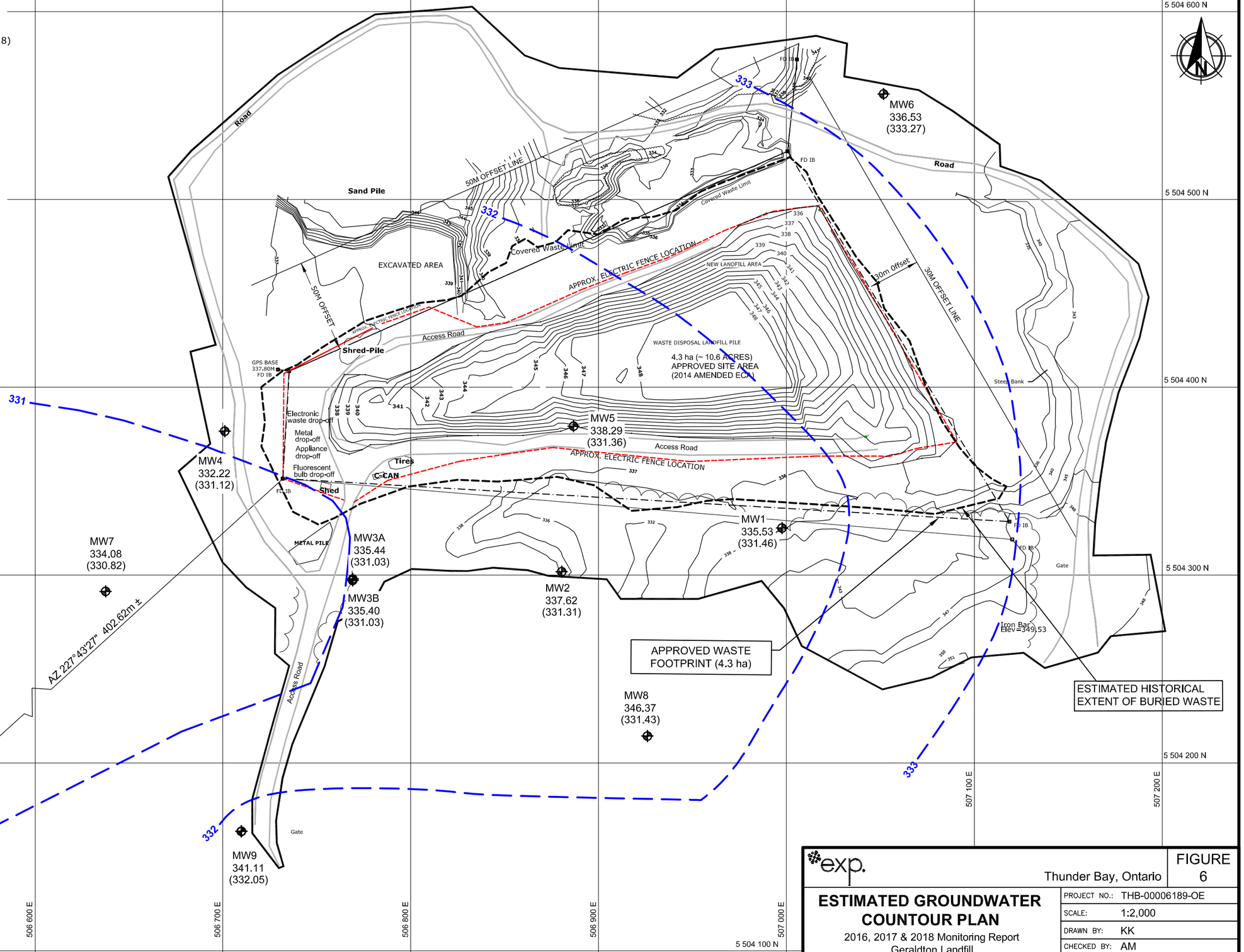
PROJECT NO.:	THB-00006189-OE
SCALE:	~1:4000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 8, 2019

Legend

- MW4 - Monitoring Well Location
- 332.22 - Ground Surface Elevation in metres (August 23, 2018)
- (331.12) - Groundwater Elevation in metres (October 2018)
- 331 - Groundwater Contour in metres (October 2018)
- ■ - Denotes Found Monument
- ◉ - Denotes Utility Pole
- —··— - Denotes Overhead Wire
- ~~~ - Denotes Treeline
- -·-·-·- - Denotes Approximate Property Line
- ⊡ - Denotes Test Pit

Notes:

1) Coordinates are metric, low order UTM control.
2) Elevations are referred to the base station having a geodetic elevation of 337.80 m.
3) Topographic survey completed by Delta Survey Inc. on August 23, 2018. Survey conducted within fenced area only.
4) Volume Increase of Waste Pile:
   - 2009 - 2012 = 21,920 m3
   - 2012 - 2014 = 17,408 m3
   - 2014 - 2015 = 4,074 m3
   - 2015 - 2016 = 4,978 m3
   - 2016 - 2018 = 3,277 m3
5) Contour Interval = 1 m



exp. Thunder Bay, Ontario

FIGURE 6

ESTIMATED GROUNDWATER COUNTOUR PLAN

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

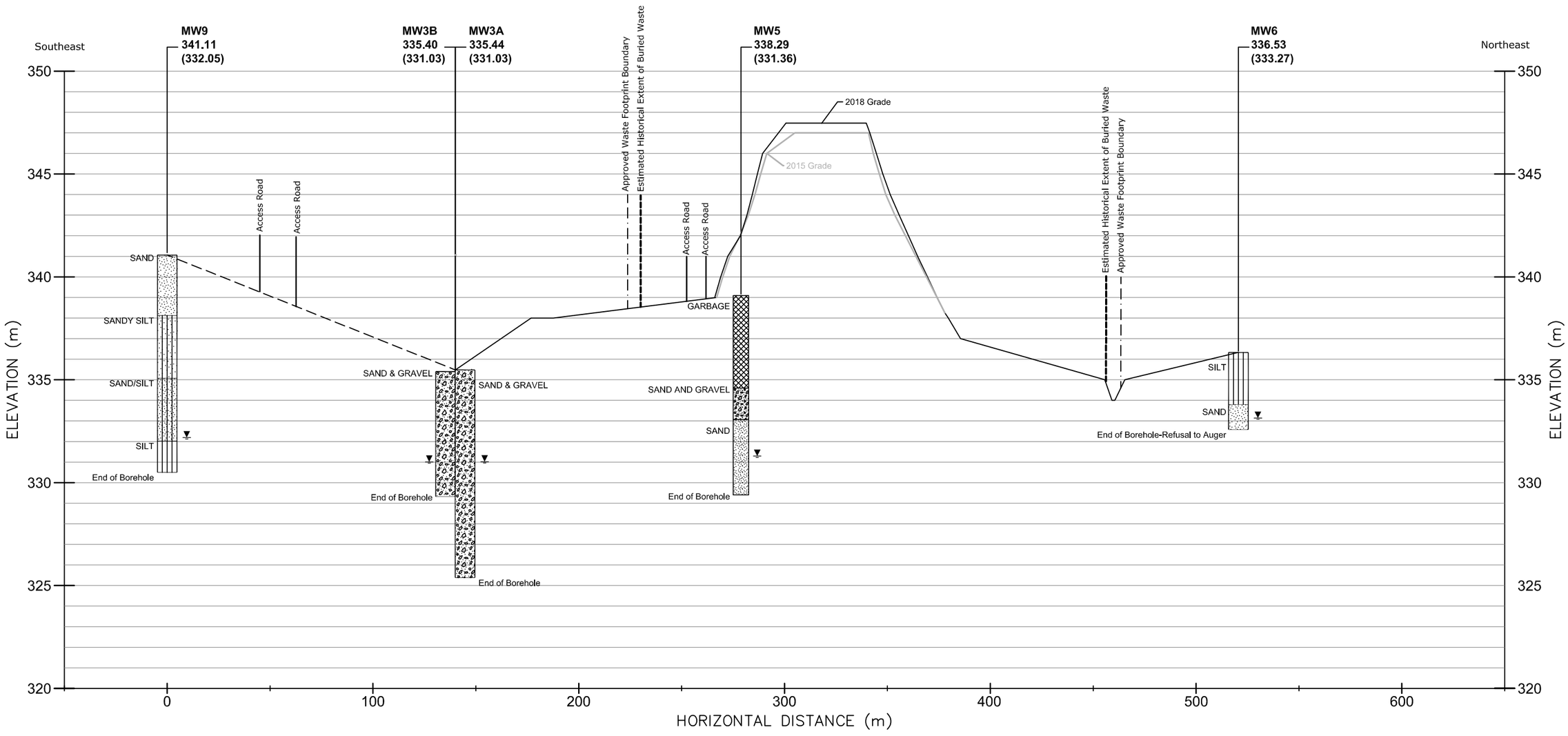
PROJECT NO.:	THB-00006189-OE
SCALE:	1:2,000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 6, 2019

Legend

MW5 - Monitoring Well Location
338.29 - Ground Surface Elevation in metres
(331.36) - Groundwater Elevation in metres (October 2018)

▼ - Denotes Groundwater Table

Notes:
1) See Figure 4 for Section location.
2) Groundwater elevations measured October 2018.



exp. Thunder Bay, Ontario

FIGURE 7A

SECTION A-A

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

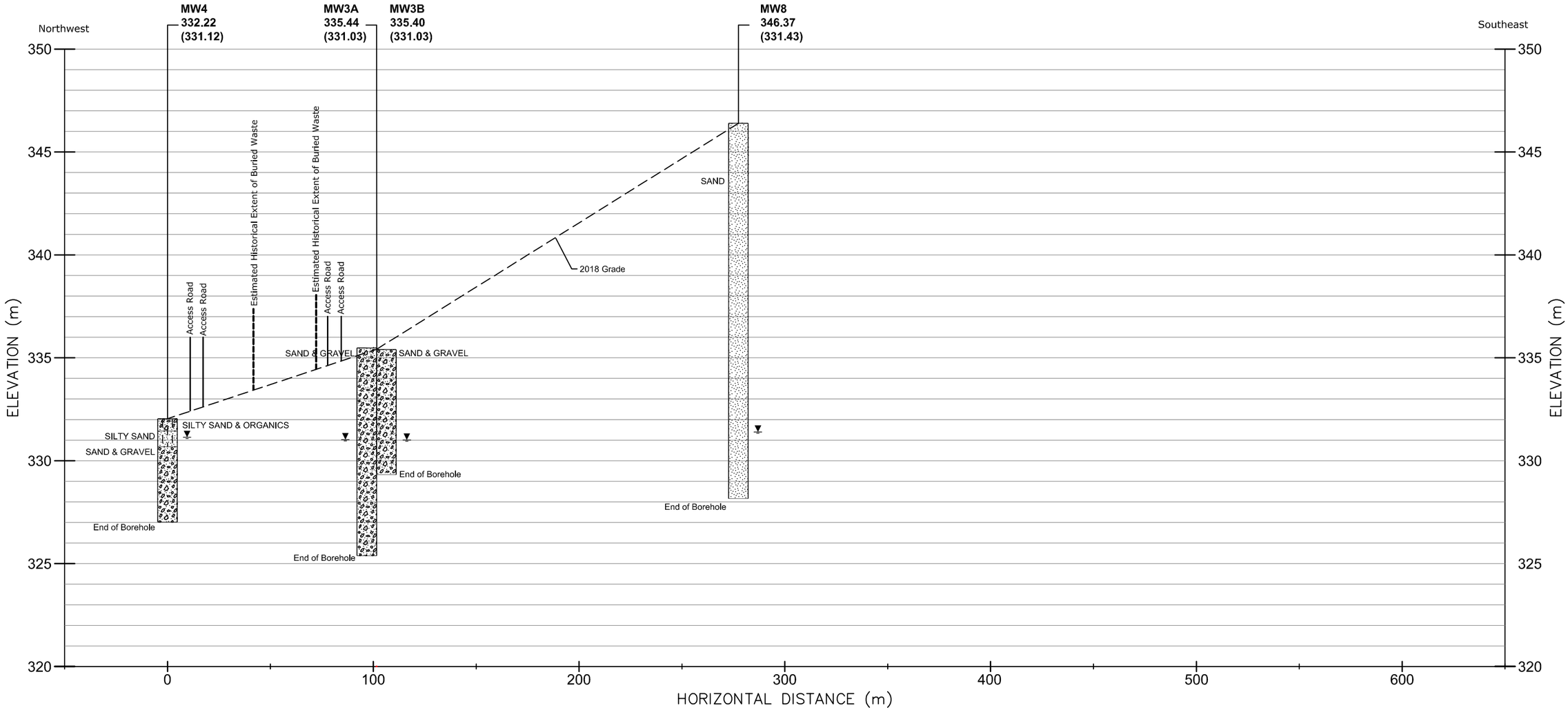
PROJECT NO.:	THB-00006189-OE
SCALE:	1:2000H / 1:200V
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 5, 2019

Legend

MW4 - Monitoring Well Location
332.22 - Ground Surface Elevation in metres
(331.12) - Groundwater Elevation in metres (October 2018)

▼ - Denotes Groundwater Table

Notes:
1) See Figure 4 for Section location.
2) Groundwater elevations measured October 2018.



exp. Thunder Bay, Ontario

FIGURE 7B

SECTION B-B

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

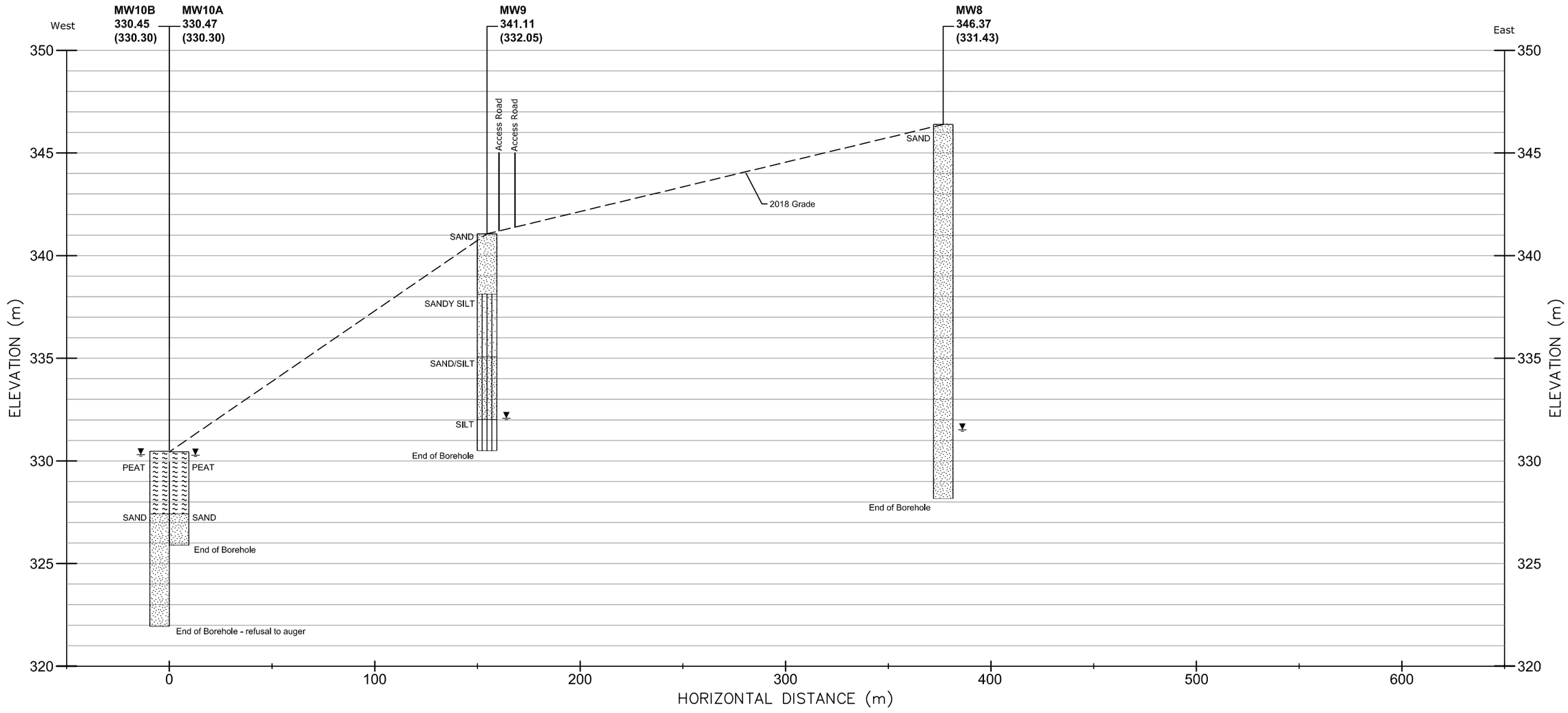
PROJECT NO.:	THB-00006189-OE
SCALE:	1:2000H / 1:200V
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 5, 2019

Legend

MW9 - Monitoring Well Location
341.11 - Ground Surface Elevation in metres
(332.05) - Groundwater Elevation in metres (October 2018)

▼ - Denotes Groundwater Table

Notes:
1) See Figure 4 for Section location.
2) Groundwater elevations measured October 2018.



exp. Thunder Bay, Ontario

FIGURE 7C

SECTION C-C

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

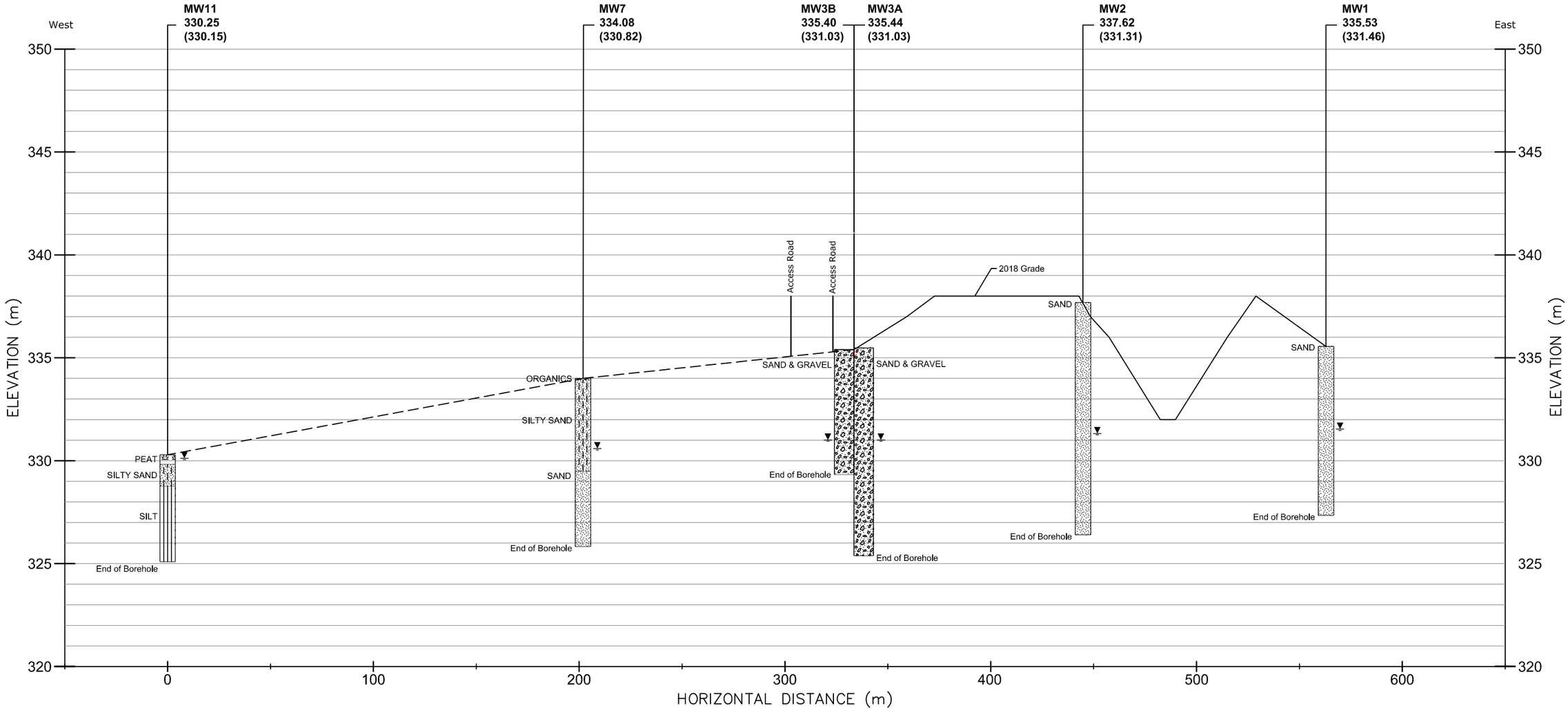
PROJECT NO.:	THB-00006189-OE
SCALE:	1:2000H / 1:200V
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 5, 2019

Legend

MW7 - Monitoring Well Location
334.08 - Ground Surface Elevation in metres
(330.82) - Groundwater Elevation in metres (October 2018)

▼ - Denotes Groundwater Table

Notes:
1) See Figure 4 for Section location.
2) Groundwater elevations measured October 2018.



exp. Thunder Bay, Ontario

FIGURE 7D

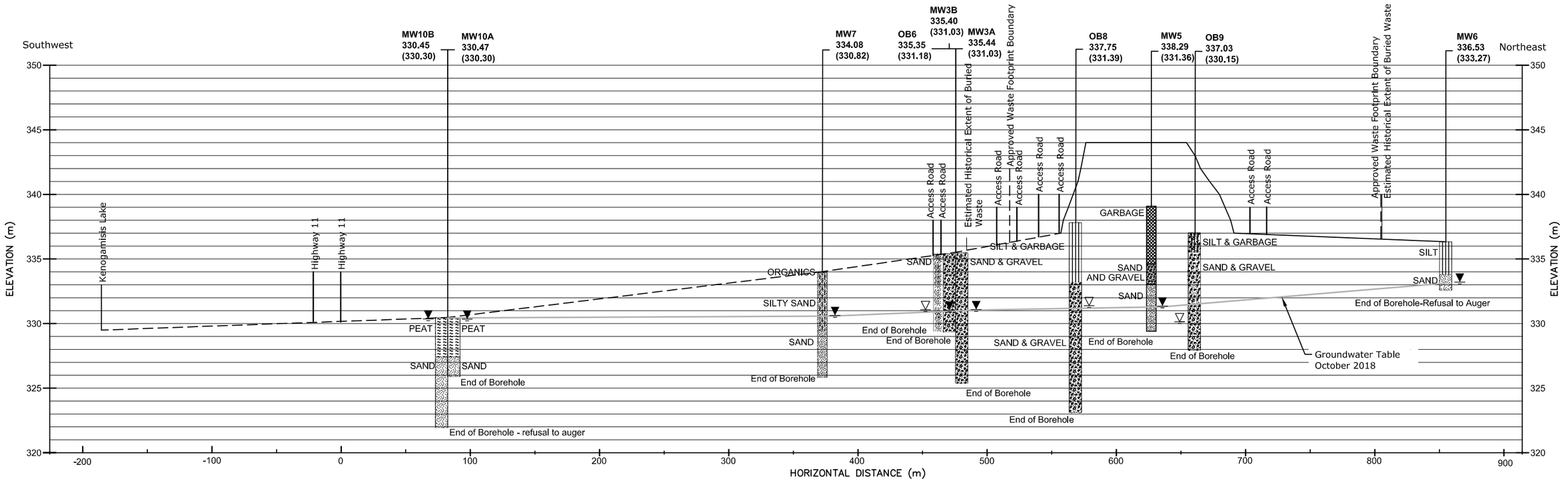
SECTION D-D

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:2000H / 1:200V
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 5, 2019

Legend

- **MW7** - Monitoring Well Location
- **334.08** - Ground Surface Elevation in metres
- **(330.82)** - Groundwater Elevation in metres (October 2018)
- **OB6** - Historical Observation Well Location (Removed)
- **335.35** - Ground Surface Elevation in metres (June 13, 2003)
- **(331.18)** - Groundwater Elevation in metres (June 13, 2003)
- Denotes Groundwater Table (October 2018)
- Denotes Groundwater Table (June 2003)



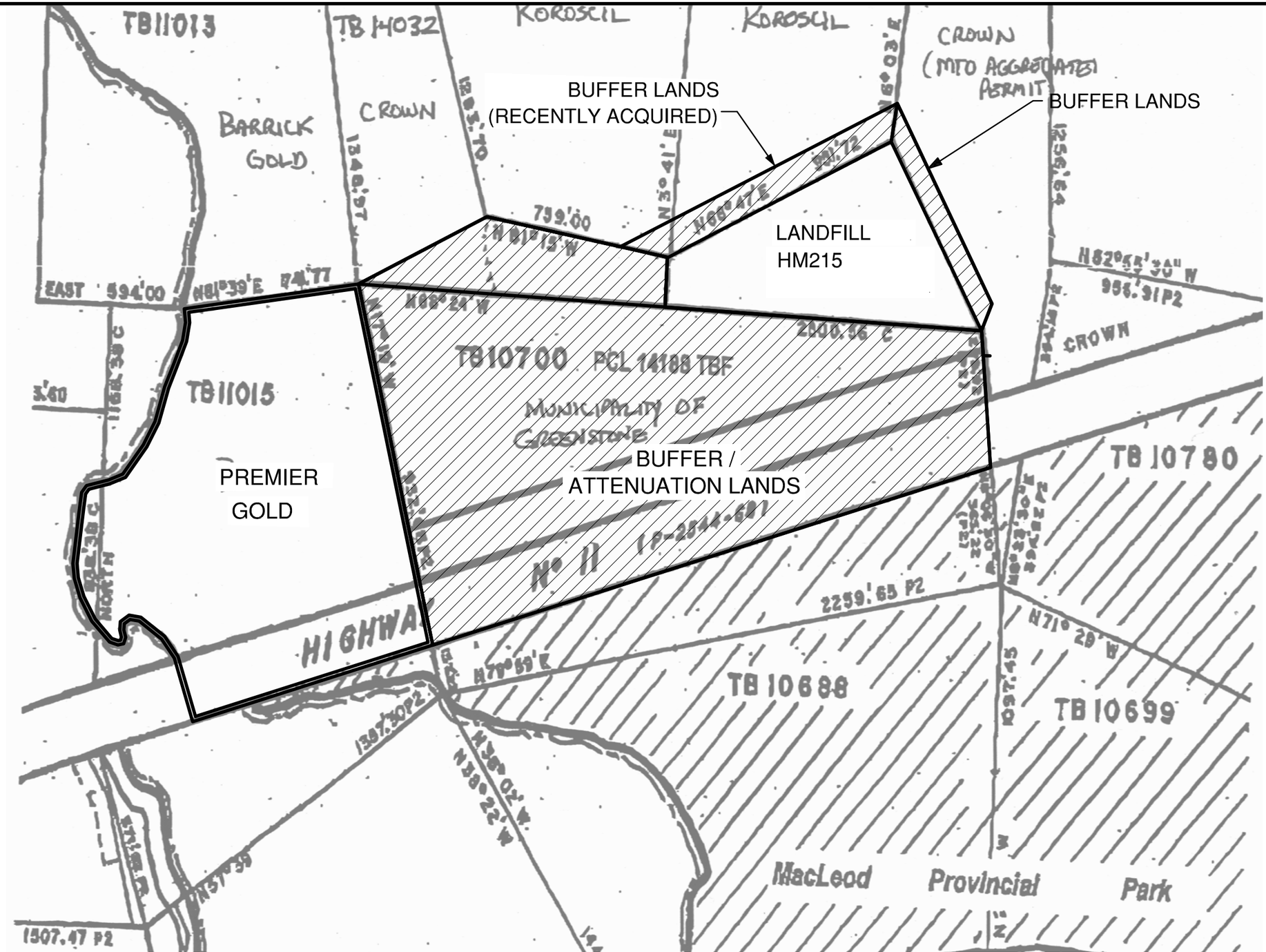
exp. Thunder Bay, Ontario

FIGURE 7E

SECTION E-E

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:2000H / 1:200V
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 8, 2019



50 0 50 100
IN METRES

Notes:

1) Base drawing provided by client
2) Drawing reproduced from 2004 Trow report on Design and Operation Plan, and 2012 EXP Updated Design and Operations Plan with Closure Plan.

exp. Thunder Bay, Ontario

FIGURE 8

SURROUNDING LAND TENURE AND ATTENUATION ZONE
2016, 2017 and 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	THB-00006189-OE
SCALE:	1:5,000
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 5, 2019

APPENDIX B-

Environmental Compliance Approval (ECA), Certificate of Approval (C of A) and related MECP Correspondence and Documentation

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A7004401
Notice No. 3
Issue Date: December 14, 2018

The Corporation of the Municipality of Greenstone
1800 Main St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584, 8272 Highway 11
Greenstone Municipality, District of Thunder Bay

You are hereby notified that I have amended Approval No. A7004401 issued on August 7, 2014 and amended on November 2, 2015 and December 19, 2016 for the use and operation of a 4.3 hectare landfilling/recycling site within a total site area of 30.65 hectares , as follows:

I. Condition 3.2 of this Approval is hereby amended as follows:

3.2 (1) The original maximum volume of waste and cover materials, excluding final cover for the *Site* was **173,000 m^3**.

(2) The maximum amount of waste approved for final disposal, excluding final cover at the *Site* based on the completed Environmental Screening Report Process is **273,000 m^3**.

(3) (i) Notwithstanding Condition 3.2 (2), the *Site* is hereby permitted to continue to accept waste for final disposal until **December 31, 2019**.

(ii) Condition 3.2 (3) (i) does not constitute an approved expansion from the volume currently approved by Condition 3.2 (2). Upon the issuance of any future Environmental Assessment Act approval, the volume of waste accepted under Condition 3.2 (3) (i) must be included as part of any expansion volume received.

(4) In the event, the *Owner* has not completed the Environment Assessment Act process by the date in which the Site is permitted to receive waste for final disposal as stated in Condition 3.2 (3) (i) and would like to continue to receive waste at the *Site* for final disposal past that date, the

Owner shall submit an application to the *Director* at least **thirty (30) days** prior to the end date for accepting waste for final disposal in Condition 3.2 (3) (i) requesting that an extension to the date for final disposal be extended. To support the request, the *Owner* include but not be limited to following to submit the request:

(i) A drawing showing the proposed location where the waste will be placed;
(ii) A summary of the environmental conditions/compliance at the Site; and
(iii) A current status of the Environmental Assessment Act process for the long-term waste management strategy for the Municipality.

II. The following item is hereby added to Schedule "A" of this Approval:

10. Letter dated October 12, 2018, and signed by Ahilcas Mitsopoulos and Demetri N. Georgiou, EXP Services Inc., addressed to Dale Gable and Matthew Wilson, Ministry of the Environment, including all figures.

III. The reason for this amendment to the Approval is as follows:

To allow the site to operate while the EA is completed.

This Notice shall constitute part of the approval issued under Approval No. A7004401 dated August 7, 2014

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of December, 2018

THIS NOTICE WAS MAILED
ON JAN 0 8 2019
(Signed)

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MT/
c: District Manager, MECP Thunder Bay - District
Ahileas Mitsopoulos, P. Eng., EXP

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A7004401
Notice No. 2
Issue Date: December 19, 2016

The Corporation of the Municipality of Greenstone
1800 Main St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584, 8272 Highway 11
Greenstone Municipality, District of Thunder Bay

You are hereby notified that I have amended Approval No. A7004401 issued on August 7, 2014 and amended on November 2, 2015 for the use and operation of a 4.3 hectare landfilling/recycling site within a total site area of 30.65 hectares , as follows:

Condition 3.2 and 13.1 is hereby amended to read as follows:

3.2 (1) The original maximum volume of waste and cover materials, excluding final cover for the *Site* was **173,000 m^3**.

(2) The maximum amount of waste approved for final disposal, excluding final cover at the *Site* based on the completed Environmental Screen Report Process is **273,000 m^3**.

(3) (i) Notwithstanding Condition 3.2(2), the *Site* is hereby permitted to continue to accept waste for final disposal until **December 31, 2018**.

(ii) Condition 3.2 (3)(i) does not constitute an approved expansion from the volume currently approved by Condition 3.2 (2). Upon the issuance of any future Environmental Assessment Act approval, the volume of waste accepted under Condition 3.2 (3)(i) must be included as part of any expansion volume received.

(4) In the event, the *Owner* has not completed the Environment Assessment Act process by the date in which the Site is permitted to receive waste for final disposal as stated in Condition

3.2(3)(i) and would like to continue to receive waste at the *Site* for final disposal past that date, the *Owner* shall submit an application to the *Director* at least **thirty (30) days** prior to the end date for accepting waste for final disposal in Condition 3.2 (3)(i) requesting that an extension to the date for final disposal be extended. To support the request, the *Owner* include but not be limited to following to submit the request:

i. A drawing showing the proposed location where the waste will be placed;
ii. A summary of the environmental conditions/compliance at the Site; and
iii. A current status of the Environmental Assessment Act process for the long-term waste management strategy for the Municipality.

13.1 The Site shall be closed, final cover placed and post-closure maintenance completed in accordance with Schedule "A".

The following item is hereby added to Schedule "A":

9. Report titled "Updated Closure Plan Geraldton Landfill, Municipality of Greenstone, Ontario" prepraed by exp Services Inc. dated December 2, 2016.

The reason for this amendment to the Approval is as follows:

The reason for the amendment to Condition No. (3.2) and (13.1) is to allow the site to operate while the EA is completed.

This Notice shall constitute part of the approval issued under Approval No. A7004401 dated November 24, 2008 as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 19th day of December, 2016

THIS APPROVAL WAS MAILED
ON JAN 10 2017
(Signed)

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MW/
c: District Manager, MOECC Thunder Bay - District
Ahileas Mitsopoulos, Exp Services Inc.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A7004401
Notice No. 1
Issue Date: November 2, 2015

The Corporation of the Municipality of Greenstone
1800 Main St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584
Greenstone Municipality, District of Thunder Bay

You are hereby notified that I have amended Approval No. A7004401 issued on August 7, 2014 for the use and operation of a 4.3 hectare landfilling/recycling site within a total site area of 30.65 hectares . , as follows:

Condition 3.2 is hereby amended to read as follows:

3.2 (1) The original maximum volume of waste and cover materials, excluding final cover for the *Site* was **173,000 m^3**.

(2) The maximum amount of waste approved for final disposal, excluding final cover at the *Site* based on the completed Environmental Screen Report Process is **273,000 m^3**.

(3) (i) Notwithstanding Condition 3.2(2), the *Site* is hereby permitted to continue to accept waste for final disposal until **December 31, 2016**.

(ii) Condition 3.2 (3)(i) does not constitute an approved expansion from the volume currently approved by Condition 3.2 (2). Upon the issuance of any future Environmental Assessment Act approval, the volume of waste accepted under Condition 3.2 (3)(i) must be included as part of any expansion volume received.

(4) In the event, the *Owner* has not completed the Environment Assessment Act process by the date in which the Site is permitted to receive waste for final disposal as stated in Condition 3.2(3)(i) and would like to continue to receive waste at the *Site* for final disposal past that date, the *Owner* shall submit an application to the *Director* at least **thirty (30) days** prior to the end date for

accepting waste for final disposal in Condition 3.2 (3)(i) requesting that an extension to the date for final disposal be extended. To support the request, the *Owner* include but not be limited to following to submit the request:

i. A drawing showing the proposed location where the waste will be placed;
ii. A summary of the environmental conditions/compliance at the Site; and
iii. A current status of the Environmental Assessment Act process for the long-term waste management strategy for the Municipality.

The following item is hereby added to Schedule "A":

8. Report Entitled "Amendment to ECA No. A7004401 - Geraldton Landfill Site, Greenstone Municipality, District of Thunder Bay" prepared by exp Services (Project Number THB-00006189-LE) dated September 9, 2015.

The reason for this amendment to the Approval is as follows:

1. The reason for the amendment to Condition No. (3.2) is to allow the site to operate while the EA is completed.

This Notice shall constitute part of the approval issued under Approval No. A7004401 dated August 7, 2014

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 2nd day of November, 2015

THIS NOTICE WAS MAILED
ON NOV. 3, 2015
DC
(Signed)

Dale D. Gable

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

AV/

c: District Manager, MOECC Thunder Bay - District
Ahileas Mitsopoulos, exp. Service Inc. ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A7004401
Issue Date: August 7, 2014

The Corporation of the Municipality of Greenstone
1800 Main St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584
Greenstone Municipality, District of Thunder Bay

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of a 4.3 hectare landfilling/recycling site within a total site area of 30.65 hectares .

For the purpose of this environmental compliance approval, the following definitions apply:

"Act" and ***"EPA"*** means the *Environmental Protection Act, R.S.O. 1990, C.E-19* as amended;

"Adverse Effect" means the same as the definition in the EPA;

"CAZ" means the Contaminant Attenuation Zone;

"Director" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part V of the EPA;

"District Manager" refers to the District Manager in the Ministry of the Environment's Thunder Bay District Office;

"District Office " refers to the Ministry of the Environment Thunder Bay District Office;

"EAB" refers to the *Environmental Approvals Branch* of the *Ministry of the Environment;*

"Environmental Compliance Approval" or "ECA" or ***"Approval"*** means this entire provisional

Environmental Compliance Approval document, issued in accordance with *Section 20.2* of the *EPA* , and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

"EPA" means *Environmental Protection Act* , *R.S.O. 1990* , c. E. 19, as amended from time to time;

"FBAL" refers to Fill Beyond Approved Limits;

"*HHW* " means household hazardous waste;

"*MOE* " or **"*Ministry* "** refers to the Ontario Ministry of the Environment;

"*Operator* " has the same meaning as "operator" as defined in *s.25* of the *EPA* ;

"*Owner* " means the Municipality of Greenstone;

"*PA* " means the *Pesticides Act* , R.S.O. 1990, c. P-11, as amended from time to time;

***"Provincial Officer* "** means any person designated in writing by the Minister as a provincial officer pursuant to *Section 5* of the *OWRA* or section 5 of the *EPA* or section 17 of *PA;*

"Refrigerant Appliances" means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;

"Regional Director" refers to the Director of the *Ministry of the Environment* 's Northern Regional Office;

"*Regulation 347* " or "*Reg. 347* " or "O. Reg. 347" means Regulation 347, R.R.O. 1990, made under the *EPA* , as amended from time to time;

"Site" or ***"WDS"*** means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Geraldton Waste Disposal Site, Part of Mining Claim T.B. 14031, 2 miles east of junction of Hwy 11 and 584, Township of Ashmore, District of Thunder Bay;

"*Substantial Completion* " has the same meaning as "substantial performance" in the Construction Lien Act; and

"Trained personnel" means knowledgeable in the following through instruction and/or practice:

a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads; and

h. the requirements of this *Certificate.*

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1.0 TERMS AND CONDITIONS

General

1.1 The Requirements specified in this ECA are the requirements under the *Environmental Protection Act, R.S.O. 1990* . The issuance of this Approval in no way abrogates the Applicant's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

1.2 The *Owner* shall ensure that all communications/correspondence made pursuant to this ECA includes reference to the ECA approval number A 412306.

1.3 The obligations imposed by the terms and conditions of this ECA are obligations of due diligence.

Compliance

1.4 The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of the *ECA* and the conditions herein and shall take all reasonable measures to ensure the person complies with the same.

1.5 Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *ECA* .

In Accordance

1.6 Except as otherwise provided for in this *ECA* , the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for ECA dated May 8, 1972 and the supporting documentation listed in Schedule "A".

Other Legal Obligations

1.7 The issuance of, and compliance with, this *ECA* does not:

(a) relieve any person of any obligation to comply with any provision of the *EPA* or any other applicable statute, regulation or other legal requirement; or
(b) limit in any way the authority of the *Ministry* to require certain steps be taken or to

request that any further information related to compliance with this *ECA* be provided to the *Ministry* ;

unless a provision of this *ECA* specifically refers to the other requirement or authority and clearly states that the other requirement or authority is to be replaced or limited by this *ECA* .

Adverse Effect

1.8 The *Owner* or *Operator* remain responsible for any contravention of any other condition of this *ECA* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect or impairment of air and/or water quality.

Furnish Information

1.9 Any information requested by the *Director* or a *Provincial Officer* concerning the *Site* and its operation under this *ECA* , including but not limited to any records required to be kept by this *ECA* shall be provided in a timely manner.

1.10 The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *ECA* or under any statute, regulation or subordinate legal instrument, in relation to the information, shall not be construed as:

i. an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any condition of this *ECA* or any statute, regulation or other subordinate legal requirement; or
ii. acceptance by the *Ministry* of the information's completeness or accuracy.

1.11 Any information related to this *ECA* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

Interpretation

1.12 Where there is a conflict between a provision of any document, including the application, referred to in this *ECA* , and the conditions of this *ECA,* the conditions in this *ECA* shall take precedence.

1.13 Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment in writing.

1.14 Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

1.15 The conditions of this *ECA* are severable. If any condition of this *ECA* , or the application of any condition of this *ECA* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *ECA* shall not be affected thereby.

Certificate of Requirement

1.16 Pursuant to Section 197 of the *EPA* , no person having an interest in the *Site* shall deal with the *Site* in any way without first giving a copy of this *ECA* to each person acquiring an interest in the *Site* as a result of the dealing.

1.17 In the event any additional land is acquired for the *Site* , then two (2) copies of a completed Certificate of Requirement, containing a registerable description of the additional lands for the *Site* , shall be submitted to the Director for the Director's signature within sixty (60) calendar days of any amendment to this *ECA* that incorporates the land into the *ECA* .

1.18 In the event any additional land is acquired for the *Site* , then the Certificate of Requirement shall be registered in the appropriate land registry office on title to the *Site* and a duplicate registered copy shall be submitted to the *Director* within ten (10) calendar days of receiving the Certificate of Requirement signed by the *Director* .

No Transfer or Encumbrance

1.19 No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and is satisfied with the arrangements made to ensure that all conditions of this *ECA* will be carried out and that sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

Change of Owner

1.20 The *Owner* shall notify the *Director* , in writing, and forward a copy of the notification to the *District Manager* , within 30 days of the occurrence of any changes in the following information:

i. the ownership of the *Site* ;
ii. the Operator of the *Site* ;
iii. the address of the *Owner* or *Operator* ;
iv. the partners, where the *Owner* or *Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R. S. O. 1990, c. B.17, shall be included in the notification;
v. the name of the corporation where the *Owner* or *Operator* is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act* , R. S. O. 1990, c. C.39, shall be included in the notification.

1.21 In the event of any change in the ownership of the *Site* , other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this *ECA* , and a copy of such notice shall be forward to the *Director* and *District Manager* .

Inspections

1.22 No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *EPA* or the *PA* , of any place to which this *ECA* relates, and without limiting the foregoing:

i. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *ECA* are kept;
ii. to have access to, inspect, and copy any records required to be kept by the conditions of this *ECA* ;
iii. to inspect the *Site,* related equipment and appurtenances;
iv. to inspect the practices, procedures, or operations required by the conditions of this *ECA* ; and
v. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *ECA* or the *EPA* or the *PA* .

2.0 SITE OPERATIONS

Proper Operation

2.1 The *Site* shall be properly operated and maintained at all times. All waste shall be managed and disposed of in accordance with the *EPA* , *Regulation 347* , and the requirements of this *ECA.* At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

2.2 The *Owner* shall ensure that the *MOE* 's Guideline B-7, Reasonable Use Concept, is applied at the *Site* boundaries.

2.3 (1*)* The *Owner* shall ensure the operations, maintenance and procedures manual for the *Site* includes discussions on the following items.:

a. Health and safety;
b. Operation and maintenance of the *Site* ;
c. Waste disposal area and development;
d. Nuisance management;
e. Leachate management;
f. Landfill gas management;
g. Surface water/Storm water management;
h. Inspections and monitoring;

i. Contingency plans and emergency procedures;
j. Complaints; and,
k. Reporting and record keeping.

(2) The operations and procedures manual shall be:

a. retained at the *Site* ;
b. reviewed on an annual basis and updated by the *Owner* as required; and
c. be available for inspection by *Ministry* staff.

Buffer

2.4 The Owner shall ensure that the buffer as described in Item 6 in Schedule "A" is maintained.

Signage

2.5 The *Owner* shall place a sign which complies with local by-laws at the main entrance and exit to the *Site* which is legible from a distance not less than 25 m and on which is displayed in prominent letters the following information:

a. the name of the *Site* and *Owner* ;
b. the number of the *ECA* ;
c. the name of the *Operator;*
d. the normal hours of operation;
e. a warning against unauthorized access;
f. the telephone number to which complaints may be directed;
g. a twenty-four (24) hour emergency telephone number (if different from above); and
h. a warning against dumping outside the *Site* .

Hours of Operation

2.6 (1) (i) Waste may be received at the *Site* between the hours of 9:00 a.m. and 6:00 p.m., Monday to Friday.

(ii) Public access to the Site for waste drop off are permitted on Tuesday, Wednesday, Thursday and Saturday between the hours of 12:00 p.m. and 5:00 p.m.

(2) Amendment to the hours of operation require approval by the *Director* prior to implementation.

2.7 Notwithstanding Condition 2.6, with prior written approval of the *District Manager* , the time periods may be extended to accommodate seasonal or unusual quantities of waste, construction activities or such factors as determined to be reasonable to the *District Manager* .

2.8 Upon reasonable notice to the *District Manager* , contingency actions may take place outside normal hours of operation. Emergency response may occur at any time as required.

Site Security

2.9 During non-operating hours, the *Site* entrance and exit gates will be locked or otherwise secured against access by unauthorized persons.

2.10 The *Owner* shall ensure that no queuing of waste vehicles will occur on public roadways.

2.11 a. No waste shall be accepted, landfilled or removed from the site unless a *Site* supervisor is present and supervises the operation.

b. The *Owner* shall ensure that all *Site* operations employees have been adequately trained prior to acceptance of waste at the *Site* with respect to the following:

i. terms, conditions and operating requirements of this *ECA* ;
ii. the operation and management of the *Site* with respect to the Operations and Maintenance Manual;
iii. relevant waste management regulations and legislation;
iv. environmental concerns related to the waste being handled at the *Site* ;
v. occupational health and safety concerns pertaining to the waste being handled at the *Site* ; and
vi. emergency procedures and contingency plans in cases of fire, off-site impacts and any other emergency situation.

c. The *Site* is deemed to be closed when a *Site* supervisor is not present at the *Site* .

d. To assist the *Site* operating personnel, the *Owner* shall ensure that the Maintenance and Operations Manual, required by Condition No. 2.3, and all revisions is kept on *Site* at all times following commencement of landfilling.

Site Access

2.12 Access to the *Site* shall be via the existing entrance from Highway 11.

Vermin, Dust, Litter, Odour, Noise, Traffic

2.13 The *Site* shall be operated and maintained such that vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Litter Control

2.14 The *Owner* shall take all practical steps to prevent off-site litter impacts from *Site* operations.

Noise

2.15 The landfill *Site* shall be required to operate within the noise level limits prescribed in the Ministry's document "Noise Guidelines for Landfill Sites".

Surface Water

2.16 The *Owner* shall take all appropriate measures to minimize surface water from coming in contact with waste. Temporary berms and ditches shall be constructed around active waste disposal areas to prevent extraneous surface water from coming in contact with the active working face.

Landfill Gas

2.17 All buildings are to be free of any landfill gas accumulation. The *Owner* shall provide adequate ventilation systems to relieve landfill gas accumulations in buildings if necessary.

3.0 LANDFILL OPERATIONS

Waste Type

3.1 The waste to be received at the *Site* for final disposal is restricted to solid non-hazardous waste.

Capacity

3.2 (1) The original maximum volume of waste and cover materials, excluding final cover for the *Site* was **173,000 m^3**.

(2) The maximum amount of waste approved for final disposal, excluding final cover at the *Site* based on the completed Environmental Screening Report Process is **273,000 m^3**.

(3) (i) Notwithstanding Condition 3.2(2), the *Site* is hereby permitted to continue to accept waste for final disposal until **December 31, 2015**.

(ii) Condition 3.2 (3)(i) does not constitute an approved expansion from the volume currently approved by Condtion 3.2 (2). Upon the issuance of any future Environmental Assessment Act approval, the volume of waste accepted under Condition 3.2 (3)(i) must be included as part of any expansion volume received.

(4) In the event, the *Owner* has not completed the Environment Assessment Act process by the date in which the Site is permitted to receive waste for final disposal as stated in Condition 3.2(3)(i) and would like to continue to receive waste at the *Site* for final disposal past that date, the *Owner*

shall submit an application to the *Director* at least **thirty (30) days** prior to the end date for accepting waste for final disposal in Condition 3.2 (3)(i) requesting that an extension to the date for final disposal be extended. To support the request, the *Owner* include but not be limited to following to submit the request:

i. A drawing showing the proposed location where the waste will be placed;
ii. A summary of the environmental conditions/compliance at the Site; and
iii. A current status of the Environmental Assessment Act process for the long-term waste management strategy for the Municipality.

Waste Placement

3.3 (1) No waste shall be landfilled outside of the **limit of fill area** for the *Site* as shown in Item 6 - Figure 2 in Schedule "A" attached to this *ECA* .

(2) The *Owner* shall ensure the limit of the landfill and top contours of final waste contours as show in Item 6 - Figures 2 and 9 in Schedule "A" is clearly staked with permanent markers.

3.4 (1) No waste shall be landfilled at any time above the **final waste grades (347.8 m which is Final Cover Elevations less final cover thickness)** as shown in Item 6 - Figure 9 in Schedule "A" attached to this *ECA* ; and

(2) Final slopes above grade at the time of *Site* closure within the waste fill area shall be within the range of 4H:1V (25%) and 20H:1V (5%).

(3) Notwithinstanding Condition 3.4 (1), the *Owner* shall ensure that any waste placed at the *Site* in accordance with Condition 3.2 (2) will not exceed a maximum elevation of 347.8 m. (the highest proposed waste elevation at the *Site*).

3.5 Waste placement shall occur at a minimum 1 meter above the highest groundwater table elevation at the *Site* .

3.6 No waste shall be landfilled in the buffer area or additional waste be placed in the *FBAL* .

3.7 The *Owner* shall deposit waste in a manner that minimizes exposure area at the landfill working face and all waste shall be compacted before cover is applied.

Cover Material

3.8 (1) Daily Cover - By the end of each working week, the entire working face shall be compacted and covered with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material.

(2) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six

(6) months or more, a minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed.

Service Area

3.9 Only waste generated within the boundaries of the Municipality of Greenstone may be received for disposal at this Site.

Waste Inspection

3.10 All loads of waste must be properly inspected by trained *Site* personnel prior to disposal at the *Site* and waste vehicles must be diverted to appropriate areas for waste disposal.

Burning Waste Prohibited

3.11 Burning of waste at the *Site* is prohibited.

4.0 WASTE TRANSFER STATION

Waste Transfer Facility

4.1 The *Owner* shall ensure that:

(a) all bins and waste storage areas are clearly labelled;
(b) all lids or doors on bins shall be kept closed during non-operating hours and during the high wind events; and
(c) if necessary to prevent litter, waste storage areas shall be covered during the high winds events.

4.2 The *Owner* shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:

(a) all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site;* **or**
(b) all *Refrigerant Appliances* accepted at the *Site,* which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal of refrigerants as required by O.Reg. 189; and
(c) all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O.Reg. 189.

4.3 Propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

4.4 The *Owner* shall transfer waste and recyclable materials from the *Site* as follows:

(a) recyclable materials shall be transferred off-site once their storage bins are full;
(b) scrap metal shall be transferred off-site at least twice a year;
(c) tires shall be transferred off-site as soon as a load for the contractor hired by the *Owner* has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and
(d) immediately, in the event that waste is creating an odour or vector problem.

4.5 The *Owner* shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off the *Site* are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

5.0 HOUSEHOLD HAZARDOUS WASTE DEPOT

HHW Facility Operations

5.1 The *HHW* depot shall not receive more than 5 cubic metres of *HHW* per day.

5.2 The *HHW* depot shall not store in excess of 10 cubic metres of *HHW* on *Site.*

5.3 *HHW* shall not be stored at the *Site* for longer than one hundred eighty (180) days, unless the consent of the *District Manager* has been obtained, with the exception of waste oil which shall be stored on *Site* in accordance with Condition 11(2).

5.4 All household hazardous waste received and stored must be managed in accordance with *Ontario Regulation 347, R.R.O. 1990,* as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.

5.5 All storage of liquid wastes shall be in accordance with this *Ministry's* publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.

5.6 All *HHW* shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.

5.7 Incoming *HHW* shall be inspected by *Trained Personnel* , prior to being accepted at the *Site,* to ensure that the *Site* is approved to accept that type of waste.

5.8 All containers shall be clearly labelled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the *Site* shall be posted to warn that the area contains hazardous materials.

5.9 No radioactive wastes shall be accepted at this *Site.*

5.10 Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:

(a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this *Certificate;*
(b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 11.10 (c) if found to contain PCBs;
(c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 11.10 (d), it shall be forthwith reported to the *District Manager* and shall be managed in accordance with Regulation 362 and stored or removed from the *Site* to an approved PCB storage site, in accordance with written instructions from the *District Manager;* and
(d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

5.11 Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.

5.12 The *Owner* shall maintain, at the *Site,* a log book which records daily, the following information:

(a) date of record;
(b) types, quantities and source of *HHW* received;
(c) quantities of *HHW* stored at the *Site;*
(d) quantities and destination of *HHW* shipped from the *Site;* and
(e) quantities of waste returned to the public as noted in Condition 12 (2).

6.0 TRAINING

Employees and Training

6.1 A training plan for all employees that operate any aspect of the site shall be developed and implemented by the *Operator.* Only trained employees shall operate any aspect of the *Site* or carry out any activity required under this *ECA* . For the purpose of this *ECA* "trained" means knowledgeable either through instruction or practice in:

i. the relevant waste management legislation *including EPA, O. Reg. 347* , regulations and guidelines;
ii. major environmental *and occupational health and safety* concerns pertaining to the waste to be handled;
iii. the proper handling of wastes;
iv. the management procedures including the use and operation of equipment for the

processes and wastes to be handled;

v. the emergency response procedures;
vi. the specific written procedures for the control of nuisance conditions;
vii. the *terms, conditions and operating* requirements of this *ECA* and,
viii. proper inspection, receiving and recording procedures and the activities to be undertaken during and after a load rejection.

7.0 INSPECTIONS AND RECORD KEEPING

Daily Inspections and Log Book

7.1 An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that the site is being operated in compliance with this *ECA* . Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

7.2 A record of the inspections shall be kept in a daily log book *or a dedicated electronic file* that includes:

i. the name and signature of person that conducted the inspection;
ii. the date and time of the inspection;
iii. the list of any deficiencies discovered;
iv. the recommendations for remedial action; and
v. the date, time and description of actions taken.

7.3 A record shall be kept in the daily log book of all the following:

i. the type, date and time of arrival, hauler, and estimated quantity (i.e. cubic metres) of all waste received at the *Site* ; and,
ii. a list of the refusal of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Site Inspections

7.4 During *Site* operations, the *Owner* shall inspect the *Site* monthly for the following items but not limited to these items:

i. General settlement areas or depressions on the waste mound;
ii. Shear and tension cracks on the waste mound;
iii. Condition of surface water drainage works;
iv. Erosion and sedimentation in surface water drainage system;
v. Presence of any ponded water on the waste mound;
vi. Evidence of vegetative stress, distressed poplars or side slope plantings on or adjacent to the waste mound; and

vii. Condition of fence surrounding the *Site*.

7.5 The *Owner* shall inspect the waste mound and surrounding areas weekly for presence of leachate seeps. Any leachate seeps that are discovered shall be repaired within 48 hours of notice by the *Owner* .

Record Retention

7.6 Except as authorized in writing by the *Director* , all records required by this *ECA* shall be retained at the *Site* for a minimum of two (2) years from their date of creation.

7.7 The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *ECA* is valid.

7.8 All monthly summary reports are to be kept at the *Site* until they are included in the Annual Report.

7.9 The *Owner* shall retain employee training records as long as the employee is working at the *Site* .

7.10 The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.

8.0 MONITORING

8.1 The *Owner* shall monitor surface water and ground water as follows:

(a) Ground water and surface water sampling is to be carried out twice per year, and the two sampling events must be a minimum of 60 days apart;

(b) Groundwater samples are to be collected from monitoring wells MW1, MW2, MW3A, MW3B, MW4, MW5, MW6, MW7, MW8, MW9, MW10A, MW10B and MW 11, (at the locations indicated in Item 6);

(c) Surface water samples are to be collected at existing locations SW1, SW2, and SW3.

(d) Ground water and surface water samples are to be analyzed for: pH (lab and field), conductivity (lab and field), temperature (field only), total dissolved solids, hardness, dissolved organic carbon (DOC), phenols, total Kjeldahl nitrogen (TKN), ammonia-N, organic nitrogen, sodium, potassium, calcium, magnesium, chloride, nitrate, nitrite, orthophosphate, sulphate, alkalinity (as CaCO3), aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, total phosphorous, selenium, silicon, silver, strontium, thallium, tin, titanium, vanadium, and zinc.

(e) For the ground water samples, the ion balance must be calculated for each well for quality control purposes, and an ion balance exceeding 10% should be investigated and explained.

(f) Surface water samples are to also be analyzed for total suspended solids, chemical oxygen demand and biological oxygen demand.

(g) A sample from the source well MW5 is to be analyzed annually for volatile organic compounds (VOC's) – acetone, benzene, bromodichloromethane, chloroform, 1,4-dichlorobenzene, ethylbenzene, methylene chloride (dichloromethane), methyl ethyl ketone (MEK), toluene, trichloroethene (trichloroethylene), vinyl chloride, m-xylene, p-xylene, and o-xylene.

(h) All analysis must use detection limits suitable for comparison with Ontario Drinking Water Standards and/or Provincial Water Quality Objectives.

8.2 A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

Groundwater Wells and Monitors

8.3 The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

8.4 Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.

8.5 Any groundwater monitoring wells included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned by the *Owner,* as required.

(a) The *Owner* shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.

(b) All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *District Manager* for abandonment, shall be decommissioned by the *Owner,* as required, in accordance with *O.Reg. 903,* that will prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Changes to the Monitoring Plan

8.6 (1) The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.

(2) Within fourteen (14) days of receiving the written correspondence from the *District Manager*

confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the monitoring program, to the *Director* requesting the *Certificate* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

(3) In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current ministry procedures for seeking approval for amending the *ECA.*

Compliance Criteria

8.7 The *Owner* shall ensure the *Site* is in compliance with MOE Guideline B-7 Reasonable Use Concept is applied and met at all points on the property line which are impacted by leachate from the *Site.*

9.0 TRIGGER MECHANISMS AND CONTINGENCY PLANS

9.1 The Trigger Mechanism Plan shall be carried out by the Owner in accordance with Item 6 set out in Schedule "A".

9.2 In the event of a confirmed exceedence of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate at the site's *CAZ* limit, the *Owner* shall immediately notify the *District Manager,* and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans.

9.3 If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:

(a) The *Owner* shall notify the *District Manager,* in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedences;
(b) Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *District Manager* for approval; and
(c) The contingency measures shall be implemented by the *Owner* upon approval by the *District Manager* .

9.4 The *Owner* shall ensure that any proposed changes to the site-specific trigger levels for leachate impacts to the surface water or groundwater, are approved in advance by the *Director* via an amendment to this *Certificate.*

9.5 (a) If expanding the contaminant attenuation zone is required as a remedial measure necessary for

proper operation of a landfilling site, the *Owner* of the landfilling site must own property rights respecting the contaminant attenuation zone, unless,

(i) the contaminant attenuation zone is on Crown land and the Crown has agreed in writing to the use of the land for that purpose; or

(ii) the contaminant attenuation zone is on a public road and the road authority has agreed in writing to the use of the land for that purpose.

(b) The holder of the *ECA* must continue to own the property rights for all of the contaminating life span of the *Site.*

(c) The ownership of the property rights must include the right to,

(i) discharge contaminants from the landfilling site into the contaminant attenuation zone;

(ii) enter into the contaminant attenuation zone and onto the surface above the contaminant attenuation zone for purposes of testing, monitoring, intercepting contaminants and carrying out remedial work;

(iii) install, operate and maintain works, for the purposes mentioned in clause (b), in or above the contaminant attenuation zone, including on the surface above the contaminant attenuation zone; and

(iv) prevent the owner of the land in which the contaminant attenuation zone is located from paving, erecting a structure or making any use of land above or in the vicinity of the contaminant attenuation zone that would interfere with the functioning of the contaminant attenuation zone or with the exercise of any of the rights mentioned in this subsection.

10.0 COMPLAINTS PROCEDURE

10.1 If at any time, the *Owner* receives complaints regarding the operation of the *Site* , the *Owner* shall respond to these complaints according to the following procedure:

(a) The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

(b) The *Owner* , upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The *Owner* shall complete a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations

for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents. A copy of the report shall be retained on-site.

10.2 The *Owner* shall post site complaints procedure at site entrance along with the name and phone number of a suitable, local contact to receive complaints or questions related to the *Site* . All complaints and the *Owner* 's actions taken to remedy the complaints must be summarized in the Annual Report.

11.0 EMERGENCY SITUATIONS

11.1 In the event of a fire or discharge of a contaminant to the environment, *Site* staff shall contact the *MOE* Spills Action Centre (1-800-268-6060) and the *District Office* of the *MOE* .

11.2 The *Owner* shall submit to the *District Manager* a written report within 3 days of the spill or incident, outlining the nature of the incident, remedial measures taken and measures taken to prevent future occurrences at the Site.

11.3 The *Owner* shall prepare an Emergency Response Manual for the *Site* and submit to the *District Manager* within 60 days of the issuance of this amendment, in consultation with local emergency response agencies. The Emergency Response Manual should indicate the responsibility of each of the stakeholders with respect to handling possible emergency situations.

11.4 The Emergency Response Manual shall be updated on a regular basis and be provided to the *District Manager* within one month of the revision date.

11.5 The *Owner* shall ensure that adequate fire fighting and contingency spill clean up equipment is available and that emergency response personnel are familiar with its use and location.

12.0 ANNUAL REPORTING

11.1 A written report on the development, operation, monitoring and closure of the *Site* , shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *Regional Director* and the *District Manager* by **March 31st, 2017** and submitted every three years by March 31 thereafter and shall cover the three years ending the preceding December 31st.

11.2 The Annual Report shall include the following:

i. the results and an interpretive analysis of the results of environmental monitoring program, including an assessment of the need to amend the monitoring program;

ii. an assessment with regards to compliance of the groundwater quality at the property boundary and compliance point with regards to Guideline B-7 - Reasonable

Use Concept;

iii. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site* , and the adequacy of and need to implement the contingency plans;

iv. an assessment of the efficiency of the leachate management at the *Site* ;

v. site plans showing the existing contours of the *Site;*

vi. areas of landfilling operation during the reporting period;

vii. areas of intended operation during the next reporting period;

viii. areas of excavation during the reporting period;

ix. the progress of final cover, vegetative cover, and any intermediate cover application;

x. previously existing site facilities;

xi. facilities installed during the reporting period;

xii. *Site* preparations and facilities planned for installation during the next reporting period;

xiii. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of Site capacity used during the reporting period;

xiv. a summary of the quantity of any leachate or pre-treated leachate removed from the *Site* during each operating week;

xv. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the Site.

xvi. a summary of any complaints received and the responses made;

xvii. a discussion of any operational problems encountered at the *Site* and corrective action taken;

xviii. a summary of the amount of wastes refused for acceptance at the *Site* , the reasons for refusal and the carrier who brought the waste to the *Site* ;

xix. a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;

xx. any other information with respect to the site which the *District Manager or Regional Director may require from time to time;*

xxi. a statement of compliance with all conditions of this *ECA* and other relevant *Ministry* groundwater and surface water requirements;

xxii. a confirmation that the site inspection program as required by this *ECA* has been complied with by the *Owner* ;

xxiii. any changes in operations, equipment or procedures employed at the *Site* ; and

xxiv. recommendations regarding any proposed changes in operations of the *Site* .

13.0 SITE CLOSURE

13.1 The Site shall be closed, final cover placed and post-closure maintenance completed in accordance with Item 6 in Schedule "A".

13.2 The Owner shall complete *Substantial Completion* of the final cover construction within one year of reaching final contours

SCHEDULE "A"

1. Application for a Certificate of Approval for a Waste Disposal Site dated Letter dated May 8, 1972.
2. Letter dated March 29, 1989 from Mr. J. de Bakker of the Ministry of the Environment to Mr. R. Sinclair, Clerk-Administrator for the Township of Geraldton.
3. Report titled "Updated Design and Operations Plan, Geraldton Landfill, Municipality of Greenstone, Ontario" dated May 1, 2007 prepared by Trow Associates Inc.
4. Report titled "2007 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario" dated February 15, 2008 prepared by Trow Associates Inc.
5. Letter dated November 23, 2009, Regarding Revised Trigger Values for Groundwater, Geraldton Landfill, from R. Rinnie and D. Georgiou, Trow Associates Inc., to Tes. Gebrezghi, Ministry of Environment.
6. Report Entitled "Municipality of Greenstone - Updated Design and Operations Plan with Closure Plan - Geraldton Landfill, Municipality of Greenstone, Ontario" prepared by exp Services (Project Number THB-00006189-IE-THB-200) dated October 16, 2012.
7. Letter dated June 20, 2014 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Demetri Georgiou and Mr. Ahileas Mitsopoulous, exp. Services Inc, requesting and providing the rationale for the continued use of the Site while undertaking the EA for the long-term waste management strategy for the the Municipality.

The reasons for the imposition of these terms and conditions are as follows:

1. *The reason for Condition 1.1, 1.2, 1.3, 1.4 and 1.5 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.*

2. *The reason for Conditions 1.6, 1.7, 1.8, 1.12, 1.13, 1.14, 1.15 and 5.1 is to clarify the legal rights and responsibilities of the Owner under this ECA.*

3. *Conditions 1.9, 1.10 and 1.11 are included to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site, which are approved under this ECA.*

4. *Conditions 1.16, 1.17 and 1.18 are included, pursuant to subsection 197(1) of the EPA, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.*

5. *The reasons for Condition 1.19 are to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this ECA.*

6. *The reasons for Condition 1.20 and 1.21 are to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.*

7. *The reason for Condition 1.22 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this ECA. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the EPA and OWRA.*

8. *Conditions 2.1, 2.2, 3.1, 4.1, 4.2, 4.3 and 4.4 are included in order to ensure that waste disposal, waste transfer operations at the site is undertaken in accordance with applicable Ministry of the Environment regulations and guidelines. Compliance with these regulations and guidelines will ensure that the site does not cause and adverse effect on the environment.*

9. *Condition 2.3 is to ensure the Owner has a operations plans for the site that details all current operations at the site and that a copy is kept on site for the Owner, the Owner's staff and/or operator. This is to ensure the site is operating is a safe manner and the environment and human health are protected.*

10. *The reason for Condition 2.4 is to ensure the Owner maintains a buffer area around the*

waste mound to ensure adequate space is available for potential contingency plan implementation.

11. *The reason for Conditions 2.5 inclusive is to ensure that users of the Site are fully aware of important information and restrictions related to Site operations under this ECA.*

12. *The reasons for Conditions 2.6, 2.7, and 2.8 are to specify the normal hours of operation for the landfill Site and a mechanism for amendment of the hours of operation.*

13. *The reasons for Conditions 2.9, 2.10, 2.11 and 2.12 are to specify site access to/from the Site and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site attendant is on duty.*

14. *The reasons for Conditions 2.13, 2.14 and 2.15 are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.*

15. *The reason Condition 2.16 is to prevent ponding in on site ditches and any adverse impact on the environment and human health.*

16. *The reason for Condition 2.17 is to ensure steps are taken to ensure landfill gas does not pose a risk to humans or the environmental within buildings at the Site.*

17. *The reason for Condition 3.1 and 3.9 is to specify the types of waste and service area that may be accepted for disposal at the Site.*

18. *Condition 3.2 specifies the maximum amount of waste that may be received at the site based on the completed Environmental Screening Process report for the Site.*

19. *The reason for Condition 3.3, 3.4, 3.5, 3.6, and 3.7 is to specify restrictions on the extent of landfilling at this Site based on the Owner's application and supporting documentation. These limits define the approved volumetric capacity of the site. Approval to landfill beyond these limits would require an application with supporting documentation submitted to the Director.*

20. *The reason for Condition 3.8 is to ensure that landfilling operations are conducted in an environmentally acceptable manner. Daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.*

21. *Condition 3.10 is necessary in order to ensure that all waste loads are inspected and waste that is disposed of at the site is in accordance with the terms and conditions in this ECA.*

22. *The reason for Condition 3.11 is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.*

23. *Conditions 4.1, 4.2, 4.3, 4.4 and 4.5 are included to ensure that the recyclable materials are stored in their temporary storage location in a manner as to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.*

24. *The reasons for the Conditions 5.1 through 5.12 are to approve the establishment and operation of a household hazardous waste collection depot and to ensure that the wastes are managed in a manner that protects the environment and the health and safety of the public.*

25. *The reason for Condition 6.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.*

26. *The reasons for Conditions 7.1, 7.2, 7.3,7.5 and 7.6 are to provide for the proper assessment of effectiveness and efficiency of site design and operation, their effect or relationship to any nuisance or environmental impacts, and the occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this ECA, the EPA and its regulations.*

27. *The reason for Conditions 7.4, 7.7 and 12.1 and 12.2 are to ensure that accurate waste records are maintained to ensure compliance with the conditions in this ECA (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.*

28. *The reason for Conditions 8.3 through 8.5 inclusive is to ensure protection of the natural environment and the integrity of the groundwater monitoring network.*

29. *The reason for Conditions 8.1, 8.2, 8.6 and 8.7 and are to demonstrate that the landfill site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.*

30. *The reason for Conditions 9.1 through 9.5 is to ensure that the Owner follows a plan with an organized set of procedures for identifying and responding to unexpected but possible problems at the Site. A remedial action / contingency plan is necessary to ensure protection of the natural environment.*

31. *The reason for Conditions 11.1 through 11.5 is to ensure that the Municipality immediately notifies the Ministry of any spills as required in Part X of the Act so that appropriate spills response can be determined.*

32. *The reason for Conditions 10.1 and 10.2 is to establish a forum for the exchange of information and public dialogue on activities carried out at the landfill Site. Open communication with the public and local authorities is important in helping to maintain high standards for site operation and environmental protection.*

33. *The reasons for Conditions 12.1 and 12.2 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.*

34. *The reason for Conditions 13.1 and 13.2 are to ensure that final closure of the Site is completed in an aesthetically pleasing manner and to ensure the long-term protection of the natural environment.*

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A7004401 issued on November 24, 2008

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*

The Director appointed for the purposes of

Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

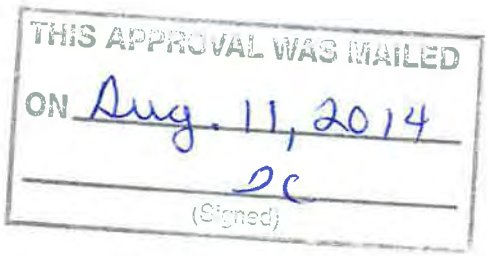
AND

Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 7th day of August, 2014



Tesfaye Gebrezghi, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

DG/
c: District Manager, MOE Thunder Bay - District
Demetri Georgiou, exp Services Inc. ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A7004401
Notice No. 1
Issue Date: March 7, 2011

The Corporation of the Municipality of Greenstone
301 East St
Post Office Box, No. 70
Geraldton, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584
Greenstone Municipality, District of Thunder Bay

You are hereby notified that I have amended Provisional Certificate of Approval No. A7004401 issued on November 24, 2008 for the use and operation of a 1.9 hectare landfilling/recycling site within a total site area of 26.35 hectares , as follows:

This Notice is to acknowledge receipt of proposed groundwater trigger values in accordance with Condition 8(8).

The following Item is hereby added to Schedule "A".

5. Letter dated November 23, 2009, Regarding Revised Trigger Values for Groundwater, Geraldton Landfill, from R. Rinnie and D. Georgiou, Trow Associates Inc., to Tes. Gebrezghi, Ministry of Environment.

The reason for this amendment to the Certificate of Approval is to document the receipt of the proposed groundwater trigger values.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A7004401 dated November 24, 2008

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 7th day of March, 2011

THIS NOTICE WAS MAILED
ON March 9, 2011
LC
(Signed)

Tes. Gebrezghi

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

LM/
c: District Manager, MOE Thunder Bay - District
Robert J. Rinne/Demeteri N. Georgiou, Trow Associates Inc. √

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A7004401
Issue Date: November 24, 2008

The Corporation of the Municipality of Greenstone
301 East Street, P.O. Box 70
Greenstone, Ontario
P0T 1M0

Site Location: Geraldton Waste Disposal Site
2 miles east of Junction Hwy 11 and 584
Greenstone Municipality, District of Thunder Bay

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

the use and operation of a 1.9 hectare landfilling/recycling site within the total site area of 26.35 hectares.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"CAZ" means the Contaminant Attenuation Zone;

"Certificate " means this entire provisional Certificate of Approval document, issued in accordance with section 39 of the *EPA,* and includes any schedules to it, the application and the supporting documentation listed in Schedule "A";

"Director" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part V of the *EPA;*

"District Manager" means the District Manager of the local district office of the *Ministry* in which the *Site* is geographically located;

"EPA " means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;

"HHW " means household hazardous waste;

"NMA " means *Nutrient Management Act* , 2002, S.O. 2002, c. 4, as amended from time to time;

"Operator" means any person, other than the Owner's employees, authorized by the *Owner* as having

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the charge, management or control of any aspect of the *Site* and includes its successors or assigns;

"*Owner*" means any person that is responsible for the establishment or operation of the *Site* being approved by this *Certificate*, and includes the Corporation of the Municipality of Greenstone, its successors and assigns;

"*OWRA* " means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

"*PA* " means the *Pesticides Act* , R.S.O. 1990, c. P-11, as amended from time to time;

"*Provincial Officer*" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA* or Section 5 of the *EPA* or Section 17 of *PA* or Section 4 of *NMA* or Section 8 of *SDWA* .

"*Refrigerant Appliances*" means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;

"*Regional Director* " means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located.

"*Regulation 347* " or "*Reg. 347* " means Regulation 347, R.R.O. 1990, made under the EPA, as amended from time to time;

"*SDWA*" means *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended from time to time;

"*Site* " means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at Geraldton Waste Disposal Site, Part of Mining Claim T.B. 14031, 2 miles east of junction of Hwy 11 and 584, Township of Ashmore, District of Thunder Bay; and

"*Trained personnel*" means knowledgeable in the following through instruction and/or practice:

a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads; and
h. the requirements of this *Certificate*.

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You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL

Compliance

(1) The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Certificate* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Certificate* .

In Accordance

(3) Except as otherwise provided for in this *Certificate* , the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for *Certificate* s of Approval, dated May 8, 1972 and the supporting documentation listed in Schedule "A".

Interpretation

(4) Where there is a conflict between a provision of any document, including the application, referred to in this *Certificate,* and the conditions of this *Certificate,* the conditions in this *Certificate* shall take precedence.

(5) Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.

(6) Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

(7) The conditions of this *Certificate* are severable. If any condition of this *Certificate,* or the application of any condition of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

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Other Legal Obligations

(8) The issuance of, and compliance with, this *Certificate* does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

(b) limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Certificate* .

Adverse Effect

(9) The *Owner* and *Operator* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site,* including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

(10) Despite an *Owner, Operator* or any other person fulfilling any obligations imposed by this *Certificate* the person remains responsible for any contravention of any other condition of this *Certificate* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Ownership

(11) The *Owner* shall notify the *Director,* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes in the following information:

(a) the ownership of the *Site;*

(b) the *Operator* of the *Site;*

(c) the address of the *Owner or Operator;* and

(d) the partners, where the *Owner or Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R. S. O. 1990, c. B.17, shall be included in the notification.

(12) No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

(13) In the event of any change in *Ownership* of the works, other than change to a successor Owner, the *Owner* shall notify the successor of and provide the successor with a copy of this *Certificate,* and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director.*

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Certificate of Requirement/Registration on Title - Site

(14) The Owner shall:

(a) Within two (2) years of the date of the issuance of this *Certificate*, submit to the *Director* for review, two copies of a completed Certificate of Requirement with a registerable description of the *Site;* and

(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the *Director*, register the Certificate of Requirement in the appropriate Land Registry Office on title to the *Site* and submit to the Director the duplicate registered copy immediately following registration.

(15) Pursuant to Section 197 of the Environmental Protection Act, neither the *Owner* nor any person having an interest in the *Site* shall deal with the *Site* in any way without first giving a copy of this *Certificate* to each person acquiring an interest in the *Site* as a result of the dealing.

Certificate of Requirement/Registration on Title - CAZ

(16) The Owner shall:

(a) Within two (2) years from the date of the issuance of this *Certificate*, submit to the *Director* for review, two copies of a completed Certificate of Requirement with a registerable description of the CAZ; and

(b) Within 10 calendar days of receiving the Certificate of Requirement authorized by the *Director*, register the Certificate of Requirement in the appropriate Land Registry Office on title to the CAZ and submit to the Director the duplicate registered copy immediately following registration.

Inspections by the Ministry

(17) No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA, the EPA,* the *PA,* the *SDWA* or the *NMA,* of any place to which this *Certificate* relates, and without limiting the foregoing:

(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Certificate* are kept;

(b) to have access to, inspect, and copy any records required to be kept by the conditions of this *Certificate;*

(c) to inspect the *Site,* related equipment and appurtenances;

(d) to inspect the practices, procedures, or operations required by the conditions of this *Certificate;* and

(e) to sample and monitor for the purposes of assessing compliance with the terms

and conditions of this Certificate or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information and Record Retention

(18) Any information requested, by the *Ministry*, concerning the *Site* and its operation under this *Certificate*, including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry*, upon request, in a timely manner. Records shall be retained for contaminating life span of the *Site* except for as otherwise authorized in writing by the *Director*.

(19) The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *Certificate* or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

(a) an approval, waiver, or justification by the *Ministry* of any act or omission of any person that contravenes any term or condition of this *Certificate* or any statute, regulation or other legal requirement; or

(b) acceptance by the *Ministry* of the information's completeness or accuracy.

(20) The Owner shall ensure that a copy of this Certificate, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule "A", are retained at the Site at all times.

2. SITE OPERATION

Operation

(1) The *Site* shall be operated and maintained at all time including management and disposal of all waste in accordance with the *EPA*, *Regulation 347*, and the conditions of this *Certificate*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted

Signs

(2) A sign shall be installed and maintained at the main entrance/exit to the *Site* on which is legibly displayed the following information:

(a) the name of the *Site* and *Owner;*
(b) the number of the *Certificate;*
(c) the name of the *Operator;*
(d) the normal hours of operation;
(e) the allowable and prohibited waste types;
(f) the telephone number to which complaints may be directed;
(g) a warning against unauthorized access;
(h) a twenty-four (24) hour emergency telephone number (if different from above); and

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(i) a warning against dumping outside the *Site* .

(3) The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.

(4) The Owner shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage area.

Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic

(5) The *Site* shall be operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Burning Waste Prohibited

(6) Burning of waste at the *Site* is prohibited.

Site Access

(7) Waste shall only be accepted at the *Site* from 9:00 a.m. to 6:00 p.m.

(8) On-site equipment used for daily site preparation and closing activities shall be operated one (1) hour before and one (1) hour after the hours of operation approved by this *Certificate*.

(9) With the prior written approval from the *District Manager*, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Site Security

(10) No waste shall be received, landfilled or removed from the *Site* unless a site supervisor or attendant is present and supervises the operations during operating hours. The *Site* shall be closed when a site attendant is not present to supervise landfilling operations.

(11) The *Site* shall be operated and maintained in a safe and secure manner. During non-operating hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons.

3. EMPLOYEE TRAINING

(1) A training plan for all employees that operate any aspect of the *Site* shall be developed and implemented by the *Operator*. Only *Trained Personnel* shall operate any aspect of the *Site* or carry out any activity required under this *Certificate* .

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4. COMPLAINTS RESPONSE PROCEDURE

(1) If at any time the *Owner* receives complaints regarding the operation of the *Site*, the *Owner* shall respond to these complaints according to the following procedure:

(a) The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

(b) The *Owner*, upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The *Owner* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

5. EMERGENCY RESPONSE

(1) Any spills, fires or other emergency situations shall be forthwith reported directly to the *Ministry's* Spills Action Centre (1-800-268-6060) and shall be cleaned up immediately.

(2) In addition, the *Owner* shall submit, to the *District Manager* a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the *Site*.

(3) All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *O.Reg. 347*.

(4) All equipment and materials required to handle the emergency situations shall be:

(a) kept on hand at all times that waste landfilling and/or handling is undertaken at the *Site;* and

(b) adequately maintained and kept in good repair.

(5) The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

6. RECORD KEEPING AND REPORTING

Daily Log Book

(1) A daily log shall be maintained in written format and shall include the following information:

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(a) the type, date and time of arrival, hauler, and quantity (tonnes) of all industrial and commercial waste and cover material received at the *Site;*
(b) the area of the *Site* in which waste disposal operations are taking place;
(c) a record of litter collection activities and the application of any dust suppressants;
(d) a record of the daily inspections; and
(e) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(2) Any information requested, by the *Director* or a *Provincial Officer,* concerning the *Site* and its operation under this *Certificate,* including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry,* upon request.

Daily Inspections and Log Book

(3) An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that: the *Site* is secure; that the operation of the *Site* is not causing any nuisances; that the operation of the *Site* is not causing any adverse effects on the environment and that the *Site* is being operated in compliance with this *Certificate.* Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

(4) A record of the inspections shall be kept in a daily log book that includes:
(a) the name and signature of person that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered;
(d) the recommendations for remedial action; and
(e) the date, time and description of actions taken.

(5) A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Annual Operations Report

(6) A written report on the development, operation and monitoring of the *Site,* shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager,* by April 30th of the year following the period being reported upon.

(7) The Annual Report shall include the following:

(a) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site,* and the adequacy of and need to implement the contingency plans;
(b) site plans showing the existing contours of the *Site;* areas of landfilling operation during the reporting period; areas of intended operation during the next reporting

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period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing site facilities; facilities installed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;

(c) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;

(d) a calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;

(e) a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the *Site;*

(f) a summary of any complaints received and the responses made;

(g) a discussion of any operational problems encountered at the *Site* and corrective action taken;

(h) any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report;*

(i) a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903;* and

(j) any other information with respect to the *Site* which the *Regional Director* may require from time to time.

(8) A written report on groundwater and surface water monitoring of the *Site,* shall be completed every three years starting 2009 (the "Monitoring Report"). The Monitoring Report shall be submitted to the *District Manager,* by April 30th of the year following the period being reported upon. The first report shall be submitted upon completion of the 2009 monitoring season by April 30, 2010.

(9) The Monitoring Report shall include the following:

(a) An accurately scaled site plan illustrating the location of all buried wastes, the site boundaries, monitoring well locations, surface water sampling locations, and the location of the contaminant attenuation zone.

(b) An accurately scaled location map illustrating topography and the site relative to nearby potentially sensitive groundwater/surface water features (i.e. lakes, streams wells).

(c) A water table contour map based on current data.

(d) A discussion indicating the landfill capacity, current fill volume, volume filled in the last year, and the status of any control measures such as interim and final or progressive cover.

(e) Stratigraphic cross sections which clearly illustrate the subsurface distribution of geological materials.

(f) Borehole logs for all monitoring wells.

(g) Tables illustrating historical water chemistry and water level data.

(h) Graphs illustrating historical water quality trends with time for key leachate indicator parameters (as a minimum these should include alkalinity, hardness, Fe,

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Mn, Zn and DOC).

(i) Durov plots for all well locations.

(j) An assessment of monitoring data to evaluate compliance with the requirements of MOE Guideline B-7 and the PWQOs.

(k) Recommendations for future monitoring and/or remedial actions.

(l) A section detailing the field sampling protocols and QA/QC measures.

7. LANDFILL DESIGN AND DEVELOPMENT

Approved Waste Types

(1) Only solid non-hazardous municipal waste as defined under *Reg. 347* shall be accepted at the *Site* for landfilling.

(2) No liquid industrial waste or hazardous wastes as defined under *Reg. 347* shall be received at the *Site*.

(3) The *Owner* shall develop and implement a program to inspect waste to ensure that the waste received at the *Site* is of a type approved for acceptance under this *Certificate*.

(4) The *Owner* shall ensure that all loads of waste are properly inspected by trained site personnel prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The *Owner* shall notify the *District Manager*, in writing, of load rejections at the *Site* within one (1) business day from their occurrence.

Capacity

(5) The maximum amount of waste, daily cover and intermediate cover excluding final cover placed within the 1.9 hectare foot print shall not exceed 173,000 cubic metres.

Service Area

(6) Only waste that is generated within the boundaries of the Municipality of Greenstone shall be accepted at the *Site*.

Cover

(7) Alternative materials to soil may be used as daily and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the *Owner* to the *Director*, copied to the *District Manager* and as approved by the *Director* via an amendment to this *Certificate*. The alternative material shall be non-hazardous according to *Reg. 347* and will be expected to perform at least as well as soil in relation to the following functions:

(a) Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and

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fires;

(b) Provision for an aesthetic condition of the landfill during the active life of the *Site;*

(c) Provision for vehicle access to the active tipping face; and

(d) Compatibility with the design of the *Site* for groundwater protection, leachate management and landfill gas management.

(8) Cover material shall be applied as follows:

(a) Daily Cover - Weather permitting, deposited waste shall be covered weekly in a manner acceptable to the *District Manager* so that no waste is exposed to the atmosphere;

(b) Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and

(c) Final Cover - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of clay and 150 millimetres of top soil (final cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

8. LANDFILL MONITORING

Landfill Gas

(1) The *Owner* shall ensure that any buildings or structures at the *Site* contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the *Site,* especially enclosed structures which at times are occupied by people.

Compliance Limits

(2) The *Site* shall be operated in such a way as to ensure compliance with the following:

(a) Reasonable Use Guideline B-7 for the protection of the groundwater at the *Site;* and

(b) Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives,* as amended from time to time or limits set by the *Regional Director,* for the protection of the surface water at and off the *Site.*

Surface Water and Ground Water

(3) The *Owner* shall monitor surface water and ground water as follows:

(a) Ground water and surface water sampling is to be carried out twice per year, and the two sampling events must be a minimum of 60 days apart;

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(b) A new monitoring well shall be installed prior to the 2009 monitoring season, to be located at the down gradient boundary of the current 21.7 ha attenuation zone, directly down gradient of MW3A and the new well MW7, and due north of MW10;

(c) Groundwater samples are to be collected from monitoring wells MW1, MW2, MW3A, MW3B, MW4, MW5, MW6, MW7, MW8, MW9, MW10A, and MW10B, (at the locations indicated on Figure 3 of the Updated Design and Operations Plan) and from the new well described above;

(d) Surface water samples are to be collected at existing locations SW1 and SW2, and a new location to be located in Barton Bay, up gradient and north of the SW2 location.

(e) Ground water and surface water samples are to be analyzed for: pH (lab and field), conductivity (lab and field), temperature (field only), total dissolved solids, hardness, dissolved organic carbon (DOC), phenols, total Kjeldahl nitrogen (TKN), ammonia-N, organic nitrogen, sodium, potassium, calcium, magnesium, chloride, nitrate, nitrite, orthophosphate, sulphate, alkalinity (as CaCO3), aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, total phosphorous, selenium, silicon, silver, strontium, thallium, tin, titanium, vanadium, and zinc.

(f) For the ground water samples, the ion balance must be calculated for each well for quality control purposes, and an ion balance exceeding 10% should be investigated and explained.

(g) Surface water samples are to also be analyzed for total suspended solids, chemical oxygen demand and biological oxygen demand.

(h) A sample from the source well MW5 is to be analyzed annually for volatile organic compounds (VOC's) – acetone, benzene, bromodichloromethane, chloroform, 1,4-dichlorobenzene, ethylbenzene, methylene chloride (dichloromethane), methyl ethyl ketone (MEK), toluene, trichloroethene (trichloroethylene), vinyl chloride, m-xylene, p-xylene, and o-xylene.

(i) All analysis must use detection limits suitable for comparison with Ontario Drinking Water Standards and/or Provincial Water Quality Objectives.

(4) A certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

Groundwater Wells and Monitors

(5) The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

(6) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.

(7) Any groundwater monitoring wells included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned by the *Owner*, as required.

(a) The *Owner* shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.

(b) All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *District Manager* for abandonment, shall be decommissioned by the *Owner*, as required, in accordance with *O.Reg. 903*, that will prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

Trigger Mechanisms and Contingency Plans

(8) Within one (1) year from the date of this *Certificate*, the *Owner* shall submit to the *Director*, for approval, and copies to the *District Manager*, revised trigger values for groundwater as per the contingency plan provided in Item number 4 in Schedule "A", but reflecting the newly expanded CAZ and Provincial Water Quality Objectives for the purpose of initiating investigative activities into the cause of increased contaminant concentrations at the Contaminant Attenuation Zone (*CAZ*) limit.

(9) In the event of a confirmed exceedence of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate at the site's *CAZ* limit, the *Owner* shall immediately notify the *District Manager*, and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans.

(10) If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:

(a) The *Owner* shall notify the *District Manager*, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedences;

(b) Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *District Manager* for approval; and

(c) The contingency measures shall be implemented by the *Owner* upon approval by the *District Manager* .

(11) The *Owner* shall ensure that any proposed changes to the site-specific trigger levels for

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leachate impacts to the surface water or groundwater, are approved in advance by the *Director* via an amendment to this *Certificate.*

(12) (a) If expanding the contaminant attenuation zone is required as a remedial measure necessary for proper operation of a landfilling site, the *Owner* of the landfilling site must own property rights respecting the contaminant attenuation zone, unless,

(i) the contaminant attenuation zone is on Crown land and the Crown has agreed in writing to the use of the land for that purpose; or

(ii) the contaminant attenuation zone is on a public road and the road authority has agreed in writing to the use of the land for that purpose.

(b) The holder of the certificate of approval must continue to own the property rights for all of the contaminating life span of the *Site.*

(c) The ownership of the property rights must include the right to,

(i) discharge contaminants from the landfilling site into the contaminant attenuation zone;

(ii) enter into the contaminant attenuation zone and onto the surface above the contaminant attenuation zone for purposes of testing, monitoring, intercepting contaminants and carrying out remedial work;

(iii) install, operate and maintain works, for the purposes mentioned in clause (b), in or above the contaminant attenuation zone, including on the surface above the contaminant attenuation zone; and

(iv) prevent the owner of the land in which the contaminant attenuation zone is located from paving, erecting a structure or making any use of land above or in the vicinity of the contaminant attenuation zone that would interfere with the functioning of the contaminant attenuation zone or with the exercise of any of the rights mentioned in this subsection.

Changes to the Monitoring Plan

(13) The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.

(14) Within fourteen (14) days of receiving the written correspondence from the *District Manager* confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the monitoring program, to the *Director* requesting the *Certificate* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

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(15) In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current ministry procedures for seeking approval for amending the *Certificate*.

9. CLOSURE PLAN

(1) At least 3 years prior to the anticipated date of closure of this *Site*, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:

- (a) a plan showing *Site* appearance after closure;
- (b) a description of the proposed end use of the *Site;*
- (c) a descriptions of the procedures for closure of the *Site*, including:
  - (i) advance notification of the public of the landfill closure;
  - (ii) posting of a sign at the *Site* entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
  - (iii) completion, inspection and maintenance of the final cover and landscaping;
  - (iv) *Site* security;
  - (v) removal of unnecessary landfill-related structures, buildings and facilities;
  - (vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas; and
  - (vii) a schedule indicating the time-period for implementing sub-conditions (i) to (vi) above;
- (d) descriptions of the procedures for post-closure care of the *Site*, including:
  - (i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
  - (ii) record keeping and reporting; and
  - (iii) complaint contact and response procedures;
- (e) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
- (f) an updated estimate of the contaminating life span of the *Site*, based on the results of the monitoring programs to date.

(2) The *Site* shall be closed in accordance with the closure plan as approved by the *Director*.

10. WASTE DIVERSION

(1) The Owner shall ensure that:

- (a) all bins and waste storage areas are clearly labelled;
- (b) all lids or doors on bins shall be kept closed during non-operating hours and

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during the high wind events; and

(c) if necessary to prevent litter, waste storage areas shall be covered during the high winds events.

(2) The Owner shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:

(a) all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site;* **or**

(b) all *Refrigerant Appliances* accepted at the *Site,* which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal of refrigerants as required by O.Reg. 189; and

(c) all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O.Reg. 189.

(3) Propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

(4) The Owner shall transfer waste and recyclable materials from the *Site* as follows:

(a) recyclable materials shall be transferred off-site once their storage bins are full;

(b) scrap metal shall be transferred off-site at least twice a year;

(c) tires shall be transferred off-site as soon as a load for the contractor hired by the Owner has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and

(d) immediately, in the event that waste is creating an odour or vector problem.

(5) The Owner shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off the *Site* are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.

11. HOUSEHOLD HAZARDOUS WASTE DEPOT

HHW Facility Operations

(1) The *HHW* depot shall not receive more than 5 cubic metres of *HHW* per day.

(2) The *HHW* depot shall not store in excess of 10 cubic metres of *HHW* on *Site.*

(3) *HHW* shall not be stored at the *Site* for longer than one hundred eighty (180) days, unless the consent of the *District Manager* has been obtained, with the exception of waste oil

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which shall be stored on *Site* in accordance with Condition 11(2).

(4) All household hazardous waste received and stored must be managed in accordance with *Ontario Regulation 347, R.R.O. 1990,* as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.

(5) All storage of liquid wastes shall be in accordance with this *Ministry's* publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.

(6) All *HHW* shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.

(7) Incoming *HHW* shall be inspected by *Trained Personnel* , prior to being accepted at the *Site,* to ensure that the *Site* is approved to accept that type of waste.

(8) All containers shall be clearly labelled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the *Site* shall be posted to warn that the area contains hazardous materials.

(9) No radioactive wastes shall be accepted at this *Site.*

(10) Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:

(a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this *Certificate;*

(b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 11.10 (c) if found to contain PCBs;

(c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 11.10 (d), it shall be forthwith reported to the *District Manager* and shall be managed in accordance with Regulation 362 and stored or removed from the *Site* to an approved PCB storage site, in accordance with written instructions from the *District Manager;* and

(d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

(11) Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.

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(12) The *Owner* shall maintain, at the *Site,* a log book which records daily, the following information:

(a) date of record;
(b) types, quantities and source of *HHW* received;
(c) quantities of *HHW* stored at the *Site;*
(d) quantities and destination of *HHW* shipped from the *Site;* and
(e) quantities of waste returned to the public as noted in Condition 11(11).

SCHEDULE "A"

1. Application for a Certificate of Approval for a Waste Disposal Site dated Letter dated May 8, 1972.
2. Letter dated March 29, 1989 from Mr. J. de Bakker of the Ministry of the Environment to Mr. R. Sinclair, Clerk-Administrator for the Township of Geraldton.
3. Report titled "Updated Design and Operations Plan, Geraldton Landfill, Municipality of Greenstone, Ontario" dated May 1, 2007 prepared by Trow Associates Inc.
4. Report titled "2007 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario" dated February 15, 2008 prepared by Trow Associates Inc.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

1. The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (18), (19) and (20) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this Certificate of Approval.
2. The reasons for Condition 1(3) is to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner,* and not in a manner which the *Director* has not been asked to consider.
3. The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the *Director* is informed of any changes.
4. The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate of Approval.
5. The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.

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6. Conditions 1 (14), (15) and (16) are included, pursuant to subsection 197(1) of the *EPA* , to provide that any persons having an interest in the *Site* are aware that the land has been approved and used for the purposes of waste disposal.

7. The reason for Condition 1(17) is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Certificate of Approval. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act* , the *OWRA* , the *PA* , the *NMA* and the *SDWA* .

SITE OPERATION

8. The reasons for Conditions 2(1), 2(5) and 6(3) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

9. The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Certificate.*

10. The reason for Condition 2(6) is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.

11. The reasons for Condition 2(7), 2(8) and 2(9) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.

12. The reasons for Condition 2(10) and 2(11) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the Site is closed and no site attendant is on duty.

EMPLOYEE TRAINING

13. The reason for Condition 3(1) is to ensure that the *Site* is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

COMPLAINTS RESPONSE PROCEDURE

14. The reason for Condition 4(1) is to ensure that any complaints regarding landfill operations at this *Site* are responded to in a timely and efficient manner.

EMERGENCY RESPONSE

15. Conditions 5(1) and 5(2) are included to ensure that emergency situations are reported to the

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Ministry to ensure public health and safety and environmental protection.

16. Conditions 5(3), 5(4) and 5(5) are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

RECORD KEEPING AND REPORTING

17. The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this Certificate of Approval (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.

18. The reason for Conditions 6(4) and 6(5) is to ensure that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.

19. The reasons for Conditions 6(6) and 6(7) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

LANDFILL DESIGN AND DEVELOPMENT

20. The reason for Conditions 7(1) to 7(6) inclusive is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted for disposal at the *Site*, based on the *Owner* 's application and supporting documentation.

21. The reason for Condition 7 (7) is to specify the approved alternative cover material and to specify requirements for use of alternative cover material at the *Site* .

22. The reasons for Condition 7(8) are to ensure that daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the *Site*, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the *Site*.

LANDFILL MONITORING

23. Reasons for Condition 8(1) are to ensure that off site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the *Site*.

24. Condition 8(2) is included to provide the groundwater and surface water limits to prevent water pollution at the *Site*.

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25. Conditions 8(3) and 8(4) are included to require the Owner to demonstrate that the *Site* is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

26. Conditions 8(5), 8(6) and 8(7) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.

27. Conditions 8(8) to 8(12) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination near or at the *Site's* compliance point.

28. Reasons for conditions 8(13), 8(14) and 8(15) are included to streamline the approval of the changes to the monitoring plan.

CLOSURE PLAN

29. The reasons for Condition 9 are to ensure that final closure of the *Site* is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

WASTE DIVERSION

30. Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location in a manner as to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

HOUSEHOLD HAZARDOUS WASTE DEPOT

31. The reasons for the condition 11 are to approve the establishment and operation of a household hazardous waste collection depot and to ensure that the wastes are managed in a manner that protects the environment and the health and safety of the public.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A7004401 issued on August 25, 1992

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

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The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of November, 2008

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

RM/

c: District Manager, MOE Thunder Bay - District
Vance A. Czerwinski, The Corporation of the Municipality of Greenstone

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Ministry of the Environment and Climate Change

Thunder Bay/Kenora District
435 James Street South
Suite 331
Thunder Bay, ON P7E 6S7

Ministère de l'Environnement et de l'Action en Matière de Changement Climatique
District de Thunder Bay/Kenora
435 rue James sud
Bureau 331
Thunder Bay, ON P7E 6S7

Ontario

Fax (807) 475-1754
Phone: (807) 475-1428

March 10, 2017

MEMORANDUM

To: Monika Holenstein
Senior Environmental Officer
Thunder Bay Regional Office

From: Jason Arnold, P.Geo.
Regional Hydrogeologist
Technical Support Section, Northern Region

Re: 2013, 2014, & 2015 Triennial Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario

1 Introduction

As requested, I have reviewed the groundwater related portions of the triennial groundwater monitoring report entitled *"2013, 2014, & 2015 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario"* dated April 13, 2016, prepared by exp Services Incorporated ("Consultant").

This report has been reviewed in conjunction with the report entitled *"2010, 2011, & 2012 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario"* dated April 25, 2013. The purpose of this review is to evaluate the on-site and off-site leachate impacts from the landfill, and compliance with provincial regulations.

The landfill is currently in compliance with the site ECA. The landfill is currently over the approved capacity of the ECA but is operating under provisional approval. The landfill has also failed the reasonable use guideline (RUG) limits at the contaminant attenuation zone (CAZ) boundary. Piper or Durov plots should be prepared for the site, as they would likely aid in differentiating the source of elevated contaminants such as chloride, sodium, and magnesium. Recommendations for mitigation measures such as expanding the CAZ or leachate collection should be provided. Potential impacts on Kenogamisis Lake should also be considered when developing mitigation measures and trigger levels should be revised to reflect the preferred mitigation strategy. It is understood the ECA will not be amended, and site closure should be initiated in compliance with Section 13.0 of the ECA. The next triennial monitoring report is due

March 31, 2019, presenting data for the three year period from 2016 through 2018.

2 Background Information

The MOECC previously provided comment on the Geraldton WDS terms of reference, for the Amended Environmental Compliance Approval (ECA), which was issued August 7, 2014 (No. A7004401). The site C of A required triennial reporting, due March 31st to cover the three years ending the preceding December 31st.

The MOECC previously provided comment on the Geraldton WDS revised trigger values and 2009 annual monitoring report in a memorandum dated January 28, 2011. The MOECC reviewer reiterated their previous recommendation (Memo, Oct 30, 2008) that actions are required to prevent the ongoing leachate impacts beyond the down gradient boundary of the CAZ. Suggested mitigation measures included expanding the CAZ, leachate collection, site closure or progressive closure. It was recommended that potential impacts on Kenogamisis Lake be considered when developing mitigation measures, and that trigger levels would have to be revised to reflect the preferred mitigation strategy.

3 Report Summary

The consultant reports that based on an August 18, 2016 topographic survey, and deposited volume estimates provided by the Municipality, the total volume of waste in the landfill is estimated to be 279,700 m^3, approximately 6,700 m^3 more than the approved capacity, as of December 31, 2016.

3.1 Site Conditions

The consultant reports that the landfill is underlain by a variable subsurface stratigraphy that ranges from clean sand and gravel in well MW5, to sand or sand and gravel with variable silt content, to silt and sand with trace clay, and finally silt and trace clay. Hydraulic conductivity ("K") analyses are provided, which range from $2.7x10^{-1}$ cm/s in well MW5, to $2.1x10^{-7}$ cm/s in well MW11. The consultant reports that the geometric mean K value is $9.8x10^{-4}$ cm/s, or 0.85 m/day. Based on a hydraulic gradient of 0.005 m/m, and an assumed soil porosity of 0.3, the average groundwater flow velocity across the site is estimated to be 0.014 m/day. The consultant reports that this is lower than initial estimates of 0.05 m/day.

3.2 Chemical Analysis Results

The consultant reports that groundwater quality results were compared to Ontario Drinking Water Quality Objectives ("ODWS") for all wells. Since groundwater flowing through the waste disposal site eventually discharges to Kenogamisis Lake, approximately 500 m southwest of the site, wells MW10A & MW10B were also compared to the Provincial Water Quality Objectives ("PWQO").

The consultant reports that parameters potentially associated with the source well (MW5),

based on their concentrations relative to background well (MW6), include conductivity, TDS, hardness, DOC, chloride, ammonia, alkalinity, barium, boron, iron, and manganese. The consultant suggests that plume impact at well MW3A & MW3B are similar in both wells, and that plume impact is uniform with depth, with the exception of higher iron concentrations in the deeper well (i.e. MW3A). At nested wells MW10A/10B, located at the southwest CAZ boundary, the deeper well (i.e. MW10B), has relatively higher concentrations of potential indicator parameters including conductivity, TDS, hardness, sodium, chloride, and alkalinity. The consultant suggests that although there are indications of a sinking plume in these wells, the plume itself appears to originate from a source other than the landfill because indicator parameter concentrations are higher than observed at the source well; the consultant suggests highway salting as a cause for elevated concentrations of leachate plume parameters.

3.3 Report Summary and Recommendations

The consultant reports that waste has been deposited outside of the boundaries of Parcel HM215, and the current toe of the landfill comprises an area of 4.6 ha, 0.3 ha greater than the approved 4.3 ha landfill footprint expansion. The consultant reports that the Municipality of Greenstone has acquired all necessary lands for the expanded CAZ, and monitoring results from down gradient wells MW7 and MW11 do not indicate a need for any additional down gradient expansion of the attenuation zone.

The consultant reports that 2015 monitoring results are similar to previous years, and parameters exceeding the reasonable use guideline ("RUG") limits in down gradient wells MW8, MW9, MW10A/10B, and MW11 include TDS, sodium, chloride, hardness, DOC, organic nitrogen, aluminium, arsenic, iron, and manganese. The consultant suggests that parameters exceeding the RUG limits can potentially be attributed to the following:

- TDS, sodium, and chloride to road salting;
- DOC, aluminium, iron, and manganese are variable and naturally occurring;
- Arsenic impacts are a result of historic gold mining.

The consultant made the following recommendations:

1) continued groundwater and surface water quality monitoring at the 13 existing monitoring wells, and 3 surface water monitoring locations on Kenogamisis Lake should continue, sampled twice annual in compliance with the current ECA;
2) Groundwater and surface water parameters outlined in the ECA should be analysed as indicated, including annual VOC monitoring at well MW5;
3) One blind duplicate sample should be collected each sampling event for QA/QC purposes;
4) The next triennial monitoring report is due March 31, 2019, presenting data for the three year period of 2016 through 2018.

4 MOECC Review Conclusions & Recommendations

Based on review of the data provided in the monitoring report, I generally disagree with the consultant's conclusions. Based on review of the monitoring report, I have made the following conclusions:

- The landfill is currently 6,700 m^3 over its approved capacity of 273,000 m^3, and recommendations to regain compliance with the ECA, and for closure and final rehabilitation should be provided;
- Based on subsurface stratigraphy observed in the monitoring wells, Northern Ontario Engineering Geology Terrain Study ("NOEGTS") data, active aggregate pit operations near the site, and K values for representative samples of subsurface material provided in the report, the landfill overlies sand and gravel deposits that trend to the southwest, and down gradient, from the landfill site. The relatively high K corridor is delineated from well MW6, through wells MW5, MW3A/3B, and MW10A/10B;
- Hydraulic conductivity values suggest the southwest trending sand and gravel deposits form a "bottle neck" flanked by lower K materials to the northwest and southeast. Hydraulic conductivity values of the sand and gravel corridor range from a high at the source well (i.e. MW5) of 2.7×10^{-1}, to a low of 9.0×10^{-4} from the shallow horizon in well MW3A. The flanking horizons have higher silt and clay contents reported, with corresponding lower K values ranging from a high of 8.1×10^{-5} at well MW8, to a low of 2.1×10^{-7} at well MW11. Due to the variable hydraulic conductivity values reported for the site, the geometric mean K value does not estimate a representative groundwater flow velocity for the site, and a range should be used. The high K corridor will likely cause contaminant transport from the landfill at a rate closer to 1.4 m/day, as opposed to the reported 0.014 m/day;
- The site is not currently in compliance with the RUG. The consultant's conclusion that groundwater quality observed in well MW10A & MW10B is more likely related to road salt or other local phenomenon, and not related to landfill leachate because "they also exceeded the concentrations of the source well (i.e. MW5)" is misleading. Based on the high K values reported at the source well (i.e. MW5), the landfill leachate plume would migrate quickly from the landfill area, potentially resulting in unreliable parameter concentrations and well MW3A/3B should be considered when comparing down gradient wells;
- Although well MW7 is the "trigger well", the conclusion that RUG limits exceeded in down gradient monitoring wells, and PWQO limits exceeded at surface water sampling locations, are not attributable to landfill leachate impacted groundwater is misleading. In addition to boundary wells MW10A/10B exceeding the calculated phosphorous limit of 0.04 mg/L, landfill leachate impacted well MW3A/3B also exceeded this limit, suggesting phosphorus levels can be attributed to landfill leachate.

The following recommendations are provided for future reports:

1) The landfill is currently over the approved capacity under the existing ECA and recommendations to meet the approved capacity, and final closure and rehabilitation should be provided;
2) As recommended by the Consultant, continued groundwater and surface water quality monitoring at the 13 existing monitoring wells, and 3 surface water monitoring locations on Kenogamisis Lake should continue, sampled twice annual in compliance with the current ECA;
3) As recommended by the Consultant, groundwater and surface water parameters outlined in the ECA should be analysed as indicated, including annual VOC monitoring at well MW5;
4) As recommended by the Consultant, one blind duplicate sample should be collected each sampling event for QA/QC purposes;
5) Piper or Durov plots should be prepared for the site, as they would likely aid in differentiating the source of elevated contaminants such as chloride, sodium, and magnesium;
6) A review of the conceptual groundwater model should be completed with this information, including:
    i) Cross sections of the site, including a long section between wells MW6 and MW10A/10B and Kenogamisis Lake;
    ii) An analysis of preferential pathways for plume migration;
    iii) A review of the trigger mechanism outlined in Section 9.0 of the amended ECA dated August 7, 2014 should be completed;
    iv) A review of monitoring well locations and their suitability as boundary wells to characterize site conditions;
7) Assuming an expanded CAZ, and groundwater reporting to Kenogamisis Lake, trigger values should be revised to reflect either the Provincial Water Quality Objectives (PWQO) or the Aquatic Protection Values (APV's) as established in the MOE document *"Rationale for the Development and Application of Generic Soil, Groundwater and Sediment Criteria for Use at Contaminated Sites in Ontario"*, dated July, 1996.

The site is currently in compliance with the ECA. The site has failed the RUG at the CAZ boundary and recommendations for mitigation measures such as expanding the CAZ or leachate collection should be provided. Potential impacts on Kenogamisis Lake should also be considered when developing mitigation measures and trigger levels should be revised to reflect the preferred mitigation strategy. It is understood the ECA will not be amended, and site closure should be initiated in compliance with Section 13.0 of the ECA. The next triennial

monitoring report is due March 31, 2019, presenting data for the three year period from 2016 through 2018.

5 Closure

If you have any questions regarding the above comments and recommendations, do not hesitate to contact the undersigned.

The purpose of the preceding review is to provide advice to the Ministry of Environment regarding groundwater conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on the information provided by others, except where otherwise specifically noted. The Ministry can not guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as an endorsing the content or views expressed in the reviewed material.

Prepared by:



Jason Arnold, P.Geo.
Regional Hydrogeologist

Ontario

Ministry of the Environment
Ministère de l'Environnement

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	The Corporation of the Municipality of Greenstone Mailing Address: 301 East St, Post Office Box, 70, Geraldton, Ontario, Canada, P0T 1M0 Physical Address: 301 East St, Greenstone, Municipality, District of Thunder Bay, Ontario, Canada, P0T 1M0 Telephone: (807)854-1100, FAX: (807)854-1468, email: administration@greenstone.ca Client #: 0380-4TKQAV, Client Type: Municipal Government		
Inspection Site Address:	Geraldton Waste Disposal Site Address: 2 miles east of Junction Hwy 11 and 584, Greenstone, Municipality, District of Thunder Bay District Office: Thunder Bay - District GeoReference: , LIO GeoReference: Zone: , UTM Easting: , UTM Northing: , Latitude: , Longitude:		
Contact Name:	Vance Czerwinski	**Title:**	Director of Public Services
Contact Telephone:	(807)854-1100 **ext**	**Contact Fax:**	
Last Inspection Date:	2010/01/11		
Inspection Start Date:	2011/10/25	**Inspection Finish Date:**	2012/03/06
Region:	Northern		

1.0 INTRODUCTION

The Geraldton municipal waste disposal site was established in the 1970's. The site was approved in 1974. The most recent amended Certificate of Approval was issued in November, 2008. This inspection focused on the main site (A7004401). There are three separate Certificates of Approval (municipal waste disposal, scrap metal and sludge drying beds) at this location.

The waste disposal site property is located along the north side of Highway 11, about 3 km east of the junction of Highways 11 and 584 in the Township of Ashmore. It is part of Mining Claim TB14031. The landfill site is located in a historical borrow pit. The site serves the Town of Geraldton with a population of approximately 2600.

The MOE continues to be concerned with the long term "fill beyond approved limits" situation at this site (see Sections 2.2 and 2.3 for more detail). In 2008, the MOE met with Township officials to discuss the need for action to address this situation. The Municipality has initiated the process to bring the site into compliance by obtaining approval for the entire site area.

The purpose of this inspection was to assess compliance with Ministry of Environment legislation, specifically Regulation 347 and the waste management provisions of the Environmental Protection Act. The inspection consisted of a review of files and reports, as well as a site visit and discussions with Bob Gendreau of Greenstone).

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):
A7004401

The original Certificate of Approval A7004401 was issued in 1974. A revised Certificate of Approval was issued on April 1, 1980, identified that the type of waste that could be deposited at this site was "domestic, commercial, and 5% non-hazardous solid industrial waste, limited to miscellaneous containers and packaging materials."

A third Certificate of Approval, issued on August 25, 1992, contained additional conditions such as; that waste be

compacted and covered at least once per week or more frequently depending on use, that no burning of waste shall take place at the landfill site, and that a detailed design and operation report (showing among other items a 30 m buffer zone) be submitted by the Town to the Ministry.

In 2006, the municipality applied for an amended Certificate of Approval and submitted the required Design and Operating Plan. A review of the application by Environmental Assessment and Approvals Branch (EAAB) found that the site had been filled beyond the approved limits of the Certificate with respect to landfill foot print and volumetric capacity, violating the Environmental Protection Act. After extensive discussions between the Municipality, EAAB and District Staff, it was decided to proceed with an amended Certificate of Approval (issued November 2008) to provide a better reflection of current conditions, with the Municipality's commitment to proceed through the Environmental Assessment (EA) screening process to bring the site into compliance. The Municipality intended to complete the Screening Process and apply for an amended Certificate of Approval in 2009, but ran into problems acquiring the additional lands needed to address the FBAL situation, and have therefore not completed the EA Screening Process.

2.1 FINANCIAL ASSURANCE:

Specifics:

The Ministry does not require that municipalities provide financial assurance.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The approved landfill area (footprint) is 1.9 hectares. A review of file records indicates that 1.9 hectares or 4.73 acres was the total fill area applied for originally. In past inspections, it was identified that waste has been deposited outside of the 1.9 hectare site footprint. The area that waste has been deposited in is approximately 4.57 hectares. This site has fill beyond the approved limits.

The Design & Operation plan developed by the Municipality, dated May 1, 2007 states that total amount of waste in place by 2006 is 209,000 cubic meters, and some waste materials have been placed outside of the approved footprint. The MOE informed the Municipality that action must be taken to bring the site into compliance. It was determined that to continue the operation of the site an approval under the Environmental Assessment Act is required. The Municipality has decided to pursue an increase to the size and capacity of the site to allow for 5 more years of disposal through a Environmental Assessment Screening process, and will pursue a longer term waste management solution through a full Environmental Assessment Process.

The Municipality was unable to apply for an emergency approval for expansion as they did not meet the criteria for an emergency expansion.

The Municipality submitted a Draft Environmental Screening Report (ESR) for the proposed expansion of Geraldton Waste Disposal Site in August, 2009. The Screening Report was for the proposal to store the current volume of waste at the landfill, as well as approval to further fill for an additional five years until a new facility is established. Projects of this type require an environmental screening under Environmental Assessment Act, Regulation 101/07. The MOE provided comments on the Draft ESR in October 2009. The consultant responded to the comments on November 11, 2009. Access concerns of neighbouring property owner were resolved by the Mining Commissioner in 2010. The Municipality has indicated that they are now in negotiations to purchase land from another adjoining property owner and do not believe they can move forward with the Screening EA until this issue is resolved.

2.3 APPROVED CAPACITY:

Specifics:

The current Certificate of Approval does not specify a capacity as the Certificate of Approval only specifies a fill area within a total site area.

In 2006, the Municipality applied for an amended Certificate of Approval to include some additional waste classes. As part of the application the municipality provided a Design and Operating Plan. EAAB reviewed the plan and determined that the site was filled beyond the approved limits of the Certificate with respect to landfill foot print and volumetric capacity, in contravention of the Environmental Protection Act. EAAB provided the following calculation:

Maximum Theoretical Approved Capacity:
Approvals issued in the past such as the Certificate of Approval for this landfill site did not state the approved capacity. When the approved capacity is not stated in the Certificate or any referenced document, the Ministry uses the information in the supporting documentation to calculate the capacity. To be consistent across the Province, the Ministry developed the 1993 protocol for Landfill Capacity Determination. According to this protocol and using the information in the Municipality's Application and Supporting Documentation dated May 8, 1972, the site's Maximum Theoretical Approved Capacity is 173,000 cubic meters.

The Design & Operating plan submitted by the municipality, dated May 1, 2007, proposed a 4.65-hectare footprint resulting in a total capacity of 370,000 cubic metres. This increase in capacity is greater than 100,000 cubic meters when compared with the approved capacity, as shown above.

In 2008, the quantity of waste (est. 223,000 m3) at the site (including the original MOE-approved area of 1.9 ha and the additional LUP area of 2.43 ha) was estimated to be some 50,000 m3 greater than the approved volume of 173,000 m3 (based on calculations of theoretical maximum capacity). Since this amount is above the maximum approved capacity, the site is currently out of compliance with the existing Certificate of Approval.

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 Environmental Screening Process (ESP). This means that successful completion of the ESP for this site will allow for placement of an estimated additional 50,000 m3 of waste. Quantities will be confirmed through a volume survey. Based on estimated annual waste volumes (including interim cover) of 9,600 m3, this would allow the site to continue to operate for at least 5 years (assuming annual waste volumes will decrease as recycling programs are fostered). After meeting with the MOE during the summer of 2008, the Municipality has decided to pursue a short term expansion through the ESP while initiating the process of locating and approving a new site which would be capable of meeting Greenstone's long term waste disposal needs.

2.4 ACCESS CONTROL:

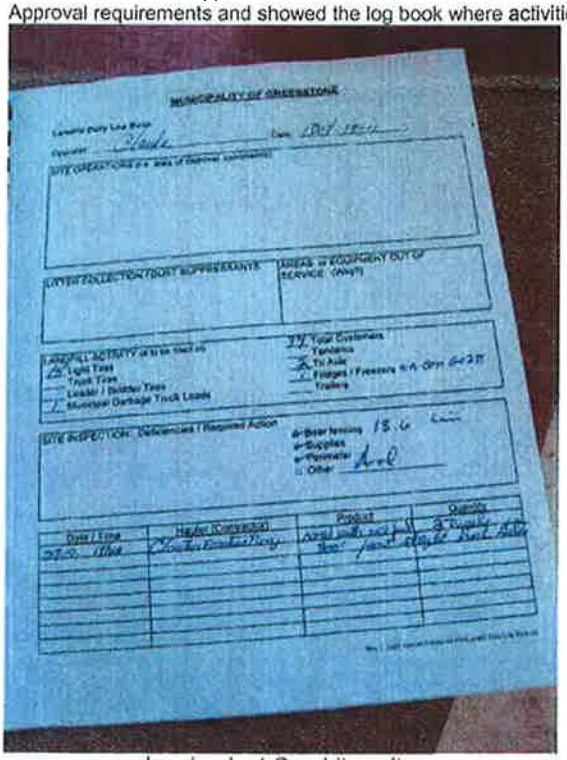
Specifics:

Access to the site is controlled by a locked gate. An attendant is on duty at any time the site is open to receive wastes.

Section 3 of the Certificate of Approval requires that a training plan be developed and that any employees working at the site be a Trained Personnel. "Trained Personnel" is defined in the Certificate of Approval as knowledgeable in the following through instruction and/or practice:

- relevant waste management legislation, regulations and guidelines
- major environmental concerns pertaining to the waste to be handled
- occupational health and safety concerns pertaining to the processes and wastes to be handled
- management procedures including the use and operation of equipment for the processes and wastes to be handled
- emergency response procedures
- specific written procedures for the control of nuisance conditions
- specific written procedures for the refusal of unacceptable waste loads and,
- the requirements of the Certificate of Approval.

At the time of the inspection, municipal officials indicated that all employees working at the site have now been trained as required by the Certificate of Approval. The attendant at the site at the time of inspection appeared to be familiar with the Certificate of Approval requirements and showed the log book where activities are logged (photo attached).



Log book at Geraldton site

2.5 COVER MATERIAL:

Specifics:

Wastes are covered on a daily basis. At the time of inspection, cover was adequate, but there was some visible wastes around the sides of the site.



Litter along side of fill area



Dumping area

2.6 WASTE BURNING:

Specifics:

At the time of inspection, there was no evidence of waste burning at the site

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

There was no obvious evidence of ground or surface water impact. There was no evidence of leachate springs or leachate ponding. All wastes appeared to have been deposited above the water table.

The municipality's engineering consultant identified a leachate plume downgradient (west and southwest) of the landfill site and beyond property currently owned by the municipality. The consultant has calculated the theoretical area of attenuation zone required as 2.5 hectares.

In 2008, Alisdair Brown, Hydrogeologist reviewed the following reports.

- *Updated Design and Operations Plan, Geraldton Landfill, Municipality of Greenstone, Ontario" dated May 1, 2007;*
- *2006 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario" dated May 15, 2007; and*
- *2007 Environmental Quality Monitoring Report, Geraldton Landfill, Municipality of Greenstone, Ontario" dated February 15, 2008.*

Alisdair's review found that based on the monitoring results, a leachate plume is evident, and iron and manganese concentrations at the down gradient well location MW10 exceed Reasonable Use Guidelines. Alisdair's review and recommendations are attached.

Alisdair concluded that the Geraldton WDS can continue to function as a natural attenuation facility, but that the contaminant attenuation zone needs to be expanded, and that the monitoring program needs to be modified with the addition of one new well location and one new surface water location to ensure the effectiveness of the natural attenuation function.

The recommended changes to the groundwater monitoring plan were incorporated into the amended Certificate of Approval. The municipality is continuing with an Environmental Assessment Screening Process to correct the fill beyond approved limits situation. As part of this process the Municipality must identify and retain ownership of the new boundaries of the site and the attenuation zone.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

There is no leachate control system required for this site as it is considered naturally attenuating.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

There is currently no requirement for methane gas control systems at this site.

2.10 OTHER WASTES:

Specifics:

The site is approved for, and accepts, only 100% solid non hazardous wastes and does not receive any treated hazardous wastes.

Adjacent to the waste disposal site is an approved metal recycling site and sludge dewatering site. These sites have their own Certificates of Approval and will be inspected separately.

There are now depots for fluorescent lights and electronics as well as metal recycling. It is positive to see the Municipality promoting recycling.

There were a few fridges at the site - all were labelled as being drained of CFC's.

There were a number of tires at the site which were awaiting removal as part of the tire stewardship program.



Scrap Metal and Electronics recycle area



Fluorescent Light Tube Recycle Area



Tire Pile



Tagged Refrigerator

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The previous inspection contained the following required actions:

By May 30, 2010, complete all required training to ensure that all staff working at the Geraldton site meet the definition of "Trained Personnel" in the Certificate of Approval. **Bob Gendreau confirms that all site staff are now trained as required by the Certificate of Approval.**

By June 30, 2010, complete the Environmental Assessment screening process for the Geraldton WDS and submit an application to Environmental Assessment and Approvals Branch for the expansion of the Geraldton Waste Disposal Site. The application must address the need for additional attenuation lands to address the exceedences of Reasonable Use Guidelines. **Municipality is still in process of acquiring adjacent land and has not completed the EA screening process.**

By June 30, 2010, provide documentation to the District Manger on the progress Greenstone has made in pursuing a longer term waste management solution through a full Environmental Assessment Process. **Information was not**

provided by June 30, 2010 as required, however in a meeting in the fall of 2011, Mr. Czerwinski indicated a consultant had been hired to prepare the Terms of Reference for an EA to establish a new site.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?
No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?
No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?
Yes

Specifics:
The site continues to be in a fill beyond approved limits situation as at the time of inspection, the quantity of waste at the site (including the original MOE-approved area of 1.9 ha and the additional LUP area of 2.43 ha) is greater than the approved volume of 173,000 m3 (based on calculations of theoretical maximum capacity).

Was there any indication of minor administrative non-compliance?
Yes

Specifics:
The site has not been registered on title as required by the Certificate of Approval.

5.0 ACTION(S) REQUIRED

1. By April 30, 2012, provide a report to the District Manager as to the progress and expected timeframe to complete the Environmental Assessment Screening process and apply for an amended Environmental Compliance Approval to address the Fill Beyond Approved Limits situation.

2. By April 30, 2012, provide a report to the District Manager as to the progress and expected timeframe to complete the Environmental Assessment process for a new waste disposal site (or option).

6.0 OTHER INSPECTION FINDINGS

At the time of inspection there was some scattered litter around the site. Operators must ensure that waste is disposed of in the correct location and cover is applied.

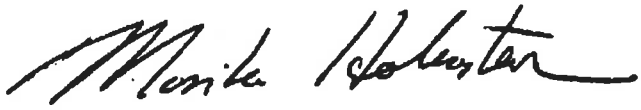
At the time of inspection there were numerous tires at the site. Tires must be regularly removed.

7.0 INCIDENT REPORT

Applicable
0104-7MDNE9

8.0 ATTACHMENTS

PREPARED BY:
Environmental Officer:
Name: **Monika Holenstein**
District Office: **Thunder Bay District Office**
Date: **2012/03/06**
Signature



REVIEWED BY:
District Supervisor:
Name: **Scott Sheriff**
District Office: **Thunder Bay District Office**
Date: **2012/03/08**

Signature:



File Storage Number: TB GT HWY11 610

Note:
"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

Trow

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1142 Roland Street
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November 23, 2009 **Ref. TBEN00006189**

MINISTRY OF THE ENVIRONMENT
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

Attention: Tesfaye Gebrezghi, P.Eng.

Revised Trigger Values for Groundwater Geraldton Landfill

Dear Ms. Gebrezghi:

In accordance with Clause 8(8) of amended provisional Certificate of Approval No. A7004401 for the Geraldton Waste Disposal Site, issued on November 24, 2008, Trow Associates Inc. (Trow) is pleased to provide revised trigger values for groundwater. The revised values are shown on the attached table.

The revised trigger values were calculated as per the methodology described in Trow report ref. F-06189-C/E, dated February 15, 2008, but incorporating recent monitoring data, including data for new well MW11 installed near the downgradient (west) boundary of the expanded attenuation zone (north of MW10) and data for the "trigger well" MW7 within the attenuation zone immediately downgradient of the landfill (see attached figure).

As indicated on the attached table, there were three exceedances of the calculated trigger values at MW7 in 2009, as follows:

- Arsenic - measured concentration 0.044 mg/L versus trigger value of 0.017 mg/L
- Iron - measured concentration of 20 mg/L versus trigger value of 10.6 mg/L
- Manganese – measured concentration of 1.9 mg/L versus trigger value of 1.5 mg/L.

However, neither the arsenic nor the iron exceedances can be attributed to landfill leachate, because concentrations of both of these parameters at MW7 exceeded the maximum measured source (leachate) concentration. Although this does not rule out landfill leachate impact, it does suggest that the elevated values are attributable to another source. Arsenic and iron are known to be naturally elevated in the rock of the area, and have been subject to wider dissemination by historical gold mining activities.

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The elevated manganese level, relative to the trigger value, could suggest leachate impact. Again, however, manganese is known to be highly variable and naturally elevated in many northern Ontario groundwaters, and one can not conclude that leachate impact is responsible for the exceedance of the calculated trigger concentration at MW7.

In general, concentrations of most potential leachate indicator parameters in new well MW11, located downgradient of MW7 near the attenuation zone west boundary, were not elevated. The only parameters whose concentration exceeded the calculated B-7 (Reasonable Use Policy) criterion at MW11 were organic nitrogen and manganese. Both of these parameters are known to be naturally highly variable in northern Ontario groundwaters. The generally low levels of other parameters do not suggest leachate impact at this location.

Concentrations of potential leachate indicator parameters in the paired wells MW10A/10B, near the southwest corner of the attenuation zone, were generally similar to historical values in these wells. Several parameters exceeded B-7 criteria, including TDS, hardness, DOC, chloride, organic nitrogen, aluminum, arsenic, iron and manganese. However, of these parameters, concentrations of DOC, chloride and aluminum also exceeded the source concentrations, which is indicative of additional sources (e.g., highway salting). The apparently elevated levels, relative to background (MW6), of TDS, hardness, organic nitrogen, arsenic, iron and manganese could also be due to natural variation or other sources (as discussed above for arsenic and iron). The observation that only arsenic, iron and manganese exceeded calculated trigger values at MW7 suggests that the exceedances of B-7 criteria for the remaining parameters (TDS, hardness, organic nitrogen) at MW10A/10B are not landfill related.

Yet a further indication that the elevated levels of various parameters measured in MW10A/10B are not attributable to landfill leachate impact is evident from the interpolated groundwater contours shown on the attached figure. Groundwater mounding south of the landfill (most apparent at MW9 near the highway) is suggested, and the primary leachate pathway from the landfill appears to be westward (toward MW11) rather than south-westward (toward MW10A/10B).

Considering all available information, the parameter that appears to have the highest likelihood of reflecting actual leachate impact at the attenuation zone boundary is manganese. However, even if leachate impact were indeed present, there are no groundwater wells between the downgradient boundary of the attenuation zone and Kenogamisis Lake, and there is no Provincial Water Quality Objective for manganese.

We trust that this letter report is sufficient for your current requirements. Raw data, historical summary tables and additional discussion will be presented in the groundwater and surface water monitoring report due by April 30, 2010.

Should you have any questions or concerns regarding the foregoing, please contact this office at your convenience.

Yours truly,

Trow Associates Inc.

Robert J. Rinne, M.Sc., QEP
Senior Scientist / Environmental Manager

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

cc: MOE Thunder Bay District (Monika Holenstein)
Municipality of Greenstone (Vance Czerwinski)

Attachments: Table – 2009 Trigger Concentrations
Figure – Sample Locations and Groundwater Elevations

Table 7 - 2009 Trigger Concentrations (mg/L)

PARAMETER	PROVINCIAL WATER QUALITY OBJECTIVE	ONTARIO DRINKING WATER STANDARD	SOURCE CONCENTRATION[1] (MW1, MW2, MW3A, MW3B, MW4 OR MW5)	BACKGROUND CONCENTRATION (MW6)[2]	2009 B-7	CALCULATED MW7 TRIGGER CONCENTRATION	MW7 MEASURED CONCENTRATION 2009[++]	WEST ATTENUATION ZONE BOUNDARY MEASURED CONCENTRATION (MW11)[3]	SOUTHWEST ATTENUATION ZONE BOUNDARY MEASURED CONCENTRATION (MW10A or MW10B average)[3]
TDS		500	1000	495	495	849	630	325	**779 (>B-7)**
Hardness		100	650	345	345**	558.5	410	240	415 (>B-7)
DOC		5	10.7	6.9	6.9**	9.6	7.3	3.1	14.4 (>source & B-7)*
Sodium		200	63	42	121	n/a***	17	7.6	94 (>source)*
Chloride		250	77	12	131	n/a	19	2	163 (>source & B-7)*
Nitrate		10*	0.3	4.1	5.6	n/a	<0.1	<0.01	<0.1
Nitrite		1*	0.02	0.005	0.25	n/a	<0.01	<0.001	<0.01
Organic Nitrogen		0.15	31.5	0.64	0.64**	22.2	0.8	17.9 (>B-7)	2.7 (>B-7)
Sulphate		500	220	50	**275**	n/a	23	7	<5
Alkalinity		500	561	331	**415**	517	477	268	401
Aluminum	(0.075)[4]	0.1	0.023	0.0025	**0.051**	n/a	0.008	<0.005	0.062 (>source & B-7)*
Antimony	(0.02)	0.006*	0.00025	0.0003	0.003	n/a	<0.0005	<0.0005	**<0.0005**
Arsenic	0.1 (0.005)	0.025*	0.022	0.0005	0.007	0.017	**0.044 (>source)***	0.002	0.020 (>B-7)
Barium		1*	0.17	0.025	0.268	n/a	0.2	0.044	0.032
Boron	(0.2)	5*	**1**	0.02	**1.26**	n/a	**0.15**	0.012	**<0.01**
Cadmium	0.0002 (0.0001)	0.005*	0.0001	0.0001	**0.001**	n/a	**0.0001**	<0.0001	**<0.0001**
Chromium	0.001	0.05*	0.0025	0.003	**0.014**	n/a	<0.005	<0.005	<0.0005
Copper	0.0009	1	0.007	0.006	**0.255**	n/a	**0.001**	<0.001	**0.002**
Iron	0.3	0.3	15	0.05	**0.18**	10.6	**20 (>source)***	**<0.1**	2.6 (>B-7)
Lead	0.01 (0.0003)	0.01*	0.00025	0.00025	**0.005**	n/a	**<0.0005**	**<0.0005**	<0.0005
Manganese		0.05	2.2	0.0013	**0.026**	1.5	**1.9**	0.22 (>B-7)	0.12 (>B-7)
Mercury	0.0002	0.001*	0.0011	0.00005	0.0003	0.0009	0.0001	0.0003	0.00045
Selenium	0.1	0.01*	0.001	0.001	**0.0033**	n/a	**<0.002**	**<0.002**	<0.002
Zinc	0.03 (0.02)	5	0.014	0.0081	2.5	n/a	0.01	0.013	0.009
Approx. Distance from Source to Trigger Point Well (m)						120			
Approx. Distance from Source to Downgradient Attenuation Zone Boundary (m)						400			

Notes:

1 - Source concentration based on highest concentration measured in indicated wells in 2009.

2 - Background concentration based on arithmetic mean of most recent two years' results for MW6.

3 - Attenuation zone boundary concentrations based on fall 2009 results (MW11) or on higher of the arithmetic mean of most recent two years' results (MW10A and MW10B).

4 - Bracketed PWQO values represent interim criteria.

* - Indicates health-based standard.

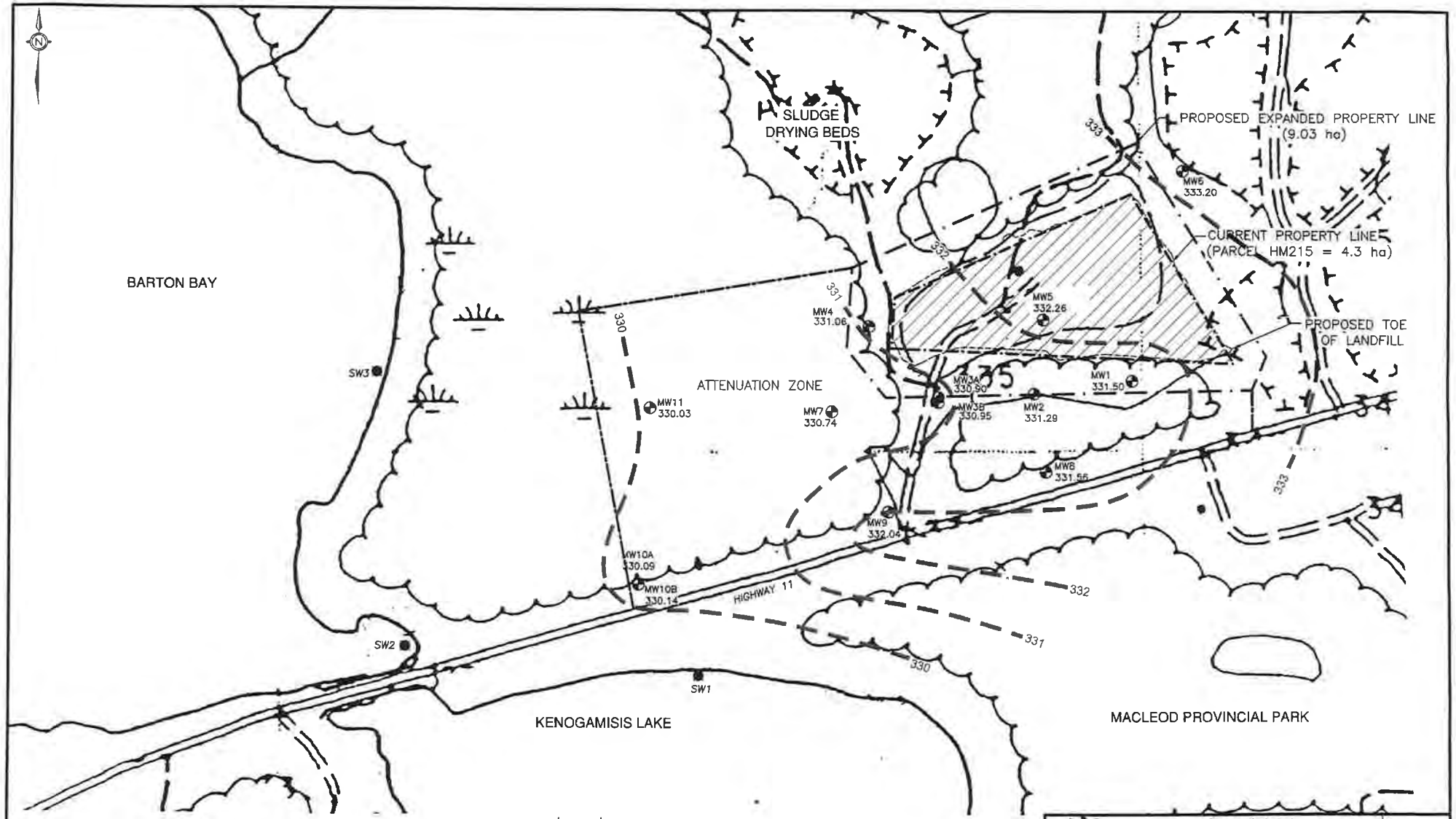
** - Background exceeds ODWS; B-7 criterion defaults to background.

***n/a - not applicable (source concentration lower than or equal to B-7 criterion).

+ Value exceeds source concentration; therefore, additional source implicated.

++ **Bolded** MW7 concentrations exceed trigger.

Non-detectable concentrations are assumed equal to 1/2 the detection limit (when required for calculations).



Notes:

1) Drawing based on 1:20,000 Ontario Base Map

Legend:

MW1 331.50 — Monitoring Well Location Groundwater Elevation (in metres) (measured Oct. 27, 2009)

SW1 — Surface water sampling location [Approx.]

331 — Est. Groundwater Contour (in metres)

Trow	Trow Associates Inc. Thunder Bay, Ontario	FIGURE 1
SAMPLE LOCATIONS & GROUNDWATER ELEVATIONS Geraldton Landfill Expansion Municipality of Greenstone	PROJECT NO. TBEN000061B9F SCALE ~1:4000 DRAWN BY: DT CHECKED BY: RR DATE: NOV. 23, 2009	

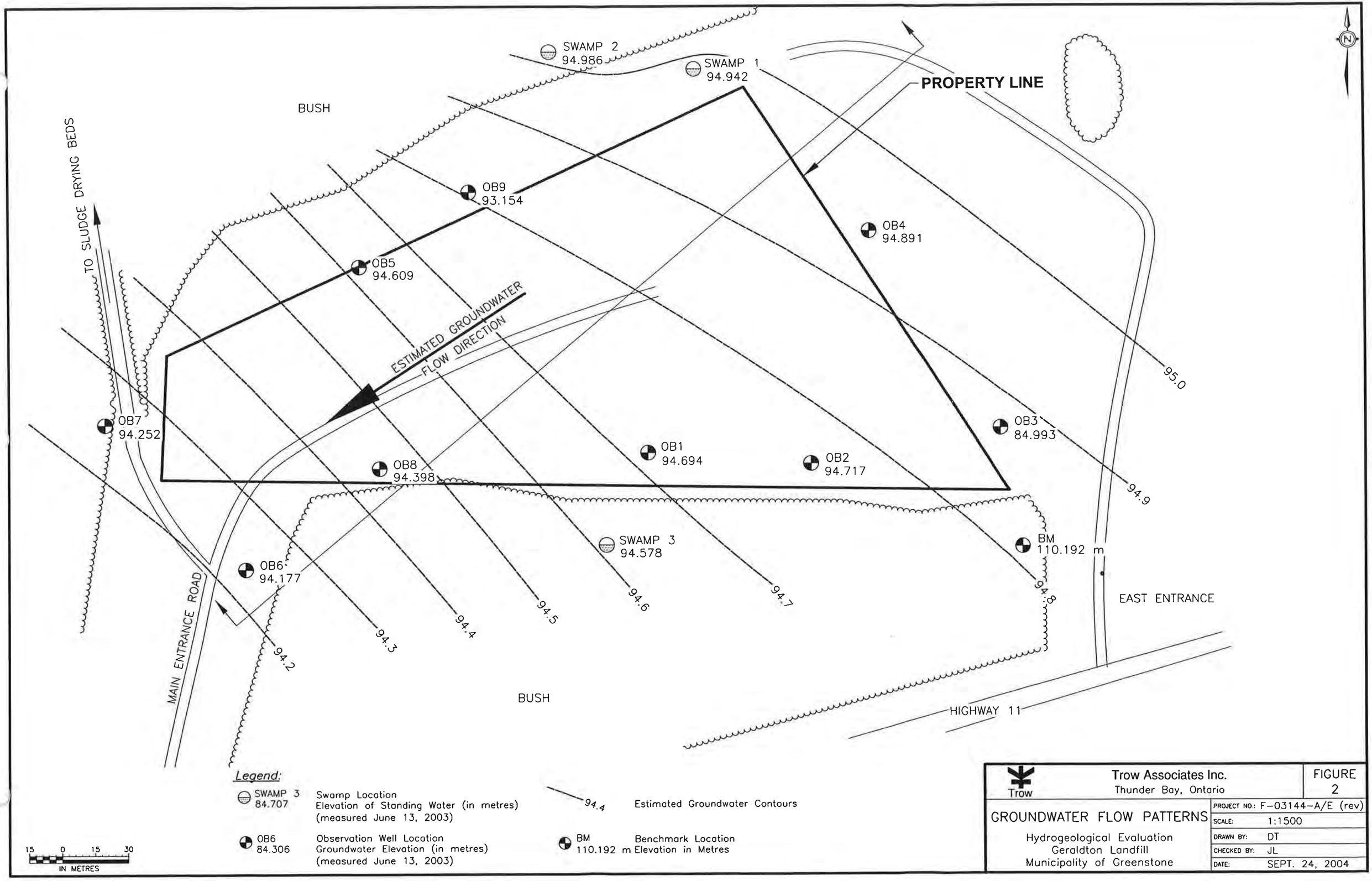
APPENDIX C-

Historical Soil Conditions And Estimated Groundwater Flow Patterns

SOIL CONDITIONS, INITIAL GROUNDWATER INVESTIGATION – JUNE 13, 2003

BH No:	OB1	OB2	OB3	OB4	OB5
Grnd Elev (m):	99.634	99.557	97.964	96.291	102.069
GW Depth (m)	4.94	4.84	3.10	1.40	7.46
GW Elev (m):	94.694	94.717	94.864	94.891	94.609
Soil Conditions:	*Surface to ~3.7 m:* **SILT & GARBAGE**, brown to dk grey, plastics, fabrics, some sand and gravel from 0.6 m depth, strong odours *~3.7 m to 7.6 m:* **SAND**, loose to compact, grey, moist to wet, coarse grained, strong odours *End of BH at 7.6 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to ~4.6 m:* **SILT & GARBAGE**, brown to dk grey, plastics, steel, wood, wire, some sand, strong odours *~4.6 m to 7.6 m:* **SAND**, loose to compact, grey, moist to wet, coarse grained, strong odours *End of BH at 7.6 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to 4.6 m:* **SILT/SAND**, light brown, damp to wet, some gravel *End of BH at 4.6 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to ~1.5 m:* **SILT/SAND**, light brown, damp to moist, some gravel, occasional cobble *~1.5 m to 3.1 m* **SILT**, brown, compact, moist to wet *End of BH at 3.1 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to ~0.6 m:* **SAND (FILL)**, brown, loose, damp some garbage *~0.6 m to 10.7 m* SILTY SAND, grey/brown, loose to compact, moist to wet, occasional cobbles *End of BH at 10.7 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.

BH No:	OB6	OB7	OB8	OB9
Grnd Elev (m):	98.346	95.252	100.752	100.034
GW Depth (m)	4.04	1.00	6.36	6.88
GW Elev (m):	94.177	94.252	94.392	93.154
Soil Conditions:	*Surface to 6.1 m:* **SAND**, light brown, damp to wet, loose to compact, medium grained -silty from to 0.6 m depth *End of BH at 6.1 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to 1.5 m:* **SILTY SAND**, light brown, moist to wet, loose to compact, medium grained *End of BH at 1.5 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to ~4.6 m:* **SILT & GARBAGE**, brown to dk grey, plastics, fabrics, some sand, strong odours *~4.6 m to 10.7 m:* **SAND & GRAVEL**, loose to compact, grey, moist to wet, odourous *End of BH at 10.7 m.* - ¾" PVC standpipe, handslotted, installed upon completion. Annulus backfilled with cuttings.	*Surface to ~1.5 m:* **SANDY SILT & GARBAGE**, brown/grey, odourous, loose, damp *~1.5 m to 9.1 m:* **SAND**, compact, grey, moist to wet, slight odour - trace to some gravel, occ cobbles from ~3.1 m depth *End of BH at 9.1 m.* - ¾" PVC standpipe, handslotted, installed upon completion (to 7.6 m dpth). Annulus backfilled with cuttings.



Trow Associates Inc.
Thunder Bay, Ontario

FIGURE 2

GROUNDWATER FLOW PATTERNS

Hydrogeological Evaluation
Geraldton Landfill
Municipality of Greenstone

PROJECT NO.:	F-03144-A/E (rev)
SCALE:	1:1500
DRAWN BY:	DT
CHECKED BY:	JL
DATE:	SEPT. 24, 2004

APPENDIX D-

Borehole Logs

SYMBOLS AND TERMS USED ON THE BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Behavioural properties (i.e. plasticity, permeability) take precedence over particle gradation in describing soils.

Terminology describing soil structure:

Desiccated	-	having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure
Varved	-	composed of regular alternating layers of silt and clay
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or slit and clay
Well Graded	-	having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Uniformly Graded	-	predominantly of one grain size.

Terminology used for describing soil strata based upon the proportion of individual particle sizes present:

Trace, or occasional	less than 10%
Some	10-20%
Adjective (e.g. silty or sandy)	20-35%
And (e.g. silt and sand)	35-50%

The standard terminology to describe cohesionless soils includes the relative density, as determined by laboratory test or by the Standard Penetration Test 'N' – value: the number of blows of 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sample one foot (305mm) into the soil.

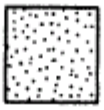
Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		'N' Value
	kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25-0.5	12.5-25	2-4
Firm	0.5-1.0	25-50	4-8
Stiff	1.0-2.0	50-100	8-15
Very Stiff	2.0-4.0	100-200	15-30
Hard	>4.0	>200	>30

STRATA PLOT


Gravel & Boulders

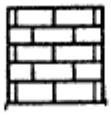

Sand


Silt


Clay


Fill

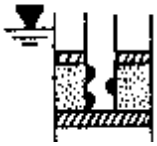

Igneous Bedrock


Sedimentary Bedrock


Metamorphic Bedrock

WATER LEVEL MEASUREMENT


Borehole or Standpipe


Piezometer

SAMPLES

SS…	Split spoon sample (obtained by performing the standard penetration test)
ST…	Shelby tube or thin wall tube
PS…	Piston sample
BS…	Bulk sample
WS…	Wash sample
RC…	Rock core AXT, BXL. etc… Rock core samples obtained with the use of standard diamond drilling bits.

OTHER TESTS

G…	Specific gravity
H…	Hydrometer analysis
S…	Sieve analysis
γ	Unit weight
C….	Consolidation
CD…	Consolidated drained triaxial
CU…	Consolidated undrained triaxial with pore pressure measurements
UU…	Unconsolidated undrained triaxial
DS…	Direct shear
P….	Field permeability

ROCK DESCRIPTION

The description of bedrock is based on the rock quality designation (RQD). The classification is based on a modified core recovery percentage in which all pieces of sound core over 100mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. In most cases RQD is run on NXL core; however, it can be used on different core sizes if the bulk of the fractures caused by drilling stresses are easily distinguishable from normal insitu fractures.

RQD	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

BOREHOLE LOG

MW1

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-03144-A/E (rev.)**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **CME 45B Drill** DATES: Boring **June 25/03** Water Level **June 25/03**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	335.58	SAND- loose, grey, moist, trace silt					
			AS	1			
			SS	2	330	8	
		- compact from 3.0m depth	SS	3	380	23	
		- wet from 4.6m depth	SS	4	535	27	
		- compact to dense from 5.2m depth	SS	5	560	33	S
			SS	0	0	10	
8	327.35		SS	6	430	19	
		End of Borehole					

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 7.62m depth (as shown).

3) MW1 caved to 2.74m depth.

4) MW1 located at 506 996 E and 5 504 318 N. Top of MW1 elevation 336.50m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW2

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT Hydrogeological Study-Geraldton Landfill — PROJECT NO. F-03144-A/E (rev.)

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD CME 45B Drill — DATES: Boring June 25/03 — Water Level June 25/03

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
0	337.68	SAND- loose to compact, brown, moist, trace silt			AS	1				▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value × Dynamic Cone 20 40 60 80
1		- compact, light brown from 0.6m depth			AS	2				
2		- grey, trace silt from 1.5m depth			SS	3	305	10		
3					SS	4	455	18		
4										
5					SS	5	355	19		
6										
7					SS	6	305	22		
8		- wet from 7.6m depth			SS	7	230	27		
9										
10					SS	8	510	19		
11	326.40				SS	9	150	25		
12		End of Borehole								
13										
14										
15										

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 10.67m depth (as shown).

3) MW2 caved to 5.94m depth.

4) MW2 located at 506 883 E and 5 504 303 N. Top of MW2 elevation 337.68m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

Trow Thunder Bay Branch

BOREHOLE LOG

MW3A

Sheet 1 of 1

PROJECT Hydrogeological Study-Geraldton Landfill — PROJECT NO. F-03144-A/E (rev.)

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD CME 45B Drill — DATES: Boring June 26/03 — Water Level June 26/03

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	335.13	**SAND & GRAVEL**- compact, light grey, damp, trace silt, occ. cobbles & boulders			AS	1			
2		- dense to very dense from 2.1m depth			SS	2	50	84	
3		- moist from 3.0m depth			SS	3	330	92	
5		- wet from 4.6m depth			SS	4	180	34	S
6					SS	5	50	18	
8					SS	6	430	50	S
9	325.38				SS	7		31	
10		**End of Borehole**							

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

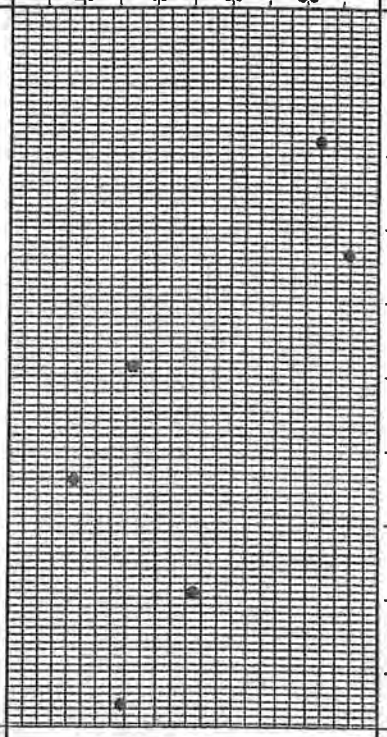
▲ HCVL

40 — 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 — 40 — 60 — 80



NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 9.14m depth (as shown).

3) MW3A caved to 0.6m depth.

4) MW3A located at 506 772 E and 5 504 293 N. Top of MW3A elevation 336.27m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▣ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

Trow Thunder Bay Branch

BOREHOLE LOG

MW3B

Sheet 1 of 1

PROJECT Hydrogeological Study-Geraldton Landfill — PROJECT NO. F-03144-A/E (rev.)

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD CME 45B Drill — DATES: Boring June 26-27/03 — Water Level June 27/03

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or (%)	SAMPLES: N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
0	335.42	SAND & GRAVEL								▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value × Dynamic Cone 20 40 60 80
6	329.32	End of Borehole								

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 6.1m depth (as shown).

3) MW3B located at 506 772 E and 5 504 293 N. Top of MW3B elevation 336.38m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▯ Rock Core (eg. BQ, NQ, etc.) ▯ VN Vane Sample

OTHER TESTS

G Specific Gravity — C Consolidation
H Hydrometer — CD Consolidated Drained Triaxial
S Sieve Analysis — CU Consolidated Undrained Triaxial
γ Unit Weight — UU Unconsolidated Undrained Triaxial
P Field Permeability — UC Unconfined Compression
K Lab Permeability — DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW4

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT Hydrogeological Study-Geraldton Landfill — PROJECT NO. F-03144-A/E (rev.)

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD CME 45B Drill — DATES: Boring June 27/03 — Water Level June 27/03

DEPTH (m)	ELEVATION (m) 332.20	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
0										▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value × Dynamic Cone 20 40 60 80
	331.44	**SILTY SAND & ORGANICS-** loose, dark brown, wet			AS	1				
1	330.68	**SILTY SAND-** loose, brown, wet, some organics to 1.1m depth			AS	2				
					AS	3				
2		**SAND & GRAVEL-** compact, brown, wet, some silt			SS	4	230	24		
3		- compact to dense from 3.0m depth			SS	5	560	89	S	
4										
5	327.02				SS	6	25	19		
		End of Borehole								
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 4.57m depth (as shown).

3) MW4 caved to 2.13m depth.

4) MW4 located at 506 696 E and 5 504 380 N. Top of MW4 elevation 333.11m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW5

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-03144-A/E (rev.)**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **CME 45B Drill** DATES: Boring **June 27/03** Water Level **June 27/03**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	337.92	**GARBAGE**							
4	333.35								
5		**SAND & GRAVEL (TILL)**- dense, grey, moist, trace silt, trace garbage to 5.2m depth			AS	1			
7		- compact, wet from 6.4m depth			AS	2			S
11					AS	3			
12	325.73				AS	4			
12		**End of Borehole**							

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 9.45m depth (As shown).

3) MW5 caved to 6.1m depth.

4) MW5 located at 506 893 E and 5 504 388 N. Top of MW5 elevation 339.00m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ⏃ Artesian (see Notes)

BOREHOLE LOG

MW5 (repl.)

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 750 - Rubber Tire** DATES: Boring **Sept. 22/09** Water Level **Sept. 22/09**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	339.17	**GARBAGE**							
	334.60	**SAND AND GRAVEL** - dense, grey, moist, trace silt			SS	S1	360	38	
6	333.07	**SAND** - compact, grey, moist, trace gravel, trace silt, coarse grained			SS	S2	250	24	
8		- becoming dark grey, wet, metallic odour at about 7.6 m depth			SS	S3	310	28	H
9					SS	S4	310	29	
	329.41	**End of Borehole**							
10									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

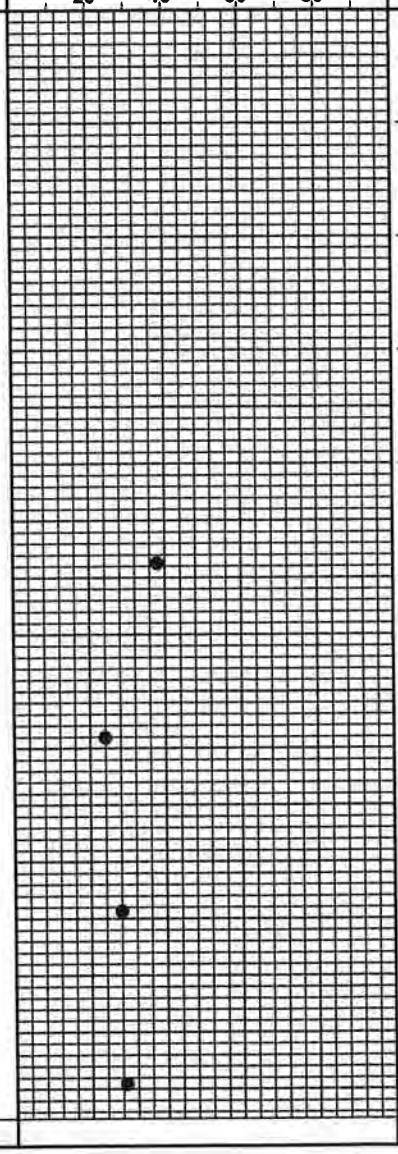
▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80



NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 9.15m depth (as shown).

3) MW9 located at 506 889 E and 5 504 379 N. Top of MW5 (repl.) elevation 340.59m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▣ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

Trow Thunder Bay Branch

BOREHOLE LOG

MW6

Sheet 1 of 1

PROJECT Hydrogeological Study-Geraldton Landfill | PROJECT NO. F-03144-A/E (rev.)

CLIENT Municipality of Greenstone | DATUM Geodetic

DRILL TYPE/METHOD CME 45B Drill | DATES: Boring June 24/03 | Water Level June 27/03

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
0	336.39	**SILT**- loose, light brown, moist, trace sand			AS	1				▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value × Dynamic Cone 20 40 60 80
1										
2					SS	2	280	17		
	333.80	- compact, moist to wet, trace gravel from 2.0m depth								
3		**SAND**- compact, light brown, wet, some silt, trace to some gravel			SS	3	180	11		
	332.58									
4		**End of Borehole-Refusal to Auger**								
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 3.81m depth (As shown).

3) MW6 caved to 2.29m depth.

4) MW6 located at 507 054 E and 5 504 559 N. Top of MW6 elevation 337.24m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW7

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / Speedstar SD100E** DATES: Boring **June 27/08** Water Level **June 27/08**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	334.06								
0	333.93	**ORGANICS** - rootmat, brown, damp, some decaying wood			AS	S-1			
		SILTY SAND - loose, brown, moist, trace fine gravel			AS	S-2			
1					SS	S-3	305	2	
2					SS	S-4	360	16	
		- becoming wet at about 2.4 m			SS	S-5	360	12	
3					SS	S-6	410	18	
4	329.49								
		SAND - compact, brown, medium to coarse grained, trace silt, blowing sands into augers at about 8.23m			SS	S-7	510	24	
6					SS	S-8	480	15	
7									
8	325.83				SS	S-9	510	29	
		End of Borehole							
9									
10									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 7.01m depth (as shown).

3) MW7 located at 506 638 E and 5 504 291 N. Top of MW7 elevation 335.01m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▯ Rock Core (eg. BQ, NQ, etc.) ▯ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW8

Sheet 1 of 2

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 55 - Trackmounted** DATES: Boring **July 25/06** Water Level **Aug 18/06**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	346.45	**SAND** - loose, brown, moist, fine grained	AS	1			
		- trace gravel from about 1.5m to 9.1m depth	SS	2	406	9	
		- becoming coarser grained at about 3.1m depth	SS	3	203	4	
			SS	4	330	8	
		- becoming compact at about 6.1m depth	SS	5	178	10	
			SS	6	203	17	
			SS	7	305	10	
			SS	8	229	22	
10							

HEADSPACE COMBUSTIBLE VAPOUR LEVEL
▲ HCVL
40 80 ppm
W_P W W_L
● SPT N Value × Dynamic Cone
20 40 60 80

Continued Next Page

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 18.29m depth (as shown).

3) MW8 located at 506 930 E and 5 504 217 N. Top of MW8 elevation 347.38m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND
- ⊠ AS Auger Sample
- ▨ SS Split Spoon
- ■ ST Shelby Tube
- ▣ Rock Core (eg. BQ, NQ, etc.)
- ▣ VN Vane Sample

OTHER TESTS
- G Specific Gravity
- H Hydrometer
- S Sieve Analysis
- γ Unit Weight
- P Field Permeability
- K Lab Permeability
- C Consolidation
- CD Consolidated Drained Triaxial
- CU Consolidated Undrained Triaxial
- UU Unconsolidated Undrained Triaxial
- UC Unconfined Compression
- DS Direct Shear

WATER LEVELS
- ▽ Apparent
- ▼ Measured
- ▲ Artesian (see Notes)

BOREHOLE LOG

MW8

Sheet 2 of 2

Trow Thunder Bay Branch

PROJECT Hydrogeological Study-Geraldton Landfill — PROJECT NO. F-06189 D/E

CLIENT Municipality of Greenstone — DATUM Geodetic

DRILL TYPE/METHOD HSA / CME 55 - Trackmounted — DATES: Boring July 25/06 — Water Level Aug 18/06

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
10	346.45								
11					SS	9	330		
12		- becoming moist to wet at about 12.2m depth			SS	10	305	19	
13									
14					SS	11	356	20	
15		- becoming wet at about 15.2m depth			SS	12	254		H
16									
17									
18	328.16								
		End of Borehole							
19									
20									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 18.29m depth (as shown).

3) MW8 located at 506 930 E and 5 504 217 N. Top of MW8 elevation 347.38m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW9

Sheet 1 of 2

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 55 - Trackmounted** DATES: Boring **July 25/06** Water Level **Aug 18/06**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	341.17	**SAND** - loose, brown, moist	AS	1			
1							
2		- becoming dense at about 1.5m depth	SS	2	432	38	
3	338.12						
		SANDY SILT - very dense, brown, moist	SS	3	508	61	
4			SS	4	559	62	
5			SS	5	406	60	
6	335.07						
		SAND/SILT - compact, brown, moist, fine-grained	SS	6	406	22	
7							
8			SS	7	305	21	
9	332.03						
		SILT - compact, brown, wet, some sand	SS	8	356	15	H
10							

HEADSPACE COMBUSTIBLE VAPOUR LEVEL
▲ HCVL
40 80 ppm
W_P W W_L
● SPT N Value × Dynamic Cone
20 40 60 80

Continued Next Page

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 10.67m depth (as shown).

3) MW9 located at 506 708 E and 5 504 163 N. Top of MW9 elevation 342.14m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND
- ⊠ AS Auger Sample
- ▨ SS Split Spoon
- ■ ST Shelby Tube
- ▣ Rock Core (eg. BQ, NQ, etc.)
- ▣ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS
- ▽ Apparent
- ▼ Measured
- ▲ Artesian (see Notes)

BOREHOLE LOG

MW9

Sheet 2 of 2

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 55 - Trackmounted** DATES: Boring **July 25/06** Water Level **Aug 18/06**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)	HEADSPACE COMBUSTIBLE VAPOUR LEVEL
10	341.17									▲ HCVL 40 80 ppm; W_P W W_L; ● SPT N Value × Dynamic Cone 20 40 60 80
	330.50	**End of Borehole**								
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 10.67m depth (as shown).

3) MW9 located at 506 708 E and 5 504 163 N. Top of MW9 elevation 342.14m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube
▣ Rock Core (eg. BQ, NQ, etc.) ◘ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW10A

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 55 - Trackmounted** DATES: Boring **July 26/06** Water Level **Aug 18/06**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	330.43	**MUSKEG** - very loose, brown, wet			AS	1			
1									
2					SS	2	0	1	
3	327.38	**SAND** - very loose, grey, wet			AS	3			
4	325.86								
5		**End of Borehole**							
6									
7									
8									
9									
10									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 6.1m depth (as shown).

3) MW10A located at 506 434 E and 5 504 083 N. Top of MW elevation 331.28m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▥ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW10B

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 55 - Trackmounted** DATES: Boring **July 26/06** Water Level **Aug 18/06**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	330.46	**MUSKEG** - very loose, grey, wet							
3	327.41	**SAND** - very loose, grey, wet							
5					SS	1	76	1	
6					SS	2	152	2	
8					SS	3	203	3	S
8	321.93								
9		**End of Borehole** - refusal to auger							
10									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 4.57m depth (as shown).

3) MW10B located at 506 435 E and 5 504 079 N. Top of MW10A elevation 331.27m referenced to the base station having a geodetic elevation of 349.94m.

4) Heaving sands prevented installation at the depth of refusal (8.54m).

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▥ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

BOREHOLE LOG

MW11

Sheet 1 of 1

Trow Thunder Bay Branch

PROJECT **Hydrogeological Study-Geraldton Landfill** PROJECT NO. **F-06189 D/E**

CLIENT **Municipality of Greenstone** DATUM **Geodetic**

DRILL TYPE/METHOD **HSA / CME 750 - Rubber Tire** DATES: Boring **Sept. 23/09** Water Level **Sept. 23/09**

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WELL LOG	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or (%)	SAMPLES N VALUE (blows) or RQD (%)	HCVL (ppm)
0	330.29								
	329.83	**PEAT** - soft, dark brown, wet, roots and rootlets			AS	S1			
1		**SILTY SAND** - very loose to loose, brown, wet			SS	S2	130	4	
	328.77								
2		**SILT** - compact, brown, wet, trace sand, trace clay			SS	S3	310	11	
3		- becoming compact to loose, grey at about 3.0 m depth			SS	S4	230	10	H
4									
5	325.10				SS	S	230	7	
		End of Borehole							
6									
7									
8									
9									
10									

HEADSPACE COMBUSTIBLE VAPOUR LEVEL

▲ HCVL

40 80 ppm

W_P W W_L

● SPT N Value × Dynamic Cone

20 40 60 80

NOTES

1) For definition of symbols & terms used on logs, see sheets prior to logs.

2) 50mm PVC monitoring well installed to 4.57m depth (as shown).

3) MW11 located at 506 435 E and 5 504 299 N. Top of MW11 elevation 331.13m referenced to the base station having a geodetic elevation of 349.94m.

SAMPLE LEGEND

☒ AS Auger Sample ▨ SS Split Spoon ■ ST Shelby Tube

▥ Rock Core (eg. BQ, NQ, etc.) ▥ VN Vane Sample

OTHER TESTS

G Specific Gravity	C Consolidation
H Hydrometer	CD Consolidated Drained Triaxial
S Sieve Analysis	CU Consolidated Undrained Triaxial
γ Unit Weight	UU Unconsolidated Undrained Triaxial
P Field Permeability	UC Unconfined Compression
K Lab Permeability	DS Direct Shear

WATER LEVELS

▽ Apparent ▼ Measured ▲ Artesian (see Notes)

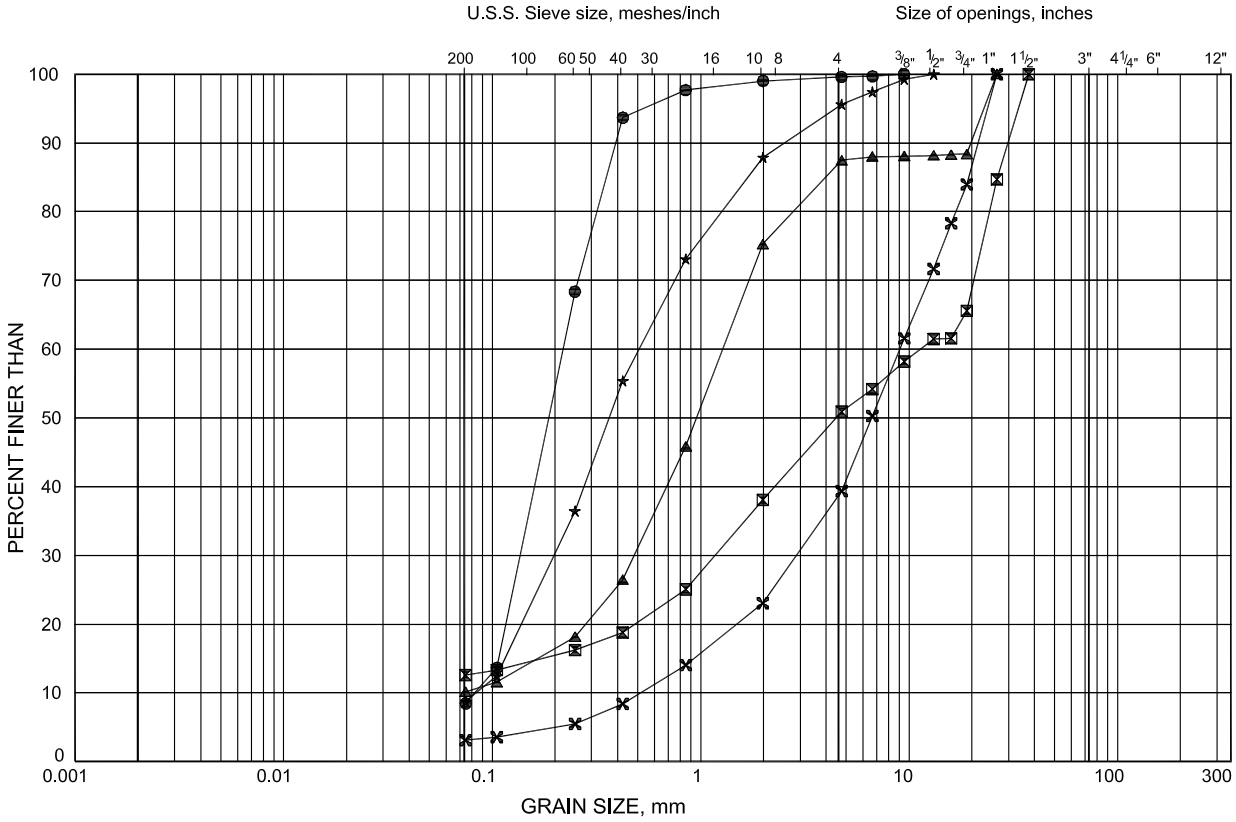
APPENDIX E-

Grain Size Distribution Curves

Grain Size Distribution

Figure E-1

Trow Thunder Bay Branch



Unified Soil Classification System

SILT or CLAY			FINE	MEDIUM	COARSE	FINE	COARSE	COBBLE SIZE
			SAND			GRAVEL		

CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE SIZE
	SILT			SAND			GRAVEL			

Modified M.I.T. Classification System

Symbol	Location	Sample No.	Mid-Sample Depth (m)	Elevation (m)	D_{10} (mm)	C_u	C_c
●	MW1	5	5.63	329.94	0.083	2.6	1.0
⊠	MW3A	4	4.88	330.45			
▲	MW3A	6	7.92	327.41		18.3	2.6
★	MW4	5	3.35	328.77	0.084	6.1	0.9
✕	MW5	2	7.31	330.66	0.516	17.5	1.8

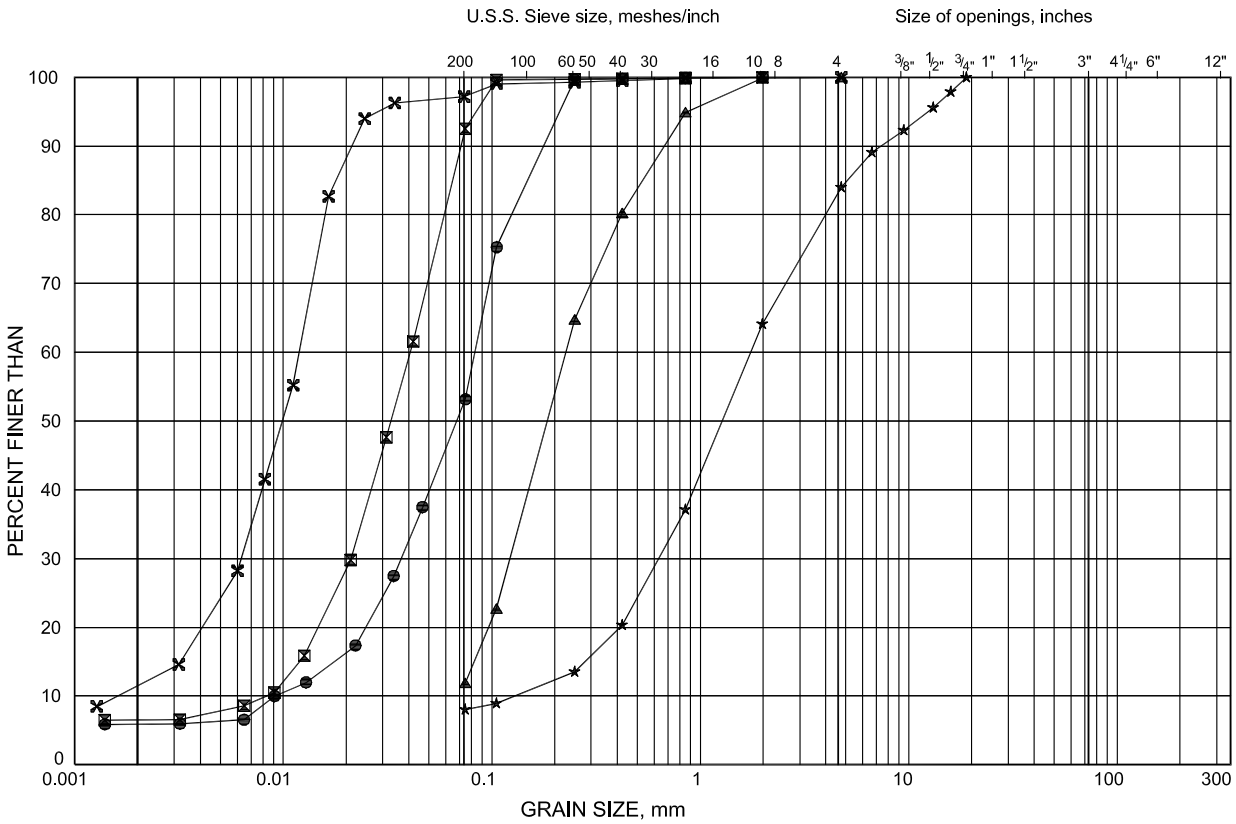
Project Hydrogeological Evaluation-Geraldton Landfill

Project No. F-03144-A/G (rev)

Grain Size Distribution

Figure E-2

Trow Thunder Bay Branch



Unified Soil Classification System

SILT or CLAY			FINE	MEDIUM	COARSE	FINE	COARSE	COBBLE SIZE
			SAND			GRAVEL		

CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE SIZE
	SILT			SAND			GRAVEL			

Modified M.I.T. Classification System

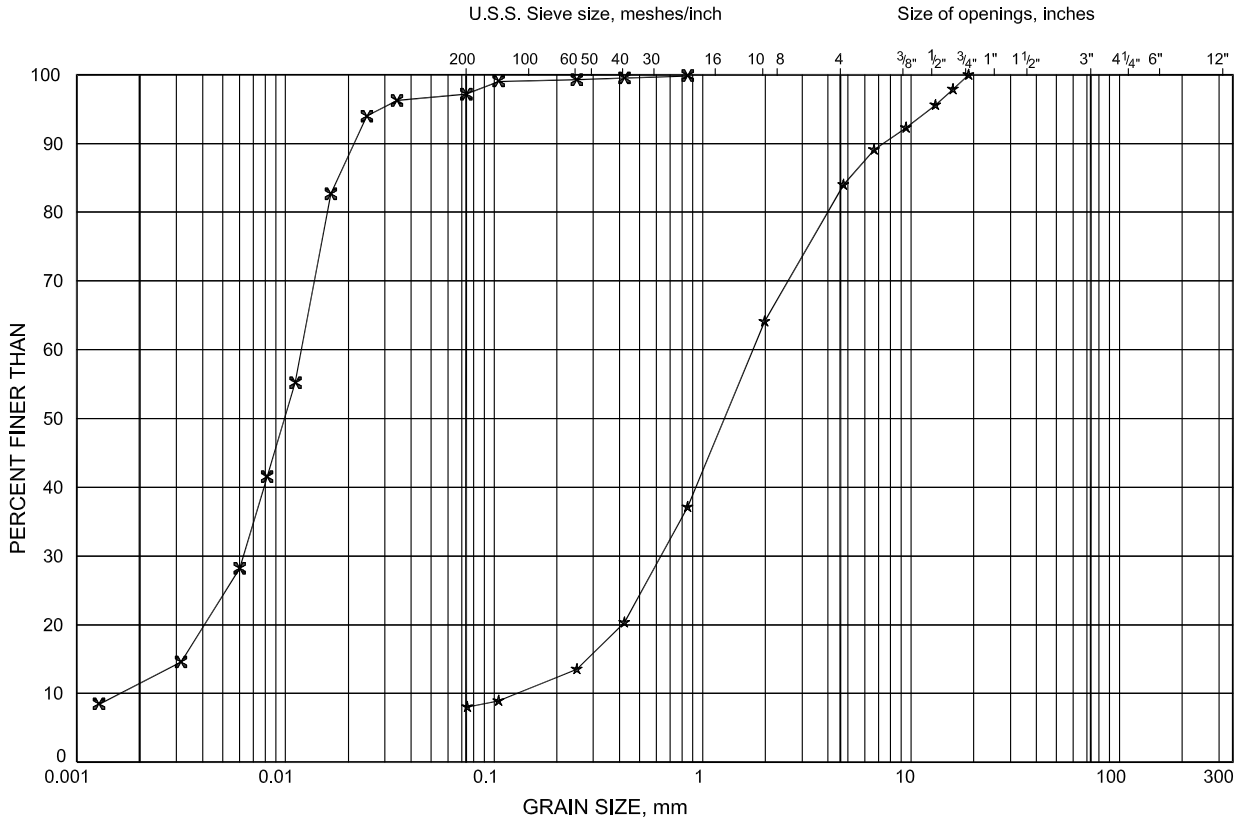
Symbol	Location	Sample No.	Mid-Sample Depth (m)	Elevation (m)	D_{10} (mm)	C_u	C_c
●	MW08	12	15.55	330.90	0.009		
⊠	MW09	8	9.45	331.72	0.008		
▲	MW10B	3	7.93	322.53		3.2	1.0
★	MW5 (repl.)	3	7.93	331.24	0.13	13.9	1.7
✖	MW11	4	3.35	326.94	0.0017	7.35	1.8

Project Environmental Quality Monitoring -Geraldton Landfill, Geraldton, Ontario Project No. TBEN00006189F

Grain Size Distribution

Figure E-3

Trow Thunder Bay Branch



Unified Soil Classification System

SILT or CLAY	FINE	MEDIUM	COARSE	FINE	COARSE	COBBLE SIZE
	SAND			GRAVEL		

CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLE SIZE
	SILT			SAND			GRAVEL			

Modified M.I.T. Classification System

Symbol	Location	Sample No.	Mid-Sample Depth (M)	Elevation (M)	D_{10} (mm)	C_u	C_c
*	MW5	3	7.93	331.24			
×	MW11	4	3.35	326.94			

Project Hydrogeological Evaluation-Geraldton Landfill Project No. F-06189-A/E

APPENDIX F-

Laboratory Certificates of Analysis

Your Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Your C.O.C. #: 559084-01-01, 559084-02-01

Attention:Michael Suslyk

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2016/06/03
Report #: R4014621
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6A8179
Received: 2016/05/28, 10:20

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2016/06/02	CAM SOP-00447	EPA 6020 m
Alkalinity	17	N/A	2016/06/02	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	3	N/A	2016/06/03	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	4	N/A	2016/05/31	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	13	N/A	2016/06/02	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	7	N/A	2016/05/31	CAM SOP-00416	SM 22 5220 D m
Chemical Oxygen Demand	10	N/A	2016/06/01	CAM SOP-00416	SM 22 5220 D m
Conductivity	17	N/A	2016/06/02	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	17	N/A	2016/05/31	CAM SOP-00446	SM 22 5310 B m
Hardness (calculated as CaCO3)	8	N/A	2016/06/02	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	9	N/A	2016/06/03	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	17	2016/06/01	2016/06/02	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	5	N/A	2016/06/01	CAM SOP-00447	EPA 6020A m
Dissolved Metals by ICPMS	9	N/A	2016/06/02	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICPMS	3	N/A	2016/06/01	CAM SOP-00447	EPA 6020A m
Ion Balance (% Difference)	2	N/A	2016/06/02		
Ion Balance (% Difference)	12	N/A	2016/06/03		
Anion and Cation Sum	4	N/A	2016/06/02		
Anion and Cation Sum	10	N/A	2016/06/03		
Total Ammonia-N	17	N/A	2016/06/02	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	17	N/A	2016/06/02	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Organic Nitrogen	14	N/A	2016/06/02		
pH	17	N/A	2016/06/02	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2016/05/31	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	8	N/A	2016/06/01	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	6	N/A	2016/06/02	CAM SOP-00444	OMOE E3179 m
Orthophosphate	4	N/A	2016/06/01	CAM SOP-00461	EPA 365.1 m
Orthophosphate	13	N/A	2016/06/02	CAM SOP-00461	EPA 365.1 m

Your Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Your C.O.C. #: 559084-01-01, 559084-02-01

Attention:Michael Suslyk

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2016/06/03
Report #: R4014621
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6A8179
Received: 2016/05/28, 10:20

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sulphate by Automated Colourimetry	4	N/A	2016/05/31	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	13	N/A	2016/06/02	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	5	N/A	2016/05/30	CAM SOP-00428	SM 22 2540C m
Total Dissolved Solids	12	N/A	2016/05/31	CAM SOP-00428	SM 22 2540C m
Total Kjeldahl Nitrogen in Water	5	2016/05/30	2016/06/01	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	11	2016/05/31	2016/06/01	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2016/05/31	2016/06/02	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2016/05/31	2016/06/01	CAM SOP-00407	SM 22 4500 P B H m
Total Phosphorus (Colourimetric)	14	2016/05/31	2016/05/31	CAM SOP-00407	SM 22 4500 P B H m
Low Level Total Suspended Solids	3	N/A	2016/05/31	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Your Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Your C.O.C. #: 559084-01-01, 559084-02-01

Attention:Michael Suslyk

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2016/06/03
Report #: R4014621
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6A8179
Received: 2016/05/28, 10:20

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Sara Singh, B.Sc, Senior Project Manager
Email: sarasingh@maxxam.ca
Phone# (905)817-5730

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ294	CKZ294		CKZ295	CKZ295		
Sampling Date		2016/05/26 09:05	2016/05/26 09:05		2016/05/26 09:40	2016/05/26 09:40		
COC Number		559084-01-01	559084-01-01		559084-01-01	559084-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**RDL**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	1.6		0.050	0.30		0.050	4520372
Total Chemical Oxygen Demand (COD)	mg/L	43		4.0	27		4.0	4518801
Conductivity	umho/cm	1200		1.0	520		1.0	4520879
Total Dissolved Solids	mg/L	754		10	332		10	4517680
Total Kjeldahl Nitrogen (TKN)	mg/L	2.2		0.10	0.62		0.10	4518797
Dissolved Organic Carbon	mg/L	9.8		0.20	7.3		0.20	4517410
pH	pH	7.65			7.90			4520880
Phenols-4AAP	mg/L	0.0033		0.0010	<0.0010		0.0010	4518135
Total Phosphorus	mg/L	0.065	0.062	0.020	0.025		0.020	4518940
Dissolved Sulphate (SO4)	mg/L	15		1.0	<5.0	<5.0	5.0	4520862
Alkalinity (Total as CaCO3)	mg/L	640		1.0	280		1.0	4520874
Dissolved Chloride (Cl)	mg/L	37		1.0	7.4	7.3	1.0	4520859
Nitrite (N)	mg/L	<0.010		0.010	<0.010		0.010	4521327
Nitrate (N)	mg/L	0.15		0.10	<0.10		0.10	4521327
Metals								
Mercury (Hg)	mg/L	<0.0001		0.0001	<0.0001		0.0001	4520356
Dissolved Aluminum (Al)	ug/L	8.1		5.0	14		5.0	4519676
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	<0.50		0.50	4519676
Dissolved Arsenic (As)	ug/L	25		1.0	4.5		1.0	4519676
Dissolved Barium (Ba)	ug/L	94		2.0	21		2.0	4519676
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	<0.50		0.50	4519676
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	<1.0		1.0	4519676
Dissolved Boron (B)	ug/L	230		10	74		10	4519676
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	<0.10		0.10	4519676
Dissolved Calcium (Ca)	ug/L	200000		200	94000		200	4519676
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	<5.0		5.0	4519676
Dissolved Cobalt (Co)	ug/L	16		0.50	4.0		0.50	4519676
Dissolved Copper (Cu)	ug/L	1.4		1.0	7.2		1.0	4519676
Dissolved Iron (Fe)	ug/L	18000		100	260		100	4519676
Dissolved Lead (Pb)	ug/L	<0.50		0.50	<0.50		0.50	4519676
Dissolved Magnesium (Mg)	ug/L	28000		50	10000		50	4519676
Dissolved Manganese (Mn)	ug/L	2500		2.0	2000		2.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ294	CKZ294		CKZ295	CKZ295		
Sampling Date		2016/05/26 09:05	2016/05/26 09:05		2016/05/26 09:40	2016/05/26 09:40		
COC Number		559084-01-01	559084-01-01		559084-01-01	559084-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**RDL**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.5		0.50	0.55		0.50	4519676
Dissolved Nickel (Ni)	ug/L	4.2		1.0	3.4		1.0	4519676
Dissolved Phosphorus (P)	ug/L	<100		100	<100		100	4519676
Dissolved Potassium (K)	ug/L	7600		200	1600		200	4519676
Dissolved Selenium (Se)	ug/L	<2.0		2.0	<2.0		2.0	4519676
Dissolved Silicon (Si)	ug/L	10000		50	5000		50	4519676
Dissolved Silver (Ag)	ug/L	<0.10		0.10	<0.10		0.10	4519676
Dissolved Sodium (Na)	ug/L	29000		100	6000		100	4519676
Dissolved Strontium (Sr)	ug/L	270		1.0	76		1.0	4519676
Dissolved Thallium (Tl)	ug/L	0.28		0.050	0.063		0.050	4519676
Dissolved Tin (Sn)	ug/L	<1.0		1.0	<1.0		1.0	4519676
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	<5.0		5.0	4519676
Dissolved Vanadium (V)	ug/L	1.6		0.50	1.6		0.50	4519676
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	<5.0		5.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ296	CKZ296			CKZ297		
Sampling Date		2016/05/26 11:15	2016/05/26 11:15			2016/05/26 11:40		
COC Number		559084-01-01	559084-01-01			559084-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	9.4		0.25	4520372	5.9	0.25	4520372
Total Chemical Oxygen Demand (COD)	mg/L	33		4.0	4518801	27	4.0	4518801
Conductivity	umho/cm	1200		1.0	4521189	1200	1.0	4520879
Total Dissolved Solids	mg/L	692		10	4517680	668	10	4517764
Total Kjeldahl Nitrogen (TKN)	mg/L	9.6	9.8	0.50	4518797	6.4	0.20	4518797
Dissolved Organic Carbon	mg/L	7.3		0.20	4517410	7.7	0.20	4517410
pH	pH	7.41			4521177	7.86		4520880
Phenols-4AAP	mg/L	<0.0010		0.0010	4517603	<0.0010	0.0010	4517603
Total Phosphorus	mg/L	0.060		0.020	4518940	0.10	0.040	4518940
Dissolved Sulphate (SO4)	mg/L	25		1.0	4520862	37	1.0	4520862
Alkalinity (Total as CaCO3)	mg/L	500		1.0	4521167	520	1.0	4520874
Dissolved Chloride (Cl)	mg/L	89		1.0	4520859	48	1.0	4520859
Nitrite (N)	mg/L	<0.010		0.010	4521324	0.011	0.010	4521327
Nitrate (N)	mg/L	<0.10		0.10	4521324	0.29	0.10	4521327
Metals								
Mercury (Hg)	mg/L	<0.0001		0.0001	4520356	<0.0001	0.0001	4520360
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4519676	<5.0	5.0	4519676
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4519676	<0.50	0.50	4519676
Dissolved Arsenic (As)	ug/L	17		1.0	4519676	5.9	1.0	4519676
Dissolved Barium (Ba)	ug/L	150		2.0	4519676	130	2.0	4519676
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4519676	<0.50	0.50	4519676
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4519676	<1.0	1.0	4519676
Dissolved Boron (B)	ug/L	280		10	4519676	360	10	4519676
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4519676	<0.10	0.10	4519676
Dissolved Calcium (Ca)	ug/L	150000		200	4519676	160000	200	4519676
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4519676	<5.0	5.0	4519676
Dissolved Cobalt (Co)	ug/L	6.1		0.50	4519676	8.7	0.50	4519676
Dissolved Copper (Cu)	ug/L	<1.0		1.0	4519676	3.2	1.0	4519676
Dissolved Iron (Fe)	ug/L	16000		100	4519676	4300	100	4519676
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4519676	<0.50	0.50	4519676
Dissolved Magnesium (Mg)	ug/L	26000		50	4519676	29000	50	4519676
Dissolved Manganese (Mn)	ug/L	1300		2.0	4519676	1300	2.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ296	CKZ296			CKZ297		
Sampling Date		2016/05/26 11:15	2016/05/26 11:15			2016/05/26 11:40		
COC Number		559084-01-01	559084-01-01			559084-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4519676	<0.50	0.50	4519676
Dissolved Nickel (Ni)	ug/L	3.6		1.0	4519676	6.1	1.0	4519676
Dissolved Phosphorus (P)	ug/L	<100		100	4519676	<100	100	4519676
Dissolved Potassium (K)	ug/L	13000		200	4519676	15000	200	4519676
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4519676	<2.0	2.0	4519676
Dissolved Silicon (Si)	ug/L	7600		50	4519676	7400	50	4519676
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4519676	<0.10	0.10	4519676
Dissolved Sodium (Na)	ug/L	50000		100	4519676	39000	100	4519676
Dissolved Strontium (Sr)	ug/L	270		1.0	4519676	310	1.0	4519676
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4519676	0.063	0.050	4519676
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4519676	<1.0	1.0	4519676
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4519676	<5.0	5.0	4519676
Dissolved Vanadium (V)	ug/L	0.69		0.50	4519676	<0.50	0.50	4519676
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4519676	<5.0	5.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ298	CKZ298			CKZ299	CKZ299		
Sampling Date		2016/05/25 20:10	2016/05/25 20:10			2016/05/26 10:30	2016/05/26 10:30		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050		0.050	4520372	2.7		0.050	4520372
Total Chemical Oxygen Demand (COD)	mg/L	9.5		4.0	4518801	30		4.0	4518801
Conductivity	umho/cm	1000	1000	1.0	4521189	1200	1200	1.0	4520879
Total Dissolved Solids	mg/L	610		10	4517680	718		10	4517764
Total Kjeldahl Nitrogen (TKN)	mg/L	0.25		0.10	4518797	3.5		1.0	4518797
Dissolved Organic Carbon	mg/L	1.5		0.20	4517410	5.3		0.20	4517410
pH	pH	7.41	7.40		4521177	7.79	7.81		4520880
Phenols-4AAP	mg/L	<0.0010		0.0010	4518135	<0.0010		0.0010	4517603
Total Phosphorus	mg/L	0.073		0.020	4518940	0.25		0.10	4518940
Dissolved Sulphate (SO4)	mg/L	28		1.0	4520862	160		1.0	4520862
Alkalinity (Total as CaCO3)	mg/L	530	530	1.0	4521167	450	450	1.0	4520874
Dissolved Chloride (Cl)	mg/L	9.0		1.0	4520859	42		1.0	4520859
Nitrite (N)	mg/L	<0.010	<0.010	0.010	4521324	<0.010		0.010	4521327
Nitrate (N)	mg/L	<0.10	<0.10	0.10	4521324	<0.10		0.10	4521327
Metals									
Mercury (Hg)	mg/L	<0.0001		0.0001	4520360	<0.0001		0.0001	4520356
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4518869
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4518869
Dissolved Arsenic (As)	ug/L	<1.0		1.0	4519676	3.5		1.0	4518869
Dissolved Barium (Ba)	ug/L	50		2.0	4519676	130		2.0	4518869
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4518869
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4519676	<1.0		1.0	4518869
Dissolved Boron (B)	ug/L	32		10	4519676	1100		10	4518869
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4519676	<0.10		0.10	4518869
Dissolved Calcium (Ca)	ug/L	200000		200	4519676	130000		200	4518869
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4518869
Dissolved Cobalt (Co)	ug/L	3.2		0.50	4519676	<0.50		0.50	4518869
Dissolved Copper (Cu)	ug/L	1.6		1.0	4519676	<1.0		1.0	4518869
Dissolved Iron (Fe)	ug/L	<100		100	4519676	6200		100	4518869
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4518869
Dissolved Magnesium (Mg)	ug/L	18000		50	4519676	54000		50	4518869
Dissolved Manganese (Mn)	ug/L	610		2.0	4519676	930		2.0	4518869

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ298	CKZ298			CKZ299	CKZ299		
Sampling Date		2016/05/25 20:10	2016/05/25 20:10			2016/05/26 10:30	2016/05/26 10:30		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4518869
Dissolved Nickel (Ni)	ug/L	3.7		1.0	4519676	4.0		1.0	4518869
Dissolved Phosphorus (P)	ug/L	<100		100	4519676	<100		100	4518869
Dissolved Potassium (K)	ug/L	1900		200	4519676	20000		200	4518869
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4519676	<2.0		2.0	4518869
Dissolved Silicon (Si)	ug/L	5600		50	4519676	5900		50	4518869
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4519676	<0.10		0.10	4518869
Dissolved Sodium (Na)	ug/L	4000		100	4519676	45000		100	4518869
Dissolved Strontium (Sr)	ug/L	170		1.0	4519676	290		1.0	4518869
Dissolved Thallium (Tl)	ug/L	0.13		0.050	4519676	<0.050		0.050	4518869
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4519676	<1.0		1.0	4518869
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4518869
Dissolved Vanadium (V)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4518869
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4518869

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ300	CKZ300			CKZ301	CKZ301		
Sampling Date		2016/05/26 08:20	2016/05/26 08:20			2016/05/25 19:40	2016/05/25 19:40		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW6**	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050		0.050	4520372	7.5		0.25	4520372
Total Chemical Oxygen Demand (COD)	mg/L	28		4.0	4518801	26	27	4.0	4518801
Conductivity	umho/cm	540		1.0	4520879	1000		1.0	4521189
Total Dissolved Solids	mg/L	344		10	4517764	566		10	4517764
Total Kjeldahl Nitrogen (TKN)	mg/L	0.30		0.10	4518797	7.9		0.20	4518797
Dissolved Organic Carbon	mg/L	5.7		0.20	4517410	6.0		0.20	4517410
pH	pH	7.98			4520880	7.38			4521177
Phenols-4AAP	mg/L	<0.0010		0.0010	4517603	<0.0010		0.0010	4517603
Total Phosphorus	mg/L	0.029		0.020	4518940	0.10		0.040	4518940
Dissolved Sulphate (SO4)	mg/L	30		1.0	4520862	19		1.0	4520862
Alkalinity (Total as CaCO3)	mg/L	270		1.0	4520874	500		1.0	4521167
Dissolved Chloride (Cl)	mg/L	1.3		1.0	4520859	34		1.0	4520859
Nitrite (N)	mg/L	<0.010		0.010	4521327	<0.010		0.010	4521324
Nitrate (N)	mg/L	0.84		0.10	4521327	<0.10		0.10	4521324
Metals									
Mercury (Hg)	mg/L	<0.0001		0.0001	4520356	<0.0001		0.0001	4520356
Dissolved Aluminum (Al)	ug/L	<5.0	<5.0	5.0	4519676	<5.0		5.0	4518869
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	0.50	4519676	<0.50		0.50	4518869
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	1.0	4519676	42		1.0	4518869
Dissolved Barium (Ba)	ug/L	18	17	2.0	4519676	220		2.0	4518869
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	0.50	4519676	<0.50		0.50	4518869
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0	1.0	4519676	<1.0		1.0	4518869
Dissolved Boron (B)	ug/L	18	16	10	4519676	170		10	4518869
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	0.10	4519676	0.37		0.10	4518869
Dissolved Calcium (Ca)	ug/L	100000	98000	200	4519676	150000		200	4518869
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	5.0	4519676	<5.0		5.0	4518869
Dissolved Cobalt (Co)	ug/L	<0.50	<0.50	0.50	4519676	14		0.50	4518869
Dissolved Copper (Cu)	ug/L	2.2	2.0	1.0	4519676	<1.0		1.0	4518869
Dissolved Iron (Fe)	ug/L	<100	<100	100	4519676	24000		100	4518869
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	4519676	<0.50		0.50	4518869
Dissolved Magnesium (Mg)	ug/L	17000	16000	50	4519676	23000		50	4518869
Dissolved Manganese (Mn)	ug/L	<2.0	<2.0	2.0	4519676	2100		2.0	4518869

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ300	CKZ300			CKZ301	CKZ301		
Sampling Date		2016/05/26 08:20	2016/05/26 08:20			2016/05/25 19:40	2016/05/25 19:40		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW6**	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**MW7 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	<0.50	0.50	4519676	<0.50		0.50	4518869
Dissolved Nickel (Ni)	ug/L	<1.0	<1.0	1.0	4519676	8.6		1.0	4518869
Dissolved Phosphorus (P)	ug/L	<100	<100	100	4519676	<100		100	4518869
Dissolved Potassium (K)	ug/L	1400	1400	200	4519676	11000		200	4518869
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	2.0	4519676	<2.0		2.0	4518869
Dissolved Silicon (Si)	ug/L	5400	5300	50	4519676	9900		50	4518869
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	4519676	<0.10		0.10	4518869
Dissolved Sodium (Na)	ug/L	9900	9600	100	4519676	24000		100	4518869
Dissolved Strontium (Sr)	ug/L	100	100	1.0	4519676	230		1.0	4518869
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	0.050	4519676	<0.050		0.050	4518869
Dissolved Tin (Sn)	ug/L	<1.0	<1.0	1.0	4519676	<1.0		1.0	4518869
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0	5.0	4519676	<5.0		5.0	4518869
Dissolved Vanadium (V)	ug/L	<0.50	<0.50	0.50	4519676	1.0		0.50	4518869
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	4519676	<5.0		5.0	4518869

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ302	CKZ302			CKZ303	CKZ303		
Sampling Date		2016/05/25 17:15	2016/05/25 17:15			2016/05/25 21:30	2016/05/25 21:30		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW8**	**MW8 Lab-Dup**	**RDL**	**QC Batch**	**MW9**	**MW9 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050	<0.050	0.050	4520372	<0.050		0.050	4520372
Total Chemical Oxygen Demand (COD)	mg/L	18		4.0	4518801	<4.0		4.0	4518801
Conductivity	umho/cm	3600		1.0	4521189	910		1.0	4521189
Total Dissolved Solids	mg/L	1870		10	4517680	642		10	4517764
Total Kjeldahl Nitrogen (TKN)	mg/L	0.45		0.10	4518797	0.18		0.10	4518797
Dissolved Organic Carbon	mg/L	2.9		0.20	4517410	1.1		0.20	4517410
pH	pH	7.93			4521177	7.99			4521177
Phenols-4AAP	mg/L	<0.0010		0.0010	4517603	<0.0010		0.0010	4517603
Total Phosphorus	mg/L	6.7		0.20	4518940	0.98		0.20	4518940
Dissolved Sulphate (SO4)	mg/L	27		1.0	4520862	3.2		1.0	4520862
Alkalinity (Total as CaCO3)	mg/L	400		1.0	4521167	230		1.0	4521167
Dissolved Chloride (Cl)	mg/L	900		10	4520859	140		1.0	4520859
Nitrite (N)	mg/L	<0.010		0.010	4521324	<0.010		0.010	4521324
Nitrate (N)	mg/L	1.35		0.10	4521324	0.19		0.10	4521324
Metals									
Mercury (Hg)	mg/L	<0.0001		0.0001	4520356	<0.0001	<0.0001	0.0001	4520360
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4519676
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4519676
Dissolved Arsenic (As)	ug/L	<2.0 (1)		2.0	4519676	<1.0		1.0	4519676
Dissolved Barium (Ba)	ug/L	60		2.0	4519676	25		2.0	4519676
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4519676
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4519676	<1.0		1.0	4519676
Dissolved Boron (B)	ug/L	<10		10	4519676	<10		10	4519676
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4519676	<0.10		0.10	4519676
Dissolved Calcium (Ca)	ug/L	150000		200	4519676	120000		200	4519676
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4519676
Dissolved Cobalt (Co)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4519676
Dissolved Copper (Cu)	ug/L	1.5		1.0	4519676	<1.0		1.0	4519676
Dissolved Iron (Fe)	ug/L	<100		100	4519676	<100		100	4519676
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4519676	<0.50		0.50	4519676
Dissolved Magnesium (Mg)	ug/L	12000		50	4519676	21000		50	4519676
Dissolved Manganese (Mn)	ug/L	<2.0		2.0	4519676	4.2		2.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) Metals Analysis: Detection Limit was raised due to matrix interferences.

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ302	CKZ302			CKZ303	CKZ303		
Sampling Date		2016/05/25 17:15	2016/05/25 17:15			2016/05/25 21:30	2016/05/25 21:30		
COC Number		559084-01-01	559084-01-01			559084-01-01	559084-01-01		
	UNITS	**MW8**	**MW8 Lab-Dup**	**RDL**	**QC Batch**	**MW9**	**MW9 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.50		0.50	4519676	<0.50		0.50	4519676
Dissolved Nickel (Ni)	ug/L	<1.0		1.0	4519676	<1.0		1.0	4519676
Dissolved Phosphorus (P)	ug/L	<100		100	4519676	<100		100	4519676
Dissolved Potassium (K)	ug/L	2900		200	4519676	1100		200	4519676
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4519676	<2.0		2.0	4519676
Dissolved Silicon (Si)	ug/L	3000		50	4519676	5000		50	4519676
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4519676	<0.10		0.10	4519676
Dissolved Sodium (Na)	ug/L	580000		100	4519676	31000		100	4519676
Dissolved Strontium (Sr)	ug/L	180		1.0	4519676	110		1.0	4519676
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4519676	<0.050		0.050	4519676
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4519676	<1.0		1.0	4519676
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4519676
Dissolved Vanadium (V)	ug/L	<1.0 (1)		1.0	4519676	<0.50		0.50	4519676
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4519676	<5.0		5.0	4519676

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(1) Metals Analysis: Detection Limit was raised due to matrix interferences.

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Maxxam Job #: B6A8179
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exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ304	CKZ304			CKZ305		
Sampling Date		2016/05/25 16:30	2016/05/25 16:30			2016/05/25 16:20		
COC Number		559084-02-01	559084-02-01			559084-02-01		
	UNITS	**MW10A**	**MW10A Lab-Dup**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.31		0.050	4518023	0.19	0.050	4518023
Total Chemical Oxygen Demand (COD)	mg/L	39		4.0	4518017	47	4.0	4518017
Conductivity	umho/cm	750		1.0	4520560	1300	1.0	4520560
Total Dissolved Solids	mg/L	498		10	4517680	834	10	4517680
Total Kjeldahl Nitrogen (TKN)	mg/L	0.54		0.10	4518031	0.50	0.10	4518031
Dissolved Organic Carbon	mg/L	11		0.20	4517410	12	0.20	4517410
pH	pH	7.52			4520564	7.60		4520564
Phenols-4AAP	mg/L	<0.0010		0.0010	4520968	<0.0010	0.0010	4520968
Total Phosphorus	mg/L	0.051		0.040	4518940	0.13	0.10	4518940
Dissolved Sulphate (SO4)	mg/L	10		1.0	4518334	<1.0	1.0	4518334
Alkalinity (Total as CaCO3)	mg/L	270		1.0	4520558	330	1.0	4520558
Dissolved Chloride (Cl)	mg/L	78		1.0	4518327	190	2.0	4518327
Nitrite (N)	mg/L	<0.010		0.010	4521785	<0.010	0.010	4521324
Nitrate (N)	mg/L	<0.10		0.10	4521785	<0.10	0.10	4521324
Metals								
Mercury (Hg)	mg/L	<0.0001	<0.0001	0.0001	4520394	<0.0001	0.0001	4520360
Dissolved Aluminum (Al)	ug/L	75		5.0	4518869	55	5.0	4518869
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4518869	<0.50	0.50	4518869
Dissolved Arsenic (As)	ug/L	17		1.0	4518869	33	1.0	4518869
Dissolved Barium (Ba)	ug/L	30		2.0	4518869	29	2.0	4518869
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4518869	<0.50	0.50	4518869
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4518869	<1.0	1.0	4518869
Dissolved Boron (B)	ug/L	<10		10	4518869	<10	10	4518869
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4518869	<0.10	0.10	4518869
Dissolved Calcium (Ca)	ug/L	99000		200	4518869	150000	200	4518869
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4518869	<5.0	5.0	4518869
Dissolved Cobalt (Co)	ug/L	<0.50		0.50	4518869	<0.50	0.50	4518869
Dissolved Copper (Cu)	ug/L	<1.0		1.0	4518869	<1.0	1.0	4518869
Dissolved Iron (Fe)	ug/L	2100		100	4518869	5700	100	4518869
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4518869	<0.50	0.50	4518869
Dissolved Magnesium (Mg)	ug/L	19000		50	4518869	13000	50	4518869
Dissolved Manganese (Mn)	ug/L	88		2.0	4518869	180	2.0	4518869

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Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ304	CKZ304			CKZ305		
Sampling Date		2016/05/25 16:30	2016/05/25 16:30			2016/05/25 16:20		
COC Number		559084-02-01	559084-02-01			559084-02-01		
	UNITS	**MW10A**	**MW10A Lab-Dup**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4518869	<0.50	0.50	4518869
Dissolved Nickel (Ni)	ug/L	1.3		1.0	4518869	<1.0	1.0	4518869
Dissolved Phosphorus (P)	ug/L	<100		100	4518869	<100	100	4518869
Dissolved Potassium (K)	ug/L	340		200	4518869	270	200	4518869
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4518869	<2.0	2.0	4518869
Dissolved Silicon (Si)	ug/L	3000		50	4518869	1900	50	4518869
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4518869	<0.10	0.10	4518869
Dissolved Sodium (Na)	ug/L	33000		100	4518869	95000	100	4518869
Dissolved Strontium (Sr)	ug/L	85		1.0	4518869	120	1.0	4518869
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4518869	<0.050	0.050	4518869
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4518869	<1.0	1.0	4518869
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4518869	<5.0	5.0	4518869
Dissolved Vanadium (V)	ug/L	1.8		0.50	4518869	0.91	0.50	4518869
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4518869	<5.0	5.0	4518869

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ306			CKZ307	CKZ307		
Sampling Date		2016/05/25 20:45			2016/05/26 11:55	2016/05/26 11:55		
COC Number		559084-02-01			559084-02-01	559084-02-01		
	UNITS	**MW11**	**RDL**	**QC Batch**	**MW12**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.068	0.050	4520909	9.3 (1)		0.25	4518023
Total Chemical Oxygen Demand (COD)	mg/L	150	8.0	4518017	35		4.0	4518064
Conductivity	umho/cm	460	1.0	4520879	1200		1.0	4521189
Total Dissolved Solids	mg/L	278	10	4517680	692		10	4517680
Total Kjeldahl Nitrogen (TKN)	mg/L	0.74	0.20	4518519	8.9 (1)	8.9 (1)	0.50	4518031
Dissolved Organic Carbon	mg/L	1.5	0.20	4517410	7.3		0.20	4517410
pH	pH	8.09		4520880	7.44			4521177
Phenols-4AAP	mg/L	<0.0010	0.0010	4521011	<0.0010		0.0010	4520968
Total Phosphorus	mg/L	8.8	0.40	4518940	0.059		0.020	4518940
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	4520862	26		1.0	4520862
Alkalinity (Total as CaCO3)	mg/L	250	1.0	4520874	500		1.0	4521167
Dissolved Chloride (Cl)	mg/L	<1.0	1.0	4520859	91		1.0	4520859
Nitrite (N)	mg/L	0.014	0.010	4521327	<0.010		0.010	4521324
Nitrate (N)	mg/L	<0.10	0.10	4521327	<0.10		0.10	4521324
Metals								
Mercury (Hg)	mg/L	<0.0001	0.0001	4520356	<0.0001		0.0001	4520356
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	4518869	<5.0		5.0	4519676
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	4518869	<0.50		0.50	4519676
Dissolved Arsenic (As)	ug/L	<1.0	1.0	4518869	17		1.0	4519676
Dissolved Barium (Ba)	ug/L	31	2.0	4518869	150		2.0	4519676
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	4518869	<0.50		0.50	4519676
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	4518869	<1.0		1.0	4519676
Dissolved Boron (B)	ug/L	11	10	4518869	270		10	4519676
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	4518869	<0.10		0.10	4519676
Dissolved Calcium (Ca)	ug/L	70000	200	4518869	150000		200	4519676
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	4518869	<5.0		5.0	4519676
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	4518869	6.0		0.50	4519676
Dissolved Copper (Cu)	ug/L	<1.0	1.0	4518869	<1.0		1.0	4519676
Dissolved Iron (Fe)	ug/L	<100	100	4518869	16000		100	4519676
Dissolved Lead (Pb)	ug/L	<0.50	0.50	4518869	<0.50		0.50	4519676
Dissolved Magnesium (Mg)	ug/L	14000	50	4518869	26000		50	4519676
Dissolved Manganese (Mn)	ug/L	130	2.0	4518869	1300		2.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		CKZ306			CKZ307	CKZ307		
Sampling Date		2016/05/25 20:45			2016/05/26 11:55	2016/05/26 11:55		
COC Number		559084-02-01			559084-02-01	559084-02-01		
	UNITS	**MW11**	**RDL**	**QC Batch**	**MW12**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.92	0.50	4518869	<0.50		0.50	4519676
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	4518869	3.7		1.0	4519676
Dissolved Phosphorus (P)	ug/L	<100	100	4518869	<100		100	4519676
Dissolved Potassium (K)	ug/L	800	200	4518869	14000		200	4519676
Dissolved Selenium (Se)	ug/L	<2.0	2.0	4518869	<2.0		2.0	4519676
Dissolved Silicon (Si)	ug/L	6100	50	4518869	7600		50	4519676
Dissolved Silver (Ag)	ug/L	<0.10	0.10	4518869	<0.10		0.10	4519676
Dissolved Sodium (Na)	ug/L	6500	100	4518869	49000		100	4519676
Dissolved Strontium (Sr)	ug/L	84	1.0	4518869	270		1.0	4519676
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	4518869	<0.050		0.050	4519676
Dissolved Tin (Sn)	ug/L	<1.0	1.0	4518869	<1.0		1.0	4519676
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	4518869	<5.0		5.0	4519676
Dissolved Vanadium (V)	ug/L	0.51	0.50	4518869	0.83		0.50	4519676
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	4518869	<5.0		5.0	4519676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		CKZ308	CKZ308		CKZ309		
Sampling Date		2016/05/25 15:20	2016/05/25 15:20		2016/05/25 14:30		
COC Number		559084-02-01	559084-02-01		559084-02-01		
	UNITS	**SW1**	**SW1 Lab-Dup**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050		4518023	<0.050	0.050	4518023
Total BOD	mg/L	<2.0	<2.0	4516607	<2.0	2.0	4516607
Total Chemical Oxygen Demand (COD)	mg/L	35		4518064	25	4.0	4518064
Conductivity	umho/cm	280		4520879	270	1.0	4520560
Total Dissolved Solids	mg/L	188		4517680	178	10	4517680
Total Kjeldahl Nitrogen (TKN)	mg/L	0.34		4518031	0.30	0.10	4518031
pH	pH	7.97		4520880	7.87		4520564
Phenols-4AAP	mg/L	<0.0010		4520968	<0.0010	0.0010	4520968
Total Phosphorus	mg/L	0.037		4518669	0.026	0.004	4518669
Total Suspended Solids	mg/L	8		4519727	32	1	4519727
Dissolved Sulphate (SO4)	mg/L	10		4520862	11	1.0	4518334
Alkalinity (Total as CaCO3)	mg/L	100		4520874	100	1.0	4520558
Dissolved Chloride (Cl)	mg/L	25		4520859	18	1.0	4518327
Nitrite (N)	mg/L	<0.010		4521327	<0.010	0.010	4521785
Nitrate (N)	mg/L	<0.10		4521327	<0.10	0.10	4521785
Metals							
Mercury (Hg)	mg/L	<0.0001		4520360	<0.0001	0.0001	4520356
Total Antimony (Sb)	ug/L	<0.50		4520510	0.55	0.50	4520510
Total Arsenic (As)	ug/L	15		4520510	36	1.0	4520510
Total Barium (Ba)	ug/L	12		4520510	13	2.0	4520510
Total Beryllium (Be)	ug/L	<0.50		4520510	<0.50	0.50	4520510
Total Bismuth (Bi)	ug/L	<1.0		4520510	<1.0	1.0	4520510
Total Boron (B)	ug/L	12		4520510	18	10	4520510
Total Cadmium (Cd)	ug/L	<0.10		4520510	<0.10	0.10	4520510
Total Calcium (Ca)	ug/L	32000		4520510	35000	200	4520510
Total Chromium (Cr)	ug/L	<5.0		4520510	<5.0	5.0	4520510
Total Cobalt (Co)	ug/L	<0.50		4520510	0.52	0.50	4520510
Total Copper (Cu)	ug/L	2.2		4520510	4.6	1.0	4520510
Total Iron (Fe)	ug/L	240		4520510	800	100	4520510
Total Lead (Pb)	ug/L	<0.50		4520510	0.71	0.50	4520510
Total Magnesium (Mg)	ug/L	6600		4520510	7100	50	4520510
Total Manganese (Mn)	ug/L	19		4520510	220	2.0	4520510

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		CKZ308	CKZ308		CKZ309		
Sampling Date		2016/05/25 15:20	2016/05/25 15:20		2016/05/25 14:30		
COC Number		559084-02-01	559084-02-01		559084-02-01		
	UNITS	**SW1**	**SW1 Lab-Dup**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50		4520510	<0.50	0.50	4520510
Total Nickel (Ni)	ug/L	<1.0		4520510	2.3	1.0	4520510
Total Phosphorus (P)	ug/L	<100		4520510	<100	100	4520510
Total Potassium (K)	ug/L	830		4520510	900	200	4520510
Total Selenium (Se)	ug/L	<2.0		4520510	<2.0	2.0	4520510
Total Silicon (Si)	ug/L	1800		4520510	2000	50	4520510
Total Silver (Ag)	ug/L	<0.10		4520510	0.13	0.10	4520510
Total Sodium (Na)	ug/L	14000		4520510	10000	100	4520510
Total Strontium (Sr)	ug/L	43		4520510	49	1.0	4520510
Total Thallium (Tl)	ug/L	<0.050		4520510	<0.050	0.050	4520510
Total Tin (Sn)	ug/L	<1.0		4520510	<1.0	1.0	4520510
Total Titanium (Ti)	ug/L	5.4		4520510	11	5.0	4520510
Total Vanadium (V)	ug/L	<0.50		4520510	0.84	0.50	4520510
Total Zinc (Zn)	ug/L	<5.0		4520510	<5.0	5.0	4520510

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		CKZ310		
Sampling Date		2016/05/25 13:30		
COC Number		559084-02-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	<0.050	0.050	4520909
Total BOD	mg/L	<2.0	2.0	4516607
Total Chemical Oxygen Demand (COD)	mg/L	28	4.0	4518017
Conductivity	umho/cm	200	1.0	4520560
Total Dissolved Solids	mg/L	136	10	4517680
Total Kjeldahl Nitrogen (TKN)	mg/L	0.36	0.10	4518519
pH	pH	7.83		4520564
Phenols-4AAP	mg/L	<0.0010	0.0010	4520968
Total Phosphorus	mg/L	0.13	0.008	4518669
Total Suspended Solids	mg/L	6	2	4519727
Dissolved Sulphate (SO4)	mg/L	10	1.0	4518334
Alkalinity (Total as CaCO3)	mg/L	69	1.0	4520558
Dissolved Chloride (Cl)	mg/L	14	1.0	4518327
Nitrite (N)	mg/L	<0.010	0.010	4521324
Nitrate (N)	mg/L	<0.10	0.10	4521324
Metals				
Mercury (Hg)	mg/L	<0.0001	0.0001	4520394
Total Antimony (Sb)	ug/L	<0.50	0.50	4520510
Total Arsenic (As)	ug/L	26	1.0	4520510
Total Barium (Ba)	ug/L	7.7	2.0	4520510
Total Beryllium (Be)	ug/L	<0.50	0.50	4520510
Total Bismuth (Bi)	ug/L	<1.0	1.0	4520510
Total Boron (B)	ug/L	<10	10	4520510
Total Cadmium (Cd)	ug/L	<0.10	0.10	4520510
Total Calcium (Ca)	ug/L	23000	200	4520510
Total Chromium (Cr)	ug/L	<5.0	5.0	4520510
Total Cobalt (Co)	ug/L	<0.50	0.50	4520510
Total Copper (Cu)	ug/L	3.2	1.0	4520510
Total Iron (Fe)	ug/L	240	100	4520510
Total Lead (Pb)	ug/L	<0.50	0.50	4520510
Total Magnesium (Mg)	ug/L	5200	50	4520510
Total Manganese (Mn)	ug/L	10	2.0	4520510
Total Molybdenum (Mo)	ug/L	<0.50	0.50	4520510

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B6A8179
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exp Services Inc
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LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		CKZ310		
Sampling Date		2016/05/25 13:30		
COC Number		559084-02-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Total Nickel (Ni)	ug/L	<1.0	1.0	4520510
Total Phosphorus (P)	ug/L	<100	100	4520510
Total Potassium (K)	ug/L	660	200	4520510
Total Selenium (Se)	ug/L	<2.0	2.0	4520510
Total Silicon (Si)	ug/L	1300	50	4520510
Total Silver (Ag)	ug/L	<0.10	0.10	4520510
Total Sodium (Na)	ug/L	7700	100	4520510
Total Strontium (Sr)	ug/L	40	1.0	4520510
Total Thallium (Tl)	ug/L	<0.050	0.050	4520510
Total Tin (Sn)	ug/L	<1.0	1.0	4520510
Total Titanium (Ti)	ug/L	<5.0	5.0	4520510
Total Vanadium (V)	ug/L	<0.50	0.50	4520510
Total Zinc (Zn)	ug/L	<5.0	5.0	4520510
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

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Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		CKZ294	CKZ295	CKZ295	CKZ296	CKZ297	CKZ298		
Sampling Date		2016/05/26 09:05	2016/05/26 09:40	2016/05/26 09:40	2016/05/26 11:15	2016/05/26 11:40	2016/05/25 20:10		
COC Number		559084-01-01	559084-01-01	559084-01-01	559084-01-01	559084-01-01	559084-01-01		
	UNITS	**MW1**	**MW2**	**MW2 Lab-Dup**	**MW3A**	**MW3B**	**MW4**	**RDL**	**QC Batch**
Calculated Parameters									
Anion Sum	me/L	14.1	5.85		13.0	12.6	11.4	N/A	4516458
Cation Sum	me/L	14.7	5.87		13.6	13.2	11.5	N/A	4516458
Hardness (CaCO3)	mg/L	620	280		500	530	570	1.0	4516339
Ion Balance (% Difference)	%	1.88	0.200		2.41	2.46	0.400	N/A	4516457
Total Organic Nitrogen	mg/L	0.59	0.32		0.18	0.51	0.25	0.10	4516459
Inorganics									
Orthophosphate (P)	mg/L	<0.010	0.010	0.010	<0.010	<0.010	<0.010	0.010	4520860

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		CKZ299	CKZ300	CKZ301	CKZ302	CKZ303		
Sampling Date		2016/05/26 10:30	2016/05/26 08:20	2016/05/25 19:40	2016/05/25 17:15	2016/05/25 21:30		
COC Number		559084-01-01	559084-01-01	559084-01-01	559084-01-01	559084-01-01		
	UNITS	**MW5**	**MW6**	**MW7**	**MW8**	**MW9**	**RDL**	**QC Batch**
Calculated Parameters								
Anion Sum	me/L	13.5	6.17	11.3	34.0	8.64	N/A	4516458
Cation Sum	me/L	13.6	6.91	12.1	33.5	9.17	N/A	4516458
Hardness (CaCO3)	mg/L	540	320	470	410	390	1.0	4516456
Ion Balance (% Difference)	%	0.380	5.65	3.51	0.770	2.97	N/A	4516457
Total Organic Nitrogen	mg/L	0.77	0.30	0.40	0.45	0.18	0.10	4516459
Inorganics								
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	0.017	<0.010	0.010	4520860

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B6A8179
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Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		CKZ304	CKZ305		CKZ306	CKZ307	CKZ308		
Sampling Date		2016/05/25 16:30	2016/05/25 16:20		2016/05/25 20:45	2016/05/26 11:55	2016/05/25 15:20		
COC Number		559084-02-01	559084-02-01		559084-02-01	559084-02-01	559084-02-01		
	UNITS	**MW10A**	**MW10B**	**QC Batch**	**MW11**	**MW12**	**SW1**	**RDL**	**QC Batch**
Calculated Parameters									
Anion Sum	me/L	7.74	12.0	4516458	5.06	13.1		N/A	4516458
Cation Sum	me/L	8.05	12.9	4516458	4.99	13.6		N/A	4516458
Hardness (CaCO3)	mg/L	330	430	4516456	230	500	110	1.0	4516456
Ion Balance (% Difference)	%	1.98	3.42	4516457	0.710	1.81		N/A	4516457
Total Organic Nitrogen	mg/L	0.23	0.31	4516459	0.68	<0.10		0.10	4516459
Inorganics									
Dissolved Organic Carbon	mg/L						8.3	0.20	4517410
Orthophosphate (P)	mg/L	0.010	<0.010	4518331	<0.010	<0.010	0.011	0.010	4520860

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		CKZ309	CKZ310		
Sampling Date		2016/05/25 14:30	2016/05/25 13:30		
COC Number		559084-02-01	559084-02-01		
	UNITS	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters					
Hardness (CaCO3)	mg/L	120	83	1.0	4516456
Inorganics					
Dissolved Organic Carbon	mg/L	8.3	8.8	0.20	4517410
Orthophosphate (P)	mg/L	0.012	0.013	0.010	4518331

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		CKZ308	CKZ309	CKZ310	CKZ310		
Sampling Date		2016/05/25 15:20	2016/05/25 14:30	2016/05/25 13:30	2016/05/25 13:30		
COC Number		559084-02-01	559084-02-01	559084-02-01	559084-02-01		
	UNITS	**SW1**	**SW2**	**SW3**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Metals							
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	<5	<5	<5	5	4521690

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

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Client Project #: THB-00006189-ME
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Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ294
Sample ID: MW1
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516339	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4518135	N/A	2016/05/31	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ294 Dup
Sample ID: MW1
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ295
Sample ID: MW2
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516339	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ295
Sample ID: MW2
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4518135	N/A	2016/05/31	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ295 Dup
Sample ID: MW2
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine

Maxxam ID: CKZ296
Sample ID: MW3A
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516339	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ296 Dup
Sample ID: MW3A
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney

Maxxam ID: CKZ297
Sample ID: MW3B
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516339	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517764	N/A	2016/05/30	Gurpreet Kaur
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ298
Sample ID: MW4
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516339	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware

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Report Date: 2016/06/03

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Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ298
Sample ID: MW4
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4518135	N/A	2016/05/31	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ298 Dup
Sample ID: MW4
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
pH	AT	4521177	N/A	2016/06/02	Surinder Rai

Maxxam ID: CKZ299
Sample ID: MW5
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4518869	N/A	2016/06/01	Cristina Petran
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/02	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/02	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517764	N/A	2016/05/30	Gurpreet Kaur
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney

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Report Date: 2016/06/03

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Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ299 **Collected:** 2016/05/26
Sample ID: MW5 **Shipped:**
Matrix: Water **Received:** 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ299 Dup **Collected:** 2016/05/26
Sample ID: MW5 **Shipped:**
Matrix: Water **Received:** 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
pH	AT	4520880	N/A	2016/06/02	Surinder Rai

Maxxam ID: CKZ300 **Collected:** 2016/05/26
Sample ID: MW6 **Shipped:**
Matrix: Water **Received:** 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517764	N/A	2016/05/30	Gurpreet Kaur
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ300 Dup **Collected:** 2016/05/26
Sample ID: MW6 **Shipped:**
Matrix: Water **Received:** 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ301
Sample ID: MW7
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4518869	N/A	2016/06/01	Cristina Petran
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517764	N/A	2016/05/30	Gurpreet Kaur
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ301 Dup
Sample ID: MW7
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex

Maxxam ID: CKZ302
Sample ID: MW8
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ302
Sample ID: MW8
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ302 Dup
Sample ID: MW8
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware

Maxxam ID: CKZ303
Sample ID: MW9
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518801	N/A	2016/06/01	Elsamma Alex
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4520372	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4517603	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517764	N/A	2016/05/30	Gurpreet Kaur
Total Kjeldahl Nitrogen in Water	SKAL	4518797	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ303 Dup
Sample ID: MW9
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos

Maxxam ID: CKZ304
Sample ID: MW10A
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520558	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4518327	N/A	2016/05/31	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4518017	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520560	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520394	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4518869	N/A	2016/06/01	Cristina Petran
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/02	Automated Statchk
Total Ammonia-N	LACH/NH4	4518023	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521785	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520564	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4518331	N/A	2016/06/01	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4518334	N/A	2016/05/31	Alina Dobreanu
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ304 Dup
Sample ID: MW10A
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	4520394	2016/06/02	2016/06/02	Magdalena Carlos

Maxxam ID: CKZ305
Sample ID: MW10B
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520558	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4518327	N/A	2016/05/31	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4518017	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520560	N/A	2016/06/02	Surinder Rai

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Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ305
Sample ID: MW10B
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4518869	N/A	2016/06/01	Cristina Petran
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/02	Automated Statchk
Total Ammonia-N	LACH/NH4	4518023	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520564	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4518331	N/A	2016/06/01	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4518334	N/A	2016/05/31	Alina Dobreanu
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ306
Sample ID: MW11
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518017	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4518869	N/A	2016/06/01	Cristina Petran
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/02	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/02	Automated Statchk
Total Ammonia-N	LACH/NH4	4520909	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4521011	N/A	2016/06/01	Faye Sabet
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518519	2016/05/31	2016/06/02	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ307
Sample ID: MW12
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4521167	N/A	2016/06/02	Surinder Rai
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518064	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4521189	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/03	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4519676	N/A	2016/06/02	Prempal Bhatti
Ion Balance (% Difference)	CALC	4516457	N/A	2016/06/03	Automated Statchk
Anion and Cation Sum	CALC	4516458	N/A	2016/06/03	Automated Statchk
Total Ammonia-N	LACH/NH4	4518023	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
Organic Nitrogen	CALC	4516459	N/A	2016/06/02	Automated Statchk
pH	AT	4521177	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding
Total Phosphorus (Colourimetric)	LACH/P	4518940	2016/05/31	2016/05/31	Sarabjit Raina

Maxxam ID: CKZ307 Dup
Sample ID: MW12
Matrix: Water

Collected: 2016/05/26
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding

Maxxam ID: CKZ308
Sample ID: SW1
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4521690	N/A	2016/06/02	Cristina Petran
Alkalinity	AT	4520874	N/A	2016/06/02	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4516607	N/A	2016/06/03	Frank Zhang
Chloride by Automated Colourimetry	KONE	4520859	N/A	2016/06/02	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4518064	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520879	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520360	2016/06/01	2016/06/02	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4520510	N/A	2016/06/01	Cristina Petran
Total Ammonia-N	LACH/NH4	4518023	N/A	2016/06/02	Charles Opoku-Ware

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Maxxam Job #: B6A8179
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Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ308
Sample ID: SW1
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521327	N/A	2016/06/02	Chandra Nandlal
pH	AT	4520880	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4520860	N/A	2016/06/02	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4520862	N/A	2016/06/02	Deonarine Ramnarine
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding
Total Phosphorus (Colourimetric)	LACH/P	4518669	2016/05/31	2016/06/01	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4519727	N/A	2016/05/31	Arpan Shah

Maxxam ID: CKZ308 Dup
Sample ID: SW1
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	4516607	N/A	2016/06/03	Frank Zhang

Maxxam ID: CKZ309
Sample ID: SW2
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4521690	N/A	2016/06/02	Cristina Petran
Alkalinity	AT	4520558	N/A	2016/06/02	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4516607	N/A	2016/06/03	Frank Zhang
Chloride by Automated Colourimetry	KONE	4518327	N/A	2016/05/31	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4518064	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520560	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520356	2016/06/01	2016/06/02	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4520510	N/A	2016/06/01	Cristina Petran
Total Ammonia-N	LACH/NH4	4518023	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521785	N/A	2016/06/02	Chandra Nandlal
pH	AT	4520564	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4518331	N/A	2016/06/01	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4518334	N/A	2016/05/31	Alina Dobreanu
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518031	2016/05/30	2016/06/01	Louise Harding
Total Phosphorus (Colourimetric)	LACH/P	4518669	2016/05/31	2016/06/01	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4519727	N/A	2016/05/31	Arpan Shah

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Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: CKZ310
Sample ID: SW3
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4521690	N/A	2016/06/02	Cristina Petran
Alkalinity	AT	4520558	N/A	2016/06/02	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4516607	N/A	2016/06/03	Frank Zhang
Chloride by Automated Colourimetry	KONE	4518327	N/A	2016/05/31	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4518017	N/A	2016/05/31	Viorica Rotaru
Conductivity	AT	4520560	N/A	2016/06/02	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4517410	N/A	2016/05/31	Anastasia Hamanov
Hardness (calculated as CaCO3)		4516456	N/A	2016/06/02	Automated Statchk
Mercury in Water by CVAA	CV/AA	4520394	2016/06/01	2016/06/02	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4520510	N/A	2016/06/01	Cristina Petran
Total Ammonia-N	LACH/NH4	4520909	N/A	2016/06/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4521324	N/A	2016/06/02	Chandra Nandlal
pH	AT	4520564	N/A	2016/06/02	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4520968	N/A	2016/06/02	Bramdeo Motiram
Orthophosphate	KONE	4518331	N/A	2016/06/01	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4518334	N/A	2016/05/31	Alina Dobreanu
Total Dissolved Solids	BAL	4517680	N/A	2016/05/31	Fang Wang
Total Kjeldahl Nitrogen in Water	SKAL	4518519	2016/05/31	2016/06/01	Amarinder Sawhney
Total Phosphorus (Colourimetric)	LACH/P	4518669	2016/05/31	2016/06/01	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4519727	N/A	2016/05/31	Arpan Shah

Maxxam ID: CKZ310 Dup
Sample ID: SW3
Matrix: Water

Collected: 2016/05/25
Shipped:
Received: 2016/05/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4521690	N/A	2016/06/02	Cristina Petran

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Maxxam Job #: B6A8179
Report Date: 2016/06/03

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.0°C
Package 2	2.0°C
Package 3	1.7°C
Package 4	2.7°C
Package 5	2.0°C
Package 6	1.0°C
Package 7	2.0°C

Results relate only to the items tested.

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Maxxam Job #: B6A8179
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QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4516607	Total BOD	2016/06/03					<2.0	mg/L	NC	25	97	80 - 120
4517410	Dissolved Organic Carbon	2016/05/31	96	80 - 120	98	80 - 120	0.21, RDL=0.20	mg/L	1.8	20		
4517603	Phenols-4AAP	2016/06/01	95	80 - 120	95	85 - 115	<0.0010	mg/L	NC	20		
4517680	Total Dissolved Solids	2016/05/31					<10	mg/L	1.5	25	101	90 - 110
4517764	Total Dissolved Solids	2016/05/30					<10	mg/L	0.20	25	95	90 - 110
4518017	Total Chemical Oxygen Demand (COD)	2016/05/31	103	75 - 125	102	75 - 125	<4.0	mg/L	NC	25		
4518023	Total Ammonia-N	2016/06/02	100	80 - 120	101	85 - 115	<0.050	mg/L	NC	20		
4518031	Total Kjeldahl Nitrogen (TKN)	2016/06/01	NC	80 - 120	97	80 - 120	<0.10	mg/L	0.13 (1)	20	92	80 - 120
4518064	Total Chemical Oxygen Demand (COD)	2016/05/31	103	75 - 125	102	75 - 125	<4.0	mg/L	NC	25		
4518135	Phenols-4AAP	2016/05/31	95	80 - 120	95	85 - 115	<0.0010	mg/L	NC	20		
4518327	Dissolved Chloride (Cl)	2016/05/31	NC	80 - 120	105	80 - 120	<1.0	mg/L	0.64	20		
4518331	Orthophosphate (P)	2016/06/01	108	75 - 125	99	80 - 120	<0.010	mg/L	NC	25		
4518334	Dissolved Sulphate (SO4)	2016/05/31	NC	75 - 125	101	80 - 120	<1.0	mg/L	0.52	20		
4518519	Total Kjeldahl Nitrogen (TKN)	2016/06/01	100	80 - 120	101	80 - 120	<0.10	mg/L	NC	20	100	80 - 120
4518669	Total Phosphorus	2016/06/01	91	80 - 120	95	80 - 120	<0.004	mg/L	NC	20	96	80 - 120
4518797	Total Kjeldahl Nitrogen (TKN)	2016/06/01	NC	80 - 120	105	80 - 120	<0.10	mg/L	2.5	20	103	80 - 120
4518801	Total Chemical Oxygen Demand (COD)	2016/06/01	110	75 - 125	103	75 - 125	<4.0	mg/L	4.3	25		
4518869	Dissolved Aluminum (Al)	2016/06/01	106	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
4518869	Dissolved Antimony (Sb)	2016/06/01	111	80 - 120	103	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Arsenic (As)	2016/06/01	106	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4518869	Dissolved Barium (Ba)	2016/06/01	109	80 - 120	105	80 - 120	<2.0	ug/L	5.5	20		
4518869	Dissolved Beryllium (Be)	2016/06/01	111	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Bismuth (Bi)	2016/06/01	102	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
4518869	Dissolved Boron (B)	2016/06/01	111	80 - 120	105	80 - 120	<10	ug/L	NC	20		
4518869	Dissolved Cadmium (Cd)	2016/06/01	110	80 - 120	103	80 - 120	<0.10	ug/L	NC	20		
4518869	Dissolved Calcium (Ca)	2016/06/01	NC	80 - 120	98	80 - 120	<200	ug/L	0.14	20		
4518869	Dissolved Chromium (Cr)	2016/06/01	104	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
4518869	Dissolved Cobalt (Co)	2016/06/01	104	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Copper (Cu)	2016/06/01	107	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
4518869	Dissolved Iron (Fe)	2016/06/01	106	80 - 120	99	80 - 120	<100	ug/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4518869	Dissolved Lead (Pb)	2016/06/01	102	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Magnesium (Mg)	2016/06/01	NC	80 - 120	99	80 - 120	<50	ug/L	0.41	20		
4518869	Dissolved Manganese (Mn)	2016/06/01	107	80 - 120	99	80 - 120	<2.0	ug/L	NC	20		
4518869	Dissolved Molybdenum (Mo)	2016/06/01	110	80 - 120	103	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Nickel (Ni)	2016/06/01	103	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
4518869	Dissolved Phosphorus (P)	2016/06/01	116	80 - 120	109	80 - 120	<100	ug/L	NC	20		
4518869	Dissolved Potassium (K)	2016/06/01	108	80 - 120	103	80 - 120	<200	ug/L	NC	20		
4518869	Dissolved Selenium (Se)	2016/06/01	103	80 - 120	95	80 - 120	<2.0	ug/L	NC	20		
4518869	Dissolved Silicon (Si)	2016/06/01	103	80 - 120	98	80 - 120	<50	ug/L	0.43	20		
4518869	Dissolved Silver (Ag)	2016/06/01	104	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
4518869	Dissolved Sodium (Na)	2016/06/01	105	80 - 120	99	80 - 120	<100	ug/L	0.48	20		
4518869	Dissolved Strontium (Sr)	2016/06/01	107	80 - 120	100	80 - 120	<1.0	ug/L	0.61	20		
4518869	Dissolved Thallium (Tl)	2016/06/01	103	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
4518869	Dissolved Tin (Sn)	2016/06/01	112	80 - 120	104	80 - 120	<1.0	ug/L	NC	20		
4518869	Dissolved Titanium (Ti)	2016/06/01	106	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
4518869	Dissolved Vanadium (V)	2016/06/01	107	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
4518869	Dissolved Zinc (Zn)	2016/06/01	104	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
4518940	Total Phosphorus	2016/05/31	100	N/A	99	N/A	<0.020	mg/L	NC	20	102	80 - 120
4519676	Dissolved Aluminum (Al)	2016/06/02	109	80 - 120	104	80 - 120	<5.0	ug/L	NC	20		
4519676	Dissolved Antimony (Sb)	2016/06/02	110	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Arsenic (As)	2016/06/02	106	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4519676	Dissolved Barium (Ba)	2016/06/02	104	80 - 120	99	80 - 120	<2.0	ug/L	1.5	20		
4519676	Dissolved Beryllium (Be)	2016/06/02	108	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Bismuth (Bi)	2016/06/02	104	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
4519676	Dissolved Boron (B)	2016/06/02	109	80 - 120	104	80 - 120	<10	ug/L	NC	20		
4519676	Dissolved Cadmium (Cd)	2016/06/02	109	80 - 120	103	80 - 120	<0.10	ug/L	NC	20		
4519676	Dissolved Calcium (Ca)	2016/06/02	NC	80 - 120	103	80 - 120	<200	ug/L	4.0	20		
4519676	Dissolved Chromium (Cr)	2016/06/02	107	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
4519676	Dissolved Cobalt (Co)	2016/06/02	106	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Copper (Cu)	2016/06/02	105	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
4519676	Dissolved Iron (Fe)	2016/06/02	110	80 - 120	105	80 - 120	<100	ug/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4519676	Dissolved Lead (Pb)	2016/06/02	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Magnesium (Mg)	2016/06/02	NC	80 - 120	101	80 - 120	<50	ug/L	2.6	20		
4519676	Dissolved Manganese (Mn)	2016/06/02	108	80 - 120	103	80 - 120	<2.0	ug/L	NC	20		
4519676	Dissolved Molybdenum (Mo)	2016/06/02	112	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Nickel (Ni)	2016/06/02	105	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
4519676	Dissolved Phosphorus (P)	2016/06/02	110	80 - 120	104	80 - 120	<100	ug/L	NC	20		
4519676	Dissolved Potassium (K)	2016/06/02	108	80 - 120	103	80 - 120	<200	ug/L	3.2	20		
4519676	Dissolved Selenium (Se)	2016/06/02	108	80 - 120	101	80 - 120	<2.0	ug/L	NC	20		
4519676	Dissolved Silicon (Si)	2016/06/02	104	80 - 120	101	80 - 120	<50	ug/L	0.89	20		
4519676	Dissolved Silver (Ag)	2016/06/02	107	80 - 120	101	80 - 120	<0.10	ug/L	NC	20		
4519676	Dissolved Sodium (Na)	2016/06/02	106	80 - 120	102	80 - 120	<100	ug/L	2.4	20		
4519676	Dissolved Strontium (Sr)	2016/06/02	107	80 - 120	105	80 - 120	<1.0	ug/L	4.0	20		
4519676	Dissolved Thallium (Tl)	2016/06/02	105	80 - 120	100	80 - 120	<0.050	ug/L	NC	20		
4519676	Dissolved Tin (Sn)	2016/06/02	108	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
4519676	Dissolved Titanium (Ti)	2016/06/02	107	80 - 120	101	80 - 120	<5.0	ug/L	NC	20		
4519676	Dissolved Vanadium (V)	2016/06/02	110	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
4519676	Dissolved Zinc (Zn)	2016/06/02	107	80 - 120	102	80 - 120	<5.0	ug/L	NC	20		
4519727	Total Suspended Solids	2016/05/31					<1	mg/L	NC	25	98	85 - 115
4520356	Mercury (Hg)	2016/06/02	112	75 - 125	100	80 - 120	<0.0001	mg/L	NC	20		
4520360	Mercury (Hg)	2016/06/02	115	75 - 125	101	80 - 120	<0.0001	mg/L	NC	20		
4520372	Total Ammonia-N	2016/06/02	95	80 - 120	103	85 - 115	<0.050	mg/L	NC	20		
4520394	Mercury (Hg)	2016/06/02	114	75 - 125	100	80 - 120	<0.0001	mg/L	NC	20		
4520510	Total Antimony (Sb)	2016/06/01	108	80 - 120	101	80 - 120	<0.50	ug/L				
4520510	Total Arsenic (As)	2016/06/01	102	80 - 120	98	80 - 120	<1.0	ug/L				
4520510	Total Barium (Ba)	2016/06/01	NC	80 - 120	98	80 - 120	<2.0	ug/L				
4520510	Total Beryllium (Be)	2016/06/01	114	80 - 120	104	80 - 120	<0.50	ug/L				
4520510	Total Bismuth (Bi)	2016/06/01	87	80 - 120	92	80 - 120	<1.0	ug/L				
4520510	Total Boron (B)	2016/06/01	109	80 - 120	101	80 - 120	<10	ug/L				
4520510	Total Cadmium (Cd)	2016/06/01	101	80 - 120	99	80 - 120	<0.10	ug/L				
4520510	Total Calcium (Ca)	2016/06/01	NC	80 - 120	93	80 - 120	<200	ug/L				
4520510	Total Chromium (Cr)	2016/06/01	103	80 - 120	97	80 - 120	<5.0	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4520510	Total Cobalt (Co)	2016/06/01	97	80 - 120	95	80 - 120	<0.50	ug/L				
4520510	Total Copper (Cu)	2016/06/01	104	80 - 120	98	80 - 120	<1.0	ug/L				
4520510	Total Iron (Fe)	2016/06/01	101	80 - 120	96	80 - 120	<100	ug/L				
4520510	Total Lead (Pb)	2016/06/01	90	80 - 120	94	80 - 120	<0.50	ug/L				
4520510	Total Magnesium (Mg)	2016/06/01	NC	80 - 120	96	80 - 120	<50	ug/L				
4520510	Total Manganese (Mn)	2016/06/01	NC	80 - 120	96	80 - 120	<2.0	ug/L	2.0	20		
4520510	Total Molybdenum (Mo)	2016/06/01	112	80 - 120	98	80 - 120	<0.50	ug/L				
4520510	Total Nickel (Ni)	2016/06/01	94	80 - 120	96	80 - 120	<1.0	ug/L				
4520510	Total Phosphorus (P)	2016/06/01	119	80 - 120	101	80 - 120	<100	ug/L				
4520510	Total Potassium (K)	2016/06/01	110	80 - 120	96	80 - 120	<200	ug/L				
4520510	Total Selenium (Se)	2016/06/01	94	80 - 120	96	80 - 120	<2.0	ug/L				
4520510	Total Silicon (Si)	2016/06/01	109	80 - 120	93	80 - 120	<50	ug/L				
4520510	Total Silver (Ag)	2016/06/01	94	80 - 120	96	80 - 120	<0.10	ug/L				
4520510	Total Sodium (Na)	2016/06/01			95	80 - 120	<100	ug/L				
4520510	Total Strontium (Sr)	2016/06/01	NC	80 - 120	96	80 - 120	<1.0	ug/L				
4520510	Total Thallium (Tl)	2016/06/01	89	80 - 120	94	80 - 120	<0.050	ug/L				
4520510	Total Tin (Sn)	2016/06/01	109	80 - 120	99	80 - 120	<1.0	ug/L				
4520510	Total Titanium (Ti)	2016/06/01	107	80 - 120	92	80 - 120	<5.0	ug/L				
4520510	Total Vanadium (V)	2016/06/01	108	80 - 120	97	80 - 120	<0.50	ug/L				
4520510	Total Zinc (Zn)	2016/06/01	92	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		
4520558	Alkalinity (Total as CaCO3)	2016/06/02			96	85 - 115	<1.0	mg/L	0.014	25		
4520560	Conductivity	2016/06/01			102	85 - 115	<1.0	umho/cm	0.22	25		
4520564	pH	2016/06/01			101	98 - 103			0.73	N/A		
4520859	Dissolved Chloride (Cl)	2016/06/02	104	80 - 120	103	80 - 120	<1.0	mg/L	0.42	20		
4520860	Orthophosphate (P)	2016/06/02	108	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
4520862	Dissolved Sulphate (SO4)	2016/06/02	104	75 - 125	99	80 - 120	<1.0	mg/L	NC	20		
4520874	Alkalinity (Total as CaCO3)	2016/06/02			97	85 - 115	<1.0	mg/L	0.91	25		
4520879	Conductivity	2016/06/02			100	85 - 115	<1.0	umho/cm	0.26	25		
4520880	pH	2016/06/02			101	98 - 103			0.26	N/A		

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
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Site Location: GERALTON LANDFILL SPRING
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4520909	Total Ammonia-N	2016/06/02	101	80 - 120	101	85 - 115	<0.050	mg/L	NC	20		
4520968	Phenols-4AAP	2016/06/02	105	80 - 120	103	85 - 115	<0.0010	mg/L	NC	20		
4521011	Phenols-4AAP	2016/06/01	94	80 - 120	96	85 - 115	<0.0010	mg/L	NC	20		
4521167	Alkalinity (Total as CaCO3)	2016/06/02			96	85 - 115	<1.0	mg/L	0.21	25		
4521177	pH	2016/06/02			101	98 - 103			0.057	N/A		
4521189	Conductivity	2016/06/02			102	85 - 115	<1.0	umho/cm	0.31	25		
4521324	Nitrate (N)	2016/06/02	92	80 - 120	101	80 - 120	<0.10	mg/L	NC	25		
4521324	Nitrite (N)	2016/06/02	NC	80 - 120	114	80 - 120	<0.010	mg/L	NC	25		
4521327	Nitrate (N)	2016/06/02	92	80 - 120	99	80 - 120	<0.10	mg/L	NC	25		
4521327	Nitrite (N)	2016/06/02	112	80 - 120	112	80 - 120	<0.010	mg/L	NC	25		
4521690	Dissolved (0.2u) Aluminum (Al)	2016/06/02	103	80 - 120	99	80 - 120	<5	ug/L	NC	20		
4521785	Nitrate (N)	2016/06/02	NC	80 - 120	98	80 - 120	<0.10	mg/L	1.1	25		
4521785	Nitrite (N)	2016/06/02	NC	80 - 120	110	80 - 120	<0.010	mg/L	1.2	25		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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exp Services Inc
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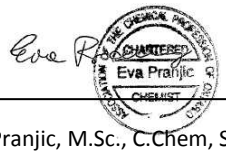
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

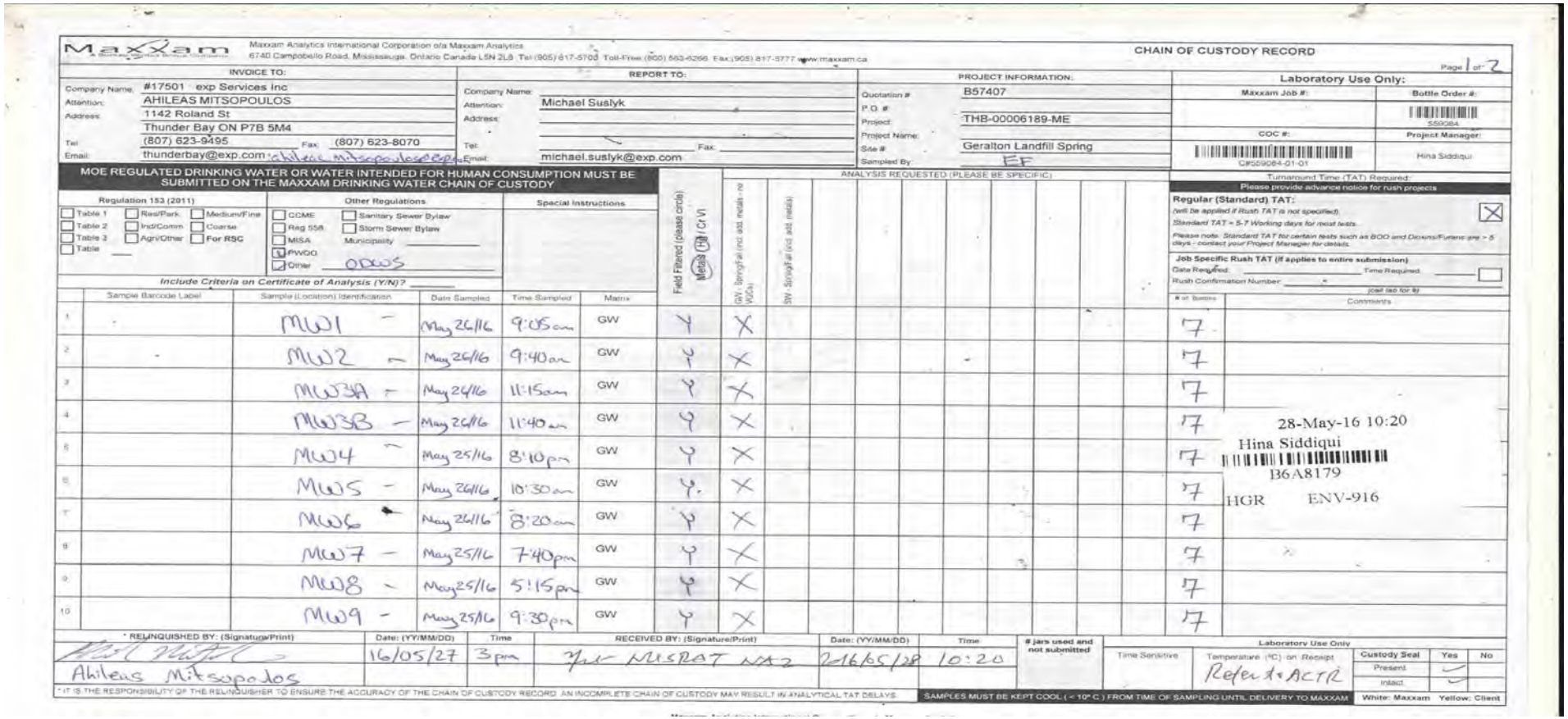


Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam



Maxxam Analytics International Corporation o/a Maxxam Analytics
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CHAIN OF CUSTODY RECORD

Page 1 of 2

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B57407	Maxxam Job #:	Bottle Order #: 559084
Attention:	AHILEAS MITSOPOULOS	Attention:	Michael Suslyk	P.O. #:			
Address:	1142 Roland St	Address:		Project:	THB-00006189-ME	COC #: C#559084-01-01	Project Manager: Hina Siddiqui
	Thunder Bay ON P7B 5M4			Project Name:			
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	Fax:	Site #:	Geralton Landfill Spring		
Email:	thunderbay@exp.com ahileas.mitsopoulos@exp.com	Email:	michael.suslyk@exp.com	Sampled By:	EF		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☒ PWQO ☒ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

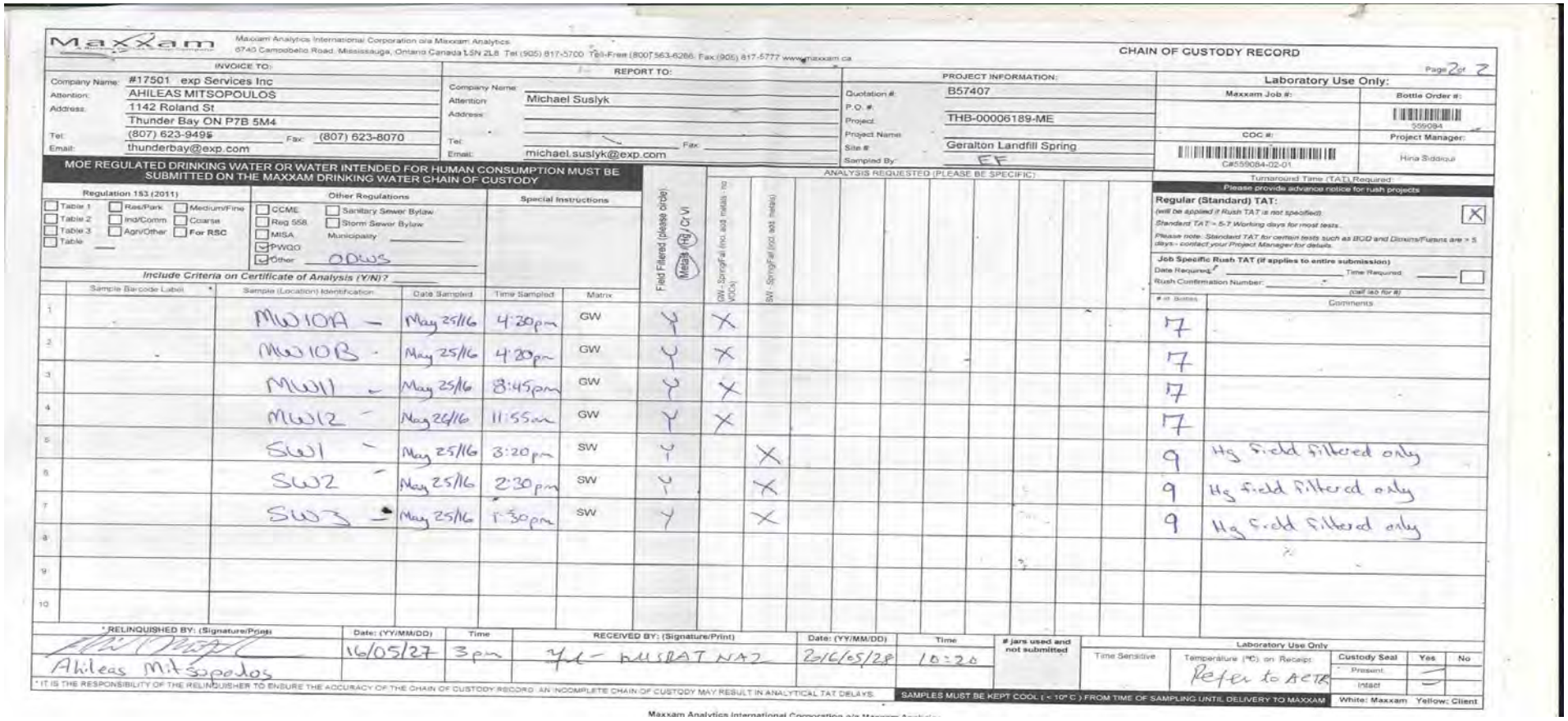
	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals (Hg / Cr VI)	GW - Spring/Fall (incl. add. metals - no VOCs)	SW - Spring/Fall (incl. add. metals)	# of Bottles	Comments
1		MW1	May 26/16	9:05am	GW	Y	X		7	
2		MW2	May 26/16	9:40am	GW	Y	X		7	
3		MW3A	May 26/16	11:15am	GW	Y	X		7	
4		MW3B	May 26/16	11:40am	GW	Y	X		7	28-May-16 10:20
5		MW4	May 25/16	8:10pm	GW	Y	X		7	Hina Siddiqui
6		MW5	May 26/16	10:30am	GW	Y	X		7	B6A8179
7		MW6	May 26/16	8:20am	GW	Y	X		7	HGR ENV-916
8		MW7	May 25/16	7:40pm	GW	Y	X		7	
9		MW8	May 25/16	5:15pm	GW	Y	X		7	
10		MW9	May 25/16	9:30pm	GW	Y	X		7	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
[signature] Ahileas Mitsopoulos	16/05/27	3pm	[signature] MUSRAT NAZ	2016/05/28	10:20			Refer to ACTR	Present	✓	
									Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client



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CHAIN OF CUSTODY RECORD

Page 2 of 2

INVOICE TO:
Company Name: #17501 exp Services Inc
Attention: AHILEAS MITSOPOULOS
Address: 1142 Roland St, Thunder Bay ON P7B 5M4
Tel: (807) 623-9495 Fax: (807) 623-8070
Email: thunderbay@exp.com

REPORT TO:
Company Name:
Attention: Michael Suslyk
Address:
Tel: Fax:
Email: michael.suslyk@exp.com

PROJECT INFORMATION:
Quotation #: B57407
P.O. #:
Project: THB-00006189-ME
Project Name:
Site #: Geralton Landfill Spring
Sampled By: EF

Laboratory Use Only:
Maxxam Job #: C#559084-02-01
Bottle Order #: 559084
COC #:
Project Manager: Hina Siddiqui

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___
Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality: ☑ PWQO ☑ Other ODWS
Special Instructions:
Include Criteria on Certificate of Analysis (Y/N)?

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):
Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: (will be applied if Rush TAT is not specified) X
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle)	Metals (Hg / Cr VI)	GW - Spring/Fall (incl. acid extr. metals, no VOCs)	SW - Spring/Fall (incl. acid extr. metals)	# of Bottles	Comments
1		MW10A	May 25/16	4:30pm	GW	Y		X		7	
2		MW10B	May 25/16	4:30pm	GW	Y		X		7	
3		MW11	May 25/16	8:45pm	GW	Y		X		7	
4		MW12	May 26/16	11:55am	GW	Y		X		7	
5		SW1	May 25/16	3:20pm	SW	Y			X	9	Hg field filtered only
6		SW2	May 25/16	2:30pm	SW	Y			X	9	Hg field filtered only
7		SW3	May 25/16	1:30pm	SW	Y			X	9	Hg field filtered only
8											
9											
10											

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Laboratory Use Only: Temperature (°C) on Receipt	Custody Seal	Yes	No
Ahileas Mitsopoulos	16/05/27	3pm	[illegible]	2016/05/28	10:20			Refer to ACTR	Present		
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL

Attention:Ahileas Mitsopoulos/Michael S

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Your C.O.C. #: 578314-01-01, 578314-02-01, 578292-01-01

Report Date: 2016/10/19
Report #: R4216200
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6L8150
Received: 2016/10/11, 10:09

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free) (1)	3	N/A	2016/10/19	CAM SOP-00447	EPA 6020B m
Alkalinity (1)	16	N/A	2016/10/13	CAM SOP-00448	SM 22 2320 B m
Alkalinity (1)	1	N/A	2016/10/17	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD) (1)	3	2016/10/12	2016/10/17	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry (1)	17	N/A	2016/10/13	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand (1)	17	N/A	2016/10/14	CAM SOP-00416	SM 22 5220 D m
Conductivity (1)	16	N/A	2016/10/13	CAM SOP-00414	SM 22 2510 m
Conductivity (1)	1	N/A	2016/10/17	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1, 2)	5	N/A	2016/10/12	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1, 2)	11	N/A	2016/10/13	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1, 2)	1	N/A	2016/10/14	CAM SOP-00446	SM 22 5310 B m
Hardness (calculated as CaCO3) (1)	3	N/A	2016/10/14	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3) (1)	14	N/A	2016/10/17	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA (1)	17	2016/10/13	2016/10/14	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS (1)	14	N/A	2016/10/14	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS (1)	3	N/A	2016/10/14	CAM SOP-00447	EPA 6020B m
Total Ammonia-N (1)	8	N/A	2016/10/14	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N (1)	9	N/A	2016/10/17	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1, 3)	16	N/A	2016/10/14	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1, 3)	1	N/A	2016/10/17	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Organic Nitrogen (1)	17	N/A	2016/10/17		
pH (1)	16	N/A	2016/10/13	CAM SOP-00413	SM 4500H+ B m
pH (1)	1	N/A	2016/10/17	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP) (1)	17	N/A	2016/10/14	CAM SOP-00444	OMOE E3179 m
Orthophosphate (1)	14	N/A	2016/10/13	CAM SOP-00461	EPA 365.1 m

Your Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL

Attention:Ahileas Mitsopoulos/Michael S

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Your C.O.C. #: 578314-01-01, 578314-02-01, 578292-01-01

Report Date: 2016/10/19
Report #: R4216200
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6L8150
Received: 2016/10/11, 10:09

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sulphate by Automated Colourimetry (1)	17	N/A	2016/10/13	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc) (1)	4	N/A	2016/10/17		
Total Dissolved Solids (1)	12	2016/10/13	2016/10/13	CAM SOP-00428	SM 22 2540C m
Total Dissolved Solids (1)	1	2016/10/14	2016/10/14	CAM SOP-00428	SM 22 2540C m
Total Kjeldahl Nitrogen in Water (1)	17	2016/10/13	2016/10/13	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric) (1)	3	2016/10/13	2016/10/13	CAM SOP-00407	SM 22 4500 P B H m
Total Phosphorus (Colourimetric) (1)	14	2016/10/13	2016/10/13	CAM SOP-00407	SM 22 4500 P B H m
Low Level Total Suspended Solids (1)	3	2016/10/12	2016/10/13	CAM SOP-00428	SM 22 2540D m
Volatile Organic Compounds in Water (1)	1	N/A	2016/10/14	CAM SOP-00226	EPA 8260C m

Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga
(2) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Your Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL

Attention:Ahileas Mitsopoulos/Michael S

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Your C.O.C. #: 578314-01-01, 578314-02-01, 578292-01-01

Report Date: 2016/10/19
Report #: R4216200
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6L8150
Received: 2016/10/11, 10:09

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Sara Singh, B.Sc, Senior Project Manager
Email: sarasingh@maxxam.ca
Phone# (905)817-5730
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ380	DFJ380		DFJ381	DFJ381		
Sampling Date		2016/10/05 08:25	2016/10/05 08:25		2016/10/05 08:50	2016/10/05 08:50		
COC Number		578314-01-01	578314-01-01		578314-01-01	578314-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**QC Batch**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	1.8		4699519	0.28		0.050	4699983
Total Chemical Oxygen Demand (COD)	mg/L	41		4699479	25		4.0	4699479
Conductivity	umho/cm	1200		4699526	480		1.0	4704184
Total Dissolved Solids	mg/L	726		4699530	276		10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	2.1		4699524	0.48		0.10	4699524
Dissolved Organic Carbon	mg/L	10		4698131	8.7		0.20	4698131
pH	pH	7.46		4699527	7.76			4704183
Phenols-4AAP	mg/L	0.0024		4696439	<0.0010		0.0010	4698007
Total Phosphorus	mg/L	0.031		4699575	<0.020		0.020	4699575
Dissolved Sulphate (SO4)	mg/L	13		4697865	<1.0		1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	630		4699520	240		1.0	4704176
Dissolved Chloride (Cl)	mg/L	39		4697863	5.6		1.0	4697863
Nitrite (N)	mg/L	<0.010		4698307	<0.010	<0.010	0.010	4699973
Nitrate (N)	mg/L	0.21		4698307	<0.10	<0.10	0.10	4699973
Metals								
Mercury (Hg)	mg/L	<0.0001		4699472	<0.0001		0.0001	4699583
Dissolved Aluminum (Al)	ug/L	9.0	8.8	4699971	17		5.0	4699971
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	4699971	<0.50		0.50	4699971
Dissolved Arsenic (As)	ug/L	25	25	4699971	3.9		1.0	4699971
Dissolved Barium (Ba)	ug/L	110	100	4699971	16		2.0	4699971
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	4699971	<0.50		0.50	4699971
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0	4699971	<1.0		1.0	4699971
Dissolved Boron (B)	ug/L	230	240	4699971	59		10	4699971
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	4699971	<0.10		0.10	4699971
Dissolved Calcium (Ca)	ug/L	190000	190000	4699971	76000		200	4699971
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	4699971	<5.0		5.0	4699971
Dissolved Cobalt (Co)	ug/L	16	16	4699971	3.0		0.50	4699971
Dissolved Copper (Cu)	ug/L	1.1	1.1	4699971	5.1		1.0	4699971
Dissolved Iron (Fe)	ug/L	20000	20000	4699971	200		100	4699971
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	4699971	<0.50		0.50	4699971
Dissolved Magnesium (Mg)	ug/L	26000	26000	4699971	9600		50	4699971
Dissolved Manganese (Mn)	ug/L	2600	2600	4699971	1700		2.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ380	DFJ380		DFJ381	DFJ381		
Sampling Date		2016/10/05 08:25	2016/10/05 08:25		2016/10/05 08:50	2016/10/05 08:50		
COC Number		578314-01-01	578314-01-01		578314-01-01	578314-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**QC Batch**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.3	1.3	4699971	0.53		0.50	4699971
Dissolved Nickel (Ni)	ug/L	7.3	7.5	4699971	3.6		1.0	4699971
Dissolved Phosphorus (P)	ug/L	<100	<100	4699971	<100		100	4699971
Dissolved Potassium (K)	ug/L	8800	8700	4699971	1500		200	4699971
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	4699971	<2.0		2.0	4699971
Dissolved Silicon (Si)	ug/L	10000	9900	4699971	4600		50	4699971
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	4699971	<0.10		0.10	4699971
Dissolved Sodium (Na)	ug/L	32000	31000	4699971	5100		100	4699971
Dissolved Strontium (Sr)	ug/L	270	270	4699971	62		1.0	4699971
Dissolved Thallium (Tl)	ug/L	0.24	0.25	4699971	0.074		0.050	4699971
Dissolved Tin (Sn)	ug/L	<1.0	<1.0	4699971	<1.0		1.0	4699971
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0	4699971	<5.0		5.0	4699971
Dissolved Vanadium (V)	ug/L	1.8	1.7	4699971	2.1		0.50	4699971
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	4699971	<5.0		5.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ382	DFJ382			DFJ383	DFJ383		
Sampling Date		2016/10/05 11:20	2016/10/05 11:20			2016/10/05 11:40	2016/10/05 11:40		
COC Number		578314-01-01	578314-01-01			578314-01-01	578314-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**MW3B Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	10 (1)		0.25	4699519	3.9		0.050	4699983
Total Chemical Oxygen Demand (COD)	mg/L	31		4.0	4699479	27	27	4.0	4699479
Conductivity	umho/cm	1200		1.0	4699526	1100		1.0	4699526
Total Dissolved Solids	mg/L	614		10	4699530	640		10	4702097
Total Kjeldahl Nitrogen (TKN)	mg/L	9.9 (1)	9.8 (1)	0.50	4699524	4.2		0.10	4699524
Dissolved Organic Carbon	mg/L	8.2		0.20	4702199	6.3		0.20	4698131
pH	pH	7.49			4699527	7.57			4699527
Phenols-4AAP	mg/L	<0.0010		0.0010	4698007	<0.0010		0.0010	4698007
Total Phosphorus	mg/L	0.039		0.020	4699575	0.055		0.020	4699575
Dissolved Sulphate (SO4)	mg/L	27		1.0	4697865	40		1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	510		1.0	4699520	490		1.0	4699520
Dissolved Chloride (Cl)	mg/L	64		1.0	4697863	39		1.0	4697863
Nitrite (N)	mg/L	<0.010		0.010	4698307	0.028		0.010	4698307
Nitrate (N)	mg/L	<0.10		0.10	4698307	0.38		0.10	4698307
Metals									
Mercury (Hg)	mg/L	<0.0001		0.0001	4699472	<0.0001		0.0001	4699583
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4699962	<5.0		5.0	4699971
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4699962	<0.50		0.50	4699971
Dissolved Arsenic (As)	ug/L	16		1.0	4699962	3.5		1.0	4699971
Dissolved Barium (Ba)	ug/L	140		2.0	4699962	100		2.0	4699971
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4699962	<0.50		0.50	4699971
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4699962	<1.0		1.0	4699971
Dissolved Boron (B)	ug/L	290		10	4699962	350		10	4699971
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4699962	<0.10		0.10	4699971
Dissolved Calcium (Ca)	ug/L	140000		200	4699962	140000		200	4699971
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4699962	<5.0		5.0	4699971
Dissolved Cobalt (Co)	ug/L	5.1		0.50	4699962	6.7		0.50	4699971
Dissolved Copper (Cu)	ug/L	<1.0		1.0	4699962	3.6		1.0	4699971
Dissolved Iron (Fe)	ug/L	14000		100	4699962	2000		100	4699971
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4699962	<0.50		0.50	4699971
Dissolved Magnesium (Mg)	ug/L	25000		50	4699962	28000		50	4699971
Dissolved Manganese (Mn)	ug/L	1200		2.0	4699962	1000		2.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ382	DFJ382			DFJ383	DFJ383		
Sampling Date		2016/10/05 11:20	2016/10/05 11:20			2016/10/05 11:40	2016/10/05 11:40		
COC Number		578314-01-01	578314-01-01			578314-01-01	578314-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**MW3B Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4699962	<0.50		0.50	4699971
Dissolved Nickel (Ni)	ug/L	4.8		1.0	4699962	7.1		1.0	4699971
Dissolved Phosphorus (P)	ug/L	<100		100	4699962	<100		100	4699971
Dissolved Potassium (K)	ug/L	13000		200	4699962	13000		200	4699971
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4699962	<2.0		2.0	4699971
Dissolved Silicon (Si)	ug/L	7200		50	4699962	6600		50	4699971
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4699962	<0.10		0.10	4699971
Dissolved Sodium (Na)	ug/L	45000		100	4699962	33000		100	4699971
Dissolved Strontium (Sr)	ug/L	240		1.0	4699962	270		1.0	4699971
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4699962	<0.050		0.050	4699971
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4699962	<1.0		1.0	4699971
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4699962	<5.0		5.0	4699971
Dissolved Vanadium (V)	ug/L	0.57		0.50	4699962	<0.50		0.50	4699971
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4699962	<5.0		5.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ384	DFJ384			DFJ385		
Sampling Date		2016/10/05 10:10	2016/10/05 10:10			2016/10/05 09:20		
COC Number		578314-01-01	578314-01-01			578314-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	<0.050		0.050	4699983	2.3	0.050	4699766
Total Chemical Oxygen Demand (COD)	mg/L	7.6		4.0	4699479	31	4.0	4699479
Conductivity	umho/cm	1100		1.0	4699526	1300	1.0	4699526
Total Dissolved Solids	mg/L	724	736	10	4699530	754	10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12		0.10	4699524	2.5	0.10	4699524
Dissolved Organic Carbon	mg/L	2.3	2.3	0.20	4698131	6.8	0.20	4699549
pH	pH	7.60			4699527	7.62		4699527
Phenols-4AAP	mg/L	<0.0010	<0.0010	0.0010	4698007	<0.0010	0.0010	4698007
Total Phosphorus	mg/L	0.32		0.040	4699575	0.20	0.10	4699575
Dissolved Sulphate (SO4)	mg/L	110		1.0	4697865	120	1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	500		1.0	4699520	510	1.0	4699520
Dissolved Chloride (Cl)	mg/L	20		1.0	4697863	62	1.0	4697863
Nitrite (N)	mg/L	<0.010		0.010	4699733	<0.010	0.010	4698307
Nitrate (N)	mg/L	0.21		0.10	4699733	<0.10	0.10	4698307
Metals								
Mercury (Hg)	mg/L	<0.0001		0.0001	4699472	<0.0001	0.0001	4699472
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699971
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699971
Dissolved Arsenic (As)	ug/L	<1.0		1.0	4699971	2.8	1.0	4699971
Dissolved Barium (Ba)	ug/L	62		2.0	4699971	140	2.0	4699971
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699971
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4699971	<1.0	1.0	4699971
Dissolved Boron (B)	ug/L	92		10	4699971	960	10	4699971
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4699971	<0.10	0.10	4699971
Dissolved Calcium (Ca)	ug/L	200000		200	4699971	120000	200	4699971
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699971
Dissolved Cobalt (Co)	ug/L	3.4		0.50	4699971	<0.50	0.50	4699971
Dissolved Copper (Cu)	ug/L	1.9		1.0	4699971	<1.0	1.0	4699971
Dissolved Iron (Fe)	ug/L	<100		100	4699971	6700	100	4699971
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699971
Dissolved Magnesium (Mg)	ug/L	20000		50	4699971	58000	50	4699971
Dissolved Manganese (Mn)	ug/L	640		2.0	4699971	900	2.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ384	DFJ384			DFJ385		
Sampling Date		2016/10/05 10:10	2016/10/05 10:10			2016/10/05 09:20		
COC Number		578314-01-01	578314-01-01			578314-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699971
Dissolved Nickel (Ni)	ug/L	6.8		1.0	4699971	4.0	1.0	4699971
Dissolved Phosphorus (P)	ug/L	<100		100	4699971	<100	100	4699971
Dissolved Potassium (K)	ug/L	2300		200	4699971	22000	200	4699971
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4699971	<2.0	2.0	4699971
Dissolved Silicon (Si)	ug/L	5800		50	4699971	5600	50	4699971
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4699971	<0.10	0.10	4699971
Dissolved Sodium (Na)	ug/L	6000		100	4699971	46000	100	4699971
Dissolved Strontium (Sr)	ug/L	180		1.0	4699971	320	1.0	4699971
Dissolved Thallium (Tl)	ug/L	0.17		0.050	4699971	<0.050	0.050	4699971
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4699971	<1.0	1.0	4699971
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699971
Dissolved Vanadium (V)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699971
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ386	DFJ386			DFJ387		
Sampling Date		2016/10/05 08:00	2016/10/05 08:00			2016/10/05 10:30		
COC Number		578314-01-01	578314-01-01			578314-01-01		
	UNITS	**MW6**	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	<0.050		0.050	4699983	7.7 (1)	0.25	4699519
Total Chemical Oxygen Demand (COD)	mg/L	18		4.0	4699479	28	4.0	4699479
Conductivity	umho/cm	510	520	1.0	4699526	1000	1.0	4699526
Total Dissolved Solids	mg/L	396		10	4699530	550	10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12		0.10	4699524	7.4 (1)	0.20	4699524
Dissolved Organic Carbon	mg/L	4.1		0.20	4699549	5.8	0.20	4698131
pH	pH	7.91	7.93		4699527	7.48		4699527
Phenols-4AAP	mg/L	<0.0010		0.0010	4698007	<0.0010	0.0010	4698007
Total Phosphorus	mg/L	0.033		0.020	4699575	0.082	0.020	4699575
Dissolved Sulphate (SO4)	mg/L	19		1.0	4697865	21	1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	260	260	1.0	4699520	460	1.0	4699520
Dissolved Chloride (Cl)	mg/L	1.5		1.0	4697863	43	1.0	4697863
Nitrite (N)	mg/L	<0.010		0.010	4698307	<0.010	0.010	4698307
Nitrate (N)	mg/L	<0.10		0.10	4698307	<0.10	0.10	4698307
Metals								
Mercury (Hg)	mg/L	<0.0001		0.0001	4699583	<0.0001	0.0001	4699472
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4699971	5.4	5.0	4699962
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699962
Dissolved Arsenic (As)	ug/L	<1.0		1.0	4699971	42	1.0	4699962
Dissolved Barium (Ba)	ug/L	15		2.0	4699971	190	2.0	4699962
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699962
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4699971	<1.0	1.0	4699962
Dissolved Boron (B)	ug/L	23		10	4699971	160	10	4699962
Dissolved Cadmium (Cd)	ug/L	0.10		0.10	4699971	<0.10	0.10	4699962
Dissolved Calcium (Ca)	ug/L	80000		200	4699971	130000	200	4699962
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699962
Dissolved Cobalt (Co)	ug/L	2.0		0.50	4699971	12	0.50	4699962
Dissolved Copper (Cu)	ug/L	1.5		1.0	4699971	<1.0	1.0	4699962
Dissolved Iron (Fe)	ug/L	<100		100	4699971	22000	100	4699962
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699962
Dissolved Magnesium (Mg)	ug/L	13000		50	4699971	20000	50	4699962
Dissolved Manganese (Mn)	ug/L	180		2.0	4699971	1800	2.0	4699962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ386	DFJ386			DFJ387		
Sampling Date		2016/10/05 08:00	2016/10/05 08:00			2016/10/05 10:30		
COC Number		578314-01-01	578314-01-01			578314-01-01		
	UNITS	**MW6**	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		0.50	4699971	<0.50	0.50	4699962
Dissolved Nickel (Ni)	ug/L	3.5		1.0	4699971	8.0	1.0	4699962
Dissolved Phosphorus (P)	ug/L	<100		100	4699971	<100	100	4699962
Dissolved Potassium (K)	ug/L	1300		200	4699971	11000	200	4699962
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4699971	<2.0	2.0	4699962
Dissolved Silicon (Si)	ug/L	5200		50	4699971	9200	50	4699962
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4699971	<0.10	0.10	4699962
Dissolved Sodium (Na)	ug/L	6100		100	4699971	30000	100	4699962
Dissolved Strontium (Sr)	ug/L	82		1.0	4699971	200	1.0	4699962
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4699971	<0.050	0.050	4699962
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4699971	<1.0	1.0	4699962
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699962
Dissolved Vanadium (V)	ug/L	<0.50		0.50	4699971	1.0	0.50	4699962
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4699971	<5.0	5.0	4699962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ388	DFJ388			DFJ389	DFJ389		
Sampling Date		2016/10/04 16:45	2016/10/04 16:45			2016/10/05 07:30	2016/10/05 07:30		
COC Number		578314-01-01	578314-01-01			578314-01-01	578314-01-01		
	UNITS	**MW8**	**MW8 Lab-Dup**	**RDL**	**QC Batch**	**MW9**	**MW9 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050		0.050	4699519	<0.050		0.050	4699983
Total Chemical Oxygen Demand (COD)	mg/L	110		4.0	4699479	260		8.0	4699479
Conductivity	umho/cm	3500		1.0	4699526	930		1.0	4699526
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.20 (1)		0.20	4699524	0.11		0.10	4699524
Dissolved Organic Carbon	mg/L	2.9		0.20	4699549	1.0	1.0	0.20	4699549
pH	pH	7.99			4699527	8.00			4699527
Phenols-4AAP	mg/L	<0.0010		0.0010	4698007	<0.0010		0.0010	4698007
Total Phosphorus	mg/L	33		0.20	4699575	100		0.40	4699575
Dissolved Sulphate (SO4)	mg/L	24		1.0	4697865	3.3		1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	390		1.0	4699520	240		1.0	4699520
Dissolved Chloride (Cl)	mg/L	870		10	4697863	140		2.0	4697863
Nitrite (N)	mg/L	0.010	<0.010	0.010	4699512	<0.010		0.010	4699733
Nitrate (N)	mg/L	1.32	1.33	0.10	4699512	0.13		0.10	4699733
Metals									
Mercury (Hg)	mg/L	<0.0001		0.0001	4699472	<0.0001		0.0001	4699472
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	4699971	<5.0		5.0	4699962
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	4699971	<0.50		0.50	4699962
Dissolved Arsenic (As)	ug/L	<1.0		1.0	4699971	<1.0		1.0	4699962
Dissolved Barium (Ba)	ug/L	58		2.0	4699971	25		2.0	4699962
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	4699971	<0.50		0.50	4699962
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	4699971	<1.0		1.0	4699962
Dissolved Boron (B)	ug/L	15		10	4699971	13		10	4699962
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	4699971	<0.10		0.10	4699962
Dissolved Calcium (Ca)	ug/L	130000		200	4699971	110000		200	4699962
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	4699971	<5.0		5.0	4699962
Dissolved Cobalt (Co)	ug/L	<0.50		0.50	4699971	<0.50		0.50	4699962
Dissolved Copper (Cu)	ug/L	1.7		1.0	4699971	<1.0		1.0	4699962
Dissolved Iron (Fe)	ug/L	<100		100	4699971	<100		100	4699962
Dissolved Lead (Pb)	ug/L	<0.50		0.50	4699971	<0.50		0.50	4699962
Dissolved Magnesium (Mg)	ug/L	11000		50	4699971	20000		50	4699962
Dissolved Manganese (Mn)	ug/L	2.9		2.0	4699971	2.6		2.0	4699962
Dissolved Molybdenum (Mo)	ug/L	0.53		0.50	4699971	<0.50		0.50	4699962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ388	DFJ388			DFJ389	DFJ389		
Sampling Date		2016/10/04 16:45	2016/10/04 16:45			2016/10/05 07:30	2016/10/05 07:30		
COC Number		578314-01-01	578314-01-01			578314-01-01	578314-01-01		
	UNITS	**MW8**	**MW8 Lab-Dup**	**RDL**	**QC Batch**	**MW9**	**MW9 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0		1.0	4699971	<1.0		1.0	4699962
Dissolved Phosphorus (P)	ug/L	<100		100	4699971	<100		100	4699962
Dissolved Potassium (K)	ug/L	2900		200	4699971	1400		200	4699962
Dissolved Selenium (Se)	ug/L	<2.0		2.0	4699971	<2.0		2.0	4699962
Dissolved Silicon (Si)	ug/L	2800		50	4699971	4600		50	4699962
Dissolved Silver (Ag)	ug/L	<0.10		0.10	4699971	<0.10		0.10	4699962
Dissolved Sodium (Na)	ug/L	580000		100	4699971	34000		100	4699962
Dissolved Strontium (Sr)	ug/L	160		1.0	4699971	91		1.0	4699962
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	4699971	<0.050		0.050	4699962
Dissolved Tin (Sn)	ug/L	<1.0		1.0	4699971	<1.0		1.0	4699962
Dissolved Titanium (Ti)	ug/L	<5.0		5.0	4699971	<5.0		5.0	4699962
Dissolved Vanadium (V)	ug/L	<0.50		0.50	4699971	<0.50		0.50	4699962
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	4699971	<5.0		5.0	4699962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ390			DFJ391		
Sampling Date		2016/10/04 15:40			2016/10/04 16:00		
COC Number		578314-02-01			578314-02-01		
	UNITS	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.29	0.050	4699983	0.16	0.050	4699519
Total Chemical Oxygen Demand (COD)	mg/L	56	4.0	4699479	51	4.0	4699479
Conductivity	umho/cm	750	1.0	4699526	1300	1.0	4699526
Total Dissolved Solids	mg/L		10		784	10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	0.52	0.10	4699524	0.45	0.10	4699524
Dissolved Organic Carbon	mg/L	12	0.20	4699611	15	0.20	4699549
pH	pH	7.33		4699527	7.51		4699527
Phenols-4AAP	mg/L	<0.0010	0.0010	4698007	<0.0010	0.0010	4698007
Total Phosphorus	mg/L	0.16	0.10	4699575	0.26	0.10	4699575
Dissolved Sulphate (SO4)	mg/L	8.2	1.0	4697865	<1.0	1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	250	1.0	4699520	330	1.0	4699520
Dissolved Chloride (Cl)	mg/L	90	1.0	4697863	210	2.0	4697863
Nitrite (N)	mg/L	<0.010	0.010	4698307	<0.010	0.010	4699733
Nitrate (N)	mg/L	<0.10	0.10	4698307	<0.10	0.10	4699733
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	4699472	<0.0001	0.0001	4699472
Dissolved Aluminum (Al)	ug/L	94	5.0	4699971	68	5.0	4699971
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	4699971	<0.50	0.50	4699971
Dissolved Arsenic (As)	ug/L	22	1.0	4699971	37	1.0	4699971
Dissolved Barium (Ba)	ug/L	30	2.0	4699971	30	2.0	4699971
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	4699971	<0.50	0.50	4699971
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	4699971	<1.0	1.0	4699971
Dissolved Boron (B)	ug/L	<10	10	4699971	<10	10	4699971
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	4699971	<0.10	0.10	4699971
Dissolved Calcium (Ca)	ug/L	95000	200	4699971	140000	200	4699971
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	4699971	<5.0	5.0	4699971
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	4699971	<0.50	0.50	4699971
Dissolved Copper (Cu)	ug/L	<1.0	1.0	4699971	<1.0	1.0	4699971
Dissolved Iron (Fe)	ug/L	2100	100	4699971	3800	100	4699971
Dissolved Lead (Pb)	ug/L	<0.50	0.50	4699971	<0.50	0.50	4699971
Dissolved Magnesium (Mg)	ug/L	19000	50	4699971	13000	50	4699971
Dissolved Manganese (Mn)	ug/L	86	2.0	4699971	110	2.0	4699971
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	4699971	<0.50	0.50	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ390			DFJ391		
Sampling Date		2016/10/04 15:40			2016/10/04 16:00		
COC Number		578314-02-01			578314-02-01		
	UNITS	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	4699971	<1.0	1.0	4699971
Dissolved Phosphorus (P)	ug/L	<100	100	4699971	<100	100	4699971
Dissolved Potassium (K)	ug/L	330	200	4699971	230	200	4699971
Dissolved Selenium (Se)	ug/L	<2.0	2.0	4699971	<2.0	2.0	4699971
Dissolved Silicon (Si)	ug/L	2800	50	4699971	1700	50	4699971
Dissolved Silver (Ag)	ug/L	<0.10	0.10	4699971	<0.10	0.10	4699971
Dissolved Sodium (Na)	ug/L	37000	100	4699971	100000	100	4699971
Dissolved Strontium (Sr)	ug/L	83	1.0	4699971	110	1.0	4699971
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	4699971	<0.050	0.050	4699971
Dissolved Tin (Sn)	ug/L	<1.0	1.0	4699971	<1.0	1.0	4699971
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	4699971	<5.0	5.0	4699971
Dissolved Vanadium (V)	ug/L	1.9	0.50	4699971	0.67	0.50	4699971
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	4699971	<5.0	5.0	4699971

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ392		DFJ393		
Sampling Date		2016/10/04 18:30		2016/10/05 12:30		
COC Number		578314-02-01		578314-02-01		
	UNITS	**MW11**	**RDL**	**MW12**	**RDL**	**QC Batch**
Inorganics						
Total Ammonia-N	mg/L	0.064	0.050	10 (1)	0.25	4699519
Total Chemical Oxygen Demand (COD)	mg/L	57	4.0	32	4.0	4699479
Conductivity	umho/cm	470	1.0	1200	1.0	4699526
Total Dissolved Solids	mg/L		10	628	10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	0.18	0.10	9.8 (1)	0.50	4699524
Dissolved Organic Carbon	mg/L	1.9	0.20	8.4	0.20	4699549
pH	pH	8.05		7.55		4699527
Phenols-4AAP	mg/L	<0.0010	0.0010	<0.0010	0.0010	4698007
Total Phosphorus	mg/L	4.5	0.10	0.039	0.020	4699575
Dissolved Sulphate (SO4)	mg/L	1.3	1.0	27	1.0	4697865
Alkalinity (Total as CaCO3)	mg/L	260	1.0	510	1.0	4699520
Dissolved Chloride (Cl)	mg/L	1.2	1.0	65	1.0	4697863
Nitrite (N)	mg/L	0.012	0.010	<0.010	0.010	4698307
Nitrate (N)	mg/L	<0.10	0.10	<0.10	0.10	4698307
Metals						
Mercury (Hg)	mg/L	<0.0001	0.0001	<0.0001	0.0001	4699472
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	<5.0	5.0	4699962
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	4699962
Dissolved Arsenic (As)	ug/L	<1.0	1.0	17	1.0	4699962
Dissolved Barium (Ba)	ug/L	38	2.0	140	2.0	4699962
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	4699962
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	<1.0	1.0	4699962
Dissolved Boron (B)	ug/L	18	10	290	10	4699962
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	0.10	4699962
Dissolved Calcium (Ca)	ug/L	68000	200	140000	200	4699962
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	4699962
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5.4	0.50	4699962
Dissolved Copper (Cu)	ug/L	<1.0	1.0	<1.0	1.0	4699962
Dissolved Iron (Fe)	ug/L	<100	100	14000	100	4699962
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	4699962
Dissolved Magnesium (Mg)	ug/L	15000	50	24000	50	4699962
Dissolved Manganese (Mn)	ug/L	84	2.0	1200	2.0	4699962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		DFJ392		DFJ393		
Sampling Date		2016/10/04 18:30		2016/10/05 12:30		
COC Number		578314-02-01		578314-02-01		
	UNITS	**MW11**	**RDL**	**MW12**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.90	0.50	<0.50	0.50	4699962
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5.0	1.0	4699962
Dissolved Phosphorus (P)	ug/L	<100	100	<100	100	4699962
Dissolved Potassium (K)	ug/L	1200	200	13000	200	4699962
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	4699962
Dissolved Silicon (Si)	ug/L	7000	50	7000	50	4699962
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	0.10	4699962
Dissolved Sodium (Na)	ug/L	7100	100	45000	100	4699962
Dissolved Strontium (Sr)	ug/L	93	1.0	240	1.0	4699962
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	4699962
Dissolved Tin (Sn)	ug/L	<1.0	1.0	<1.0	1.0	4699962
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	<5.0	5.0	4699962
Dissolved Vanadium (V)	ug/L	0.84	0.50	0.55	0.50	4699962
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	4699962

RDL = Reportable Detection Limit
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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		DFJ395			DFJ396		DFJ397		
Sampling Date		2016/10/04 15:00			2016/10/04 14:30		2016/10/04 14:00		
COC Number		578292-01-01			578292-01-01		578292-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050	0.050	4699519	<0.050	4699766	<0.050	0.050	4699983
Total BOD	mg/L	<2.0	2.0	4697730	<2.0	4697730	<2.0	2.0	4697730
Total Chemical Oxygen Demand (COD)	mg/L	68	4.0	4699479	33	4699479	34	4.0	4699479
Conductivity	umho/cm	260	1.0	4699526	210	4699526	240	1.0	4699526
Total Dissolved Solids	mg/L	186	10	4699530	144	4699530	132	10	4699530
Total Kjeldahl Nitrogen (TKN)	mg/L	0.36	0.10	4699524	0.34	4699524	0.34	0.10	4699524
pH	pH	7.94		4699527	7.99	4699527	8.00		4699527
Phenols-4AAP	mg/L	<0.0010	0.0010	4698007	<0.0010	4698007	<0.0010	0.0010	4698007
Total Phosphorus	mg/L	0.11	0.02	4699725	0.023	4699725	0.022	0.004	4699725
Total Suspended Solids	mg/L	52	1	4698020	7	4698020	5	1	4698020
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	4698795	8.6	4698795	11	1.0	4698795
Alkalinity (Total as CaCO3)	mg/L	100	1.0	4699520	87	4699520	96	1.0	4699520
Dissolved Chloride (Cl)	mg/L	20	1.0	4698781	10	4698781	12	1.0	4698781
Nitrite (N)	mg/L	<0.010	0.010	4698307	<0.010	4698307	<0.010	0.010	4699512
Nitrate (N)	mg/L	<0.10	0.10	4698307	<0.10	4698307	<0.10	0.10	4699512
Metals									
Mercury (Hg)	mg/L	<0.0001	0.0001	4699472	<0.0001	4699472	<0.0001	0.0001	4699472
Total Antimony (Sb)	ug/L	0.59	0.50	4699774	0.76	4699774	0.80	0.50	4699774
Total Arsenic (As)	ug/L	110	1.0	4699774	73	4699774	77	1.0	4699774
Total Barium (Ba)	ug/L	19	2.0	4699774	9.1	4699774	9.8	2.0	4699774
Total Beryllium (Be)	ug/L	<0.50	0.50	4699774	<0.50	4699774	<0.50	0.50	4699774
Total Bismuth (Bi)	ug/L	<1.0	1.0	4699774	<1.0	4699774	<1.0	1.0	4699774
Total Boron (B)	ug/L	<10	10	4699774	<10	4699774	<10	10	4699774
Total Cadmium (Cd)	ug/L	<0.10	0.10	4699774	<0.10	4699774	<0.10	0.10	4699774
Total Calcium (Ca)	ug/L	33000	200	4699774	29000	4699774	32000	200	4699774
Total Chromium (Cr)	ug/L	<5.0	5.0	4699774	<5.0	4699774	<5.0	5.0	4699774
Total Cobalt (Co)	ug/L	0.85	0.50	4699774	<0.50	4699774	<0.50	0.50	4699774
Total Copper (Cu)	ug/L	11	1.0	4699774	4.5	4699774	4.9	1.0	4699774
Total Iron (Fe)	ug/L	3600	100	4699774	360	4699774	340	100	4699774
Total Lead (Pb)	ug/L	1.8	0.50	4699774	<0.50	4699774	0.56	0.50	4699774
Total Magnesium (Mg)	ug/L	7200	50	4699774	6300	4699774	7000	50	4699774
Total Manganese (Mn)	ug/L	140	2.0	4699774	21	4699774	42	2.0	4699774
Total Molybdenum (Mo)	ug/L	<0.50	0.50	4699774	<0.50	4699774	<0.50	0.50	4699774

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		DFJ395			DFJ396		DFJ397		
Sampling Date		2016/10/04 15:00			2016/10/04 14:30		2016/10/04 14:00		
COC Number		578292-01-01			578292-01-01		578292-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Total Nickel (Ni)	ug/L	3.5	1.0	4699774	1.2	4699774	1.9	1.0	4699774
Total Phosphorus (P)	ug/L	<100	100	4699774	<100	4699774	<100	100	4699774
Total Potassium (K)	ug/L	860	200	4699774	650	4699774	770	200	4699774
Total Selenium (Se)	ug/L	<2.0	2.0	4699774	<2.0	4699774	<2.0	2.0	4699774
Total Silicon (Si)	ug/L	3800	50	4699774	2800	4699774	2900	50	4699774
Total Silver (Ag)	ug/L	<0.10	0.10	4699774	<0.10	4699774	<0.10	0.10	4699774
Total Sodium (Na)	ug/L	11000	100	4699774	6000	4699774	6900	100	4699774
Total Strontium (Sr)	ug/L	42	1.0	4699774	43	4699774	49	1.0	4699774
Total Thallium (Tl)	ug/L	<0.050	0.050	4699774	<0.050	4699774	<0.050	0.050	4699774
Total Tin (Sn)	ug/L	<1.0	1.0	4699774	<1.0	4699774	<1.0	1.0	4699774
Total Titanium (Ti)	ug/L	30	5.0	4699774	<5.0	4699774	<5.0	5.0	4699774
Total Vanadium (V)	ug/L	3.2	0.50	4699774	0.95	4699774	0.90	0.50	4699774
Total Zinc (Zn)	ug/L	10	5.0	4699774	<5.0	4699774	<5.0	5.0	4699774

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		DFJ380	DFJ381	DFJ382	DFJ383	DFJ384	DFJ385		
Sampling Date		2016/10/05 08:25	2016/10/05 08:50	2016/10/05 11:20	2016/10/05 11:40	2016/10/05 10:10	2016/10/05 09:20		
COC Number		578314-01-01	578314-01-01	578314-01-01	578314-01-01	578314-01-01	578314-01-01		
	UNITS	**MW1**	**MW2**	**MW3A**	**MW3B**	**MW4**	**MW5**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	580	230	460	460	590	550	1.0	4695660
Total Organic Nitrogen	mg/L	0.28	0.20	<0.10	0.22	0.12	0.23	0.10	4697692
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4697864

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		DFJ386	DFJ387	DFJ388	DFJ389	DFJ390	DFJ391		
Sampling Date		2016/10/05 08:00	2016/10/05 10:30	2016/10/04 16:45	2016/10/05 07:30	2016/10/04 15:40	2016/10/04 16:00		
COC Number		578314-01-01	578314-01-01	578314-01-01	578314-01-01	578314-02-01	578314-02-01		
	UNITS	**MW6**	**MW7**	**MW8**	**MW9**	**MW10A**	**MW10B**	**RDL**	**QC Batch**
Calculated Parameters									
Calculated TDS	mg/L			1900	460	410		1.0	4699444
Hardness (CaCO3)	mg/L	260	420	370	350	320	410	1.0	4695660
Total Organic Nitrogen	mg/L	0.12	<0.10	<0.10	0.11	0.23	0.29	0.10	4697692
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4697864

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		DFJ392	DFJ393	DFJ395	DFJ396		DFJ397		
Sampling Date		2016/10/04 18:30	2016/10/05 12:30	2016/10/04 15:00	2016/10/04 14:30		2016/10/04 14:00		
COC Number		578314-02-01	578314-02-01	578292-01-01	578292-01-01		578292-01-01		
	UNITS	**MW11**	**MW12**	**SW1**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters									
Calculated TDS	mg/L	260				4699444		1.0	4699444
Hardness (CaCO3)	mg/L	230	440	110	100	4695660	110	1.0	4695660
Total Organic Nitrogen	mg/L	0.12	<0.10	0.36	0.34	4697692	0.34	0.10	4697692
Inorganics									
Dissolved Organic Carbon	mg/L			12	12	4699549	12	0.20	4699611
Orthophosphate (P)	mg/L	<0.010	<0.010			4697864		0.010	

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		DFJ395	DFJ396	DFJ397		
Sampling Date		2016/10/04 15:00	2016/10/04 14:30	2016/10/04 14:00		
COC Number		578292-01-01	578292-01-01	578292-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	<5	<5	5	4707310

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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		DFJ385		
Sampling Date		2016/10/05 09:20		
COC Number		578314-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	4699620
Benzene	ug/L	<0.10	0.10	4699620
Bromodichloromethane	ug/L	<0.10	0.10	4699620
Bromoform	ug/L	<0.20	0.20	4699620
Bromomethane	ug/L	<0.50	0.50	4699620
Carbon Tetrachloride	ug/L	<0.10	0.10	4699620
Chlorobenzene	ug/L	0.71	0.10	4699620
Chloroform	ug/L	<0.10	0.10	4699620
Dibromochloromethane	ug/L	<0.20	0.20	4699620
1,2-Dichlorobenzene	ug/L	<0.20	0.20	4699620
1,3-Dichlorobenzene	ug/L	<0.20	0.20	4699620
1,4-Dichlorobenzene	ug/L	0.89	0.20	4699620
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	4699620
1,1-Dichloroethane	ug/L	0.23	0.10	4699620
1,2-Dichloroethane	ug/L	<0.20	0.20	4699620
1,1-Dichloroethylene	ug/L	<0.10	0.10	4699620
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	4699620
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	4699620
1,2-Dichloropropane	ug/L	<0.10	0.10	4699620
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	4699620
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	4699620
Ethylbenzene	ug/L	<0.10	0.10	4699620
Ethylene Dibromide	ug/L	<0.20	0.20	4699620
Hexane	ug/L	<0.50	0.50	4699620
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	4699620
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	4699620
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	4699620
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	4699620
Styrene	ug/L	<0.20	0.20	4699620
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	4699620
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	4699620
Tetrachloroethylene	ug/L	<0.10	0.10	4699620
Toluene	ug/L	<0.20	0.20	4699620

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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exp Services Inc
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		DFJ385		
Sampling Date		2016/10/05 09:20		
COC Number		578314-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	4699620
1,1,2-Trichloroethane	ug/L	<0.20	0.20	4699620
Trichloroethylene	ug/L	<0.10	0.10	4699620
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	4699620
Vinyl Chloride	ug/L	<0.20	0.20	4699620
p+m-Xylene	ug/L	<0.10	0.10	4699620
o-Xylene	ug/L	<0.10	0.10	4699620
Total Xylenes	ug/L	<0.10	0.10	4699620
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	99		4699620
D4-1,2-Dichloroethane	%	99		4699620
D8-Toluene	%	99		4699620

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ380
Sample ID: MW1
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4696439	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ380 Dup
Sample ID: MW1
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran

Maxxam ID: DFJ381
Sample ID: MW2
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4704176	N/A	2016/10/17	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4704184	N/A	2016/10/17	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699583	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699973	N/A	2016/10/17	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4704183	N/A	2016/10/17	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram

Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ381
Sample ID: MW2
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ381 Dup
Sample ID: MW2
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699973	N/A	2016/10/17	Chandra Nandlal

Maxxam ID: DFJ382
Sample ID: MW3A
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4702199	N/A	2016/10/14	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699962	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ382 Dup
Sample ID: MW3A
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi

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TEST SUMMARY

Maxxam ID: DFJ383
Sample ID: MW3B
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699583	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4702097	2016/10/14	2016/10/14	Zahid Soikot
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ383 Dup
Sample ID: MW3B
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru

Maxxam ID: DFJ384
Sample ID: MW4
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699733	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram

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Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ384
Sample ID: MW4
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ384 Dup
Sample ID: MW4
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah

Maxxam ID: DFJ385
Sample ID: MW5
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699766	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina
Volatile Organic Compounds in Water	P&T/MS	4699620	N/A	2016/10/14	Karen Huynh

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ386
Sample ID: MW6
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699583	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ386 Dup
Sample ID: MW6
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
pH	AT	4699527	N/A	2016/10/13	Surinder Rai

Maxxam ID: DFJ387
Sample ID: MW7
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4698131	N/A	2016/10/12	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699962	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ387
Sample ID: MW7
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ388
Sample ID: MW8
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699512	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4699444	N/A	2016/10/17	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ388 Dup
Sample ID: MW8
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699512	N/A	2016/10/14	Chandra Nandlal

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Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ389
Sample ID: MW9
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699962	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699733	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4699444	N/A	2016/10/17	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ389 Dup
Sample ID: MW9
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov

Maxxam ID: DFJ390
Sample ID: MW10A
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699611	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ390
Sample ID: MW10A
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4699444	N/A	2016/10/17	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ391
Sample ID: MW10B
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699971	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699733	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ392
Sample ID: MW11
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699962	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ392
Sample ID: MW11
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4699444	N/A	2016/10/17	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ393
Sample ID: MW12
Matrix: Water

Collected: 2016/10/05
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Chloride by Automated Colourimetry	KONE	4697863	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/17	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4699962	N/A	2016/10/14	Cristina Petran
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Orthophosphate	KONE	4697864	N/A	2016/10/13	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4697865	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699575	2016/10/13	2016/10/13	Sarabjit Raina

Maxxam ID: DFJ395
Sample ID: SW1
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4707310	N/A	2016/10/19	Prempal Bhatti
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4697730	2016/10/17	2016/10/17	Prakash Piya
Chloride by Automated Colourimetry	KONE	4698781	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru

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Maxxam Job #: B6L8150
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Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ395
Sample ID: SW1
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4699774	N/A	2016/10/14	Arefa Dabhad
Total Ammonia-N	LACH/NH4	4699519	N/A	2016/10/14	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	4698795	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699725	2016/10/13	2016/10/13	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4698020	2016/10/13	2016/10/13	Zahid Soikot

Maxxam ID: DFJ396
Sample ID: SW2
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4707310	N/A	2016/10/19	Prempal Bhatti
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4697730	2016/10/17	2016/10/17	Prakash Piya
Chloride by Automated Colourimetry	KONE	4698781	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699549	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4699774	N/A	2016/10/14	Arefa Dabhad
Total Ammonia-N	LACH/NH4	4699766	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4698307	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	4698795	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699725	2016/10/13	2016/10/13	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4698020	2016/10/13	2016/10/13	Zahid Soikot

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exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: DFJ397
Sample ID: SW3
Matrix: Water

Collected: 2016/10/04
Shipped:
Received: 2016/10/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	4707310	N/A	2016/10/19	Prempal Bhatti
Alkalinity	AT	4699520	N/A	2016/10/13	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4697730	2016/10/17	2016/10/17	Prakash Piya
Chloride by Automated Colourimetry	KONE	4698781	N/A	2016/10/13	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4699479	N/A	2016/10/14	Viorica Rotaru
Conductivity	AT	4699526	N/A	2016/10/13	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4699611	N/A	2016/10/13	Anastasia Hamanov
Hardness (calculated as CaCO3)		4695660	N/A	2016/10/14	Automated Statchk
Mercury in Water by CVAA	CV/AA	4699472	2016/10/13	2016/10/14	Magdalena Carlos
Total Metals Analysis by ICPMS	ICP/MS	4699774	N/A	2016/10/14	Arefa Dabhad
Total Ammonia-N	LACH/NH4	4699983	N/A	2016/10/17	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4699512	N/A	2016/10/14	Chandra Nandlal
Organic Nitrogen	CALC	4697692	N/A	2016/10/17	Automated Statchk
pH	AT	4699527	N/A	2016/10/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4698007	N/A	2016/10/14	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	4698795	N/A	2016/10/13	Alina Dobreanu
Total Dissolved Solids	BAL	4699530	2016/10/13	2016/10/13	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4699524	2016/10/13	2016/10/13	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4699725	2016/10/13	2016/10/13	Sarabjit Raina
Low Level Total Suspended Solids	BAL	4698020	2016/10/13	2016/10/13	Zahid Soikot

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	9.0°C
Package 2	7.7°C
Package 3	8.3°C
Package 4	8.0°C
Package 5	9.3°C
Package 6	8.7°C
Package 7	8.3°C
Package 8	7.0°C

Report Revised [2016/10/19]: Dissloved Al run to follow PWQO method.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-ME
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			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699620	4-Bromofluorobenzene	2016/10/14	101	70 - 130	102	70 - 130	97	%				
4699620	D4-1,2-Dichloroethane	2016/10/14	97	70 - 130	95	70 - 130	96	%				
4699620	D8-Toluene	2016/10/14	99	70 - 130	99	70 - 130	100	%				
4696439	Phenols-4AAP	2016/10/14	91	80 - 120	93	85 - 115	<0.0010	mg/L	NC	20		
4697730	Total BOD	2016/10/17					<2.0	mg/L	17	25	89	80 - 120
4697863	Dissolved Chloride (Cl)	2016/10/13	NC	80 - 120	105	80 - 120	<1.0	mg/L	1.3	20		
4697864	Orthophosphate (P)	2016/10/13	104	75 - 125	99	80 - 120	<0.010	mg/L	NC	25		
4697865	Dissolved Sulphate (SO4)	2016/10/13	NC	75 - 125	97	80 - 120	<1.0	mg/L	0.39	20		
4698007	Phenols-4AAP	2016/10/14	88	80 - 120	99	85 - 115	<0.0010	mg/L	NC	20		
4698020	Total Suspended Solids	2016/10/13					<1	mg/L	NC	25	98	85 - 115
4698131	Dissolved Organic Carbon	2016/10/12	97	80 - 120	100	80 - 120	0.21, RDL=0.20	mg/L	0.79	20		
4698307	Nitrate (N)	2016/10/14	92	80 - 120	99	80 - 120	<0.10	mg/L	NC	25		
4698307	Nitrite (N)	2016/10/14	99	80 - 120	105	80 - 120	<0.010	mg/L	NC	25		
4698781	Dissolved Chloride (Cl)	2016/10/13	NC	80 - 120	105	80 - 120	<1.0	mg/L	1.4	20		
4698795	Dissolved Sulphate (SO4)	2016/10/13	NC	75 - 125	99	80 - 120	<1.0	mg/L	1.3	20		
4699472	Mercury (Hg)	2016/10/14	108	75 - 125	103	80 - 120	<0.0001	mg/L	NC	20		
4699479	Total Chemical Oxygen Demand (COD)	2016/10/14	103	75 - 125	102	75 - 125	<4.0	mg/L	0.98	25		
4699512	Nitrate (N)	2016/10/14	83	80 - 120	95	80 - 120	<0.10	mg/L	0.82	25		
4699512	Nitrite (N)	2016/10/14	98	80 - 120	103	80 - 120	<0.010	mg/L	NC	25		
4699519	Total Ammonia-N	2016/10/14	NC	80 - 120	99	85 - 115	<0.050	mg/L	0.60	20		
4699520	Alkalinity (Total as CaCO3)	2016/10/13			98	85 - 115	<1.0	mg/L	1.7	25		
4699524	Total Kjeldahl Nitrogen (TKN)	2016/10/13	NC	80 - 120	103	80 - 120	<0.10	mg/L	1.4 (1)	20	101	80 - 120
4699526	Conductivity	2016/10/13			101	85 - 115	<1.0	umho/cm	0.97	25		
4699527	pH	2016/10/13			102	98 - 103			0.34	N/A		
4699530	Total Dissolved Solids	2016/10/13					<10	mg/L	1.6	25	100	90 - 110
4699549	Dissolved Organic Carbon	2016/10/13	100	80 - 120	104	80 - 120	0.32, RDL=0.20	mg/L	2.2	20		
4699575	Total Phosphorus	2016/10/13	103	80 - 120	102	80 - 120	<0.020	mg/L	0.11	20	103	80 - 120
4699583	Mercury (Hg)	2016/10/14	109	75 - 125	102	80 - 120	<0.0001	mg/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699611	Dissolved Organic Carbon	2016/10/13	97	80 - 120	100	80 - 120	<0.20	mg/L	0.46	20		
4699620	1,1,1,2-Tetrachloroethane	2016/10/14	92	70 - 130	97	70 - 130	<0.20	ug/L				
4699620	1,1,1-Trichloroethane	2016/10/14	89	70 - 130	94	70 - 130	<0.10	ug/L				
4699620	1,1,2,2-Tetrachloroethane	2016/10/14	97	70 - 130	100	70 - 130	<0.20	ug/L				
4699620	1,1,2-Trichloroethane	2016/10/14	95	70 - 130	97	70 - 130	<0.20	ug/L				
4699620	1,1-Dichloroethane	2016/10/14	91	70 - 130	94	70 - 130	<0.10	ug/L				
4699620	1,1-Dichloroethylene	2016/10/14	94	70 - 130	99	70 - 130	<0.10	ug/L				
4699620	1,2-Dichlorobenzene	2016/10/14	92	70 - 130	99	70 - 130	<0.20	ug/L				
4699620	1,2-Dichloroethane	2016/10/14	90	70 - 130	93	70 - 130	<0.20	ug/L				
4699620	1,2-Dichloropropane	2016/10/14	93	70 - 130	97	70 - 130	<0.10	ug/L				
4699620	1,3-Dichlorobenzene	2016/10/14	90	70 - 130	98	70 - 130	<0.20	ug/L				
4699620	1,4-Dichlorobenzene	2016/10/14	92	70 - 130	100	70 - 130	<0.20	ug/L				
4699620	Acetone (2-Propanone)	2016/10/14	99	60 - 140	93	60 - 140	<10	ug/L				
4699620	Benzene	2016/10/14	93	70 - 130	95	70 - 130	<0.10	ug/L	NC	30		
4699620	Bromodichloromethane	2016/10/14	95	70 - 130	99	70 - 130	<0.10	ug/L				
4699620	Bromoform	2016/10/14	99	70 - 130	103	70 - 130	<0.20	ug/L				
4699620	Bromomethane	2016/10/14	73	60 - 140	81	60 - 140	<0.50	ug/L				
4699620	Carbon Tetrachloride	2016/10/14	92	70 - 130	98	70 - 130	<0.10	ug/L				
4699620	Chlorobenzene	2016/10/14	97	70 - 130	99	70 - 130	<0.10	ug/L				
4699620	Chloroform	2016/10/14	88	70 - 130	92	70 - 130	<0.10	ug/L				
4699620	cis-1,2-Dichloroethylene	2016/10/14	96	70 - 130	101	70 - 130	<0.10	ug/L				
4699620	cis-1,3-Dichloropropene	2016/10/14	97	70 - 130	107	70 - 130	<0.20	ug/L				
4699620	Dibromochloromethane	2016/10/14	96	70 - 130	100	70 - 130	<0.20	ug/L				
4699620	Dichlorodifluoromethane (FREON 12)	2016/10/14	86	60 - 140	98	60 - 140	<0.50	ug/L				
4699620	Ethylbenzene	2016/10/14	98	70 - 130	103	70 - 130	<0.10	ug/L	NC	30		
4699620	Ethylene Dibromide	2016/10/14	96	70 - 130	99	70 - 130	<0.20	ug/L				
4699620	Hexane	2016/10/14	89	70 - 130	110	70 - 130	<0.50	ug/L				
4699620	Methyl Ethyl Ketone (2-Butanone)	2016/10/14	104	60 - 140	102	60 - 140	<5.0	ug/L				
4699620	Methyl Isobutyl Ketone	2016/10/14	104	70 - 130	104	70 - 130	<5.0	ug/L				
4699620	Methyl t-butyl ether (MTBE)	2016/10/14	101	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
4699620	Methylene Chloride(Dichloromethane)	2016/10/14	99	70 - 130	101	70 - 130	<0.50	ug/L				

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exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699620	o-Xylene	2016/10/14	96	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
4699620	p+m-Xylene	2016/10/14	97	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
4699620	Styrene	2016/10/14	99	70 - 130	104	70 - 130	<0.20	ug/L				
4699620	Tetrachloroethylene	2016/10/14	88	70 - 130	95	70 - 130	<0.10	ug/L				
4699620	Toluene	2016/10/14	91	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		
4699620	Total Xylenes	2016/10/14					<0.10	ug/L				
4699620	trans-1,2-Dichloroethylene	2016/10/14	91	70 - 130	95	70 - 130	<0.10	ug/L				
4699620	trans-1,3-Dichloropropene	2016/10/14	97	70 - 130	104	70 - 130	<0.20	ug/L				
4699620	Trichloroethylene	2016/10/14	90	70 - 130	95	70 - 130	<0.10	ug/L				
4699620	Trichlorofluoromethane (FREON 11)	2016/10/14	96	70 - 130	102	70 - 130	<0.20	ug/L				
4699620	Vinyl Chloride	2016/10/14	NC	70 - 130	98	70 - 130	<0.20	ug/L				
4699725	Total Phosphorus	2016/10/13	91	80 - 120	91	80 - 120	<0.004	mg/L	NC	20	88	80 - 120
4699733	Nitrate (N)	2016/10/14	NC	80 - 120	97	80 - 120	<0.10	mg/L	0.42	25		
4699733	Nitrite (N)	2016/10/14	98	80 - 120	103	80 - 120	<0.010	mg/L	NC	25		
4699766	Total Ammonia-N	2016/10/17	90	80 - 120	97	85 - 115	<0.050	mg/L	NC	20		
4699774	Total Antimony (Sb)	2016/10/14	104	80 - 120	101	80 - 120	<0.50	ug/L				
4699774	Total Arsenic (As)	2016/10/14	101	80 - 120	101	80 - 120	<1.0	ug/L				
4699774	Total Barium (Ba)	2016/10/14	NC	80 - 120	101	80 - 120	<2.0	ug/L				
4699774	Total Beryllium (Be)	2016/10/14	106	80 - 120	103	80 - 120	<0.50	ug/L				
4699774	Total Bismuth (Bi)	2016/10/14	97	80 - 120	96	80 - 120	<1.0	ug/L				
4699774	Total Boron (B)	2016/10/14	97	80 - 120	95	80 - 120	<10	ug/L				
4699774	Total Cadmium (Cd)	2016/10/14	103	80 - 120	101	80 - 120	<0.10	ug/L				
4699774	Total Calcium (Ca)	2016/10/14	NC	80 - 120	97	80 - 120	<200	ug/L	2.0	20		
4699774	Total Chromium (Cr)	2016/10/14	101	80 - 120	102	80 - 120	<5.0	ug/L				
4699774	Total Cobalt (Co)	2016/10/14	99	80 - 120	101	80 - 120	<0.50	ug/L				
4699774	Total Copper (Cu)	2016/10/14	102	80 - 120	101	80 - 120	<1.0	ug/L				
4699774	Total Iron (Fe)	2016/10/14	102	80 - 120	102	80 - 120	<100	ug/L	1.4	20		
4699774	Total Lead (Pb)	2016/10/14	100	80 - 120	99	80 - 120	<0.50	ug/L				
4699774	Total Magnesium (Mg)	2016/10/14	NC	80 - 120	102	80 - 120	<50	ug/L	1.6	20		
4699774	Total Manganese (Mn)	2016/10/14	NC	80 - 120	97	80 - 120	<2.0	ug/L				
4699774	Total Molybdenum (Mo)	2016/10/14	102	80 - 120	97	80 - 120	<0.50	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
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Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699774	Total Nickel (Ni)	2016/10/14	96	80 - 120	98	80 - 120	<1.0	ug/L				
4699774	Total Phosphorus (P)	2016/10/14	107	80 - 120	96	80 - 120	<100	ug/L				
4699774	Total Potassium (K)	2016/10/14	101	80 - 120	101	80 - 120	<200	ug/L				
4699774	Total Selenium (Se)	2016/10/14	103	80 - 120	102	80 - 120	<2.0	ug/L				
4699774	Total Silicon (Si)	2016/10/14	97	80 - 120	96	80 - 120	<50	ug/L				
4699774	Total Silver (Ag)	2016/10/14	100	80 - 120	98	80 - 120	<0.10	ug/L				
4699774	Total Sodium (Na)	2016/10/14	NC	80 - 120	100	80 - 120	<100	ug/L				
4699774	Total Strontium (Sr)	2016/10/14	NC	80 - 120	97	80 - 120	<1.0	ug/L				
4699774	Total Thallium (Tl)	2016/10/14	101	80 - 120	99	80 - 120	<0.050	ug/L				
4699774	Total Tin (Sn)	2016/10/14	103	80 - 120	100	80 - 120	<1.0	ug/L				
4699774	Total Titanium (Ti)	2016/10/14	100	80 - 120	96	80 - 120	<5.0	ug/L				
4699774	Total Vanadium (V)	2016/10/14	102	80 - 120	101	80 - 120	<0.50	ug/L				
4699774	Total Zinc (Zn)	2016/10/14	98	80 - 120	101	80 - 120	<5.0	ug/L				
4699962	Dissolved Aluminum (Al)	2016/10/17	101	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4699962	Dissolved Antimony (Sb)	2016/10/17	105	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
4699962	Dissolved Arsenic (As)	2016/10/17	104	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
4699962	Dissolved Barium (Ba)	2016/10/17	101	80 - 120	100	80 - 120	<2.0	ug/L	1.4	20		
4699962	Dissolved Beryllium (Be)	2016/10/17	107	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
4699962	Dissolved Bismuth (Bi)	2016/10/17	97	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
4699962	Dissolved Boron (B)	2016/10/17	105	80 - 120	101	80 - 120	<10	ug/L	2.2	20		
4699962	Dissolved Cadmium (Cd)	2016/10/17	104	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
4699962	Dissolved Calcium (Ca)	2016/10/17	NC	80 - 120	93	80 - 120	<200	ug/L	0.12	20		
4699962	Dissolved Chromium (Cr)	2016/10/17	102	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
4699962	Dissolved Cobalt (Co)	2016/10/17	101	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
4699962	Dissolved Copper (Cu)	2016/10/17	101	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
4699962	Dissolved Iron (Fe)	2016/10/17	103	80 - 120	99	80 - 120	<100	ug/L	NC	20		
4699962	Dissolved Lead (Pb)	2016/10/17	98	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
4699962	Dissolved Magnesium (Mg)	2016/10/17	NC	80 - 120	100	80 - 120	<50	ug/L	1.6	20		
4699962	Dissolved Manganese (Mn)	2016/10/17	102	80 - 120	98	80 - 120	<2.0	ug/L	3.4	20		
4699962	Dissolved Molybdenum (Mo)	2016/10/17	107	80 - 120	101	80 - 120	<0.50	ug/L	2.6	20		
4699962	Dissolved Nickel (Ni)	2016/10/17	100	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699962	Dissolved Phosphorus (P)	2016/10/14	111	80 - 120	102	80 - 120	<100	ug/L				
4699962	Dissolved Potassium (K)	2016/10/17	NC	80 - 120	99	80 - 120	<200	ug/L	0.85	20		
4699962	Dissolved Selenium (Se)	2016/10/17	100	80 - 120	95	80 - 120	<2.0	ug/L	NC	20		
4699962	Dissolved Silicon (Si)	2016/10/17	102	80 - 120	95	80 - 120	<50	ug/L	0.20	20		
4699962	Dissolved Silver (Ag)	2016/10/14	88	80 - 120	89	80 - 120	<0.10	ug/L				
4699962	Dissolved Sodium (Na)	2016/10/17	NC	80 - 120	98	80 - 120	<100	ug/L	1.5	20		
4699962	Dissolved Strontium (Sr)	2016/10/17	NC	80 - 120	97	80 - 120	<1.0	ug/L	0.32	20		
4699962	Dissolved Thallium (Tl)	2016/10/14	98	80 - 120	95	80 - 120	<0.050	ug/L				
4699962	Dissolved Tin (Sn)	2016/10/17	106	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
4699962	Dissolved Titanium (Ti)	2016/10/14	104	80 - 120	96	80 - 120	<5.0	ug/L				
4699962	Dissolved Vanadium (V)	2016/10/17	103	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
4699962	Dissolved Zinc (Zn)	2016/10/17	102	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
4699971	Dissolved Aluminum (Al)	2016/10/14	99	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4699971	Dissolved Antimony (Sb)	2016/10/14	107	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
4699971	Dissolved Arsenic (As)	2016/10/14	103	80 - 120	97	80 - 120	<1.0	ug/L	1.0	20		
4699971	Dissolved Barium (Ba)	2016/10/14	103	80 - 120	97	80 - 120	<2.0	ug/L	2.2	20		
4699971	Dissolved Beryllium (Be)	2016/10/14	105	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
4699971	Dissolved Bismuth (Bi)	2016/10/14	95	80 - 120	92	80 - 120	<1.0	ug/L	NC	20		
4699971	Dissolved Boron (B)	2016/10/14	105	80 - 120	101	80 - 120	<10	ug/L	1.0	20		
4699971	Dissolved Cadmium (Cd)	2016/10/14	104	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
4699971	Dissolved Calcium (Ca)	2016/10/14	NC	80 - 120	92	80 - 120	<200	ug/L	1.9	20		
4699971	Dissolved Chromium (Cr)	2016/10/14	100	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4699971	Dissolved Cobalt (Co)	2016/10/14	98	80 - 120	94	80 - 120	<0.50	ug/L	3.0	20		
4699971	Dissolved Copper (Cu)	2016/10/14	102	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
4699971	Dissolved Iron (Fe)	2016/10/14	NC	80 - 120	97	80 - 120	<100	ug/L	0.37	20		
4699971	Dissolved Lead (Pb)	2016/10/14	96	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
4699971	Dissolved Magnesium (Mg)	2016/10/14	NC	80 - 120	96	80 - 120	<50	ug/L	0.38	20		
4699971	Dissolved Manganese (Mn)	2016/10/14	NC	80 - 120	96	80 - 120	<2.0	ug/L	0.12	20		
4699971	Dissolved Molybdenum (Mo)	2016/10/14	107	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
4699971	Dissolved Nickel (Ni)	2016/10/14	98	80 - 120	94	80 - 120	<1.0	ug/L	2.7	20		
4699971	Dissolved Phosphorus (P)	2016/10/14	109	80 - 120	101	80 - 120	<100	ug/L	NC	20		

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4699971	Dissolved Potassium (K)	2016/10/14	102	80 - 120	97	80 - 120	<200	ug/L	0.28	20		
4699971	Dissolved Selenium (Se)	2016/10/14	98	80 - 120	93	80 - 120	<2.0	ug/L	NC	20		
4699971	Dissolved Silicon (Si)	2016/10/14	99	80 - 120	95	80 - 120	<50	ug/L	1.1	20		
4699971	Dissolved Silver (Ag)	2016/10/14	74 (2)	80 - 120	88	80 - 120	<0.10	ug/L	NC	20		
4699971	Dissolved Sodium (Na)	2016/10/14	NC	80 - 120	95	80 - 120	<100	ug/L	0.12	20		
4699971	Dissolved Strontium (Sr)	2016/10/14	NC	80 - 120	95	80 - 120	<1.0	ug/L	1.5	20		
4699971	Dissolved Thallium (Tl)	2016/10/14	97	80 - 120	93	80 - 120	<0.050	ug/L	NC	20		
4699971	Dissolved Tin (Sn)	2016/10/14	105	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4699971	Dissolved Titanium (Ti)	2016/10/14	104	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
4699971	Dissolved Vanadium (V)	2016/10/14	101	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
4699971	Dissolved Zinc (Zn)	2016/10/14	100	80 - 120	94	80 - 120	<5.0	ug/L	NC	20		
4699973	Nitrate (N)	2016/10/17	99	80 - 120	102	80 - 120	<0.10	mg/L	NC	25		
4699973	Nitrite (N)	2016/10/17	103	80 - 120	106	80 - 120	<0.010	mg/L	NC	25		
4699983	Total Ammonia-N	2016/10/17	96	80 - 120	99	85 - 115	<0.050	mg/L	NC	20		
4702097	Total Dissolved Solids	2016/10/14					<10	mg/L	0.90	25	101	90 - 110
4702199	Dissolved Organic Carbon	2016/10/14	97	80 - 120	99	80 - 120	<0.20	mg/L	1.3	20		
4704176	Alkalinity (Total as CaCO3)	2016/10/17			95	85 - 115	<1.0	mg/L	1.1	25		
4704183	pH	2016/10/17			101	98 - 103			0.36	N/A		
4704184	Conductivity	2016/10/17			100	85 - 115	<1.0	umho/cm	0.15	25		

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Maxxam Job #: B6L8150
Report Date: 2016/10/19

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4707310	Dissolved (0.2u) Aluminum (Al)	2016/10/19	101	80 - 120	98	80 - 120	<5	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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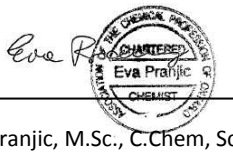
Maxxam Job #: B6L8150
Report Date: 2016/10/19

exp Services Inc
Client Project #: THB-00006189-ME
Site Location: GERALDTON LANDFILL
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name	#17501 exp Services Inc	Company Name		Quotation #:	B57407	Maxxam Job #:	Bottle Order #: 578314
Attention	AHILEAS MITSOPOULOS	Attention	Ahileas Mitsopoulos	P.O. #:			
Address	1142 Roland St	Address		Project	THB-00006189-ME	COC #: C#578314-01-01	Project Manager: Sara Singh
	Thunder Bay ON P7B 5M4			Project Name			
Tel	(807) 623-9495 Fax: (807) 623-8070	Tel	Fax	Site #:	Geraldton Landfill		
Email	thunderbay@exp.com; Karen.Burke@exp.com	Email	ahileas.mitsopoulos@exp.com	Sampled By	Ewan Farkas		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☒ PWQO ☒ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Schedule 5 - GW Comprehensive List	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Volatile Organic Compounds	Additional Dissolved Metals by ICPMS					# of Bottles	Comments
1		MW 1	Oct 5/16	825am	GW	Y	X	X	X	X		X					9	
2		MW 2	Oct 5/16	850am	GW	Y	X	X	X	X		X					9	
3		MW 3A	Oct 5/16	11:20am	GW	Y	X	X	X	X		X					9	
4		MW 3B	Oct 5/16	11:40am	GW	Y	X	X	X	X		X					9	
5		MW 4	Oct 5/16	10:10am	GW	Y	X	X	X	X		X					9	
6		MW 5	Oct 5/16	9:20am	GW	Y	X	X	X	X	X	X					12	
7		MW 6	Oct 5/16	8:00am	GW	Y	X	X	X	X	[illegible]	X					9	11-Oct-16 10:09
8		MW 7	Oct 5/16	10:30am	GW	Y	X	X	X	X	[illegible]	X					9	Sara Singh B6L8150
9		MW 8	Oct 4/16	4:45pm	GW	Y	X	X	X	X		X					9	KP7 ENV-706
10		MW 9	Oct 5/16	7:30am	GW	Y	X	X	X	X	[illegible]	X					9	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
[signature] / Michael Suscyk	06/10/16	2:15pm	[signature] Harwin Grewal	2016/10/11	10:09			REFER TO ACTR	Present		
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

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CHAIN OF CUSTODY RECORD

Page 2 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name	#17501 exp Services Inc	Company Name		Quotation #	B57407	Maxxam Job #:	Bottle Order #:
Attention	AHILEAS MITSOPOULOS	Attention	Ahileas Mitsopoulos	P.O. #			578314
Address	1142 Roland St Thunder Bay ON P7B 5M4	Address		Project	THB-00006189-ME	COC #:	Project Manager:
Tel	(807) 623-9495 Fax (807) 623-8070	Tel	Fax	Project Name		C#578314-02-01	Sara Singh
Email	thunderbay@exp.com; Karen.Burke@exp.com	Email	ahileas.mitsopoulos@exp.com	Site #	Geraldton Landfill		
				Sampled By	ELWIN FARKAS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality: ___ ☒ PWQO ☒ Other ODWS	

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Schedule 5 - GW Comprehensive List	Organic Nitrogen	Orthophosphate	Hardness (calculated as CaCO3)	Volatile Organic Compounds	Additional Dissolved Metals by ICPMS				# of Bottles	Comments
1		MW10A	Oct 4/16	3:40 PM	GW	Y	X	X	X	X		X				9	
2		MW10B	Oct 4/16	4:00 PM	GW	Y	X	X	X	X		X				9	
3		MW11	Oct 4/16	6:30 PM	GW	Y	X	X	X	X		X				9	
4		MW12	Oct 5/16	12:30 PM	GW	Y	X	X	X	X		X				9	
5					GW												
6					GW												
7					GW												
8					GW												
9					GW												
10					GW												

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
MICHAEL SUSZYK	16/10/06	2:15pm	ELWIN HARWIN GRENNAL	2016/10/11	10:09		Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
								REFER TO AIR BILL	Present		
									Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B57407	Maxxam Job #:	Bottle Order #: 578292
Attention:	AHILEAS MITSOPOULOS	Attention:	Ahileas Mitsopoulos	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-ME		
				Project Name:		COC #:	Project Manager:
Tel:	(807) 623-9495 Fax (807) 623-8070	Tel:	Fax:	Site #:	Geraldton Landfill	C#578292-01-01	Sara Singh
Email:	thunderbay@exp.com; Karen.Burke@exp.com	Email:	ahileas.mitsopoulos@exp.com	Sampled By:	ELWIN FARKAS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Schedule 5 - SW Comprehensive List	Dissolved Organic Carbon (DOC)	Organic Nitrogen	Hardness (calculated as CaCO3)	Dissolved Aluminum by ICPMS	Additional Total Metals	Ca, Mg, K, Na by ICPMS			# of Bottles	Comments
1		SW 1	Oct4/16	3:00Pm	SW	Y	X	X	X	X	X	X	X			10	
2		SW 2	Oct4/16	2:30Pm	SW	Y	X	X	X	X	X	X	X			10	
3		SW 3	Oct4/16	2:00Pm	SW	Y	X	X	X	X	X	X	X			10	
4					SW												
5					SW												
6					SW												
7					SW												
8					SW												
9					SW												
10					SW												

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
MICHAEL SOLEK.	16/10/06	2:15Pm	HARWIN GREWAL	2016/10/11	10:09	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
	REFER TO MCTR	Present		
		Intact		

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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Maxxam
A Bureau Veritas Group Company

Your Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Your C.O.C. #: 608158-01-01

Attention:Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2017/05/29
Report #: R4490734
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A3684
Received: 2017/05/20, 09:50

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2017/05/29	CAM SOP-00447	EPA 6020B m
Alkalinity	7	N/A	2017/05/24	CAM SOP-00448	SM 22 2320 B m
Alkalinity	10	N/A	2017/05/25	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	3	2017/05/20	2017/05/25	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	12	N/A	2017/05/24	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	5	N/A	2017/05/26	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	17	N/A	2017/05/25	CAM SOP-00416	SM 22 5220 D m
Conductivity	7	N/A	2017/05/24	CAM SOP-00414	SM 22 2510 m
Conductivity	10	N/A	2017/05/25	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	17	N/A	2017/05/24	CAM SOP-00446	SM 22 5310 B m
Hardness (calculated as CaCO3)	2	N/A	2017/05/24	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	4	N/A	2017/05/25	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	10	N/A	2017/05/26	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	1	N/A	2017/05/29	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	14	2017/05/25	2017/05/25	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	3	2017/05/25	2017/05/26	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	4	N/A	2017/05/25	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	10	N/A	2017/05/26	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2017/05/25	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	17	N/A	2017/05/27	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	16	N/A	2017/05/25	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	1	N/A	2017/05/26	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Organic Nitrogen	17	N/A	2017/05/28		
pH	7	N/A	2017/05/24	CAM SOP-00413	SM 4500H+ B m
pH	10	N/A	2017/05/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	11	N/A	2017/05/25	CAM SOP-00444	OMOE E3179 m

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Your Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Your C.O.C. #: 608158-01-01

Attention:Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2017/05/29
Report #: R4490734
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A3684
Received: 2017/05/20, 09:50

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Phenols (4AAP)	6	N/A	2017/05/26	CAM SOP-00444	OMOE E3179 m
Orthophosphate	11	N/A	2017/05/24	CAM SOP-00461	EPA 365.1 m
Orthophosphate	3	N/A	2017/05/25	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	12	N/A	2017/05/24	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	5	N/A	2017/05/25	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	15	2017/05/23	2017/05/24	CAM SOP-00428	SM 22 2540C m
Total Dissolved Solids	1	2017/05/24	2017/05/24	CAM SOP-00428	SM 22 2540C m
Total Dissolved Solids	1	2017/05/25	2017/05/25	CAM SOP-00428	SM 22 2540C m
Total Kjeldahl Nitrogen in Water	12	2017/05/25	2017/05/26	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	5	2017/05/25	2017/05/28	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2017/05/25	2017/05/25	CAM SOP-00407	SM 22 4500 P B H m
Total Phosphorus (Colourimetric)	14	2017/05/25	2017/05/26	CAM SOP-00407	SM 22 4500 P B H m
Low Level Total Suspended Solids	1	2017/05/23	2017/05/23	CAM SOP-00428	SM 22 2540D m
Low Level Total Suspended Solids	2	2017/05/23	2017/05/24	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Your Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Your C.O.C. #: 608158-01-01

Attention:Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2017/05/29
Report #: R4490734
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A3684
Received: 2017/05/20, 09:50

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM853	EKM853		EKM854	EKM854		
Sampling Date		2017/05/17 15:45	2017/05/17 15:45		2017/05/17 16:30	2017/05/17 16:30		
COC Number		608158-01-01	608158-01-01		608158-01-01	608158-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**QC Batch**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.35	0.35	4998461	0.25		0.050	4998461
Total Chemical Oxygen Demand (COD)	mg/L	14		4998395	17		4.0	4998395
Conductivity	umho/cm	760		4995473	490		1.0	4995473
Total Dissolved Solids	mg/L	432		4994865	242		10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	0.57		4998433	0.36	0.40	0.10	4998433
Dissolved Organic Carbon	mg/L	4.3		4996759	4.7		0.20	4996759
pH	pH	7.72		4995483	7.98			4995483
Phenols-4AAP	mg/L	<0.0010		4998998	<0.0010		0.0010	5000502
Total Phosphorus	mg/L	0.036		4998290	0.027		0.020	4998290
Dissolved Sulphate (SO4)	mg/L	8.8		4995449	<1.0		1.0	4995449
Alkalinity (Total as CaCO3)	mg/L	390		4995472	250		1.0	4995472
Dissolved Chloride (Cl)	mg/L	7.8		4995444	4.6		1.0	4995444
Nitrite (N)	mg/L	0.027		4995471	<0.010		0.010	4995471
Nitrate (N)	mg/L	0.12		4995471	<0.10		0.10	4995471
Metals								
Mercury (Hg)	mg/L	<0.0001		4998114	<0.0001		0.0001	4998114
Dissolved Aluminum (Al)	ug/L	<5.0		4997059	10		5.0	4997059
Dissolved Antimony (Sb)	ug/L	<0.50		4997059	<0.50		0.50	4997059
Dissolved Arsenic (As)	ug/L	5.1		4997059	2.6		1.0	4997059
Dissolved Barium (Ba)	ug/L	41		4997059	16		2.0	4997059
Dissolved Beryllium (Be)	ug/L	<0.50		4997059	<0.50		0.50	4997059
Dissolved Bismuth (Bi)	ug/L	<1.0		4997059	<1.0		1.0	4997059
Dissolved Boron (B)	ug/L	68		4997059	33		10	4997059
Dissolved Cadmium (Cd)	ug/L	<0.10		4997059	<0.10		0.10	4997059
Dissolved Calcium (Ca)	ug/L	130000		4997059	80000		200	4997059
Dissolved Chromium (Cr)	ug/L	<5.0		4997059	<5.0		5.0	4997059
Dissolved Cobalt (Co)	ug/L	3.8		4997059	2.5		0.50	4997059
Dissolved Copper (Cu)	ug/L	1.7		4997059	3.0		1.0	4997059
Dissolved Iron (Fe)	ug/L	1900		4997059	130		100	4997059
Dissolved Lead (Pb)	ug/L	<0.50		4997059	<0.50		0.50	4997059
Dissolved Magnesium (Mg)	ug/L	12000		4997059	9400		50	4997059
Dissolved Manganese (Mn)	ug/L	610		4997059	1700		2.0	4997059

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM853	EKM853		EKM854	EKM854		
Sampling Date		2017/05/17 15:45	2017/05/17 15:45		2017/05/17 16:30	2017/05/17 16:30		
COC Number		608158-01-01	608158-01-01		608158-01-01	608158-01-01		
	UNITS	**MW1**	**MW1 Lab-Dup**	**QC Batch**	**MW2**	**MW2 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		4997059	0.53		0.50	4997059
Dissolved Nickel (Ni)	ug/L	2.2		4997059	2.6		1.0	4997059
Dissolved Potassium (K)	ug/L	4200		4997059	1400		200	4997059
Dissolved Selenium (Se)	ug/L	<2.0		4997059	<2.0		2.0	4997059
Dissolved Silicon (Si)	ug/L	5000		4997059	4600		50	4997059
Dissolved Sodium (Na)	ug/L	8400		4997059	4500		100	4997059
Dissolved Strontium (Sr)	ug/L	130		4997059	63		1.0	4997059
Dissolved Thallium (Tl)	ug/L	0.19		4997059	0.079		0.050	4997059
Dissolved Tin (Sn)	ug/L	<1.0		4997059	<1.0		1.0	4997059
Dissolved Vanadium (V)	ug/L	<0.50		4997059	0.83		0.50	4997059
Dissolved Zinc (Zn)	ug/L	<5.0		4997059	<5.0		5.0	4997059

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM855	EKM855			EKM856		
Sampling Date		2017/05/17 09:20	2017/05/17 09:20			2017/05/17 10:00		
COC Number		608158-01-01	608158-01-01			608158-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	9.1		0.25	4998461	7.0	0.25	4998461
Total Chemical Oxygen Demand (COD)	mg/L	25		4.0	4998395	28	4.0	4998395
Conductivity	umho/cm	1300		1.0	4995473	1300	1.0	4995473
Total Dissolved Solids	mg/L	708		10	4994865	648	10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	9.5		0.50	4998433	8.0	0.20	4998433
Dissolved Organic Carbon	mg/L	6.4		0.20	4996759	8.2	0.20	4996759
pH	pH	7.68			4995483	7.63		4995483
Phenols-4AAP	mg/L	<0.0010		0.0010	4998998	<0.0010	0.0010	5000502
Total Phosphorus	mg/L	0.040		0.020	4998290	0.086	0.020	4998290
Dissolved Sulphate (SO4)	mg/L	16		1.0	4995449	21	1.0	4995449
Alkalinity (Total as CaCO3)	mg/L	480		1.0	4995472	530	1.0	4995472
Dissolved Chloride (Cl)	mg/L	130		1.0	4995444	81	1.0	4995444
Nitrite (N)	mg/L	<0.010		0.010	4995471	<0.010	0.010	4995471
Nitrate (N)	mg/L	<0.10		0.10	4995471	0.22	0.10	4995471
Metals								
Mercury (Hg)	mg/L	<0.0001		0.0001	4998326	<0.0001	0.0001	4998114
Dissolved Aluminum (Al)	ug/L	6.1	<5.0	5.0	4997059	<5.0	5.0	4996897
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Arsenic (As)	ug/L	17	17	1.0	4997059	4.4	1.0	4996897
Dissolved Barium (Ba)	ug/L	150	150	2.0	4997059	130	2.0	4996897
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0	1.0	4997059	<1.0	1.0	4996897
Dissolved Boron (B)	ug/L	220	220	10	4997059	300	10	4996897
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	0.10	4997059	<0.10	0.10	4996897
Dissolved Calcium (Ca)	ug/L	140000	140000	200	4997059	160000	200	4996897
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	5.0	4997059	<5.0	5.0	4996897
Dissolved Cobalt (Co)	ug/L	5.7	5.4	0.50	4997059	9.4	0.50	4996897
Dissolved Copper (Cu)	ug/L	<1.0	<1.0	1.0	4997059	3.1	1.0	4996897
Dissolved Iron (Fe)	ug/L	15000	15000	100	4997059	3800	100	4996897
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Magnesium (Mg)	ug/L	24000	24000	50	4997059	27000	50	4996897
Dissolved Manganese (Mn)	ug/L	1200	1200	2.0	4997059	1300	2.0	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM855	EKM855			EKM856		
Sampling Date		2017/05/17 09:20	2017/05/17 09:20			2017/05/17 10:00		
COC Number		608158-01-01	608158-01-01			608158-01-01		
	UNITS	**MW3A**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	<0.50	0.50	4997059	0.54	0.50	4996897
Dissolved Nickel (Ni)	ug/L	4.3	3.8	1.0	4997059	8.5	1.0	4996897
Dissolved Potassium (K)	ug/L	13000	13000	200	4997059	15000	200	4996897
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	2.0	4997059	<2.0	2.0	4996897
Dissolved Silicon (Si)	ug/L	7200	7200	50	4997059	7200	50	4996897
Dissolved Sodium (Na)	ug/L	68000	68000	100	4997059	46000	100	4996897
Dissolved Strontium (Sr)	ug/L	240	240	1.0	4997059	280	1.0	4996897
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	0.050	4997059	0.065	0.050	4996897
Dissolved Tin (Sn)	ug/L	<1.0	<1.0	1.0	4997059	<1.0	1.0	4996897
Dissolved Vanadium (V)	ug/L	<0.50	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	4997059	<5.0	5.0	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM857	EKM857		EKM858		EKM859		
Sampling Date		2017/05/17 12:50	2017/05/17 12:50		2017/05/17 17:00		2017/05/17 15:00		
COC Number		608158-01-01	608158-01-01		608158-01-01		608158-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**QC Batch**	**MW5**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050		4998461	3.0	4998461	<0.050	0.050	4998461
Total Chemical Oxygen Demand (COD)	mg/L	<4.0		4998395	17	4998395	21	4.0	4998395
Conductivity	umho/cm	770	780	4995445	990	4995473	610	1.0	4995445
Total Dissolved Solids	mg/L	428		4994865	546	4994865	306	10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	0.15		4998433	3.5	4998433	0.18	0.10	4998433
Dissolved Organic Carbon	mg/L	1.7		4996759	4.0	4996759	4.3	0.20	4996759
pH	pH	7.62	7.61	4995446	7.74	4995483	7.99		4995446
Phenols-4AAP	mg/L	<0.0010		4998998	<0.0010	4998998	<0.0010	0.0010	4998998
Total Phosphorus	mg/L	0.13		4998290	0.14	4998290	0.053	0.020	4998290
Dissolved Sulphate (SO4)	mg/L	24		4997516	81	4995449	22	1.0	4995449
Alkalinity (Total as CaCO3)	mg/L	380	380	4995443	400	4995472	300	1.0	4995443
Dissolved Chloride (Cl)	mg/L	11		4997510	29	4995444	1.4	1.0	4995444
Nitrite (N)	mg/L	<0.010	<0.010	4995471	<0.010	4995471	<0.010	0.010	4995471
Nitrate (N)	mg/L	<0.10	<0.10	4995471	<0.10	4995471	0.66	0.10	4995471
Metals									
Mercury (Hg)	mg/L	<0.0001		4998326	<0.0001	4997957	<0.0001	0.0001	4998114
Dissolved Aluminum (Al)	ug/L	<5.0		4997059	<5.0	4997103	<5.0	5.0	4997059
Dissolved Antimony (Sb)	ug/L	<0.50		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Arsenic (As)	ug/L	<1.0		4997059	2.6	4997103	<1.0	1.0	4997059
Dissolved Barium (Ba)	ug/L	33		4997059	110	4997103	17	2.0	4997059
Dissolved Beryllium (Be)	ug/L	<0.50		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Bismuth (Bi)	ug/L	<1.0		4997059	<1.0	4997103	<1.0	1.0	4997059
Dissolved Boron (B)	ug/L	57		4997059	510	4997103	17	10	4997059
Dissolved Cadmium (Cd)	ug/L	<0.10		4997059	<0.10	4997103	<0.10	0.10	4997059
Dissolved Calcium (Ca)	ug/L	140000		4997059	100000	4997103	96000	200	4997059
Dissolved Chromium (Cr)	ug/L	<5.0		4997059	<5.0	4997103	<5.0	5.0	4997059
Dissolved Cobalt (Co)	ug/L	2.2		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Copper (Cu)	ug/L	<1.0		4997059	<1.0	4997103	1.7	1.0	4997059
Dissolved Iron (Fe)	ug/L	<100		4997059	6500	4997103	<100	100	4997059
Dissolved Lead (Pb)	ug/L	<0.50		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Magnesium (Mg)	ug/L	14000		4997059	38000	4997103	18000	50	4997059
Dissolved Manganese (Mn)	ug/L	390		4997059	700	4997103	<2.0	2.0	4997059

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM857	EKM857		EKM858		EKM859		
Sampling Date		2017/05/17 12:50	2017/05/17 12:50		2017/05/17 17:00		2017/05/17 15:00		
COC Number		608158-01-01	608158-01-01		608158-01-01		608158-01-01		
	UNITS	**MW4**	**MW4 Lab-Dup**	**QC Batch**	**MW5**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Nickel (Ni)	ug/L	3.9		4997059	2.4	4997103	<1.0	1.0	4997059
Dissolved Potassium (K)	ug/L	1600		4997059	17000	4997103	1300	200	4997059
Dissolved Selenium (Se)	ug/L	<2.0		4997059	<2.0	4997103	<2.0	2.0	4997059
Dissolved Silicon (Si)	ug/L	4800		4997059	5300	4997103	5200	50	4997059
Dissolved Sodium (Na)	ug/L	7000		4997059	28000	4997103	10000	100	4997059
Dissolved Strontium (Sr)	ug/L	110		4997059	240	4997103	88	1.0	4997059
Dissolved Thallium (Tl)	ug/L	0.11		4997059	<0.050	4997103	<0.050	0.050	4997059
Dissolved Tin (Sn)	ug/L	<1.0		4997059	<1.0	4997103	<1.0	1.0	4997059
Dissolved Vanadium (V)	ug/L	<0.50		4997059	<0.50	4997103	<0.50	0.50	4997059
Dissolved Zinc (Zn)	ug/L	<5.0		4997059	<5.0	4997103	<5.0	5.0	4997059

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM860			EKM861		
Sampling Date		2017/05/17 11:30			2017/05/16 14:15		
COC Number		608158-01-01			608158-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	7.3	0.25	4998461	<0.050	0.050	4998461
Total Chemical Oxygen Demand (COD)	mg/L	26	4.0	4998395	15	4.0	4998395
Conductivity	umho/cm	1100	1.0	4995445	3900	1.0	4995445
Total Dissolved Solids	mg/L	568	10	4994865	2060	10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	8.3	0.20	4998433	0.46	0.10	4998433
Dissolved Organic Carbon	mg/L	5.8	0.20	4996759	2.3	0.20	4996759
pH	pH	7.46		4995446	7.96		4995446
Phenols-4AAP	mg/L	<0.0010	0.0010	4998998	<0.0010	0.0010	5000502
Total Phosphorus	mg/L	0.073	0.020	4998290	2.6	0.10	4998290
Dissolved Sulphate (SO4)	mg/L	26	1.0	4995449	22	1.0	4995449
Alkalinity (Total as CaCO3)	mg/L	520	1.0	4995443	340	1.0	4995443
Dissolved Chloride (Cl)	mg/L	27	1.0	4995444	950	10	4995444
Nitrite (N)	mg/L	<0.010	0.010	4995471	<0.010	0.010	4995471
Nitrate (N)	mg/L	<0.10	0.10	4995471	1.19	0.10	4995471
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	4998114	<0.0001	0.0001	4998114
Dissolved Aluminum (Al)	ug/L	7.5	5.0	4997059	<5.0	5.0	4996897
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Arsenic (As)	ug/L	43	1.0	4997059	<1.0	1.0	4996897
Dissolved Barium (Ba)	ug/L	220	2.0	4997059	60	2.0	4996897
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	4997059	<1.0	1.0	4996897
Dissolved Boron (B)	ug/L	150	10	4997059	11	10	4996897
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	4997059	<0.10	0.10	4996897
Dissolved Calcium (Ca)	ug/L	150000	200	4997059	150000	200	4996897
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	4997059	<5.0	5.0	4996897
Dissolved Cobalt (Co)	ug/L	16	0.50	4997059	<0.50	0.50	4996897
Dissolved Copper (Cu)	ug/L	<1.0	1.0	4997059	1.4	1.0	4996897
Dissolved Iron (Fe)	ug/L	26000	100	4997059	<100	100	4996897
Dissolved Lead (Pb)	ug/L	<0.50	0.50	4997059	<0.50	0.50	4996897
Dissolved Magnesium (Mg)	ug/L	23000	50	4997059	12000	50	4996897
Dissolved Manganese (Mn)	ug/L	2100	2.0	4997059	<2.0	2.0	4996897
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	4997059	<0.50	0.50	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM860			EKM861		
Sampling Date		2017/05/17 11:30			2017/05/16 14:15		
COC Number		608158-01-01			608158-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	10	1.0	4997059	<1.0	1.0	4996897
Dissolved Potassium (K)	ug/L	11000	200	4997059	2700	200	4996897
Dissolved Selenium (Se)	ug/L	<2.0	2.0	4997059	<2.0	2.0	4996897
Dissolved Silicon (Si)	ug/L	10000	50	4997059	2700	50	4996897
Dissolved Sodium (Na)	ug/L	22000	100	4997059	600000	100	4996897
Dissolved Strontium (Sr)	ug/L	230	1.0	4997059	180	1.0	4996897
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	4997059	<0.050	0.050	4996897
Dissolved Tin (Sn)	ug/L	<1.0	1.0	4997059	<1.0	1.0	4996897
Dissolved Vanadium (V)	ug/L	1.0	0.50	4997059	<0.50	0.50	4996897
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	4997059	<5.0	5.0	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM862		EKM863			EKM864		
Sampling Date		2017/05/17 14:35		2017/05/17 13:55			2017/05/17 14:15		
COC Number		608158-01-01		608158-01-01			608158-01-01		
	UNITS	**MW9**	**RDL**	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050	0.050	0.34	0.050	4998461	0.16	0.050	4998461
Total Chemical Oxygen Demand (COD)	mg/L	5.1	4.0	35	4.0	4998395	50	4.0	4998395
Conductivity	umho/cm	1100	1.0	800	1.0	4995445	1300	1.0	4995445
Total Dissolved Solids	mg/L	836	10	480	10	4994865	828	10	4998851
Total Kjeldahl Nitrogen (TKN)	mg/L	0.40	0.10	0.75	0.10	4998433	0.68	0.10	4998433
Dissolved Organic Carbon	mg/L	1.1	0.20	12	0.20	4996759	16	0.20	4996759
pH	pH	8.01		7.52		4995446	7.55		4995446
Phenols-4AAP	mg/L	<0.0010	0.0010	<0.0010	0.0010	4998998	<0.0010	0.0010	4998998
Total Phosphorus	mg/L	0.60	0.020	0.55	0.020	4998290	0.11	0.020	4998290
Dissolved Sulphate (SO4)	mg/L	2.5	1.0	10	1.0	4995449	<1.0	1.0	4995449
Alkalinity (Total as CaCO3)	mg/L	220	1.0	300	1.0	4995443	300	1.0	4995443
Dissolved Chloride (Cl)	mg/L	190	2.0	68	1.0	4995444	180	2.0	4995444
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	4995471	<0.010	0.010	4995471
Nitrate (N)	mg/L	0.14	0.10	<0.10	0.10	4995471	<0.10	0.10	4995471
Metals									
Mercury (Hg)	mg/L	<0.0001	0.0001	<0.0001	0.0001	4998114	<0.0001	0.0001	4998114
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	85	5.0	4997059	68	5.0	4997059
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	4997059	<0.50	0.50	4997059
Dissolved Arsenic (As)	ug/L	<1.0	1.0	16	1.0	4997059	32	1.0	4997059
Dissolved Barium (Ba)	ug/L	32	2.0	27	2.0	4997059	26	2.0	4997059
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	4997059	<0.50	0.50	4997059
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	<1.0	1.0	4997059	<1.0	1.0	4997059
Dissolved Boron (B)	ug/L	11	10	<10	10	4997059	<10	10	4997059
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	0.10	4997059	<0.10	0.10	4997059
Dissolved Calcium (Ca)	ug/L	130000	200	97000	200	4997059	130000	200	4997059
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	4997059	<5.0	5.0	4997059
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	<0.50	0.50	4997059	<0.50	0.50	4997059
Dissolved Copper (Cu)	ug/L	1.1	1.0	<1.0	1.0	4997059	<1.0	1.0	4997059
Dissolved Iron (Fe)	ug/L	<100	100	2000	100	4997059	4300	100	4997059
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	4997059	<0.50	0.50	4997059
Dissolved Magnesium (Mg)	ug/L	24000	50	18000	50	4997059	12000	50	4997059
Dissolved Manganese (Mn)	ug/L	3.4	2.0	83	2.0	4997059	130	2.0	4997059
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	<0.50	0.50	4997059	<0.50	0.50	4997059

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM862		EKM863			EKM864		
Sampling Date		2017/05/17 14:35		2017/05/17 13:55			2017/05/17 14:15		
COC Number		608158-01-01		608158-01-01			608158-01-01		
	UNITS	**MW9**	**RDL**	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	1.3	1.0	1.2	1.0	4997059	<1.0	1.0	4997059
Dissolved Potassium (K)	ug/L	2400	200	300	200	4997059	200	200	4997059
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	4997059	<2.0	2.0	4997059
Dissolved Silicon (Si)	ug/L	4800	50	2900	50	4997059	1700	50	4997059
Dissolved Sodium (Na)	ug/L	39000	100	33000	100	4997059	97000	100	4997059
Dissolved Strontium (Sr)	ug/L	110	1.0	83	1.0	4997059	100	1.0	4997059
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	4997059	<0.050	0.050	4997059
Dissolved Tin (Sn)	ug/L	<1.0	1.0	<1.0	1.0	4997059	<1.0	1.0	4997059
Dissolved Vanadium (V)	ug/L	<0.50	0.50	2.0	0.50	4997059	0.83	0.50	4997059
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	4997059	<5.0	5.0	4997059

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QC Batch = Quality Control Batch

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM865	EKM865		EKM866	EKM866		
Sampling Date		2017/05/17 11:30	2017/05/17 11:30		2017/05/17 08:15	2017/05/17 08:15		
COC Number		608158-01-01	608158-01-01		608158-01-01	608158-01-01		
	UNITS	**MW11**	**MW11 Lab-Dup**	**RDL**	**MW12**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.096		0.050	8.8		0.25	4998461
Total Chemical Oxygen Demand (COD)	mg/L	6.9		4.0	26		4.0	4998395
Conductivity	umho/cm	490		1.0	1300		1.0	4995445
Total Dissolved Solids	mg/L	238		10	688		10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	0.75		0.50	9.5		0.50	4998433
Dissolved Organic Carbon	mg/L	1.3	1.3	0.20	6.4		0.20	4996759
pH	pH	8.04			7.64			4995446
Phenols-4AAP	mg/L	<0.0010		0.0010	<0.0010		0.0010	5000502
Total Phosphorus	mg/L	0.54		0.020	0.036		0.020	4998290
Dissolved Sulphate (SO4)	mg/L	<1.0		1.0	17	18	1.0	4997516
Alkalinity (Total as CaCO3)	mg/L	260		1.0	480		1.0	4995443
Dissolved Chloride (Cl)	mg/L	1.0		1.0	130	130	1.0	4997510
Nitrite (N)	mg/L	<0.010		0.010	<0.010		0.010	4995471
Nitrate (N)	mg/L	<0.10		0.10	<0.10		0.10	4995471
Metals								
Mercury (Hg)	mg/L	<0.0001	<0.0001	0.0001	<0.0001		0.0001	4998114
Dissolved Aluminum (Al)	ug/L	<5.0		5.0	<5.0		5.0	4996897
Dissolved Antimony (Sb)	ug/L	<0.50		0.50	<0.50		0.50	4996897
Dissolved Arsenic (As)	ug/L	<1.0		1.0	17		1.0	4996897
Dissolved Barium (Ba)	ug/L	26		2.0	150		2.0	4996897
Dissolved Beryllium (Be)	ug/L	<0.50		0.50	<0.50		0.50	4996897
Dissolved Bismuth (Bi)	ug/L	<1.0		1.0	<1.0		1.0	4996897
Dissolved Boron (B)	ug/L	12		10	230		10	4996897
Dissolved Cadmium (Cd)	ug/L	<0.10		0.10	<0.10		0.10	4996897
Dissolved Calcium (Ca)	ug/L	71000		200	150000		200	4996897
Dissolved Chromium (Cr)	ug/L	<5.0		5.0	<5.0		5.0	4996897
Dissolved Cobalt (Co)	ug/L	<0.50		0.50	5.6		0.50	4996897
Dissolved Copper (Cu)	ug/L	<1.0		1.0	<1.0		1.0	4996897
Dissolved Iron (Fe)	ug/L	<100		100	16000		100	4996897
Dissolved Lead (Pb)	ug/L	<0.50		0.50	<0.50		0.50	4996897
Dissolved Magnesium (Mg)	ug/L	15000		50	25000		50	4996897
Dissolved Manganese (Mn)	ug/L	94		2.0	1200		2.0	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		EKM865	EKM865		EKM866	EKM866		
Sampling Date		2017/05/17 11:30	2017/05/17 11:30		2017/05/17 08:15	2017/05/17 08:15		
COC Number		608158-01-01	608158-01-01		608158-01-01	608158-01-01		
	UNITS	**MW11**	**MW11 Lab-Dup**	**RDL**	**MW12**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.1		0.50	<0.50		0.50	4996897
Dissolved Nickel (Ni)	ug/L	<1.0		1.0	4.8		1.0	4996897
Dissolved Potassium (K)	ug/L	940		200	13000		200	4996897
Dissolved Selenium (Se)	ug/L	<2.0		2.0	<2.0		2.0	4996897
Dissolved Silicon (Si)	ug/L	6700		50	7600		50	4996897
Dissolved Sodium (Na)	ug/L	6800		100	71000		100	4996897
Dissolved Strontium (Sr)	ug/L	84		1.0	240		1.0	4996897
Dissolved Thallium (Tl)	ug/L	<0.050		0.050	<0.050		0.050	4996897
Dissolved Tin (Sn)	ug/L	<1.0		1.0	<1.0		1.0	4996897
Dissolved Vanadium (V)	ug/L	<0.50		0.50	0.55		0.50	4996897
Dissolved Zinc (Zn)	ug/L	<5.0		5.0	<5.0		5.0	4996897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		EKM867			EKM868	EKM868		
Sampling Date		2017/05/16 15:00			2017/05/16 15:30	2017/05/16 15:30		
COC Number		608158-01-01			608158-01-01	608158-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW2**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	<0.050	0.050	4998461	<0.050		0.050	4998461
Total BOD	mg/L	2.0	2.0	4993359	<2.0		2.0	4993359
Total Chemical Oxygen Demand (COD)	mg/L	30	4.0	4998395	35		4.0	4998395
Conductivity	umho/cm	330	1.0	4995473	210		1.0	4995473
Total Dissolved Solids	mg/L	154	10	4994865	124	128	10	4994865
Total Kjeldahl Nitrogen (TKN)	mg/L	0.39	0.10	4998433	0.32		0.10	4998433
pH	pH	7.86		4995483	7.82			4995483
Phenols-4AAP	mg/L	<0.0010	0.0010	4998998	<0.0010	<0.0010	0.0010	4998998
Total Phosphorus	mg/L	0.094	0.008	4997975	0.014		0.004	4997975
Total Suspended Solids	mg/L	63	1	4994712	3		1	4994712
Dissolved Sulphate (SO4)	mg/L	13	1.0	4997516	<1.0		1.0	4995498
Alkalinity (Total as CaCO3)	mg/L	97	1.0	4995472	68		1.0	4995472
Dissolved Chloride (Cl)	mg/L	36	1.0	4997510	18		1.0	4995494
Nitrite (N)	mg/L	<0.010	0.010	4995471	<0.010		0.010	4994918
Nitrate (N)	mg/L	<0.10	0.10	4995471	<0.10		0.10	4994918
Metals								
Mercury (Hg)	mg/L	<0.0001	0.0001	4998114	<0.0001		0.0001	4998326
Total Antimony (Sb)	ug/L	<0.50	0.50	4998006	<0.50		0.50	4998006
Total Arsenic (As)	ug/L	48	1.0	4998006	16		1.0	4998006
Total Barium (Ba)	ug/L	19	2.0	4998006	6.9		2.0	4998006
Total Beryllium (Be)	ug/L	<0.50	0.50	4998006	<0.50		0.50	4998006
Total Bismuth (Bi)	ug/L	<1.0	1.0	4998006	<1.0		1.0	4998006
Total Boron (B)	ug/L	16	10	4998006	<10		10	4998006
Total Cadmium (Cd)	ug/L	<0.10	0.10	4998006	<0.10		0.10	4998006
Total Calcium (Ca)	ug/L	38000	200	4998006	28000		200	4998006
Total Chromium (Cr)	ug/L	<5.0	5.0	4998006	<5.0		5.0	4998006
Total Cobalt (Co)	ug/L	0.60	0.50	4998006	<0.50		0.50	4998006
Total Copper (Cu)	ug/L	5.0	1.0	4998006	1.7		1.0	4998006
Total Iron (Fe)	ug/L	2500	100	4998006	210		100	4998006
Total Lead (Pb)	ug/L	0.90	0.50	4998006	<0.50		0.50	4998006
Total Magnesium (Mg)	ug/L	7400	50	4998006	5600		50	4998006
Total Manganese (Mn)	ug/L	150	2.0	4998006	58		2.0	4998006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		EKM867			EKM868	EKM868		
Sampling Date		2017/05/16 15:00			2017/05/16 15:30	2017/05/16 15:30		
COC Number		608158-01-01			608158-01-01	608158-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW2**	**SW2 Lab-Dup**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50	0.50	4998006	<0.50		0.50	4998006
Total Nickel (Ni)	ug/L	2.3	1.0	4998006	<1.0		1.0	4998006
Total Potassium (K)	ug/L	810	200	4998006	600		200	4998006
Total Selenium (Se)	ug/L	<2.0	2.0	4998006	<2.0		2.0	4998006
Total Silicon (Si)	ug/L	2300	50	4998006	1500		50	4998006
Total Silver (Ag)	ug/L	<0.10	0.10	4998006	<0.10		0.10	4998006
Total Sodium (Na)	ug/L	27000	100	4998006	12000		100	4998006
Total Strontium (Sr)	ug/L	54	1.0	4998006	38		1.0	4998006
Total Thallium (Tl)	ug/L	<0.050	0.050	4998006	<0.050		0.050	4998006
Total Titanium (Ti)	ug/L	15	5.0	4998006	<5.0		5.0	4998006
Total Vanadium (V)	ug/L	1.6	0.50	4998006	<0.50		0.50	4998006
Total Zinc (Zn)	ug/L	7.6	5.0	4998006	<5.0		5.0	4998006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		EKM869	EKM869		
Sampling Date		2017/05/16 09:15	2017/05/16 09:15		
COC Number		608158-01-01	608158-01-01		
	UNITS	**SW3**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics					
Total Ammonia-N	mg/L	<0.050		0.050	4998461
Total BOD	mg/L	2.0		2.0	4993359
Total Chemical Oxygen Demand (COD)	mg/L	32	31	4.0	4998395
Conductivity	umho/cm	170		1.0	4995445
Total Dissolved Solids	mg/L	162		10	4996295
Total Kjeldahl Nitrogen (TKN)	mg/L	0.32		0.10	4998433
pH	pH	7.78			4995446
Phenols-4AAP	mg/L	<0.0010		0.0010	5000502
Total Phosphorus	mg/L	0.014		0.004	4997975
Total Suspended Solids	mg/L	2		2	4994745
Dissolved Sulphate (SO4)	mg/L	<1.0		1.0	4997516
Alkalinity (Total as CaCO3)	mg/L	58		1.0	4995443
Dissolved Chloride (Cl)	mg/L	12		1.0	4997510
Nitrite (N)	mg/L	<0.010		0.010	4995469
Nitrate (N)	mg/L	<0.10		0.10	4995469
Metals					
Mercury (Hg)	mg/L	<0.0001		0.0001	4998114
Total Antimony (Sb)	ug/L	<0.50		0.50	4998006
Total Arsenic (As)	ug/L	17		1.0	4998006
Total Barium (Ba)	ug/L	4.7		2.0	4998006
Total Beryllium (Be)	ug/L	<0.50		0.50	4998006
Total Bismuth (Bi)	ug/L	<1.0		1.0	4998006
Total Boron (B)	ug/L	<10		10	4998006
Total Cadmium (Cd)	ug/L	<0.10		0.10	4998006
Total Calcium (Ca)	ug/L	21000		200	4998006
Total Chromium (Cr)	ug/L	<5.0		5.0	4998006
Total Cobalt (Co)	ug/L	<0.50		0.50	4998006
Total Copper (Cu)	ug/L	1.5		1.0	4998006
Total Iron (Fe)	ug/L	210		100	4998006
Total Lead (Pb)	ug/L	<0.50		0.50	4998006
Total Magnesium (Mg)	ug/L	4400		50	4998006
Total Manganese (Mn)	ug/L	15		2.0	4998006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		EKM869	EKM869		
Sampling Date		2017/05/16 09:15	2017/05/16 09:15		
COC Number		608158-01-01	608158-01-01		
	UNITS	**SW3**	**SW3 Lab-Dup**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50		0.50	4998006
Total Nickel (Ni)	ug/L	<1.0		1.0	4998006
Total Potassium (K)	ug/L	460		200	4998006
Total Selenium (Se)	ug/L	<2.0		2.0	4998006
Total Silicon (Si)	ug/L	1400		50	4998006
Total Silver (Ag)	ug/L	<0.10		0.10	4998006
Total Sodium (Na)	ug/L	7100		100	4998006
Total Strontium (Sr)	ug/L	29		1.0	4998006
Total Thallium (Tl)	ug/L	<0.050		0.050	4998006
Total Titanium (Ti)	ug/L	<5.0		5.0	4998006
Total Vanadium (V)	ug/L	<0.50		0.50	4998006
Total Zinc (Zn)	ug/L	<5.0		5.0	4998006

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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exp Services Inc
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Site Location: Geraldton Landfill (GW) - Spring Sampling Event
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RESULTS OF ANALYSES OF WATER

Maxxam ID		EKM853	EKM854	EKM855	EKM856		EKM857		
Sampling Date		2017/05/17 15:45	2017/05/17 16:30	2017/05/17 09:20	2017/05/17 10:00		2017/05/17 12:50		
COC Number		608158-01-01	608158-01-01	608158-01-01	608158-01-01		608158-01-01		
	UNITS	**MW1**	**MW2**	**MW3A**	**MW3B**	**QC Batch**	**MW4**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	370	240	460	500	4993287	400	1.0	4993287
Total Organic Nitrogen	mg/L	0.22	0.11	0.40	0.92	4993347	0.15	0.10	4993347
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	4995447	<0.010	0.010	4997517

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		EKM858	EKM859	EKM860	EKM861		EKM862		
Sampling Date		2017/05/17 17:00	2017/05/17 15:00	2017/05/17 11:30	2017/05/16 14:15		2017/05/17 14:35		
COC Number		608158-01-01	608158-01-01	608158-01-01	608158-01-01		608158-01-01		
	UNITS	**MW5**	**MW6**	**MW7**	**MW8**	**QC Batch**	**MW9**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	420	310	480	430	4993287	420	1.0	4993354
Total Organic Nitrogen	mg/L	0.42	0.18	1.0	0.46	4993347	0.40	0.10	4993347
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	4995447	<0.010	0.010	4995447

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		EKM863	EKM864		EKM865	EKM866	EKM866		
Sampling Date		2017/05/17 13:55	2017/05/17 14:15		2017/05/17 11:30	2017/05/17 08:15	2017/05/17 08:15		
COC Number		608158-01-01	608158-01-01		608158-01-01	608158-01-01	608158-01-01		
	UNITS	**MW10A**	**MW10B**	**QC Batch**	**MW11**	**MW12**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	310	390	4993354	240	480		1.0	4993354
Total Organic Nitrogen	mg/L	0.41	0.52	4993347	0.66	0.73		0.10	4993347
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	4995447	<0.010	<0.010	<0.010	0.010	4997517

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		EKM867	EKM868	EKM869		
Sampling Date		2017/05/16 15:00	2017/05/16 15:30	2017/05/16 09:15		
COC Number		608158-01-01	608158-01-01	608158-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters						
Hardness (CaCO3)	mg/L	110	80	67	1.0	4993354
Total Organic Nitrogen	mg/L	0.39	0.32	0.32	0.10	4993347
Inorganics						
Dissolved Organic Carbon	mg/L	10	11	12	0.20	4996759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		EKM867	EKM868	EKM869		
Sampling Date		2017/05/16 15:00	2017/05/16 15:30	2017/05/16 09:15		
COC Number		608158-01-01	608158-01-01	608158-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	9	9	5	5002294

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM853
Sample ID: MW1
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM853 Dup
Sample ID: MW1
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov

Maxxam ID: EKM854
Sample ID: MW2
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM854
Sample ID: MW2
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM854 Dup
Sample ID: MW2
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi

Maxxam ID: EKM855
Sample ID: MW3A
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998326	2017/05/25	2017/05/26	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM855 Dup
Sample ID: MW3A
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen

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Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM856
Sample ID: MW3B
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4996897	N/A	2017/05/25	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM857
Sample ID: MW4
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998326	2017/05/25	2017/05/26	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4997517	N/A	2017/05/25	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM857 Dup
Sample ID: MW4
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
pH	AT	4995446	N/A	2017/05/25	Surinder Rai

Maxxam ID: EKM858
Sample ID: MW5
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/29	Automated Statchk
Mercury in Water by CVAA	CV/AA	4997957	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997103	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM859
Sample ID: MW6
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM859
Sample ID: MW6
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM860
Sample ID: MW7
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM861
Sample ID: MW8
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993287	N/A	2017/05/25	Automated Statchk

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM861
Sample ID: MW8
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4996897	N/A	2017/05/25	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM862
Sample ID: MW9
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM863
Sample ID: MW10A
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM863
Sample ID: MW10A
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM864
Sample ID: MW10B
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4995444	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4997059	N/A	2017/05/26	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Orthophosphate	KONE	4995447	N/A	2017/05/24	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4995449	N/A	2017/05/24	Alina Dobreanu
Total Dissolved Solids	BAL	4998851	2017/05/25	2017/05/25	Xue Zheng Li(Scott)
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM865
Sample ID: MW11
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4996897	N/A	2017/05/25	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot
Orthophosphate	KONE	4997517	N/A	2017/05/25	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM865 Dup
Sample ID: MW11
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison

Maxxam ID: EKM866
Sample ID: MW12
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	4996897	N/A	2017/05/25	Thao Nguyen
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai

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Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM866
Sample ID: MW12
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot
Orthophosphate	KONE	4997517	N/A	2017/05/25	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4998290	2017/05/25	2017/05/26	Amanpreet Sappal

Maxxam ID: EKM866 Dup
Sample ID: MW12
Matrix: Water

Collected: 2017/05/17
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Orthophosphate	KONE	4997517	N/A	2017/05/25	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu

Maxxam ID: EKM867
Sample ID: SW1
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5002294	N/A	2017/05/29	Thao Nguyen
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4993359	2017/05/20	2017/05/25	Frank Zhang
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	4998006	N/A	2017/05/25	Prempal Bhatti
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995471	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4997975	2017/05/25	2017/05/25	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	4994712	2017/05/23	2017/05/24	Arpan Shah

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM868
Sample ID: SW2
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5002294	N/A	2017/05/29	Thao Nguyen
Alkalinity	AT	4995472	N/A	2017/05/24	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4993359	2017/05/20	2017/05/25	Frank Zhang
Chloride by Automated Colourimetry	KONE	4995494	N/A	2017/05/24	Alina Dobreanu
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995473	N/A	2017/05/24	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/26	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998326	2017/05/25	2017/05/26	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	4998006	N/A	2017/05/25	Prempal Bhatti
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4994918	N/A	2017/05/26	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995483	N/A	2017/05/24	Surinder Rai
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	4995498	N/A	2017/05/24	Deonarine Ramnarine
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4997975	2017/05/25	2017/05/25	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	4994712	2017/05/23	2017/05/24	Arpan Shah

Maxxam ID: EKM868 Dup
Sample ID: SW2
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	4998998	N/A	2017/05/25	Zahid Soikot
Total Dissolved Solids	BAL	4994865	2017/05/23	2017/05/24	Arpan Shah

Maxxam ID: EKM869
Sample ID: SW3
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5002294	N/A	2017/05/29	Thao Nguyen
Alkalinity	AT	4995443	N/A	2017/05/25	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	4993359	2017/05/20	2017/05/25	Frank Zhang
Chloride by Automated Colourimetry	KONE	4997510	N/A	2017/05/26	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel
Conductivity	AT	4995445	N/A	2017/05/25	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4996759	N/A	2017/05/24	Azadeh Shahbazi
Hardness (calculated as CaCO3)		4993354	N/A	2017/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	4998114	2017/05/25	2017/05/25	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	4998006	N/A	2017/05/25	Prempal Bhatti

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: EKM869
Sample ID: SW3
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	4998461	N/A	2017/05/27	Anastasia Hamanov
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4995469	N/A	2017/05/25	Chandra Nandlal
Organic Nitrogen	CALC	4993347	N/A	2017/05/28	Automated Statchk
pH	AT	4995446	N/A	2017/05/25	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5000502	N/A	2017/05/26	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	4997516	N/A	2017/05/25	Alina Dobreanu
Total Dissolved Solids	BAL	4996295	2017/05/24	2017/05/24	Xue Zheng Li(Scott)
Total Kjeldahl Nitrogen in Water	SKAL	4998433	2017/05/25	2017/05/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	4997975	2017/05/25	2017/05/25	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	4994745	2017/05/23	2017/05/23	Arpan Shah

Maxxam ID: EKM869 Dup
Sample ID: SW3
Matrix: Water

Collected: 2017/05/16
Shipped:
Received: 2017/05/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	4998395	N/A	2017/05/25	Yogesh Patel

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Maxxam Job #: B7A3684
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exp Services Inc
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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.7°C
Package 2	4.7°C
Package 3	5.0°C
Package 4	4.3°C

Results relate only to the items tested.

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4993359	Total BOD	2017/05/25					<2.0	mg/L	13	25	96	80 - 120
4994712	Total Suspended Solids	2017/05/24					<1	mg/L	NC	25	96	85 - 115
4994745	Total Suspended Solids	2017/05/23					<1	mg/L	8.7	25	96	85 - 115
4994865	Total Dissolved Solids	2017/05/24					<10	mg/L	3.2	25	97	90 - 110
4994918	Nitrate (N)	2017/05/26	110	80 - 120	99	80 - 120	<0.10	mg/L	NC	20		
4994918	Nitrite (N)	2017/05/26	102	80 - 120	95	80 - 120	<0.010	mg/L	NC	20		
4995443	Alkalinity (Total as CaCO3)	2017/05/25			96	85 - 115	<1.0	mg/L	0.65	20		
4995444	Dissolved Chloride (Cl)	2017/05/24	117	80 - 120	102	80 - 120	<1.0	mg/L	3.2	20		
4995445	Conductivity	2017/05/25			101	85 - 115	<1.0	umho/cm	0.51	25		
4995446	pH	2017/05/25			102	98 - 103			0.11	N/A		
4995447	Orthophosphate (P)	2017/05/24	110	75 - 125	100	80 - 120	<0.010	mg/L	2.8	25		
4995449	Dissolved Sulphate (SO4)	2017/05/24	NC	75 - 125	98	80 - 120	<1.0	mg/L	0.25	20		
4995469	Nitrate (N)	2017/05/25	117	80 - 120	103	80 - 120	<0.10	mg/L	NC	20		
4995469	Nitrite (N)	2017/05/25	100	80 - 120	95	80 - 120	<0.010	mg/L	13	20		
4995471	Nitrate (N)	2017/05/25	115	80 - 120	103	80 - 120	<0.10	mg/L	NC	20		
4995471	Nitrite (N)	2017/05/25	102	80 - 120	94	80 - 120	<0.010	mg/L	NC	20		
4995472	Alkalinity (Total as CaCO3)	2017/05/24			95	85 - 115	<1.0	mg/L	0.82	20		
4995473	Conductivity	2017/05/24			101	85 - 115	<1.0	umho/cm	0.24	25		
4995483	pH	2017/05/24			102	98 - 103			0.53	N/A		
4995494	Dissolved Chloride (Cl)	2017/05/24	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.1	20		
4995498	Dissolved Sulphate (SO4)	2017/05/24	109	75 - 125	102	80 - 120	<1.0	mg/L	1.5	20		
4996295	Total Dissolved Solids	2017/05/24					<10	mg/L	1.6	25	99	90 - 110
4996759	Dissolved Organic Carbon	2017/05/24	94	80 - 120	95	80 - 120	<0.20	mg/L	1.1	20		
4996897	Dissolved Aluminum (Al)	2017/05/25	99	80 - 120	99	80 - 120	<5.0	ug/L				
4996897	Dissolved Antimony (Sb)	2017/05/25	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Arsenic (As)	2017/05/25	99	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
4996897	Dissolved Barium (Ba)	2017/05/25	98	80 - 120	97	80 - 120	<2.0	ug/L	1.4	20		
4996897	Dissolved Beryllium (Be)	2017/05/25	99	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Bismuth (Bi)	2017/05/25	95	80 - 120	93	80 - 120	<1.0	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4996897	Dissolved Boron (B)	2017/05/25	101	80 - 120	98	80 - 120	<10	ug/L	NC	20		
4996897	Dissolved Cadmium (Cd)	2017/05/25	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
4996897	Dissolved Calcium (Ca)	2017/05/25	NC	80 - 120	95	80 - 120	<200	ug/L	2.5	20		
4996897	Dissolved Chromium (Cr)	2017/05/25	100	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
4996897	Dissolved Cobalt (Co)	2017/05/25	97	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Copper (Cu)	2017/05/25	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4996897	Dissolved Iron (Fe)	2017/05/25	100	80 - 120	98	80 - 120	<100	ug/L				
4996897	Dissolved Lead (Pb)	2017/05/25	93	80 - 120	92	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Magnesium (Mg)	2017/05/25	NC	80 - 120	98	80 - 120	<50	ug/L	1.0	20		
4996897	Dissolved Manganese (Mn)	2017/05/25	99	80 - 120	97	80 - 120	<2.0	ug/L				
4996897	Dissolved Molybdenum (Mo)	2017/05/25	102	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Nickel (Ni)	2017/05/25	96	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
4996897	Dissolved Potassium (K)	2017/05/25	100	80 - 120	98	80 - 120	<200	ug/L				
4996897	Dissolved Selenium (Se)	2017/05/25	100	80 - 120	95	80 - 120	<2.0	ug/L	NC	20		
4996897	Dissolved Silicon (Si)	2017/05/25	98	80 - 120	95	80 - 120	<50	ug/L				
4996897	Dissolved Sodium (Na)	2017/05/25	99	80 - 120	98	80 - 120	<100	ug/L	1.5	20		
4996897	Dissolved Strontium (Sr)	2017/05/25	98	80 - 120	96	80 - 120	<1.0	ug/L				
4996897	Dissolved Thallium (Tl)	2017/05/25	93	80 - 120	91	80 - 120	<0.050	ug/L	NC	20		
4996897	Dissolved Tin (Sn)	2017/05/25	102	80 - 120	98	80 - 120	<1.0	ug/L				
4996897	Dissolved Vanadium (V)	2017/05/25	99	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4996897	Dissolved Zinc (Zn)	2017/05/25	98	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4997059	Dissolved Aluminum (Al)	2017/05/26	100	80 - 120	100	80 - 120	<5.0	ug/L	20	20		
4997059	Dissolved Antimony (Sb)	2017/05/26	103	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
4997059	Dissolved Arsenic (As)	2017/05/26	100	80 - 120	97	80 - 120	<1.0	ug/L	4.9	20		
4997059	Dissolved Barium (Ba)	2017/05/26	101	80 - 120	100	80 - 120	<2.0	ug/L	0.039	20		
4997059	Dissolved Beryllium (Be)	2017/05/26	98	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
4997059	Dissolved Bismuth (Bi)	2017/05/26	91	80 - 120	92	80 - 120	<1.0	ug/L	NC	20		
4997059	Dissolved Boron (B)	2017/05/26	98	80 - 120	96	80 - 120	<10	ug/L	0.48	20		
4997059	Dissolved Cadmium (Cd)	2017/05/26	99	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
4997059	Dissolved Calcium (Ca)	2017/05/26	NC	80 - 120	96	80 - 120	<200	ug/L	0.039	20		
4997059	Dissolved Chromium (Cr)	2017/05/26	97	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4997059	Dissolved Cobalt (Co)	2017/05/26	96	80 - 120	97	80 - 120	<0.50	ug/L	5.5	20		
4997059	Dissolved Copper (Cu)	2017/05/26	99	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4997059	Dissolved Iron (Fe)	2017/05/26	96	80 - 120	98	80 - 120	<100	ug/L	0.87	20		
4997059	Dissolved Lead (Pb)	2017/05/26	91	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
4997059	Dissolved Magnesium (Mg)	2017/05/26	97	80 - 120	98	80 - 120	<50	ug/L	0.39	20		
4997059	Dissolved Manganese (Mn)	2017/05/26	NC	80 - 120	97	80 - 120	<2.0	ug/L	0.015	20		
4997059	Dissolved Molybdenum (Mo)	2017/05/26	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
4997059	Dissolved Nickel (Ni)	2017/05/26	95	80 - 120	96	80 - 120	<1.0	ug/L	11	20		
4997059	Dissolved Potassium (K)	2017/05/26	99	80 - 120	98	80 - 120	<200	ug/L	0.56	20		
4997059	Dissolved Selenium (Se)	2017/05/26	99	80 - 120	98	80 - 120	<2.0	ug/L	NC	20		
4997059	Dissolved Silicon (Si)	2017/05/26	99	80 - 120	95	80 - 120	<50	ug/L	0.70	20		
4997059	Dissolved Sodium (Na)	2017/05/26	NC	80 - 120	97	80 - 120	<100	ug/L	0.36	20		
4997059	Dissolved Strontium (Sr)	2017/05/26	97	80 - 120	96	80 - 120	<1.0	ug/L	1.4	20		
4997059	Dissolved Thallium (Tl)	2017/05/26	92	80 - 120	93	80 - 120	<0.050	ug/L	NC	20		
4997059	Dissolved Tin (Sn)	2017/05/26	102	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4997059	Dissolved Vanadium (V)	2017/05/26	98	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4997059	Dissolved Zinc (Zn)	2017/05/26	95	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
4997103	Dissolved Aluminum (Al)	2017/05/26	90	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4997103	Dissolved Antimony (Sb)	2017/05/26	93	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		
4997103	Dissolved Arsenic (As)	2017/05/26	91	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
4997103	Dissolved Barium (Ba)	2017/05/26	90	80 - 120	98	80 - 120	<2.0	ug/L	1.3	20		
4997103	Dissolved Beryllium (Be)	2017/05/26	90	80 - 120	93	80 - 120	<0.50	ug/L				
4997103	Dissolved Bismuth (Bi)	2017/05/26	86	80 - 120	95	80 - 120	<1.0	ug/L	NC	20		
4997103	Dissolved Boron (B)	2017/05/26	90	80 - 120	95	80 - 120	<10	ug/L	0.61	20		
4997103	Dissolved Cadmium (Cd)	2017/05/26	91	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
4997103	Dissolved Calcium (Ca)	2017/05/26	NC	80 - 120	94	80 - 120	<200	ug/L	0.88	20		
4997103	Dissolved Chromium (Cr)	2017/05/26	89	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
4997103	Dissolved Cobalt (Co)	2017/05/26	88	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
4997103	Dissolved Copper (Cu)	2017/05/26	90	80 - 120	99	80 - 120	<1.0	ug/L	7.5	20		
4997103	Dissolved Iron (Fe)	2017/05/26	89	80 - 120	96	80 - 120	<100	ug/L	NC	20		
4997103	Dissolved Lead (Pb)	2017/05/26	87	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		

Maxxam Job #: B7A3684
Report Date: 2017/05/29

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4997103	Dissolved Magnesium (Mg)	2017/05/26	NC	80 - 120	95	80 - 120	<50	ug/L	0.23	20		
4997103	Dissolved Manganese (Mn)	2017/05/26	90	80 - 120	95	80 - 120	<2.0	ug/L	3.8	20		
4997103	Dissolved Molybdenum (Mo)	2017/05/26	93	80 - 120	100	80 - 120	<0.50	ug/L	3.1	20		
4997103	Dissolved Nickel (Ni)	2017/05/26	88	80 - 120	95	80 - 120	<1.0	ug/L	5.6	20		
4997103	Dissolved Potassium (K)	2017/05/26	88	80 - 120	95	80 - 120	<200	ug/L	0.30	20		
4997103	Dissolved Selenium (Se)	2017/05/26	91	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
4997103	Dissolved Silicon (Si)	2017/05/26	89	80 - 120	92	80 - 120	<50	ug/L	0.041	20		
4997103	Dissolved Sodium (Na)	2017/05/26	88	80 - 120	94	80 - 120	<100	ug/L	0.44	20		
4997103	Dissolved Strontium (Sr)	2017/05/26	87	80 - 120	96	80 - 120	<1.0	ug/L	1.3	20		
4997103	Dissolved Thallium (Tl)	2017/05/26	87	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
4997103	Dissolved Tin (Sn)	2017/05/26	94	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
4997103	Dissolved Vanadium (V)	2017/05/26	90	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
4997103	Dissolved Zinc (Zn)	2017/05/26	87	80 - 120	95	80 - 120	<5.0	ug/L	4.8	20		
4997510	Dissolved Chloride (Cl)	2017/05/26	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.1	20		
4997516	Dissolved Sulphate (SO4)	2017/05/25	107	75 - 125	101	80 - 120	<1.0	mg/L	1.3	20		
4997517	Orthophosphate (P)	2017/05/25	112	75 - 125	100	80 - 120	<1.0	mg/L	NC	25		
4997957	Mercury (Hg)	2017/05/25	99	75 - 125	102	80 - 120	<0.0001	mg/L	NC	20		
4997975	Total Phosphorus	2017/05/25	98	80 - 120	92	80 - 120	<0.004	mg/L	2.1	20	90	80 - 120
4998006	Total Antimony (Sb)	2017/05/25	99	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
4998006	Total Arsenic (As)	2017/05/25	100	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
4998006	Total Barium (Ba)	2017/05/25	97	80 - 120	96	80 - 120	<2.0	ug/L	5.7	20		
4998006	Total Beryllium (Be)	2017/05/25	92	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
4998006	Total Bismuth (Bi)	2017/05/25	103	80 - 120	103	80 - 120	<1.0	ug/L	NC	20		
4998006	Total Boron (B)	2017/05/25	87	80 - 120	90	80 - 120	<10	ug/L	NC	20		
4998006	Total Cadmium (Cd)	2017/05/25	99	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
4998006	Total Calcium (Ca)	2017/05/25	NC	80 - 120	97	80 - 120	<200	ug/L	3.7	20		
4998006	Total Chromium (Cr)	2017/05/25	98	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
4998006	Total Cobalt (Co)	2017/05/25	101	80 - 120	103	80 - 120	<0.50	ug/L	3.6	20		
4998006	Total Copper (Cu)	2017/05/25	96	80 - 120	94	80 - 120	<1.0	ug/L	3.1	20		
4998006	Total Iron (Fe)	2017/05/25	101	80 - 120	102	80 - 120	<100	ug/L	1.4	20		
4998006	Total Lead (Pb)	2017/05/25	102	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4998006	Total Magnesium (Mg)	2017/05/25	NC	80 - 120	103	80 - 120	<50	ug/L	1.6	20		
4998006	Total Manganese (Mn)	2017/05/25	98	80 - 120	99	80 - 120	<2.0	ug/L	2.8	20		
4998006	Total Molybdenum (Mo)	2017/05/25	100	80 - 120	98	80 - 120	<0.50	ug/L	1.2	20		
4998006	Total Nickel (Ni)	2017/05/25	100	80 - 120	102	80 - 120	<1.0	ug/L	4.1	20		
4998006	Total Potassium (K)	2017/05/25	96	80 - 120	97	80 - 120	<200	ug/L	3.3	20		
4998006	Total Selenium (Se)	2017/05/25	105	80 - 120	104	80 - 120	<2.0	ug/L	NC	20		
4998006	Total Silicon (Si)	2017/05/25	99	80 - 120	98	80 - 120	<50	ug/L	1.4	20		
4998006	Total Silver (Ag)	2017/05/25	99	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
4998006	Total Sodium (Na)	2017/05/25	95	80 - 120	100	80 - 120	<100	ug/L	3.3	20		
4998006	Total Strontium (Sr)	2017/05/25	NC	80 - 120	99	80 - 120	<1.0	ug/L	2.8	20		
4998006	Total Thallium (Tl)	2017/05/25	103	80 - 120	102	80 - 120	<0.050	ug/L	NC	20		
4998006	Total Titanium (Ti)	2017/05/25	99	80 - 120	97	80 - 120	<5.0	ug/L	8.7	20		
4998006	Total Vanadium (V)	2017/05/25	96	80 - 120	96	80 - 120	<0.50	ug/L	0.90	20		
4998006	Total Zinc (Zn)	2017/05/25	99	80 - 120	102	80 - 120	<5.0	ug/L	9.0	20		
4998114	Mercury (Hg)	2017/05/25	98	75 - 125	98	80 - 120	<0.0001	mg/L	NC	20		
4998290	Total Phosphorus	2017/05/26	100	80 - 120	99	80 - 120	<0.020	mg/L	4.3	20	101	80 - 120
4998326	Mercury (Hg)	2017/05/26	97	75 - 125	94	80 - 120	<0.0001	mg/L	NC	20		
4998395	Total Chemical Oxygen Demand (COD)	2017/05/25	104	75 - 125	103	75 - 125	4.8, RDL=4.0	mg/L	1.1	25		
4998433	Total Kjeldahl Nitrogen (TKN)	2017/05/26	100	80 - 120	96	80 - 120	<0.10	mg/L	9.5	20	95	80 - 120
4998461	Total Ammonia-N	2017/05/27	95	80 - 120	99	85 - 115	<0.050	mg/L	0.57	20		
4998851	Total Dissolved Solids	2017/05/25					<10	mg/L	0.28	25	101	90 - 110
4998998	Phenols-4AAP	2017/05/25	96	80 - 120	97	85 - 115	<0.0010	mg/L	NC	20		
5000502	Phenols-4AAP	2017/05/26	102	80 - 120	101	85 - 115	<0.0010	mg/L	NC	20		

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Maxxam Job #: B7A3684
Report Date: 2017/05/29

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5002294	Dissolved (0.2u) Aluminum (Al)	2017/05/29	105	80 - 120	107	80 - 120	<5	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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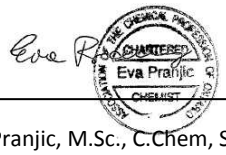
Maxxam Job #: B7A3684
Report Date: 2017/05/29

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: Geraldton Landfill (GW) - Spring Sampling Event
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B66896	Maxxam Job #:	Bottle Order #: 608158
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-NE		
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	Fax:	Project Name:	Gualdton LF	COC #:	Project Manager:
Email:	thunderbay@exp.com; Karen.Burke@exp.com	Email:	ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Site #:		C#608158-01-01	Alison Cameron
				Sampled By:	EF		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☑ Other ODWS	

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Landfill Standards Sch 5 - GW Comp List	Organic Nitrogen, Orthophosphate, Hardness	GW Additional Metals	# of Bottles	Comments
1		MW1	May 17/17	3:45 pm	GW	X	X	X	X	10	
2		MW2	May 17/17	4:30 pm	GW	X	X	X	X	10	
3		MW3A	May 17/17	9:20 am	GW	X	X	X	X	10	
4		MW3B	May 17/17	10:00 am	GW	X	X	X	X	10	
5		MW4	May 17/17	12:50 pm	GW	X	X	X	X	10	
6		MW5	May 17/17	5:00 pm	GW	X	X	X	X	10	
7		MW6	May 17/17	3:00 pm	GW	X	X	X	X	10	
8		MW7	May 17/17	11:30 am	GW	X	X	X	X	10	
9		MW8	May 16/17	2:15 pm	GW	X	X	X	X	10	
10		MW9	May 17/17	2:35 pm	GW	X	X	X	X	10	

20-May-17 09:50
Alison Cameron
B7A3684
HG2 ENV-622

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
Ahileas Mitsopoulos	17/05/19	2:00 pm	Parvjeet SARAMSEET SINGH	2017/05/20	09:50			5/4.5 4/6/4	Intact	✓	

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** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B66896	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos	P.O. #:			608158
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-NE	COC #:	Project Manager:
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	Fax:	Project Name:	Geraldton LF	C#608158-03-01	Alison Cameron
Email:	thunderbay@exp.com; Karen.Burke@exp.com	Email:	ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Site #:			
				Sampled By:	EF		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☒ Other OPWS	

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals) / (Hg / Cr VI)	Landfill Standards Sch 5 - GW Comp List	Organic Nitrogen, Orthophosphate, Hardness	GW Additional Metals							# of Bottles	Comments
1		MW10A	May 17/17	1:55 pm	GW	X	X	X	X							10	
2		MW10B	May 17/17	2:15 pm	GW	X	X	X	X							10	
3		MW11	May 17/17	11:30 am	GW	X	X	X	X							10	
4		MW12	May 17/17	8:15 am	GW	X	X	X	X							10	
5					GW												
6					GW												
7					GW												
8					GW												
9					GW												
10					GW												

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Ahileas Mitsopoulos	17/05/19	2:00 pm	Parajeet PARAMOBBT SINGH	2017/05/20	09:50		Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
								5/4/5 4/6/4	Present	✓	
									Intact	✓	

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CHAIN OF CUSTODY RECORD

Page 3 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B66896	Maxxam Job #:	Bottle Order #: 608263
Attention:	accounts payable	Attention:	Ahileas Mitsopoulos	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-NE		
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	Fax:	Project Name:	Geraldton Landfill	COC #: C#608263-01-01	Project Manager: Alison Cameron
Email:	thunderbay@exp.com; Karen.Burke@exp.com	Email:	ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Site #:			
				Sampled By:	EF		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ___ ☑ PWQO ☐ Other ___

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

Turnaround Time (TAT) Required:

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Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - SW Comp List	Hardness (calculated as CaCO3)	Organic Nitrogen, DOC, Dissolved Al	Hardness (including Ca, Mg, Na, K)	SW Additional Metals	# of Bottles	Comments
1		SW1	May 16/17	3:00 pm	SW	Hg	X	X	X	X	X	13	
2		SW2	May 16/17	3:30 pm	SW	Hg	X	X	X	X	X	13	
3		SW3	May 16/17	4:15 pm	SW	Hg	X	X	X	X	X	13	
4					SW								
5					SW								
6					SW								
7					SW								
8					SW								
9					SW								
10					SW								

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ahileas Mitsopoulos	17/05/19	2:00 pm	Project PARAMETERS SW4A	2017/05/20	09:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Rece	Custody Seal	Yes	No
	5/4/5 4/6/4	Present	✓	
		Intact	✓	

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Maxxam
A Bureau Veritas Group Company

Your Project #: THB-00006189-NE
Site Location: GERALDTON LF
Your C.O.C. #: 628797-01-01, 628797-02-01

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2018/03/06
Report #: R5031405
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7L4438
Received: 2017/09/29, 10:43

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2017/10/05	CAM SOP-00447	EPA 6020B m
Alkalinity	17	N/A	2017/10/04	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2017/10/02	2017/10/07	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	15	N/A	2017/10/03	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	2	N/A	2017/10/04	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	17	N/A	2017/10/05	CAM SOP-00416	SM 23 5220 D m
Conductivity	17	N/A	2017/10/04	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	6	N/A	2017/10/02	CAM SOP-00446	SM 23 5310 B m
Dissolved Organic Carbon (DOC) (1)	11	N/A	2017/10/03	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	6	N/A	2017/10/04	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	11	N/A	2017/10/05	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	17	2017/10/04	2017/10/05	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	13	N/A	2017/10/03	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2017/10/05	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2017/10/05	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	2	N/A	2017/10/04	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	15	N/A	2017/10/05	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/10/03	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	14	N/A	2017/10/05	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	2	N/A	2017/10/04		
Organic Nitrogen	15	N/A	2017/10/05		
pH	17	N/A	2017/10/04	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	17	N/A	2017/10/03	CAM SOP-00444	OMOE E3179 m
Orthophosphate	12	N/A	2017/10/03	CAM SOP-00461	EPA 365.1 m
Orthophosphate	2	N/A	2017/10/04	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	15	N/A	2017/10/03	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	2	N/A	2017/10/04	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	17	2017/10/02	2017/10/03	CAM SOP-00428	SM 23 2540C m

Your Project #: THB-00006189-NE
Site Location: GERALDTON LF
Your C.O.C. #: 628797-01-01, 628797-02-01

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2018/03/06
Report #: R5031405
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7L4438
Received: 2017/09/29, 10:43

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Total Kjeldahl Nitrogen in Water	6	2017/10/03	2017/10/03	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	11	2017/10/03	2017/10/04	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2017/10/03	2017/10/04	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	14	2017/10/04	2017/10/04	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	1	2017/10/02	2017/10/02	CAM SOP-00428	SM 23 2540D m
Low Level Total Suspended Solids	2	2017/10/03	2017/10/03	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2017/10/04	CAM SOP-00226	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006189-NE
Site Location: GERALDTON LF
Your C.O.C. #: 628797-01-01, 628797-02-01

Attention: Ahileas Mitsopoulos

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
P7B 5M4

Report Date: 2018/03/06
Report #: R5031405
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7L4438
Received: 2017/09/29, 10:43

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alison Cameron, Project Manager
Email: ACameron@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN803			FFN803			FFN804		
Sampling Date		2017/09/26 13:35			2017/09/26 13:35			2017/09/26 13:05		
COC Number		628797-01-01			628797-01-01			628797-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	2.2	0.050	5195621				0.33	0.050	5195621
Total Chemical Oxygen Demand (COD)	mg/L	39	4.0	5195615	40	4.0	5195615	21	4.0	5195615
Conductivity	umho/cm	1200	1.0	5193295				460	1.0	5193295
Total Dissolved Solids	mg/L	745	50	5193316				295	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L	2.7	0.10	5195631				0.42	0.10	5195631
Dissolved Organic Carbon	mg/L	9.9	0.20	5192820				6.2	0.20	5192820
pH	pH	7.59		5193297				7.94		5193297
Phenols-4AAP	mg/L	0.0024	0.0010	5194315				0.0015	0.0010	5194315
Total Phosphorus	mg/L	0.042	0.020	5195909				<0.020	0.020	5195909
Dissolved Sulphate (SO4)	mg/L	29	1.0	5193651				7.1	1.0	5193651
Alkalinity (Total as CaCO3)	mg/L	620	1.0	5193290				230	1.0	5193290
Dissolved Chloride (Cl)	mg/L	39	1.0	5193649				7.2	1.0	5193649
Nitrite (N)	mg/L	0.016	0.010	5193309	0.014	0.010	5193309	<0.010	0.010	5193309
Nitrate (N)	mg/L	0.75	0.10	5193309	0.75	0.10	5193309	<0.10	0.10	5193309
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5196841				<0.0001	0.0001	5196852
Dissolved Aluminum (Al)	ug/L	7.7	5.0	5193301				8.6	5.0	5193301
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5193301				<0.50	0.50	5193301
Dissolved Arsenic (As)	ug/L	15	1.0	5193301				2.1	1.0	5193301
Dissolved Barium (Ba)	ug/L	97	2.0	5193301				17	2.0	5193301
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5193301				<0.50	0.50	5193301
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5193301				<1.0	1.0	5193301
Dissolved Boron (B)	ug/L	200	10	5193301				31	10	5193301
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5193301				<0.10	0.10	5193301
Dissolved Calcium (Ca)	ug/L	190000	200	5193301				74000	200	5193301
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5193301				<5.0	5.0	5193301
Dissolved Cobalt (Co)	ug/L	15	0.50	5193301				2.6	0.50	5193301
Dissolved Copper (Cu)	ug/L	1.5	1.0	5193301				2.1	1.0	5193301
Dissolved Iron (Fe)	ug/L	15000	100	5193301				120	100	5193301
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5193301				<0.50	0.50	5193301
Dissolved Magnesium (Mg)	ug/L	20000	50	5193301				8500	50	5193301
Dissolved Manganese (Mn)	ug/L	2200	2.0	5193301				1600	2.0	5193301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN803			FFN803			FFN804		
Sampling Date		2017/09/26 13:35			2017/09/26 13:35			2017/09/26 13:05		
COC Number		628797-01-01			628797-01-01			628797-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.86	0.50	5193301				<0.50	0.50	5193301
Dissolved Nickel (Ni)	ug/L	7.3	1.0	5193301				3.1	1.0	5193301
Dissolved Potassium (K)	ug/L	11000	200	5193301				1500	200	5193301
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5193301				<2.0	2.0	5193301
Dissolved Silicon (Si)	ug/L	8800	50	5193301				4200	50	5193301
Dissolved Sodium (Na)	ug/L	25000	100	5193301				3800	100	5193301
Dissolved Strontium (Sr)	ug/L	280	1.0	5193301				63	1.0	5193301
Dissolved Thallium (Tl)	ug/L	0.17	0.050	5193301				0.092	0.050	5193301
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5193301				<1.0	1.0	5193301
Dissolved Vanadium (V)	ug/L	1.2	0.50	5193301				0.85	0.50	5193301
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5193301				<5.0	5.0	5193301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN804			FFN805		FFN806		
Sampling Date		2017/09/26 13:05			2017/09/26 17:45		2017/09/26 18:00		
COC Number		628797-01-01			628797-01-01		628797-01-01		
	UNITS	**MW2 Lab-Dup**	**RDL**	**QC Batch**	**MW3A**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L				9.3	5195621	8.4	0.25	5195621
Total Chemical Oxygen Demand (COD)	mg/L				27	5195615	34	4.0	5195615
Conductivity	umho/cm				1200	5193295	1300	1.0	5193295
Total Dissolved Solids	mg/L				655	5193316	715	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L	0.42	0.10	5195631	9.4	5195631	8.7	0.50	5195631
Dissolved Organic Carbon	mg/L				6.6	5192820	9.2	0.20	5192820
pH	pH				7.68	5193297	7.66		5193297
Phenols-4AAP	mg/L				0.0014	5194315	0.0021	0.0010	5194315
Total Phosphorus	mg/L				0.039	5195909	0.031	0.020	5195909
Dissolved Sulphate (SO4)	mg/L				20	5193651	21	1.0	5193651
Alkalinity (Total as CaCO3)	mg/L				490	5193290	570	1.0	5193290
Dissolved Chloride (Cl)	mg/L				92	5193649	83	1.0	5193649
Nitrite (N)	mg/L				<0.010	5193309	0.013	0.010	5193309
Nitrate (N)	mg/L				<0.10	5193309	<0.10	0.10	5193309
Metals									
Mercury (Hg)	mg/L				<0.0001	5196852	<0.0001	0.0001	5196841
Dissolved Aluminum (Al)	ug/L	9.1	5.0	5193301	<5.0	5193301	<5.0	5.0	5193301
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5193301	<0.50	5193301	<0.50	0.50	5193301
Dissolved Arsenic (As)	ug/L	2.1	1.0	5193301	18	5193301	4.2	1.0	5193301
Dissolved Barium (Ba)	ug/L	15	2.0	5193301	140	5193301	140	2.0	5193301
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5193301	<0.50	5193301	<0.50	0.50	5193301
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5193301	<1.0	5193301	<1.0	1.0	5193301
Dissolved Boron (B)	ug/L	31	10	5193301	230	5193301	330	10	5193301
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5193301	<0.10	5193301	<0.10	0.10	5193301
Dissolved Calcium (Ca)	ug/L	75000	200	5193301	140000	5193301	160000	200	5193301
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5193301	<5.0	5193301	<5.0	5.0	5193301
Dissolved Cobalt (Co)	ug/L	2.6	0.50	5193301	5.1	5193301	9.1	0.50	5193301
Dissolved Copper (Cu)	ug/L	2.1	1.0	5193301	<1.0	5193301	1.4	1.0	5193301
Dissolved Iron (Fe)	ug/L	120	100	5193301	15000	5193301	5200	100	5193301
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5193301	<0.50	5193301	<0.50	0.50	5193301
Dissolved Magnesium (Mg)	ug/L	8800	50	5193301	22000	5193301	29000	50	5193301
Dissolved Manganese (Mn)	ug/L	1700	2.0	5193301	1200	5193301	1400	2.0	5193301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN804			FFN805		FFN806		
Sampling Date		2017/09/26 13:05			2017/09/26 17:45		2017/09/26 18:00		
COC Number		628797-01-01			628797-01-01		628797-01-01		
	UNITS	**MW2 Lab-Dup**	**RDL**	**QC Batch**	**MW3A**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5193301	<0.50	5193301	0.56	0.50	5193301
Dissolved Nickel (Ni)	ug/L	2.7	1.0	5193301	4.5	5193301	8.3	1.0	5193301
Dissolved Potassium (K)	ug/L	1500	200	5193301	12000	5193301	17000	200	5193301
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5193301	<2.0	5193301	<2.0	2.0	5193301
Dissolved Silicon (Si)	ug/L	4300	50	5193301	7200	5193301	7900	50	5193301
Dissolved Sodium (Na)	ug/L	3900	100	5193301	60000	5193301	56000	100	5193301
Dissolved Strontium (Sr)	ug/L	64	1.0	5193301	230	5193301	320	1.0	5193301
Dissolved Thallium (Tl)	ug/L	0.070	0.050	5193301	<0.050	5193301	<0.050	0.050	5193301
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5193301	<1.0	5193301	<1.0	1.0	5193301
Dissolved Vanadium (V)	ug/L	0.95	0.50	5193301	0.66	5193301	<0.50	0.50	5193301
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5193301	<5.0	5193301	<5.0	5.0	5193301

RDL = Reportable Detection Limit
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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN807		FFN808			FFN808		
Sampling Date		2017/09/26 17:25		2017/09/26 18:20			2017/09/26 18:20		
COC Number		628797-01-01		628797-01-01			628797-01-01		
	UNITS	**MW4**	**QC Batch**	**MW5**	**RDL**	**QC Batch**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	<0.050	5195621	1.5	0.050	5195621			
Total Chemical Oxygen Demand (COD)	mg/L	8.7	5195615	23	4.0	5195615			
Conductivity	umho/cm	790	5193295	1000	1.0	5193295			
Total Dissolved Solids	mg/L	505	5193316	625	50	5193316			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12	5195631	1.8	0.10	5195631			
Dissolved Organic Carbon	mg/L	1.9	5192820	5.2	0.20	5193024			
pH	pH	7.82	5193297	7.77		5193297			
Phenols-4AAP	mg/L	<0.0010	5194315	0.0010	0.0010	5194315			
Total Phosphorus	mg/L	0.16	5195909	0.20	0.020	5195909			
Dissolved Sulphate (SO4)	mg/L	36	5193651	91	1.0	5193651			
Alkalinity (Total as CaCO3)	mg/L	400	5193290	440	1.0	5193290			
Dissolved Chloride (Cl)	mg/L	9.4	5193649	32	1.0	5193649			
Nitrite (N)	mg/L	<0.010	5193309	<0.010	0.010	5193309			
Nitrate (N)	mg/L	0.22	5193309	<0.10	0.10	5193309			
Metals									
Mercury (Hg)	mg/L	<0.0001	5196852	<0.0001	0.0001	5196852	<0.0001	0.0001	5196852
Dissolved Aluminum (Al)	ug/L	<5.0	5193301	<5.0	5.0	5193301			
Dissolved Antimony (Sb)	ug/L	<0.50	5193301	<0.50	0.50	5193301			
Dissolved Arsenic (As)	ug/L	<1.0	5193301	2.3	1.0	5193301			
Dissolved Barium (Ba)	ug/L	40	5193301	110	2.0	5193301			
Dissolved Beryllium (Be)	ug/L	<0.50	5193301	<0.50	0.50	5193301			
Dissolved Bismuth (Bi)	ug/L	<1.0	5193301	<1.0	1.0	5193301			
Dissolved Boron (B)	ug/L	66	5193301	470	10	5193301			
Dissolved Cadmium (Cd)	ug/L	<0.10	5193301	<0.10	0.10	5193301			
Dissolved Calcium (Ca)	ug/L	140000	5193301	120000	200	5193301			
Dissolved Chromium (Cr)	ug/L	<5.0	5193301	<5.0	5.0	5193301			
Dissolved Cobalt (Co)	ug/L	2.1	5193301	<0.50	0.50	5193301			
Dissolved Copper (Cu)	ug/L	1.4	5193301	<1.0	1.0	5193301			
Dissolved Iron (Fe)	ug/L	<100	5193301	7800	100	5193301			
Dissolved Lead (Pb)	ug/L	<0.50	5193301	<0.50	0.50	5193301			
Dissolved Magnesium (Mg)	ug/L	15000	5193301	47000	50	5193301			
Dissolved Manganese (Mn)	ug/L	390	5193301	840	2.0	5193301			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN807		FFN808			FFN808		
Sampling Date		2017/09/26 17:25		2017/09/26 18:20			2017/09/26 18:20		
COC Number		628797-01-01		628797-01-01			628797-01-01		
	UNITS	**MW4**	**QC Batch**	**MW5**	**RDL**	**QC Batch**	**MW5 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	5193301	<0.50	0.50	5193301			
Dissolved Nickel (Ni)	ug/L	3.6	5193301	2.2	1.0	5193301			
Dissolved Potassium (K)	ug/L	1900	5193301	16000	200	5193301			
Dissolved Selenium (Se)	ug/L	<2.0	5193301	<2.0	2.0	5193301			
Dissolved Silicon (Si)	ug/L	5200	5193301	5700	50	5193301			
Dissolved Sodium (Na)	ug/L	8500	5193301	27000	100	5193301			
Dissolved Strontium (Sr)	ug/L	120	5193301	290	1.0	5193301			
Dissolved Thallium (Tl)	ug/L	0.14	5193301	<0.050	0.050	5193301			
Dissolved Tin (Sn)	ug/L	<1.0	5193301	<1.0	1.0	5193301			
Dissolved Vanadium (V)	ug/L	<0.50	5193301	<0.50	0.50	5193301			
Dissolved Zinc (Zn)	ug/L	<5.0	5193301	<5.0	5.0	5193301			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN809			FFN809		
Sampling Date		2017/09/26 14:05			2017/09/26 14:05		
COC Number		628797-01-01			628797-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	5195621	<0.050	0.050	5195621
Total Chemical Oxygen Demand (COD)	mg/L	15	4.0	5195615			
Conductivity	umho/cm	530	1.0	5193295			
Total Dissolved Solids	mg/L	330	50	5193316			
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.10	0.10	5195631			
Dissolved Organic Carbon	mg/L	3.5	0.20	5193024			
pH	pH	8.08		5193297			
Phenols-4AAP	mg/L	<0.0010	0.0010	5194315			
Total Phosphorus	mg/L	0.036	0.020	5195909	0.034	0.020	5195909
Dissolved Sulphate (SO4)	mg/L	16	1.0	5193651			
Alkalinity (Total as CaCO3)	mg/L	280	1.0	5193290			
Dissolved Chloride (Cl)	mg/L	1.2	1.0	5193649			
Nitrite (N)	mg/L	<0.010	0.010	5193309			
Nitrate (N)	mg/L	<0.10	0.10	5193309			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5197309	<0.0001	0.0001	5197309
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5193301			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5193301			
Dissolved Arsenic (As)	ug/L	3.4	1.0	5193301			
Dissolved Barium (Ba)	ug/L	19	2.0	5193301			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5193301			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5193301			
Dissolved Boron (B)	ug/L	20	10	5193301			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5193301			
Dissolved Calcium (Ca)	ug/L	86000	200	5193301			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5193301			
Dissolved Cobalt (Co)	ug/L	10	0.50	5193301			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5193301			
Dissolved Iron (Fe)	ug/L	<100	100	5193301			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5193301			
Dissolved Magnesium (Mg)	ug/L	14000	50	5193301			
Dissolved Manganese (Mn)	ug/L	1500	2.0	5193301			

RDL = Reportable Detection Limit
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Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN809			FFN809		
Sampling Date		2017/09/26 14:05			2017/09/26 14:05		
COC Number		628797-01-01			628797-01-01		
	UNITS	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	2.4	0.50	5193301			
Dissolved Nickel (Ni)	ug/L	21	1.0	5193301			
Dissolved Potassium (K)	ug/L	1300	200	5193301			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5193301			
Dissolved Silicon (Si)	ug/L	5600	50	5193301			
Dissolved Sodium (Na)	ug/L	6400	100	5193301			
Dissolved Strontium (Sr)	ug/L	83	1.0	5193301			
Dissolved Thallium (Tl)	ug/L	0.15	0.050	5193301			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5193301			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5193301			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5193301			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN810		FFN811		FFN812		
Sampling Date		2017/09/26 11:35		2017/09/26 14:30		2017/09/26 17:05		
COC Number		628797-01-01		628797-01-01		628797-01-01		
	UNITS	**MW7**	**RDL**	**MW8**	**RDL**	**MW9**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	7.4 (1)	0.25	0.052	0.050	<0.050	0.050	5195621
Total Chemical Oxygen Demand (COD)	mg/L	32	4.0	20	4.0	10	4.0	5195615
Conductivity	umho/cm	1100	1.0	4200	1.0	990	1.0	5193295
Total Dissolved Solids	mg/L	635	50	2240	50	735	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L	7.2 (1)	0.50	0.88	0.10	0.39	0.10	5195631
Dissolved Organic Carbon	mg/L	7.2	0.20	2.7	0.20	0.99	0.20	5193024
pH	pH	7.62		7.94		8.06		5193297
Phenols-4AAP	mg/L	0.0018	0.0010	<0.0010	0.0010	<0.0010	0.0010	5194315
Total Phosphorus	mg/L	0.098	0.020	11	0.10	6.9	0.10	5195909
Dissolved Sulphate (SO4)	mg/L	27	1.0	29	1.0	3.6	1.0	5193651
Alkalinity (Total as CaCO3)	mg/L	520	1.0	360	1.0	200	1.0	5193290
Dissolved Chloride (Cl)	mg/L	37	1.0	1100	15	170	2.0	5193649
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010	0.010	5193309
Nitrate (N)	mg/L	<0.10	0.10	1.45	0.10	0.17	0.10	5193309
Metals								
Mercury (Hg)	mg/L	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	5196852
Dissolved Aluminum (Al)	ug/L	7.0	5.0	<5.0	5.0	<5.0	5.0	5193301
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	5193301
Dissolved Arsenic (As)	ug/L	48	1.0	<1.0	1.0	<1.0	1.0	5193301
Dissolved Barium (Ba)	ug/L	220	2.0	70	2.0	30	2.0	5193301
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	5193301
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	<1.0	1.0	<1.0	1.0	5193301
Dissolved Boron (B)	ug/L	170	10	13	10	11	10	5193301
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	0.10	<0.10	0.10	5193301
Dissolved Calcium (Ca)	ug/L	160000	200	170000	200	130000	200	5193301
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	5193301
Dissolved Cobalt (Co)	ug/L	17	0.50	<0.50	0.50	<0.50	0.50	5193301
Dissolved Copper (Cu)	ug/L	<1.0	1.0	1.6	1.0	3.9	1.0	5193301
Dissolved Iron (Fe)	ug/L	27000	100	<100	100	<100	100	5193301
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	0.94	0.50	5193301
Dissolved Magnesium (Mg)	ug/L	23000	50	15000	50	24000	50	5193301
Dissolved Manganese (Mn)	ug/L	2100	2.0	<2.0	2.0	<2.0	2.0	5193301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN810		FFN811		FFN812		
Sampling Date		2017/09/26 11:35		2017/09/26 14:30		2017/09/26 17:05		
COC Number		628797-01-01		628797-01-01		628797-01-01		
	UNITS	**MW7**	**RDL**	**MW8**	**RDL**	**MW9**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.53	0.50	<0.50	0.50	<0.50	0.50	5193301
Dissolved Nickel (Ni)	ug/L	11	1.0	<1.0	1.0	1.1	1.0	5193301
Dissolved Potassium (K)	ug/L	11000	200	2900	200	1200	200	5193301
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	<2.0	2.0	5193301
Dissolved Silicon (Si)	ug/L	11000	50	2800	50	4900	50	5193301
Dissolved Sodium (Na)	ug/L	27000	100	530000	500	43000	100	5193301
Dissolved Strontium (Sr)	ug/L	240	1.0	210	1.0	110	1.0	5193301
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	<0.050	0.050	5193301
Dissolved Tin (Sn)	ug/L	<1.0	1.0	<1.0	1.0	<1.0	1.0	5193301
Dissolved Vanadium (V)	ug/L	1.0	0.50	<0.50	0.50	<0.50	0.50	5193301
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	19	5.0	5193301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN812			FFN819			FFN820		
Sampling Date		2017/09/26 17:05			2017/09/26 15:00			2017/09/26 15:15		
COC Number		628797-01-01			628797-02-01			628797-02-01		
	UNITS	**MW9 Lab-Dup**	**RDL**	**QC Batch**	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L				0.29	0.050	5196477	0.18	0.050	5196477
Total Chemical Oxygen Demand (COD)	mg/L				39	4.0	5195603	48	4.0	5195603
Conductivity	umho/cm				720	1.0	5194462	1300	1.0	5194462
Total Dissolved Solids	mg/L	740	50	5193316	470	50	5193316	810	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L				0.74	0.10	5194093	0.68	0.10	5194093
Dissolved Organic Carbon	mg/L				13	0.20	5193024	15	0.20	5193024
pH	pH				7.48		5194465	7.62		5194465
Phenols-4AAP	mg/L				0.0016	0.0010	5194315	0.0024	0.0010	5194315
Total Phosphorus	mg/L				0.74	0.020	5195909	0.45	0.020	5195909
Dissolved Sulphate (SO4)	mg/L				5.9	1.0	5193651	<1.0	1.0	5194916
Alkalinity (Total as CaCO3)	mg/L				260	1.0	5194459	320	1.0	5194459
Dissolved Chloride (Cl)	mg/L				78	1.0	5193649	210	3.0	5194913
Nitrite (N)	mg/L				<0.010	0.010	5193313	<0.010	0.010	5193309
Nitrate (N)	mg/L				<0.10	0.10	5193313	<0.10	0.10	5193309
Metals										
Mercury (Hg)	mg/L				<0.0001	0.0001	5196852	<0.0001	0.0001	5196852
Dissolved Aluminum (Al)	ug/L				79	5.0	5194271	59	5.0	5194271
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Arsenic (As)	ug/L				16	1.0	5194271	32	1.0	5194271
Dissolved Barium (Ba)	ug/L				26	2.0	5194271	27	2.0	5194271
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Boron (B)	ug/L				<10	10	5194271	<10	10	5194271
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	5194271	<0.10	0.10	5194271
Dissolved Calcium (Ca)	ug/L				92000	200	5194271	140000	200	5194271
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	5194271	<5.0	5.0	5194271
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Copper (Cu)	ug/L				<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Iron (Fe)	ug/L				1900	100	5194271	3600	100	5194271
Dissolved Lead (Pb)	ug/L				<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Magnesium (Mg)	ug/L				19000	50	5194271	12000	50	5194271
Dissolved Manganese (Mn)	ug/L				85	2.0	5194271	100	2.0	5194271

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN812			FFN819			FFN820		
Sampling Date		2017/09/26 17:05			2017/09/26 15:00			2017/09/26 15:15		
COC Number		628797-01-01			628797-02-01			628797-02-01		
	UNITS	**MW9 Lab-Dup**	**RDL**	**QC Batch**	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Nickel (Ni)	ug/L				1.2	1.0	5194271	<1.0	1.0	5194271
Dissolved Potassium (K)	ug/L				350	200	5194271	<200	200	5194271
Dissolved Selenium (Se)	ug/L				<2.0	2.0	5194271	<2.0	2.0	5194271
Dissolved Silicon (Si)	ug/L				2900	50	5194271	1700	50	5194271
Dissolved Sodium (Na)	ug/L				34000	100	5194271	97000	100	5194271
Dissolved Strontium (Sr)	ug/L				84	1.0	5194271	110	1.0	5194271
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	5194271	<0.050	0.050	5194271
Dissolved Tin (Sn)	ug/L				<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Vanadium (V)	ug/L				2.2	0.50	5194271	0.87	0.50	5194271
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	5194271	<5.0	5.0	5194271

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN821			FFN822		
Sampling Date		2017/09/26 10:45			2017/09/26 17:15		
COC Number		628797-02-01			628797-02-01		
	UNITS	**MW11**	**RDL**	**QC Batch**	**MW12**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.092	0.050	5196477	9.2 (1)	0.25	5196477
Total Chemical Oxygen Demand (COD)	mg/L	14	4.0	5195603	24	4.0	5195603
Conductivity	umho/cm	470	1.0	5193295	1200	1.0	5194462
Total Dissolved Solids	mg/L	290	50	5193316	635	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L	0.41	0.10	5194093	9.0 (1)	0.50	5194093
Dissolved Organic Carbon	mg/L	1.8	0.20	5193024	6.6	0.20	5193024
pH	pH	8.14		5193297	7.66		5194465
Phenols-4AAP	mg/L	<0.0010	0.0010	5194315	0.0021	0.0010	5194315
Total Phosphorus	mg/L	5.3	0.10	5195909	0.035	0.020	5195909
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5193651	19	1.0	5194916
Alkalinity (Total as CaCO3)	mg/L	260	1.0	5193290	490	1.0	5194459
Dissolved Chloride (Cl)	mg/L	1.3	1.0	5193649	91	1.0	5194913
Nitrite (N)	mg/L	<0.010	0.010	5193313	<0.010	0.010	5193313
Nitrate (N)	mg/L	<0.10	0.10	5193313	<0.10	0.10	5193313
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5196852	<0.0001	0.0001	5196852
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5194271	<5.0	5.0	5194271
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5194271	17	1.0	5194271
Dissolved Barium (Ba)	ug/L	28	2.0	5194271	140	2.0	5194271
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Boron (B)	ug/L	15	10	5194271	230	10	5194271
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5194271	<0.10	0.10	5194271
Dissolved Calcium (Ca)	ug/L	69000	200	5194271	140000	200	5194271
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5194271	<5.0	5.0	5194271
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5194271	5.2	0.50	5194271
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Iron (Fe)	ug/L	<100	100	5194271	15000	100	5194271
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5194271	<0.50	0.50	5194271
Dissolved Magnesium (Mg)	ug/L	15000	50	5194271	23000	50	5194271
Dissolved Manganese (Mn)	ug/L	77	2.0	5194271	1200	2.0	5194271

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		FFN821			FFN822		
Sampling Date		2017/09/26 10:45			2017/09/26 17:15		
COC Number		628797-02-01			628797-02-01		
	UNITS	**MW11**	**RDL**	**QC Batch**	**MW12**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.1	0.50	5194271	<0.50	0.50	5194271
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5194271	4.4	1.0	5194271
Dissolved Potassium (K)	ug/L	1100	200	5194271	13000	200	5194271
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5194271	<2.0	2.0	5194271
Dissolved Silicon (Si)	ug/L	7000	50	5194271	7300	50	5194271
Dissolved Sodium (Na)	ug/L	7100	100	5194271	61000	100	5194271
Dissolved Strontium (Sr)	ug/L	87	1.0	5194271	230	1.0	5194271
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5194271	<0.050	0.050	5194271
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5194271	<1.0	1.0	5194271
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5194271	0.73	0.50	5194271
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5194271	<5.0	5.0	5194271

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		FFN823			FFN823		
Sampling Date		2017/09/26 15:30			2017/09/26 15:30		
COC Number		628797-02-01			628797-02-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	5196068			
Total BOD	mg/L	3	2	5193102			
Total Chemical Oxygen Demand (COD)	mg/L	39	4.0	5195603			
Conductivity	umho/cm	250	1.0	5194462			
Total Dissolved Solids	mg/L	205	50	5193316			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.49	0.10	5194093			
pH	pH	7.92		5194465			
Phenols-4AAP	mg/L	0.0034	0.0020	5194315	0.0039	0.0020	5194315
Total Phosphorus	mg/L	0.029	0.004	5195120			
Total Suspended Solids	mg/L	6	1	5194510			
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5193659			
Alkalinity (Total as CaCO3)	mg/L	85	1.0	5194459			
Dissolved Chloride (Cl)	mg/L	21	1.0	5193656			
Nitrite (N)	mg/L	<0.010	0.010	5194821			
Nitrate (N)	mg/L	<0.10	0.10	5194821			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5196852			
Total Antimony (Sb)	ug/L	<0.50	0.50	5196857			
Total Arsenic (As)	ug/L	40	1.0	5196857			
Total Barium (Ba)	ug/L	9.4	2.0	5196857			
Total Beryllium (Be)	ug/L	<0.50	0.50	5196857			
Total Bismuth (Bi)	ug/L	<1.0	1.0	5196857			
Total Boron (B)	ug/L	<10	10	5196857			
Total Cadmium (Cd)	ug/L	<0.10	0.10	5196857			
Total Calcium (Ca)	ug/L	30000	200	5196857			
Total Chromium (Cr)	ug/L	<5.0	5.0	5196857			
Total Cobalt (Co)	ug/L	<0.50	0.50	5196857			
Total Copper (Cu)	ug/L	6.2	1.0	5196857			
Total Iron (Fe)	ug/L	300	100	5196857			
Total Lead (Pb)	ug/L	<0.50	0.50	5196857			
Total Magnesium (Mg)	ug/L	6000	50	5196857			
Total Manganese (Mn)	ug/L	19	2.0	5196857			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		FFN823			FFN823		
Sampling Date		2017/09/26 15:30			2017/09/26 15:30		
COC Number		628797-02-01			628797-02-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5196857			
Total Nickel (Ni)	ug/L	1.9	1.0	5196857			
Total Potassium (K)	ug/L	660	200	5196857			
Total Selenium (Se)	ug/L	<2.0	2.0	5196857			
Total Silicon (Si)	ug/L	2600	50	5196857			
Total Silver (Ag)	ug/L	<0.10	0.10	5196857			
Total Sodium (Na)	ug/L	13000	100	5196857			
Total Strontium (Sr)	ug/L	45	1.0	5196857			
Total Thallium (Tl)	ug/L	<0.050	0.050	5196857			
Total Vanadium (V)	ug/L	<0.50	0.50	5196857			
Total Zinc (Zn)	ug/L	<5.0	5.0	5196857			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		FFN824		FFN825		
Sampling Date		2017/09/26 15:50		2017/09/26 16:30		
COC Number		628797-02-01		628797-02-01		
	UNITS	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Inorganics						
Total Ammonia-N	mg/L	<0.050	5196068	<0.050	0.050	5196477
Total BOD	mg/L	2	5193102	<2	2	5193102
Total Chemical Oxygen Demand (COD)	mg/L	45	5195603	48	4.0	5195603
Conductivity	umho/cm	190	5193295	190	1.0	5193295
Total Dissolved Solids	mg/L	190	5193316	190	50	5193316
Total Kjeldahl Nitrogen (TKN)	mg/L	0.52	5194093	0.55	0.10	5194093
pH	pH	7.98	5193297	7.97		5193297
Phenols-4AAP	mg/L	0.0030	5194315	0.0030	0.0020	5194315
Total Phosphorus	mg/L	0.028	5195120	0.021	0.004	5195120
Total Suspended Solids	mg/L	4	5192811	6	1	5194510
Dissolved Sulphate (SO4)	mg/L	<1.0	5193659	<1.0	1.0	5193320
Alkalinity (Total as CaCO3)	mg/L	77	5193290	76	1.0	5193290
Dissolved Chloride (Cl)	mg/L	11	5193656	11	1.0	5193318
Nitrite (N)	mg/L	<0.010	5193309	<0.010	0.010	5193309
Nitrate (N)	mg/L	<0.10	5193309	<0.10	0.10	5193309
Metals						
Mercury (Hg)	mg/L	<0.0001	5196852	<0.0001	0.0001	5196852
Total Antimony (Sb)	ug/L	<0.50	5196857	0.53	0.50	5196857
Total Arsenic (As)	ug/L	44	5196857	50	1.0	5196857
Total Barium (Ba)	ug/L	7.9	5196857	8.4	2.0	5196857
Total Beryllium (Be)	ug/L	<0.50	5196857	<0.50	0.50	5196857
Total Bismuth (Bi)	ug/L	<1.0	5196857	<1.0	1.0	5196857
Total Boron (B)	ug/L	<10	5196857	<10	10	5196857
Total Cadmium (Cd)	ug/L	<0.10	5196857	<0.10	0.10	5196857
Total Calcium (Ca)	ug/L	27000	5196857	29000	200	5196857
Total Chromium (Cr)	ug/L	<5.0	5196857	<5.0	5.0	5196857
Total Cobalt (Co)	ug/L	<0.50	5196857	<0.50	0.50	5196857
Total Copper (Cu)	ug/L	2.5	5196857	2.8	1.0	5196857
Total Iron (Fe)	ug/L	370	5196857	420	100	5196857
Total Lead (Pb)	ug/L	<0.50	5196857	0.68	0.50	5196857
Total Magnesium (Mg)	ug/L	5600	5196857	5900	50	5196857
Total Manganese (Mn)	ug/L	24	5196857	23	2.0	5196857
Total Molybdenum (Mo)	ug/L	<0.50	5196857	<0.50	0.50	5196857

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		FFN824		FFN825		
Sampling Date		2017/09/26 15:50		2017/09/26 16:30		
COC Number		628797-02-01		628797-02-01		
	UNITS	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Total Nickel (Ni)	ug/L	<1.0	5196857	1.1	1.0	5196857
Total Potassium (K)	ug/L	550	5196857	590	200	5196857
Total Selenium (Se)	ug/L	<2.0	5196857	<2.0	2.0	5196857
Total Silicon (Si)	ug/L	2600	5196857	2800	50	5196857
Total Silver (Ag)	ug/L	<0.10	5196857	<0.10	0.10	5196857
Total Sodium (Na)	ug/L	6800	5196857	7000	100	5196857
Total Strontium (Sr)	ug/L	40	5196857	43	1.0	5196857
Total Thallium (Tl)	ug/L	<0.050	5196857	<0.050	0.050	5196857
Total Vanadium (V)	ug/L	0.52	5196857	0.62	0.50	5196857
Total Zinc (Zn)	ug/L	<5.0	5196857	<5.0	5.0	5196857

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		FFN803	FFN804	FFN805	FFN806	FFN807	FFN808		
Sampling Date		2017/09/26 13:35	2017/09/26 13:05	2017/09/26 17:45	2017/09/26 18:00	2017/09/26 17:25	2017/09/26 18:20		
COC Number		628797-01-01	628797-01-01	628797-01-01	628797-01-01	628797-01-01	628797-01-01		
	UNITS	**MW1**	**MW2**	**MW3A**	**MW3B**	**MW4**	**MW5**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	550	220	430	520	420	490	1.0	5192219
Total Organic Nitrogen	mg/L	0.59	<0.10	0.13	0.28	0.12	0.26	0.10	5192223
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5193652

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FFN809	FFN810	FFN811	FFN812	FFN819		
Sampling Date		2017/09/26 14:05	2017/09/26 11:35	2017/09/26 14:30	2017/09/26 17:05	2017/09/26 15:00		
COC Number		628797-01-01	628797-01-01	628797-01-01	628797-01-01	628797-02-01		
	UNITS	**MW6**	**MW7**	**MW8**	**MW9**	**MW10A**	**RDL**	**QC Batch**
Calculated Parameters								
Hardness (CaCO3)	mg/L	270	490	490	430	310	1.0	5192219
Total Organic Nitrogen	mg/L	<0.10	<0.10	0.83	0.39	0.45	0.10	5192223
Inorganics								
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	0.011	0.010	5193652

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FFN820		FFN821		FFN822		
Sampling Date		2017/09/26 15:15		2017/09/26 10:45		2017/09/26 17:15		
COC Number		628797-02-01		628797-02-01		628797-02-01		
	UNITS	**MW10B**	**QC Batch**	**MW11**	**QC Batch**	**MW12**	**RDL**	**QC Batch**
Calculated Parameters								
Hardness (CaCO3)	mg/L	410	5192219	230	5192219	440	1.0	5192219
Total Organic Nitrogen	mg/L	0.51	5192223	0.32	5192223	<0.10	0.10	5192223
Inorganics								
Orthophosphate (P)	mg/L	<0.010	5194917	<0.010	5193652	<0.010	0.010	5194917

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

RESULTS OF ANALYSES OF WATER

Maxxam ID		FFN823	FFN824	FFN825		
Sampling Date		2017/09/26 15:30	2017/09/26 15:50	2017/09/26 16:30		
COC Number		628797-02-01	628797-02-01	628797-02-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters						
Hardness (CaCO3)	mg/L	100	91	90	1.0	5192219
Total Organic Nitrogen	mg/L	0.49	0.52	0.55	0.10	5192223
Inorganics						
Dissolved Organic Carbon	mg/L	15	16	16	0.20	5193970

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		FFN823	FFN824	FFN825		
Sampling Date		2017/09/26 15:30	2017/09/26 15:50	2017/09/26 16:30		
COC Number		628797-02-01	628797-02-01	628797-02-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	10	10	10	5	5196966

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		FFN808		
Sampling Date		2017/09/26 18:20		
COC Number		628797-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	5193875
Benzene	ug/L	0.14	0.10	5193875
Bromodichloromethane	ug/L	<0.10	0.10	5193875
Bromoform	ug/L	<0.20	0.20	5193875
Bromomethane	ug/L	<0.50	0.50	5193875
Carbon Tetrachloride	ug/L	<0.10	0.10	5193875
Chlorobenzene	ug/L	1.4	0.10	5193875
Chloroform	ug/L	<0.10	0.10	5193875
Dibromochloromethane	ug/L	<0.20	0.20	5193875
1,2-Dichlorobenzene	ug/L	<0.20	0.20	5193875
1,3-Dichlorobenzene	ug/L	0.29	0.20	5193875
1,4-Dichlorobenzene	ug/L	1.1	0.20	5193875
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	5193875
1,1-Dichloroethane	ug/L	0.17	0.10	5193875
1,2-Dichloroethane	ug/L	<0.20	0.20	5193875
1,1-Dichloroethylene	ug/L	<0.10	0.10	5193875
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	5193875
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	5193875
1,2-Dichloropropane	ug/L	<0.10	0.10	5193875
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	5193875
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	5193875
Ethylbenzene	ug/L	0.43	0.10	5193875
Ethylene Dibromide	ug/L	<0.20	0.20	5193875
Hexane	ug/L	<0.50	0.50	5193875
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	5193875
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	5193875
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	5193875
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	5193875
Styrene	ug/L	<0.20	0.20	5193875
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	5193875
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	5193875
Tetrachloroethylene	ug/L	<0.10	0.10	5193875
Toluene	ug/L	<0.20	0.20	5193875

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		FFN808		
Sampling Date		2017/09/26 18:20		
COC Number		628797-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	5193875
1,1,2-Trichloroethane	ug/L	<0.20	0.20	5193875
Trichloroethylene	ug/L	<0.10	0.10	5193875
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	5193875
Vinyl Chloride	ug/L	<0.20	0.20	5193875
p+m-Xylene	ug/L	0.46	0.10	5193875
o-Xylene	ug/L	0.12	0.10	5193875
Total Xylenes	ug/L	0.58	0.10	5193875
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	103		5193875
D4-1,2-Dichloroethane	%	104		5193875
D8-Toluene	%	97		5193875

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN803
Sample ID: MW1
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5192820	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196841	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN803 Dup
Sample ID: MW1
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal

Maxxam ID: FFN804
Sample ID: MW2
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5192820	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN804
Sample ID: MW2
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN804 Dup
Sample ID: MW2
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi

Maxxam ID: FFN805
Sample ID: MW3A
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5192820	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN806
Sample ID: MW3B
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5192820	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196841	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN807
Sample ID: MW4
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5192820	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN808
Sample ID: MW5
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5193875	N/A	2017/10/04	Juan Pangilinan

Maxxam ID: FFN808 Dup
Sample ID: MW5
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison

Maxxam ID: FFN809
Sample ID: MW6
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5197309	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN809
Sample ID: MW6
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN809 Dup
Sample ID: MW6
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5197309	2017/10/04	2017/10/05	Ron Morrison
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN810
Sample ID: MW7
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN811
Sample ID: MW8
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/05	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN812
Sample ID: MW9
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195615	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5193301	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5195621	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5195631	2017/10/03	2017/10/04	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

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Maxxam Job #: B7L4438
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Client Project #: THB-00006189-NE
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Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN812 Dup
Sample ID: MW9
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah

Maxxam ID: FFN819
Sample ID: MW10A
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5194459	N/A	2017/10/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5194462	N/A	2017/10/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5194271	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5196477	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193313	N/A	2017/10/03	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5194465	N/A	2017/10/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN820
Sample ID: MW10B
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5194459	N/A	2017/10/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	5194913	N/A	2017/10/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5194462	N/A	2017/10/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5194271	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5196477	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5194465	N/A	2017/10/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN820
Sample ID: MW10B
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Orthophosphate	KONE	5194917	N/A	2017/10/04	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5194916	N/A	2017/10/04	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN821
Sample ID: MW11
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Chloride by Automated Colourimetry	KONE	5193649	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/02	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5194271	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5196477	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193313	N/A	2017/10/03	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5193652	N/A	2017/10/03	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5193651	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN822
Sample ID: MW12
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5194459	N/A	2017/10/04	Surinder Rai
Chloride by Automated Colourimetry	KONE	5194913	N/A	2017/10/04	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5194462	N/A	2017/10/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193024	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5194271	N/A	2017/10/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5196477	N/A	2017/10/05	Charles Opoku-Ware

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN822
Sample ID: MW12
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193313	N/A	2017/10/03	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5194465	N/A	2017/10/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Orthophosphate	KONE	5194917	N/A	2017/10/04	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5194916	N/A	2017/10/04	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/04	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195909	2017/10/04	2017/10/04	Amanpreet Sappal

Maxxam ID: FFN823
Sample ID: SW1
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5196966	N/A	2017/10/05	Thao Nguyen
Alkalinity	AT	5194459	N/A	2017/10/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5193102	2017/10/02	2017/10/07	Frank Zhang
Chloride by Automated Colourimetry	KONE	5193656	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5194462	N/A	2017/10/04	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193970	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/05	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5196857	N/A	2017/10/05	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5196068	N/A	2017/10/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5194821	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/04	Automated Statchk
pH	AT	5194465	N/A	2017/10/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5193659	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195120	2017/10/03	2017/10/04	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5194510	2017/10/03	2017/10/03	Arpan Shah

Maxxam ID: FFN823 Dup
Sample ID: SW1
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN824
Sample ID: SW2
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5196966	N/A	2017/10/05	Thao Nguyen
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Biochemical Oxygen Demand (BOD)	DO	5193102	2017/10/02	2017/10/07	Frank Zhang
Chloride by Automated Colourimetry	KONE	5193656	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193970	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5196857	N/A	2017/10/05	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5196068	N/A	2017/10/04	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/04	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5193659	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5195120	2017/10/03	2017/10/04	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5192811	2017/10/02	2017/10/02	Arpan Shah

Maxxam ID: FFN825
Sample ID: SW3
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5196966	N/A	2017/10/05	Thao Nguyen
Alkalinity	AT	5193290	N/A	2017/10/04	Neil Dassanayake
Biochemical Oxygen Demand (BOD)	DO	5193102	2017/10/02	2017/10/07	Frank Zhang
Chloride by Automated Colourimetry	KONE	5193318	N/A	2017/10/03	Alina Dobreanu
Chemical Oxygen Demand	SPEC	5195603	N/A	2017/10/05	Mihaela Ghiricociu
Conductivity	AT	5193295	N/A	2017/10/04	Neil Dassanayake
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5193970	N/A	2017/10/03	Anastasia Hamanov
Hardness (calculated as CaCO3)		5192219	N/A	2017/10/04	Automated Statchk
Mercury in Water by CVAA	CV/AA	5196852	2017/10/04	2017/10/05	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5196857	N/A	2017/10/05	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5196477	N/A	2017/10/05	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5193309	N/A	2017/10/05	Chandra Nandlal
Organic Nitrogen	CALC	5192223	N/A	2017/10/05	Automated Statchk
pH	AT	5193297	N/A	2017/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	5194315	N/A	2017/10/03	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5193320	N/A	2017/10/03	Alina Dobreanu
Total Dissolved Solids	BAL	5193316	2017/10/02	2017/10/03	Arpan Shah
Total Kjeldahl Nitrogen in Water	SKAL	5194093	2017/10/03	2017/10/03	Bramdeo Motiram

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

TEST SUMMARY

Maxxam ID: FFN825
Sample ID: SW3
Matrix: Water

Collected: 2017/09/26
Shipped:
Received: 2017/09/29

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	5195120	2017/10/03	2017/10/04	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5194510	2017/10/03	2017/10/03	Arpan Shah

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
Package 2	2.3°C
Package 3	2.3°C
Package 4	1.0°C
Package 5	3.0°C
Package 6	3.3°C
Package 7	6.0°C
Package 8	1.3°C
Package 9	0.7°C
Package 10	2.0°C

BOD Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

Revised Report (2018/03/06): Additional parameters have been included in the metals scan.

Sample FFN810 [MW7] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample FFN822 [MW12] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5193875	4-Bromofluorobenzene	2017/10/04	102	70 - 130	99	70 - 130	99	%				
5193875	D4-1,2-Dichloroethane	2017/10/04	97	70 - 130	102	70 - 130	99	%				
5193875	D8-Toluene	2017/10/04	101	70 - 130	100	70 - 130	99	%				
5192811	Total Suspended Solids	2017/10/02					<1	mg/L	12	25	99	85 - 115
5192820	Dissolved Organic Carbon	2017/10/02	NC	80 - 120	101	80 - 120	0.21, RDL=0.20	mg/L	0.34	20		
5193024	Dissolved Organic Carbon	2017/10/02	98	80 - 120	101	80 - 120	0.20, RDL=0.20	mg/L	1.3	20		
5193102	Total BOD	2017/10/07					<2	mg/L	NC	30	105	80 - 120
5193290	Alkalinity (Total as CaCO3)	2017/10/04			96	85 - 115	<1.0	mg/L	0.43	20		
5193295	Conductivity	2017/10/04			101	85 - 115	<1.0	umho/cm	0.30	25		
5193297	pH	2017/10/04			101	98 - 103			0.33	N/A		
5193301	Dissolved Aluminum (Al)	2017/10/03	100	80 - 120	93	80 - 120	<5.0	ug/L	5.4	20		
5193301	Dissolved Antimony (Sb)	2017/10/03	106	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5193301	Dissolved Arsenic (As)	2017/10/03	100	80 - 120	93	80 - 120	<1.0	ug/L	0.62	20		
5193301	Dissolved Barium (Ba)	2017/10/03	98	80 - 120	94	80 - 120	<2.0	ug/L	12	20		
5193301	Dissolved Beryllium (Be)	2017/10/03	102	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5193301	Dissolved Bismuth (Bi)	2017/10/03	97	80 - 120	92	80 - 120	<1.0	ug/L	NC	20		
5193301	Dissolved Boron (B)	2017/10/03	100	80 - 120	96	80 - 120	<10	ug/L	1.2	20		
5193301	Dissolved Cadmium (Cd)	2017/10/03	103	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
5193301	Dissolved Calcium (Ca)	2017/10/03	NC	80 - 120	90	80 - 120	<200	ug/L	2.4	20		
5193301	Dissolved Chromium (Cr)	2017/10/03	101	80 - 120	94	80 - 120	<5.0	ug/L	NC	20		
5193301	Dissolved Cobalt (Co)	2017/10/03	100	80 - 120	94	80 - 120	<0.50	ug/L	2.5	20		
5193301	Dissolved Copper (Cu)	2017/10/03	100	80 - 120	97	80 - 120	<1.0	ug/L	3.9	20		
5193301	Dissolved Iron (Fe)	2017/10/03	100	80 - 120	94	80 - 120	<100	ug/L	0.090	20		
5193301	Dissolved Lead (Pb)	2017/10/03	98	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
5193301	Dissolved Magnesium (Mg)	2017/10/03	102	80 - 120	95	80 - 120	<50	ug/L	3.8	20		
5193301	Dissolved Manganese (Mn)	2017/10/03	NC	80 - 120	93	80 - 120	<2.0	ug/L	3.3	20		
5193301	Dissolved Molybdenum (Mo)	2017/10/03	102	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5193301	Dissolved Nickel (Ni)	2017/10/03	99	80 - 120	94	80 - 120	<1.0	ug/L	13	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5193301	Dissolved Potassium (K)	2017/10/03	100	80 - 120	94	80 - 120	<200	ug/L	0.10	20		
5193301	Dissolved Selenium (Se)	2017/10/03	101	80 - 120	93	80 - 120	<2.0	ug/L	NC	20		
5193301	Dissolved Silicon (Si)	2017/10/03	100	80 - 120	93	80 - 120	<50	ug/L	2.3	20		
5193301	Dissolved Sodium (Na)	2017/10/03	100	80 - 120	94	80 - 120	<100	ug/L	1.2	20		
5193301	Dissolved Strontium (Sr)	2017/10/03	101	80 - 120	94	80 - 120	<1.0	ug/L	0.31	20		
5193301	Dissolved Thallium (Tl)	2017/10/03	97	80 - 120	93	80 - 120	<0.050	ug/L	NC	20		
5193301	Dissolved Tin (Sn)	2017/10/03	104	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
5193301	Dissolved Vanadium (V)	2017/10/03	100	80 - 120	93	80 - 120	<0.50	ug/L	12	20		
5193301	Dissolved Zinc (Zn)	2017/10/03	101	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
5193309	Nitrate (N)	2017/10/05	99	80 - 120	97	80 - 120	<0.10	mg/L	0.59	20		
5193309	Nitrite (N)	2017/10/05	104	80 - 120	102	80 - 120	<0.010	mg/L	14	20		
5193313	Nitrate (N)	2017/10/03	88	80 - 120	94	80 - 120	<0.10	mg/L	0.43	20		
5193313	Nitrite (N)	2017/10/03	106	80 - 120	104	80 - 120	<0.010	mg/L	NC	20		
5193316	Total Dissolved Solids	2017/10/03					<50	mg/L	0.68	25	102	90 - 110
5193318	Dissolved Chloride (Cl)	2017/10/03	NC	80 - 120	104	80 - 120	<1.0	mg/L	1.6	20		
5193320	Dissolved Sulphate (SO4)	2017/10/03	NC	75 - 125	101	80 - 120	<1.0	mg/L	0.42	20		
5193649	Dissolved Chloride (Cl)	2017/10/03	NC	80 - 120	103	80 - 120	<1.0	mg/L	0.094	20		
5193651	Dissolved Sulphate (SO4)	2017/10/03	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.28	20		
5193652	Orthophosphate (P)	2017/10/03	108	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5193656	Dissolved Chloride (Cl)	2017/10/03	NC	80 - 120	104	80 - 120	<1.0	mg/L	1.2	20		
5193659	Dissolved Sulphate (SO4)	2017/10/03	108	75 - 125	100	80 - 120	<1.0	mg/L	1.1	20		
5193875	1,1,1,2-Tetrachloroethane	2017/10/04	92	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
5193875	1,1,1-Trichloroethane	2017/10/04	93	70 - 130	101	70 - 130	<0.10	ug/L	NC	30		
5193875	1,1,2,2-Tetrachloroethane	2017/10/04	88	70 - 130	98	70 - 130	<0.20	ug/L	NC	30		
5193875	1,1,2-Trichloroethane	2017/10/04	88	70 - 130	98	70 - 130	<0.20	ug/L	NC	30		
5193875	1,1-Dichloroethane	2017/10/04	94	70 - 130	105	70 - 130	<0.10	ug/L	NC	30		
5193875	1,1-Dichloroethylene	2017/10/04	101	70 - 130	110	70 - 130	<0.10	ug/L	NC	30		
5193875	1,2-Dichlorobenzene	2017/10/04	83	70 - 130	91	70 - 130	<0.20	ug/L	NC	30		
5193875	1,2-Dichloroethane	2017/10/04	90	70 - 130	101	70 - 130	<0.20	ug/L	NC	30		
5193875	1,2-Dichloropropane	2017/10/04	86	70 - 130	98	70 - 130	<0.10	ug/L	NC	30		
5193875	1,3-Dichlorobenzene	2017/10/04	88	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		

Maxxam Job #: B7L4438
Report Date: 2018/03/06

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5193875	1,4-Dichlorobenzene	2017/10/04	86	70 - 130	94	70 - 130	<0.20	ug/L	NC	30		
5193875	Acetone (2-Propanone)	2017/10/04	85	60 - 140	96	60 - 140	<10	ug/L	6.2	30		
5193875	Benzene	2017/10/04	94	70 - 130	104	70 - 130	<0.10	ug/L	NC	30		
5193875	Bromodichloromethane	2017/10/04	89	70 - 130	102	70 - 130	<0.10	ug/L	NC	30		
5193875	Bromoform	2017/10/04	95	70 - 130	109	70 - 130	<0.20	ug/L	NC	30		
5193875	Bromomethane	2017/10/04	104	60 - 140	119	60 - 140	<0.50	ug/L	NC	30		
5193875	Carbon Tetrachloride	2017/10/04	94	70 - 130	102	70 - 130	<0.10	ug/L	NC	30		
5193875	Chlorobenzene	2017/10/04	85	70 - 130	98	70 - 130	<0.10	ug/L	NC	30		
5193875	Chloroform	2017/10/04	88	70 - 130	100	70 - 130	<0.10	ug/L	1.3	30		
5193875	cis-1,2-Dichloroethylene	2017/10/04	88	70 - 130	99	70 - 130	<0.10	ug/L	NC	30		
5193875	cis-1,3-Dichloropropene	2017/10/04	88	70 - 130	101	70 - 130	<0.20	ug/L	NC	30		
5193875	Dibromochloromethane	2017/10/04	94	70 - 130	106	70 - 130	<0.20	ug/L	NC	30		
5193875	Dichlorodifluoromethane (FREON 12)	2017/10/04	95	60 - 140	110	60 - 140	<0.50	ug/L				
5193875	Ethylbenzene	2017/10/04	90	70 - 130	99	70 - 130	<0.10	ug/L	NC	30		
5193875	Ethylene Dibromide	2017/10/04	91	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
5193875	Hexane	2017/10/04	86	70 - 130	108	70 - 130	<0.50	ug/L				
5193875	Methyl Ethyl Ketone (2-Butanone)	2017/10/04	86	60 - 140	98	60 - 140	<5.0	ug/L	8.3	30		
5193875	Methyl Isobutyl Ketone	2017/10/04	88	70 - 130	98	70 - 130	<5.0	ug/L	NC	30		
5193875	Methyl t-butyl ether (MTBE)	2017/10/04	85	70 - 130	99	70 - 130	<0.20	ug/L	NC	30		
5193875	Methylene Chloride(Dichloromethane)	2017/10/04	79	70 - 130	99	70 - 130	<0.50	ug/L	NC	30		
5193875	o-Xylene	2017/10/04	91	70 - 130	102	70 - 130	<0.10	ug/L	NC	30		
5193875	p+m-Xylene	2017/10/04	93	70 - 130	104	70 - 130	<0.10	ug/L	2.2	30		
5193875	Styrene	2017/10/04	88	70 - 130	99	70 - 130	<0.20	ug/L	NC	30		
5193875	Tetrachloroethylene	2017/10/04	85	70 - 130	94	70 - 130	<0.10	ug/L	NC	30		
5193875	Toluene	2017/10/04	92	70 - 130	98	70 - 130	<0.20	ug/L	3.8	30		
5193875	Total Xylenes	2017/10/04					<0.10	ug/L	2.2	30		
5193875	trans-1,2-Dichloroethylene	2017/10/04	92	70 - 130	102	70 - 130	<0.10	ug/L	NC	30		
5193875	trans-1,3-Dichloropropene	2017/10/04	92	70 - 130	103	70 - 130	<0.20	ug/L	NC	30		
5193875	Trichloroethylene	2017/10/04	88	70 - 130	97	70 - 130	<0.10	ug/L	NC	30		
5193875	Trichlorofluoromethane (FREON 11)	2017/10/04	92	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
5193875	Vinyl Chloride	2017/10/04	97	70 - 130	104	70 - 130	<0.20	ug/L	NC	30		

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Maxxam Job #: B7L4438
Report Date: 2018/03/06

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5193970	Dissolved Organic Carbon	2017/10/03	97	80 - 120	101	80 - 120	0.26, RDL=0.20	mg/L	2.5	20		
5194093	Total Kjeldahl Nitrogen (TKN)	2017/10/04	NC	80 - 120	106	80 - 120	<0.10	mg/L	2.4	20	109	80 - 120
5194271	Dissolved Aluminum (Al)	2017/10/03	98	80 - 120	100	80 - 120	<5.0	ug/L				
5194271	Dissolved Antimony (Sb)	2017/10/03	104	80 - 120	106	80 - 120	<0.50	ug/L	NC	20		
5194271	Dissolved Arsenic (As)	2017/10/03	99	80 - 120	100	80 - 120	<1.0	ug/L	13	20		
5194271	Dissolved Barium (Ba)	2017/10/03	97	80 - 120	98	80 - 120	<2.0	ug/L	2.7	20		
5194271	Dissolved Beryllium (Be)	2017/10/03	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5194271	Dissolved Bismuth (Bi)	2017/10/03	96	80 - 120	97	80 - 120	<1.0	ug/L				
5194271	Dissolved Boron (B)	2017/10/03	99	80 - 120	101	80 - 120	<10	ug/L	0.73	20		
5194271	Dissolved Cadmium (Cd)	2017/10/03	101	80 - 120	102	80 - 120	<0.10	ug/L	NC	20		
5194271	Dissolved Calcium (Ca)	2017/10/03	NC	80 - 120	95	80 - 120	<200	ug/L				
5194271	Dissolved Chromium (Cr)	2017/10/03	100	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		
5194271	Dissolved Cobalt (Co)	2017/10/03	98	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5194271	Dissolved Copper (Cu)	2017/10/03	99	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
5194271	Dissolved Iron (Fe)	2017/10/03	99	80 - 120	101	80 - 120	<100	ug/L				
5194271	Dissolved Lead (Pb)	2017/10/03	97	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
5194271	Dissolved Magnesium (Mg)	2017/10/03	100	80 - 120	102	80 - 120	<50	ug/L				
5194271	Dissolved Manganese (Mn)	2017/10/03	97	80 - 120	99	80 - 120	<2.0	ug/L				
5194271	Dissolved Molybdenum (Mo)	2017/10/03	101	80 - 120	101	80 - 120	<0.50	ug/L	7.2	20		
5194271	Dissolved Nickel (Ni)	2017/10/03	97	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5194271	Dissolved Potassium (K)	2017/10/03	NC	80 - 120	101	80 - 120	<200	ug/L				
5194271	Dissolved Selenium (Se)	2017/10/03	94	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
5194271	Dissolved Silicon (Si)	2017/10/03	96	80 - 120	98	80 - 120	<50	ug/L				
5194271	Dissolved Sodium (Na)	2017/10/03	NC	80 - 120	100	80 - 120	<100	ug/L	1.5	20		
5194271	Dissolved Strontium (Sr)	2017/10/03	NC	80 - 120	98	80 - 120	<1.0	ug/L				
5194271	Dissolved Thallium (Tl)	2017/10/03	95	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
5194271	Dissolved Tin (Sn)	2017/10/03	102	80 - 120	103	80 - 120	<1.0	ug/L				
5194271	Dissolved Vanadium (V)	2017/10/03	99	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5194271	Dissolved Zinc (Zn)	2017/10/03	101	80 - 120	102	80 - 120	<5.0	ug/L	4.8	20		
5194315	Phenols-4AAP	2017/10/03	92	80 - 120	98	80 - 120	<0.0010	mg/L	14	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5194459	Alkalinity (Total as CaCO3)	2017/10/04			94	85 - 115	<1.0	mg/L	0.31	20		
5194462	Conductivity	2017/10/04			99	85 - 115	<1.0	umho/cm	0	25		
5194465	pH	2017/10/04			101	98 - 103			0.51	N/A		
5194510	Total Suspended Solids	2017/10/03					<1	mg/L	0	25	98	85 - 115
5194821	Nitrate (N)	2017/10/05	NC	80 - 120	93	80 - 120	<0.10	mg/L	0.46	20		
5194821	Nitrite (N)	2017/10/05	NC	80 - 120	104	80 - 120	<0.010	mg/L	0.94	20		
5194913	Dissolved Chloride (Cl)	2017/10/04	NC	80 - 120	102	80 - 120	<1.0	mg/L	0.86	20		
5194916	Dissolved Sulphate (SO4)	2017/10/04	NC	75 - 125	97	80 - 120	<1.0	mg/L	0.40	20		
5194917	Orthophosphate (P)	2017/10/04	109	75 - 125	101	80 - 120	<0.010	mg/L	NC	25		
5195120	Total Phosphorus	2017/10/04	93	80 - 120	89	80 - 120	<0.004	mg/L	1.7	20	90	80 - 120
5195603	Total Chemical Oxygen Demand (COD)	2017/10/05	94	80 - 120	106	80 - 120	4.8, RDL=4.0	mg/L	11	20		
5195615	Total Chemical Oxygen Demand (COD)	2017/10/05	98	80 - 120	95	80 - 120	<4.0	mg/L	1.8	20		
5195621	Total Ammonia-N	2017/10/05	96	80 - 120	95	85 - 115	<0.050	mg/L	NC	20		
5195631	Total Kjeldahl Nitrogen (TKN)	2017/10/04	105	N/A	98	N/A	<0.10	mg/L	0	20	97	80 - 120
5195909	Total Phosphorus	2017/10/04	108	80 - 120	102	80 - 120	<0.020	mg/L	5.9	20	105	80 - 120
5196068	Total Ammonia-N	2017/10/04	96	80 - 120	98	85 - 115	<0.050	mg/L	NC	20		
5196477	Total Ammonia-N	2017/10/05	98	80 - 120	96	85 - 115	<0.050	mg/L	NC	20		
5196841	Mercury (Hg)	2017/10/05	117	75 - 125	106	80 - 120	<0.0001	mg/L	NC	20		
5196852	Mercury (Hg)	2017/10/05	94	75 - 125	91	80 - 120	<0.0001	mg/L	NC	20		
5196857	Total Antimony (Sb)	2017/10/05	110	80 - 120	110	80 - 120	<0.50	ug/L				
5196857	Total Arsenic (As)	2017/10/05	102	80 - 120	104	80 - 120	<1.0	ug/L				
5196857	Total Barium (Ba)	2017/10/05	100	80 - 120	99	80 - 120	<2.0	ug/L				
5196857	Total Beryllium (Be)	2017/10/05	102	80 - 120	107	80 - 120	<0.50	ug/L				
5196857	Total Bismuth (Bi)	2017/10/05	99	80 - 120	103	80 - 120	<1.0	ug/L				
5196857	Total Boron (B)	2017/10/05	94	80 - 120	105	80 - 120	<10	ug/L				
5196857	Total Cadmium (Cd)	2017/10/05	105	80 - 120	106	80 - 120	<0.10	ug/L	2.6	20		
5196857	Total Calcium (Ca)	2017/10/05	NC	80 - 120	100	80 - 120	230, RDL=200	ug/L				
5196857	Total Chromium (Cr)	2017/10/05	102	80 - 120	102	80 - 120	<5.0	ug/L	NC	20		
5196857	Total Cobalt (Co)	2017/10/05	102	80 - 120	104	80 - 120	<0.50	ug/L				
5196857	Total Copper (Cu)	2017/10/05	105	80 - 120	105	80 - 120	<1.0	ug/L	0.080	20		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5196857	Total Iron (Fe)	2017/10/05	99	80 - 120	102	80 - 120	<100	ug/L	0.79	20		
5196857	Total Lead (Pb)	2017/10/05	105	80 - 120	104	80 - 120	<0.50	ug/L	8.3	20		
5196857	Total Magnesium (Mg)	2017/10/05	99	80 - 120	102	80 - 120	<50	ug/L				
5196857	Total Manganese (Mn)	2017/10/05	96	80 - 120	97	80 - 120	<2.0	ug/L				
5196857	Total Molybdenum (Mo)	2017/10/05	113	80 - 120	107	80 - 120	<0.50	ug/L				
5196857	Total Nickel (Ni)	2017/10/05	98	80 - 120	99	80 - 120	<1.0	ug/L	3.6	20		
5196857	Total Potassium (K)	2017/10/05	98	80 - 120	104	80 - 120	<200	ug/L				
5196857	Total Selenium (Se)	2017/10/05	106	80 - 120	109	80 - 120	<2.0	ug/L				
5196857	Total Silicon (Si)	2017/10/05	106	80 - 120	102	80 - 120	<50	ug/L				
5196857	Total Silver (Ag)	2017/10/05	100	80 - 120	102	80 - 120	<0.10	ug/L				
5196857	Total Sodium (Na)	2017/10/05	NC	80 - 120	103	80 - 120	<100	ug/L				
5196857	Total Strontium (Sr)	2017/10/05	95	80 - 120	99	80 - 120	<1.0	ug/L				
5196857	Total Thallium (Tl)	2017/10/05	104	80 - 120	103	80 - 120	<0.050	ug/L				
5196857	Total Vanadium (V)	2017/10/05	99	80 - 120	98	80 - 120	<0.50	ug/L				
5196857	Total Zinc (Zn)	2017/10/05	102	80 - 120	106	80 - 120	<5.0	ug/L	0.74	20		
5196966	Dissolved (0.2u) Aluminum (Al)	2017/10/05	91	80 - 120	102	80 - 120	<5	ug/L	5.1	20		
5197309	Mercury (Hg)	2017/10/05	110	75 - 125	99	80 - 120	<0.0001	mg/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Maxxam Job #: B7L4438
Report Date: 2018/03/06

exp Services Inc
Client Project #: THB-00006189-NE
Site Location: GERALDTON LF
Sampler Initials: EF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Service Specialist

Cristina Carriere, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #17501 exp Services Inc	Company Name:	Quotation #: B66896	Maxxam Job #: / Bottle Order #: 628797
Attention: Ahileas Mitsopoulos	Attention: Ahileas Mitsopoulos	P.O. #:	
Address: 1142 Roland St, Thunder Bay ON P7B 5M4	Address:	Project: THB-00006189-NE	COC #: C#628797-01-01 / Project Manager: Alison Cameron
Tel: (807) 623-9495 x Fax: (807) 623-8070 x	Tel: Fax:	Project Name: Geraldton LF	
Email: ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Email: ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Site #:	
		Sampled By: EF	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA ☐ Municipality ___ ☐ PWQO ☐ Other CDWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: (will be applied if Rush TAT is not specified) ☒

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: ___ Time Required: ___ ☐

Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): GW - Spring/Fall (VOCs) Schedule 5 Comprehensive	GW Addition Metals	Volatile Organic Compounds in Water	SW - Spring/Fall	SW Additional Metals	Organic Nitrogen, Orthophosphate, Hardness				# of Bottles	Comments
1		MW 1	Sept 26/17	1:35pm	GW	X	X	X				X				8	
2		MW 2	Sept 26/17	1:05 pm	GW	X	X	X				X				8	
3		MW 3A	Sept 26/17	5:45pm	GW	X	X	X				X				8	
4		MW3B	Sept 26/17	6:00pm	GW	X	X	X				X				8	
5		MW 4	Sept 26/17	5:25pm	GW	X	X	X				X				8	
6		MW 5	Sept 26/17	6:20pm	GW	X	X	X	X			X				8	
7		MW 6	Sept 26/17	2:05pm	GW	X	X	X				X				8	
8		MW 7	Sept 26/17	11:35am	GW	X	X	X				X				8	
9		MW 8	Sept 26/17	2:30pm	GW	X	X	X				X				8	
10		MW 9	Sept 26/17	5:05pm	GW	X	X	X				X				8	

29-Sep-17 10:43
Alison Cameron
B7L4438
TSP env-1301

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jay Zhang Jay Zhang	17/09/28	04:11pm	Richilda Ocheleman RICHILDA OCHELEMAN	2017/09/29	10:43	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei: 4.6 FER 10 ACTR	Custody Seal	Yes	No
		Present		
		Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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8740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #17501 exp Services Inc	Company Name:	Quotation #: B66896	Maxxam Job #: / Bottle Order #: 628797
Attention: Ahileas Mitsopoulos	Attention: Ahileas Mitsopoulos	P.O. #:	
Address: 1142 Roland St, Thunder Bay ON P7B 5M4	Address:	Project: THB-00006189-NE	
Tel: (807) 623-9495 x Fax: (807) 623-8070 x	Tel: Fax:	Project Name: Geraldton LF	COC #: C#628797-02-01 / Project Manager: Alison Cameron
Email: ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Email: ahileas.mitsopoulos@exp.com, michael.suslyk@exp.co	Site #:	
		Sampled By: EF	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☒ PWQO for SW ☐ Other CCME	

* Include Criteria on Certificate of Analysis (Y/N)? *

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	GW - Spring (all) Schedule 5 & Comprehensive	GW Addition Metals	Volatile Organic Compounds in Water	SW - Spring (all) Schedule 5 SW (complete suite)	SW Additional Metals	Organic Nitrogen, Orthophosphate, Hardness	Hardness (calculated as $CaCO_3$)	Organic Nitrogen, DOC, Dissolved Ca	Hardness (including Ca, Mg, Na, K)	# of Bottles	Comments
1		MW 10A	Sept 26/17	3:00pm	GW	X	X	X				X				8	
2		MW 10B	Sept 26/17	3:15pm	GW	X	X	X				X				8	
3		MW 11	Sept 26/17	10:45am	GW	X	X	X				X				8	
4		MW 12	Sept 26/17	5:15pm	GW	X	X	X				X				8	
5						-											
6		SW 1	Sept 26/17	3:30pm	SW	Hg only				X	X		X	X	X	10	
7		SW 2	Sept 26/17	3:50pm	SW	Hg only				X	X		X	X	X	10	
8		SW 3	Sept 26/17	4:30pm	SW	Hg only				X	X		X	X	X	10	
9																	
10																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Tony Thomas	17/09/28	04:12PM	Michelle Sukkeewah ASTTBC	2017/09/29	10:43			REFER TO ATTR	Present		
Tony Thomas			Michael Suslyk						Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 663249-01-01, 663249-02-01, 663250-01-01

Report Date: 2018/05/24
Report #: R5169250
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B6788
Received: 2018/05/17, 14:45

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2018/05/23	CAM SOP-00447	EPA 6020B m
Alkalinity	8	N/A	2018/05/19	CAM SOP-00448	SM 23 2320 B m
Alkalinity	9	N/A	2018/05/20	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2018/05/18	2018/05/23	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	17	N/A	2018/05/22	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	5	N/A	2018/05/22	CAM SOP-00416	SM 23 5220 D m
Chemical Oxygen Demand	12	N/A	2018/05/24	CAM SOP-00416	SM 23 5220 D m
Conductivity	8	N/A	2018/05/19	CAM SOP-00414	SM 23 2510 m
Conductivity	9	N/A	2018/05/20	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	17	N/A	2018/05/18	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	7	N/A	2018/05/22	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	3	N/A	2018/05/23	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	7	N/A	2018/05/24	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	17	2018/05/23	2018/05/23	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	7	N/A	2018/05/22	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	7	N/A	2018/05/24	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2018/05/23	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	7	N/A	2018/05/23		
Ion Balance (% Difference)	7	N/A	2018/05/24		
Total Ammonia-N	16	N/A	2018/05/23	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2018/05/24	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	17	N/A	2018/05/18	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	17	N/A	2018/05/24		
pH	8	N/A	2018/05/19	CAM SOP-00413	SM 4500H+ B m

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 663249-01-01, 663249-02-01, 663250-01-01

Report Date: 2018/05/24
Report #: R5169250
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B6788
Received: 2018/05/17, 14:45

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
pH	9	N/A	2018/05/20	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	16	N/A	2018/05/22	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	1	N/A	2018/05/23	CAM SOP-00444	OMOE E3179 m
Orthophosphate	14	N/A	2018/05/22	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	17	N/A	2018/05/22	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	5	2018/05/18	2018/05/19	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	1	2018/05/18	2018/05/22	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	11	2018/05/22	2018/05/22	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	14	2018/05/22	2018/05/23	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	3	2018/05/22	2018/05/24	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2018/05/24	2018/05/24	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	14	2018/05/22	2018/05/23	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	2	2018/05/18	2018/05/19	CAM SOP-00428	SM 23 2540D m
Low Level Total Suspended Solids	1	2018/05/22	2018/05/22	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

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Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 663249-01-01, 663249-02-01, 663250-01-01

Report Date: 2018/05/24
Report #: R5169250
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B6788
Received: 2018/05/17, 14:45

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Brescacin, Project Manager Assistant - National Accounts
Email: MBrescacin@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK726			GSK726			GSK727		
Sampling Date		2018/05/14			2018/05/14			2018/05/14 12:55		
COC Number		663249-01-01			663249-01-01			663249-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	2.5	0.050	5542068				0.47	0.050	5542068
Total Chemical Oxygen Demand (COD)	mg/L	31	4.0	5541847				17	4.0	5541847
Conductivity	umho/cm	1400	1.0	5540056				540	1.0	5540056
Total Dissolved Solids	mg/L	720	10	5541256				245	10	5541256
Total Kjeldahl Nitrogen (TKN)	mg/L	2.8	0.10	5542022				0.56	0.10	5542022
Dissolved Organic Carbon	mg/L	8.5	0.50	5538488				5.9	0.50	5538488
pH	pH	7.26		5540057				7.67		5540057
Phenols-4AAP	mg/L	<0.0010	0.0010	5541795				<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.049	0.020	5541390	0.045	0.020	5541390	0.054	0.020	5541390
Dissolved Sulphate (SO4)	mg/L	53	1.0	5540318				<1.0	1.0	5540318
Alkalinity (Total as CaCO3)	mg/L	600	1.0	5540054				280	1.0	5540054
Dissolved Chloride (Cl)	mg/L	88	1.0	5540317				8.1	1.0	5540317
Nitrite (N)	mg/L	0.022	0.010	5538873				<0.010	0.010	5538873
Nitrate (N)	mg/L	0.68	0.10	5538873				<0.10	0.10	5538873
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5543093				<0.0001	0.0001	5543093
Dissolved Aluminum (Al)	ug/L	8.4	5.0	5539837				9.2	5.0	5539837
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539837				<0.50	0.50	5539837
Dissolved Arsenic (As)	ug/L	15	1.0	5539837				2.6	1.0	5539837
Dissolved Barium (Ba)	ug/L	130	2.0	5539837				19	2.0	5539837
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539837				<0.50	0.50	5539837
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539837				<1.0	1.0	5539837
Dissolved Boron (B)	ug/L	190	10	5539837				37	10	5539837
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539837				<0.10	0.10	5539837
Dissolved Calcium (Ca)	ug/L	220000	200	5539837				91000	200	5539837
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539837				<5.0	5.0	5539837
Dissolved Cobalt (Co)	ug/L	18	0.50	5539837				2.9	0.50	5539837
Dissolved Copper (Cu)	ug/L	1.7	1.0	5539837				3.1	1.0	5539837
Dissolved Iron (Fe)	ug/L	15000	100	5539837				160	100	5539837
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539837				<0.50	0.50	5539837
Dissolved Magnesium (Mg)	ug/L	23000	50	5539837				10000	50	5539837
Dissolved Manganese (Mn)	ug/L	2500	2.0	5539837				1900	2.0	5539837

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK726			GSK726			GSK727		
Sampling Date		2018/05/14			2018/05/14			2018/05/14 12:55		
COC Number		663249-01-01			663249-01-01			663249-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	0.91	0.50	5539837				<0.50	0.50	5539837
Dissolved Nickel (Ni)	ug/L	7.5	1.0	5539837				3.4	1.0	5539837
Dissolved Potassium (K)	ug/L	17000	200	5539837				2100	200	5539837
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539837				<2.0	2.0	5539837
Dissolved Silicon (Si)	ug/L	9800	50	5539837				4500	50	5539837
Dissolved Sodium (Na)	ug/L	42000	100	5539837				5500	100	5539837
Dissolved Strontium (Sr)	ug/L	330	1.0	5539837				77	1.0	5539837
Dissolved Thallium (Tl)	ug/L	0.20	0.050	5539837				0.078	0.050	5539837
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539837				<1.0	1.0	5539837
Dissolved Vanadium (V)	ug/L	1.0	0.50	5539837				0.72	0.50	5539837
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539837				<5.0	5.0	5539837

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK728		GSK729			GSK730		
Sampling Date		2018/05/14 14:19		2018/05/14 14:10			2018/05/14 15:08		
COC Number		663249-01-01		663249-01-01			663249-01-01		
	UNITS	**MW3A**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**	**MW4**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	9.3 (1)	5542068	6.5 (1)	0.050	5542068	0.062	0.050	5542068
Total Chemical Oxygen Demand (COD)	mg/L	31	5542035	26	4.0	5542035	8.4	4.0	5542035
Conductivity	umho/cm	1400	5538838	1200	1.0	5540056	1100	1.0	5538838
Total Dissolved Solids	mg/L	655	5541256	680	10	5538811	575	10	5541256
Total Kjeldahl Nitrogen (TKN)	mg/L	9.0 (1)	5542022	6.3 (1)	0.50	5542022	0.13	0.10	5542022
Dissolved Organic Carbon	mg/L	7.4	5538488	8.1	0.50	5538488	2.1	0.50	5538488
pH	pH	7.35	5538839	7.37		5540057	7.40		5538839
Phenols-4AAP	mg/L	<0.0010	5541795	<0.0010	0.0010	5541795	<0.0010	0.0010	5542522
Total Phosphorus	mg/L	0.039	5541390	0.059	0.020	5541390	0.24	0.020	5541390
Dissolved Sulphate (SO4)	mg/L	23	5538882	24	1.0	5538882	70	1.0	5538882
Alkalinity (Total as CaCO3)	mg/L	540	5538830	550	1.0	5540054	540	1.0	5538830
Dissolved Chloride (Cl)	mg/L	110	5538879	68	1.0	5538879	13	1.0	5538879
Nitrite (N)	mg/L	<0.010	5538861	<0.010	0.010	5538873	<0.010	0.010	5538873
Nitrate (N)	mg/L	<0.10	5538861	0.94	0.10	5538873	0.26	0.10	5538873
Metals									
Mercury (Hg)	mg/L	<0.0001	5543103	<0.0001	0.0001	5543103	<0.0001	0.0001	5543093
Dissolved Aluminum (Al)	ug/L	5.4	5539837	8.6	5.0	5539836	<5.0	5.0	5539836
Dissolved Antimony (Sb)	ug/L	<0.50	5539837	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Arsenic (As)	ug/L	17	5539837	4.3	1.0	5539836	<1.0	1.0	5539836
Dissolved Barium (Ba)	ug/L	140	5539837	130	2.0	5539836	51	2.0	5539836
Dissolved Beryllium (Be)	ug/L	<0.50	5539837	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Bismuth (Bi)	ug/L	<1.0	5539837	<1.0	1.0	5539836	<1.0	1.0	5539836
Dissolved Boron (B)	ug/L	270	5539837	290	10	5539836	410	10	5539836
Dissolved Cadmium (Cd)	ug/L	<0.10	5539837	<0.10	0.10	5539836	0.15	0.10	5539836
Dissolved Calcium (Ca)	ug/L	160000	5539837	170000	200	5539836	210000	200	5539836
Dissolved Chromium (Cr)	ug/L	<5.0	5539837	<5.0	5.0	5539836	<5.0	5.0	5539836
Dissolved Cobalt (Co)	ug/L	5.6	5539837	7.6	0.50	5539836	3.0	0.50	5539836
Dissolved Copper (Cu)	ug/L	<1.0	5539837	3.3	1.0	5539836	1.4	1.0	5539836
Dissolved Iron (Fe)	ug/L	17000	5539837	3900	100	5539836	<100	100	5539836
Dissolved Lead (Pb)	ug/L	<0.50	5539837	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Magnesium (Mg)	ug/L	26000	5539837	27000	50	5539836	21000	50	5539836
Dissolved Manganese (Mn)	ug/L	1300	5539837	1200	2.0	5539836	490	2.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK728		GSK729			GSK730		
Sampling Date		2018/05/14 14:19		2018/05/14 14:10			2018/05/14 15:08		
COC Number		663249-01-01		663249-01-01			663249-01-01		
	UNITS	**MW3A**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**	**MW4**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	5539837	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Nickel (Ni)	ug/L	5.1	5539837	8.4	1.0	5539836	4.8	1.0	5539836
Dissolved Potassium (K)	ug/L	13000	5539837	14000	200	5539836	2000	200	5539836
Dissolved Selenium (Se)	ug/L	<2.0	5539837	<2.0	2.0	5539836	<2.0	2.0	5539836
Dissolved Silicon (Si)	ug/L	7800	5539837	6800	50	5539836	5400	50	5539836
Dissolved Sodium (Na)	ug/L	65000	5539837	46000	100	5539836	12000	100	5539836
Dissolved Strontium (Sr)	ug/L	250	5539837	280	1.0	5539836	160	1.0	5539836
Dissolved Thallium (Tl)	ug/L	<0.050	5539837	0.061	0.050	5539836	0.11	0.050	5539836
Dissolved Tin (Sn)	ug/L	<1.0	5539837	<1.0	1.0	5539836	<1.0	1.0	5539836
Dissolved Vanadium (V)	ug/L	0.63	5539837	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Zinc (Zn)	ug/L	<5.0	5539837	5.0	5.0	5539836	<5.0	5.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK730			GSK731		GSK732		
Sampling Date		2018/05/14 15:08			2018/05/14 13:17		2018/05/14 17:35		
COC Number		663249-01-01			663249-01-01		663249-01-01		
	UNITS	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L				2.7 (1)	5542068	<0.050	0.050	5542983
Total Chemical Oxygen Demand (COD)	mg/L				22	5542035	17	4.0	5541636
Conductivity	umho/cm				1300	5538838	650	1.0	5538838
Total Dissolved Solids	mg/L				720	5538811	275	10	5541256
Total Kjeldahl Nitrogen (TKN)	mg/L				2.7 (1)	5542022	<0.10	0.10	5542022
Dissolved Organic Carbon	mg/L				5.2	5538488	4.6	0.50	5538488
pH	pH				7.63	5538839	7.93		5538839
Phenols-4AAP	mg/L	<0.0010	0.0010	5542522	<0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L				0.11	5541390	0.035	0.020	5541390
Dissolved Sulphate (SO4)	mg/L				150	5538882	28	1.0	5538882
Alkalinity (Total as CaCO3)	mg/L				480	5538830	330	1.0	5538830
Dissolved Chloride (Cl)	mg/L				42	5538879	1.5	1.0	5538879
Nitrite (N)	mg/L				<0.010	5538861	<0.010	0.010	5538861
Nitrate (N)	mg/L				<0.10	5538861	0.28	0.10	5538861
Metals									
Mercury (Hg)	mg/L				<0.0001	5543103	<0.0001	0.0001	5543093
Dissolved Aluminum (Al)	ug/L				<5.0	5539837	<5.0	5.0	5539837
Dissolved Antimony (Sb)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Arsenic (As)	ug/L				2.7	5539837	<1.0	1.0	5539837
Dissolved Barium (Ba)	ug/L				110	5539837	21	2.0	5539837
Dissolved Beryllium (Be)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Bismuth (Bi)	ug/L				<1.0	5539837	<1.0	1.0	5539837
Dissolved Boron (B)	ug/L				1200	5539837	16	10	5539837
Dissolved Cadmium (Cd)	ug/L				<0.10	5539837	<0.10	0.10	5539837
Dissolved Calcium (Ca)	ug/L				130000	5539837	100000	200	5539837
Dissolved Chromium (Cr)	ug/L				<5.0	5539837	<5.0	5.0	5539837
Dissolved Cobalt (Co)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Copper (Cu)	ug/L				<1.0	5539837	2.7	1.0	5539837
Dissolved Iron (Fe)	ug/L				6400	5539837	<100	100	5539837
Dissolved Lead (Pb)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Magnesium (Mg)	ug/L				48000	5539837	18000	50	5539837
Dissolved Manganese (Mn)	ug/L				950	5539837	11	2.0	5539837

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK730			GSK731		GSK732		
Sampling Date		2018/05/14 15:08			2018/05/14 13:17		2018/05/14 17:35		
COC Number		663249-01-01			663249-01-01		663249-01-01		
	UNITS	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**QC Batch**	**MW6**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Nickel (Ni)	ug/L				4.8	5539837	3.1	1.0	5539837
Dissolved Potassium (K)	ug/L				16000	5539837	1500	200	5539837
Dissolved Selenium (Se)	ug/L				<2.0	5539837	<2.0	2.0	5539837
Dissolved Silicon (Si)	ug/L				6000	5539837	5600	50	5539837
Dissolved Sodium (Na)	ug/L				54000	5539837	7600	100	5539837
Dissolved Strontium (Sr)	ug/L				310	5539837	94	1.0	5539837
Dissolved Thallium (Tl)	ug/L				<0.050	5539837	0.11	0.050	5539837
Dissolved Tin (Sn)	ug/L				<1.0	5539837	<1.0	1.0	5539837
Dissolved Vanadium (V)	ug/L				<0.50	5539837	<0.50	0.50	5539837
Dissolved Zinc (Zn)	ug/L				<5.0	5539837	<5.0	5.0	5539837

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK732			GSK733			GSK734		
Sampling Date		2018/05/14 17:35			2018/05/14 15:10			2018/05/14 19:25		
COC Number		663249-01-01			663249-01-01			663249-01-01		
	UNITS	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	5542983	6.6	0.050	5542068	0.077	0.050	5542068
Total Chemical Oxygen Demand (COD)	mg/L	16	4.0	5541636	27	4.0	5542035	13	4.0	5541847
Conductivity	umho/cm				1100	1.0	5540056	4800	1.0	5540056
Total Dissolved Solids	mg/L				510	10	5541256	2880	10	5538811
Total Kjeldahl Nitrogen (TKN)	mg/L				6.7	0.20	5542022	0.48	0.10	5542022
Dissolved Organic Carbon	mg/L				6.0	0.50	5538488	2.8	0.50	5538488
pH	pH				7.23		5540057	7.87		5540057
Phenols-4AAP	mg/L				<0.0010	0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L				0.048	0.020	5541390	0.51	0.040	5541390
Dissolved Sulphate (SO4)	mg/L				29	1.0	5538882	28	1.0	5538882
Alkalinity (Total as CaCO3)	mg/L				510	1.0	5540054	420	1.0	5540054
Dissolved Chloride (Cl)	mg/L				41	1.0	5538879	1300	15	5538879
Nitrite (N)	mg/L				<0.010	0.010	5538873	<0.010	0.010	5538873
Nitrate (N)	mg/L				<0.10	0.10	5538873	1.86	0.10	5538873
Metals										
Mercury (Hg)	mg/L				<0.0001	0.0001	5543093	<0.0001	0.0001	5543103
Dissolved Aluminum (Al)	ug/L				6.3	5.0	5539837	<5.0	5.0	5539836
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Arsenic (As)	ug/L				41	1.0	5539837	<1.0	1.0	5539836
Dissolved Barium (Ba)	ug/L				190	2.0	5539837	90	2.0	5539836
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	5539837	<1.0	1.0	5539836
Dissolved Boron (B)	ug/L				200	10	5539837	<10	10	5539836
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	5539837	<0.10	0.10	5539836
Dissolved Calcium (Ca)	ug/L				150000	200	5539837	220000	200	5539836
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	5539837	<5.0	5.0	5539836
Dissolved Cobalt (Co)	ug/L				14	0.50	5539837	<0.50	0.50	5539836
Dissolved Copper (Cu)	ug/L				<1.0	1.0	5539837	2.1	1.0	5539836
Dissolved Iron (Fe)	ug/L				23000	100	5539837	<100	100	5539836
Dissolved Lead (Pb)	ug/L				<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Magnesium (Mg)	ug/L				22000	50	5539837	18000	50	5539836
Dissolved Manganese (Mn)	ug/L				1900	2.0	5539837	6.4	2.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK732			GSK733			GSK734		
Sampling Date		2018/05/14 17:35			2018/05/14 15:10			2018/05/14 19:25		
COC Number		663249-01-01			663249-01-01			663249-01-01		
	UNITS	**MW6 Lab-Dup**	**RDL**	**QC Batch**	**MW7**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Nickel (Ni)	ug/L				9.9	1.0	5539837	<1.0	1.0	5539836
Dissolved Potassium (K)	ug/L				11000	200	5539837	3200	200	5539836
Dissolved Selenium (Se)	ug/L				<2.0	2.0	5539837	<2.0	2.0	5539836
Dissolved Silicon (Si)	ug/L				10000	50	5539837	2800	50	5539836
Dissolved Sodium (Na)	ug/L				32000	100	5539837	690000	500	5539836
Dissolved Strontium (Sr)	ug/L				210	1.0	5539837	260	1.0	5539836
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	5539837	<0.050	0.050	5539836
Dissolved Tin (Sn)	ug/L				<1.0	1.0	5539837	<1.0	1.0	5539836
Dissolved Vanadium (V)	ug/L				0.87	0.50	5539837	<0.50	0.50	5539836
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	5539837	<5.0	5.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Report Date: 2018/05/24

exp Services Inc
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Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK735			GSK740		
Sampling Date		2018/05/14 17:09			2018/05/14 19:05		
COC Number		663249-01-01			663249-02-01		
	UNITS	**MW9**	**RDL**	**QC Batch**	**MW10A**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.065	0.050	5542068	0.41	0.050	5542068
Total Chemical Oxygen Demand (COD)	mg/L	5.5	4.0	5542035	37	4.0	5542035
Conductivity	umho/cm	980	1.0	5538838	820	1.0	5538838
Total Dissolved Solids	mg/L	790	10	5538811	420	10	5541256
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.10	0.10	5542022	0.61	0.10	5542022
Dissolved Organic Carbon	mg/L	0.97	0.50	5538488	12	0.50	5538488
pH	pH	7.97		5538839	7.33		5538839
Phenols-4AAP	mg/L	<0.0010	0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.17	0.020	5541390	0.49	0.020	5541390
Dissolved Sulphate (SO4)	mg/L	6.2	1.0	5538882	8.5	1.0	5538882
Alkalinity (Total as CaCO3)	mg/L	240	1.0	5538830	300	1.0	5538830
Dissolved Chloride (Cl)	mg/L	140	2.0	5538879	79	1.0	5538879
Nitrite (N)	mg/L	<0.010	0.010	5538873	<0.010	0.010	5538873
Nitrate (N)	mg/L	0.17	0.10	5538873	<0.10	0.10	5538873
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5543093	<0.0001	0.0001	5543103
Dissolved Aluminum (Al)	ug/L	8.7	5.0	5539837	120	5.0	5539836
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5539837	16	1.0	5539836
Dissolved Barium (Ba)	ug/L	25	2.0	5539837	23	2.0	5539836
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539837	<1.0	1.0	5539836
Dissolved Boron (B)	ug/L	<10	10	5539837	<10	10	5539836
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539837	<0.10	0.10	5539836
Dissolved Calcium (Ca)	ug/L	110000	200	5539837	85000	200	5539836
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539837	<5.0	5.0	5539836
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Copper (Cu)	ug/L	5.7	1.0	5539837	<1.0	1.0	5539836
Dissolved Iron (Fe)	ug/L	<100	100	5539837	1800	100	5539836
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539837	<0.50	0.50	5539836
Dissolved Magnesium (Mg)	ug/L	20000	50	5539837	14000	50	5539836
Dissolved Manganese (Mn)	ug/L	4.4	2.0	5539837	69	2.0	5539836
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539837	<0.50	0.50	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK735			GSK740		
Sampling Date		2018/05/14 17:09			2018/05/14 19:05		
COC Number		663249-01-01			663249-02-01		
	UNITS	**MW9**	**RDL**	**QC Batch**	**MW10A**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	1.1	1.0	5539837	1.5	1.0	5539836
Dissolved Potassium (K)	ug/L	1300	200	5539837	390	200	5539836
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539837	<2.0	2.0	5539836
Dissolved Silicon (Si)	ug/L	4900	50	5539837	3000	50	5539836
Dissolved Sodium (Na)	ug/L	48000	100	5539837	35000	100	5539836
Dissolved Strontium (Sr)	ug/L	97	1.0	5539837	74	1.0	5539836
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539837	<0.050	0.050	5539836
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539837	<1.0	1.0	5539836
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539837	1.9	0.50	5539836
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539837	<5.0	5.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK741			GSK742		
Sampling Date		2018/05/14 19:45			2018/05/14 16:30		
COC Number		663249-02-01			663249-02-01		
	UNITS	**MW10B**	**RDL**	**QC Batch**	**MW11**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.24	0.050	5542068	0.16	0.050	5542068
Total Chemical Oxygen Demand (COD)	mg/L	52	4.0	5542035	7.7	4.0	5542035
Conductivity	umho/cm	1300	1.0	5538838	490	1.0	5538838
Total Dissolved Solids	mg/L	670	10	5541256	285	10	5538811
Total Kjeldahl Nitrogen (TKN)	mg/L	0.58	0.10	5542022	0.17	0.10	5542022
Dissolved Organic Carbon	mg/L	15	0.50	5538488	1.6	0.50	5538488
pH	pH	7.38		5538839	7.92		5538839
Phenols-4AAP	mg/L	<0.0010	0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.98	0.040	5541390	2.6	0.10	5541390
Dissolved Sulphate (SO4)	mg/L	<1.0	1.0	5538882	<1.0	1.0	5538882
Alkalinity (Total as CaCO3)	mg/L	350	1.0	5538830	270	1.0	5538830
Dissolved Chloride (Cl)	mg/L	200	2.0	5538879	<1.0	1.0	5538879
Nitrite (N)	mg/L	<0.010	0.010	5538873	<0.010	0.010	5538873
Nitrate (N)	mg/L	<0.10	0.10	5538873	<0.10	0.10	5538873
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5543093	<0.0001	0.0001	5543093
Dissolved Aluminum (Al)	ug/L	77	5.0	5539836	<5.0	5.0	5539836
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Arsenic (As)	ug/L	32	1.0	5539836	<1.0	1.0	5539836
Dissolved Barium (Ba)	ug/L	28	2.0	5539836	30	2.0	5539836
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539836	<1.0	1.0	5539836
Dissolved Boron (B)	ug/L	<10	10	5539836	<10	10	5539836
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539836	<0.10	0.10	5539836
Dissolved Calcium (Ca)	ug/L	130000	200	5539836	75000	200	5539836
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539836	<5.0	5.0	5539836
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539836	<0.50	0.50	5539836
Dissolved Copper (Cu)	ug/L	6.4	1.0	5539836	<1.0	1.0	5539836
Dissolved Iron (Fe)	ug/L	4500	100	5539836	<100	100	5539836
Dissolved Lead (Pb)	ug/L	1.2	0.50	5539836	<0.50	0.50	5539836
Dissolved Magnesium (Mg)	ug/L	11000	50	5539836	15000	50	5539836
Dissolved Manganese (Mn)	ug/L	120	2.0	5539836	83	2.0	5539836
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539836	1.1	0.50	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK741			GSK742		
Sampling Date		2018/05/14 19:45			2018/05/14 16:30		
COC Number		663249-02-01			663249-02-01		
	UNITS	**MW10B**	**RDL**	**QC Batch**	**MW11**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	1.3	1.0	5539836	<1.0	1.0	5539836
Dissolved Potassium (K)	ug/L	250	200	5539836	1000	200	5539836
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539836	<2.0	2.0	5539836
Dissolved Silicon (Si)	ug/L	1900	50	5539836	6700	50	5539836
Dissolved Sodium (Na)	ug/L	110000	100	5539836	7000	100	5539836
Dissolved Strontium (Sr)	ug/L	100	1.0	5539836	85	1.0	5539836
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539836	<0.050	0.050	5539836
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539836	<1.0	1.0	5539836
Dissolved Vanadium (V)	ug/L	0.97	0.50	5539836	<0.50	0.50	5539836
Dissolved Zinc (Zn)	ug/L	19	5.0	5539836	<5.0	5.0	5539836

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK743			GSK743		
Sampling Date		2018/05/14 16:20			2018/05/14 16:20		
COC Number		663249-02-01			663249-02-01		
	UNITS	**MW12**	**RDL**	**QC Batch**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	1.6	0.050	5542068			
Total Chemical Oxygen Demand (COD)	mg/L	18	4.0	5542035			
Conductivity	umho/cm	1200	1.0	5540056	1200	1.0	5540056
Total Dissolved Solids	mg/L	745	10	5542410			
Total Kjeldahl Nitrogen (TKN)	mg/L	1.7	0.10	5542022			
Dissolved Organic Carbon	mg/L	5.2	0.50	5538488			
pH	pH	7.50		5540057	7.54		5540057
Phenols-4AAP	mg/L	<0.0010	0.0010	5541795			
Total Phosphorus	mg/L	0.081	0.020	5541390			
Dissolved Sulphate (SO4)	mg/L	150	1.0	5538882			
Alkalinity (Total as CaCO3)	mg/L	480	1.0	5540054	480	1.0	5540054
Dissolved Chloride (Cl)	mg/L	41	1.0	5538879			
Nitrite (N)	mg/L	<0.010	0.010	5538873			
Nitrate (N)	mg/L	<0.10	0.10	5538873			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5543103			
Dissolved Aluminum (Al)	ug/L	100	5.0	5539836			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5539836			
Dissolved Arsenic (As)	ug/L	2.5	1.0	5539836			
Dissolved Barium (Ba)	ug/L	110	2.0	5539836			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5539836			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5539836			
Dissolved Boron (B)	ug/L	1100	10	5539836			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5539836			
Dissolved Calcium (Ca)	ug/L	130000	200	5539836			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5539836			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5539836			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5539836			
Dissolved Iron (Fe)	ug/L	6200	100	5539836			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5539836			
Dissolved Magnesium (Mg)	ug/L	46000	50	5539836			
Dissolved Manganese (Mn)	ug/L	870	2.0	5539836			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		GSK743			GSK743		
Sampling Date		2018/05/14 16:20			2018/05/14 16:20		
COC Number		663249-02-01			663249-02-01		
	UNITS	**MW12**	**RDL**	**QC Batch**	**MW12 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5539836			
Dissolved Nickel (Ni)	ug/L	4.0	1.0	5539836			
Dissolved Potassium (K)	ug/L	15000	200	5539836			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5539836			
Dissolved Silicon (Si)	ug/L	5600	50	5539836			
Dissolved Sodium (Na)	ug/L	51000	100	5539836			
Dissolved Strontium (Sr)	ug/L	300	1.0	5539836			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5539836			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5539836			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5539836			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5539836			

RDL = Reportable Detection Limit
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Lab-Dup = Laboratory Initiated Duplicate

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Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSK831			GSK831		
Sampling Date		2018/05/14 20:15			2018/05/14 20:15		
COC Number		663250-01-01			663250-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.051	0.050	5542068			
Total BOD	mg/L	3	2	5538047			
Total Chemical Oxygen Demand (COD)	mg/L	27	4.0	5542035			
Conductivity	umho/cm	230	1.0	5540056			
Total Dissolved Solids	mg/L	85	10	5541256			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24	0.10	5542022			
pH	pH	7.66		5540057			
Phenols-4AAP	mg/L	<0.0010	0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.027	0.004	5545398			
Total Suspended Solids	mg/L	8	1	5538781			
Dissolved Sulphate (SO4)	mg/L	2.3	1.0	5538878			
Alkalinity (Total as CaCO3)	mg/L	66	1.0	5540054			
Dissolved Chloride (Cl)	mg/L	25	1.0	5538876			
Nitrite (N)	mg/L	<0.010	0.010	5538873			
Nitrate (N)	mg/L	<0.10	0.10	5538873			
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5543103			
Total Antimony (Sb)	ug/L	<0.50	0.50	5543429			
Total Arsenic (As)	ug/L	11	1.0	5543429			
Total Barium (Ba)	ug/L	7.0	2.0	5543429			
Total Beryllium (Be)	ug/L	<0.50	0.50	5543429			
Total Bismuth (Bi)	ug/L	<1.0	1.0	5543429			
Total Boron (B)	ug/L	<10	10	5543429			
Total Cadmium (Cd)	ug/L	<0.10	0.10	5543429			
Total Calcium (Ca)	ug/L	22000	200	5543429			
Total Chromium (Cr)	ug/L	<5.0	5.0	5543429			
Total Cobalt (Co)	ug/L	<0.50	0.50	5543429			
Total Copper (Cu)	ug/L	<1.0	1.0	5543429			
Total Iron (Fe)	ug/L	240	100	5543429			
Total Lead (Pb)	ug/L	<0.50	0.50	5543429			
Total Magnesium (Mg)	ug/L	4500	50	5543429			
Total Manganese (Mn)	ug/L	13	2.0	5543429			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSK831			GSK831		
Sampling Date		2018/05/14 20:15			2018/05/14 20:15		
COC Number		663250-01-01			663250-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5543429			
Total Nickel (Ni)	ug/L	<1.0	1.0	5543429			
Total Potassium (K)	ug/L	590	200	5543429			
Total Selenium (Se)	ug/L	<2.0	2.0	5543429			
Total Silicon (Si)	ug/L	1300	50	5543429			
Total Silver (Ag)	ug/L	<0.10	0.10	5543429			
Total Sodium (Na)	ug/L	16000	100	5543429			
Total Strontium (Sr)	ug/L	35	1.0	5543429			
Total Thallium (Tl)	ug/L	<0.050	0.050	5543429			
Total Vanadium (V)	ug/L	<0.50	0.50	5543429			
Total Zinc (Zn)	ug/L	<5.0	5.0	5543429			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSK832		GSK833		
Sampling Date		2018/05/14 20:00		2018/05/15 13:20		
COC Number		663250-01-01		663250-01-01		
	UNITS	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Inorganics						
Total Ammonia-N	mg/L	<0.050	5542068	<0.050	0.050	5542068
Total BOD	mg/L	<2	5538047	<2	2	5538047
Total Chemical Oxygen Demand (COD)	mg/L	33	5542035	29	4.0	5541847
Conductivity	umho/cm	180	5540056	140	1.0	5540056
Total Dissolved Solids	mg/L	35	5541256	<10	10	5541256
Total Kjeldahl Nitrogen (TKN)	mg/L	0.19	5542022	0.22	0.10	5542022
pH	pH	7.71	5540057	7.65		5540057
Phenols-4AAP	mg/L	<0.0010	5541795	<0.0010	0.0010	5541795
Total Phosphorus	mg/L	0.024	5545398	0.027	0.004	5545398
Total Suspended Solids	mg/L	5	5541587	35	1	5538781
Dissolved Sulphate (SO4)	mg/L	<1.0	5538878	<1.0	1.0	5538878
Alkalinity (Total as CaCO3)	mg/L	63	5540054	51	1.0	5540054
Dissolved Chloride (Cl)	mg/L	13	5538876	7.5	1.0	5538876
Nitrite (N)	mg/L	<0.010	5538873	<0.010	0.010	5538873
Nitrate (N)	mg/L	<0.10	5538873	<0.10	0.10	5538873
Metals						
Mercury (Hg)	mg/L	<0.0001	5543093	<0.0001	0.0001	5543103
Total Antimony (Sb)	ug/L	<0.50	5542928	<0.50	0.50	5543429
Total Arsenic (As)	ug/L	15	5542928	17	1.0	5543429
Total Barium (Ba)	ug/L	5.7	5542928	7.0	2.0	5543429
Total Beryllium (Be)	ug/L	<0.50	5542928	<0.50	0.50	5543429
Total Bismuth (Bi)	ug/L	<1.0	5542928	<1.0	1.0	5543429
Total Boron (B)	ug/L	<10	5542928	<10	10	5543429
Total Cadmium (Cd)	ug/L	<0.10	5542928	<0.10	0.10	5543429
Total Calcium (Ca)	ug/L	21000	5542928	19000	200	5543429
Total Chromium (Cr)	ug/L	<5.0	5542928	<5.0	5.0	5543429
Total Cobalt (Co)	ug/L	<0.50	5542928	<0.50	0.50	5543429
Total Copper (Cu)	ug/L	1.3	5542928	1.4	1.0	5543429
Total Iron (Fe)	ug/L	330	5542928	490	100	5543429
Total Lead (Pb)	ug/L	<0.50	5542928	<0.50	0.50	5543429
Total Magnesium (Mg)	ug/L	4100	5542928	3900	50	5543429
Total Manganese (Mn)	ug/L	30	5542928	43	2.0	5543429
Total Molybdenum (Mo)	ug/L	<0.50	5542928	<0.50	0.50	5543429

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		GSK832		GSK833		
Sampling Date		2018/05/14 20:00		2018/05/15 13:20		
COC Number		663250-01-01		663250-01-01		
	UNITS	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Total Nickel (Ni)	ug/L	<1.0	5542928	<1.0	1.0	5543429
Total Potassium (K)	ug/L	500	5542928	520	200	5543429
Total Selenium (Se)	ug/L	<2.0	5542928	<2.0	2.0	5543429
Total Silicon (Si)	ug/L	1600	5542928	1700	50	5543429
Total Silver (Ag)	ug/L	<0.10	5542928	<0.10	0.10	5543429
Total Sodium (Na)	ug/L	6200	5542928	4400	100	5543429
Total Strontium (Sr)	ug/L	27	5542928	29	1.0	5543429
Total Thallium (Tl)	ug/L	<0.050	5542928	<0.050	0.050	5543429
Total Vanadium (V)	ug/L	0.63	5542928	0.96	0.50	5543429
Total Zinc (Zn)	ug/L	<5.0	5542928	<5.0	5.0	5543429

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
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Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

RESULTS OF ANALYSES OF WATER

Maxxam ID		GSK726	GSK727		GSK728	GSK729	GSK730		
Sampling Date		2018/05/14	2018/05/14 12:55		2018/05/14 14:19	2018/05/14 14:10	2018/05/14 15:08		
COC Number		663249-01-01	663249-01-01		663249-01-01	663249-01-01	663249-01-01		
	UNITS	**MW1**	**MW2**	**QC Batch**	**MW3A**	**MW3B**	**MW4**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	630	270	5536589	500	540	610	1.0	5536589
Ion Balance (% Difference)	%	0.280	1.39	5535816	0.150	0.350	0.470	N/A	5535816
Total Organic Nitrogen	mg/L	0.32	<0.10	5536593	<0.10	<0.10	<0.10	0.10	5536593
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	5540319	<0.010	<0.010	<0.010	0.010	5538885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		GSK731	GSK732	GSK733	GSK734	GSK735	GSK740		
Sampling Date		2018/05/14 13:17	2018/05/14 17:35	2018/05/14 15:10	2018/05/14 19:25	2018/05/14 17:09	2018/05/14 19:05		
COC Number		663249-01-01	663249-01-01	663249-01-01	663249-01-01	663249-01-01	663249-02-01		
	UNITS	**MW5**	**MW6**	**MW7**	**MW8**	**MW9**	**MW10A**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	530	320	470	620	360	270	1.0	5536589
Ion Balance (% Difference)	%	0.850	3.47	1.77	2.21	1.42	8.27	N/A	5535816
Total Organic Nitrogen	mg/L	<0.10	<0.10	<0.10	0.40	<0.10	0.20	0.10	5536593
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.010	5538885

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Sampler Initials: JZ

RESULTS OF ANALYSES OF WATER

Maxxam ID		GSK741	GSK742	GSK743			GSK831	GSK832		
Sampling Date		2018/05/14 19:45	2018/05/14 16:30	2018/05/14 16:20			2018/05/14 20:15	2018/05/14 20:00		
COC Number		663249-02-01	663249-02-01	663249-02-01			663250-01-01	663250-01-01		
	UNITS	**MW10B**	**MW11**	**MW12**	**RDL**	**QC Batch**	**SW1**	**SW2**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	380	250	530	1.0	5536589	76	71	1.0	5536589
Ion Balance (% Difference)	%	0.240	1.67	1.45	N/A	5535816				
Total Organic Nitrogen	mg/L	0.35	<0.10	0.10	0.10	5536593	0.19	0.19	0.10	5536593
Inorganics										
Dissolved Organic Carbon	mg/L						9.7	11	0.50	5538488
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	0.010	5538885				

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		GSK832			GSK833		
Sampling Date		2018/05/14 20:00			2018/05/15 13:20		
COC Number		663250-01-01			663250-01-01		
	UNITS	**SW2 Lab-Dup**	**RDL**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters							
Hardness (CaCO3)	mg/L				59	1.0	5536589
Total Organic Nitrogen	mg/L				0.22	0.10	5536593
Inorganics							
Dissolved Organic Carbon	mg/L	11	0.50	5538488	11	0.50	5538488

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Sampler Initials: JZ

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		GSK831	GSK832	GSK833		
Sampling Date		2018/05/14 20:15	2018/05/14 20:00	2018/05/15 13:20		
COC Number		663250-01-01	663250-01-01	663250-01-01		
	UNITS	**SW1**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	8	9	10	5	5541456

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

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Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK726
Sample ID: MW1
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK726 Dup
Sample ID: MW1
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK727
Sample ID: MW2
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5540317	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK727
Sample ID: MW2
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5540319	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5540318	N/A	2018/05/22	Alina Dobreanu
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK728
Sample ID: MW3A
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538861	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK729
Sample ID: MW3B
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

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Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK729
Sample ID: MW3B
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5538811	2018/05/18	2018/05/19	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK730
Sample ID: MW4
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5542522	N/A	2018/05/23	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

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Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK730 Dup
Sample ID: MW4
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5542522	N/A	2018/05/23	Zahid Soikot

Maxxam ID: GSK731
Sample ID: MW5
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538861	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5538811	2018/05/18	2018/05/19	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK732
Sample ID: MW6
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541636	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542983	N/A	2018/05/24	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538861	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk

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TEST SUMMARY

Maxxam ID: GSK732
Sample ID: MW6
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK732 Dup
Sample ID: MW6
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	5541636	N/A	2018/05/22	Shivani Shivani
Total Ammonia-N	LACH/NH4	5542983	N/A	2018/05/24	Parminder Sangha

Maxxam ID: GSK733
Sample ID: MW7
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

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TEST SUMMARY

Maxxam ID: GSK734
Sample ID: MW8
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5538811	2018/05/18	2018/05/19	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK735
Sample ID: MW9
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539837	N/A	2018/05/24	Arefa Dabhad
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5538811	2018/05/18	2018/05/19	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

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Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK740
Sample ID: MW10A
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK741
Sample ID: MW10B
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK742
Sample ID: MW11
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5538830	N/A	2018/05/19	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5538838	N/A	2018/05/19	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5538839	N/A	2018/05/19	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5538811	2018/05/18	2018/05/19	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

Maxxam ID: GSK743
Sample ID: MW12
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Chloride by Automated Colourimetry	KONE	5538879	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/22	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5539836	N/A	2018/05/22	Matthew Ritenburg
Ion Balance (% Difference)	CALC	5535816	N/A	2018/05/23	Automated Statchk
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Orthophosphate	KONE	5538885	N/A	2018/05/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5538882	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5542410	2018/05/18	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5541390	2018/05/22	2018/05/23	Amanpreet Sappal

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK743 Dup
Sample ID: MW12
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel

Maxxam ID: GSK831
Sample ID: SW1
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	5538047	2018/05/18	2018/05/23	Prakash Piya
Chloride by Automated Colourimetry	KONE	5538876	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5543429	N/A	2018/05/23	Thao Nguyen
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5538878	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5538781	2018/05/18	2018/05/19	Nusrat Naz

Maxxam ID: GSK831 Dup
Sample ID: SW1
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot

Maxxam ID: GSK832
Sample ID: SW2
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK832
Sample ID: SW2
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	5538047	2018/05/18	2018/05/23	Prakash Piya
Chloride by Automated Colourimetry	KONE	5538876	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5542035	N/A	2018/05/24	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543093	2018/05/23	2018/05/23	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5542928	N/A	2018/05/23	Arefa Dabhad
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5538878	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5541587	2018/05/22	2018/05/22	Nusrat Naz

Maxxam ID: GSK832 Dup
Sample ID: SW2
Matrix: Water

Collected: 2018/05/14
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh

Maxxam ID: GSK833
Sample ID: SW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5541456	N/A	2018/05/23	Thao Nguyen
Alkalinity	AT	5540054	N/A	2018/05/20	Yogesh Patel
Biochemical Oxygen Demand (BOD)	DO	5538047	2018/05/18	2018/05/23	Prakash Piya
Chloride by Automated Colourimetry	KONE	5538876	N/A	2018/05/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5541847	N/A	2018/05/22	Shivani Shivani
Conductivity	AT	5540056	N/A	2018/05/20	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5538488	N/A	2018/05/18	Nimarta Singh
Hardness (calculated as CaCO3)		5536589	N/A	2018/05/23	Automated Statchk
Mercury in Water by CVAA	CV/AA	5543103	2018/05/23	2018/05/23	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5543429	N/A	2018/05/23	Thao Nguyen
Total Ammonia-N	LACH/NH4	5542068	N/A	2018/05/23	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5538873	N/A	2018/05/18	Chandra Nandlal
Organic Nitrogen	CALC	5536593	N/A	2018/05/24	Automated Statchk

Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

TEST SUMMARY

Maxxam ID: GSK833
Sample ID: SW3
Matrix: Water

Collected: 2018/05/15
Shipped:
Received: 2018/05/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5540057	N/A	2018/05/20	Yogesh Patel
Phenols (4AAP)	TECH/PHEN	5541795	N/A	2018/05/22	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5538878	N/A	2018/05/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5541256	2018/05/22	2018/05/22	Jingwei (Alvin) Shi
Total Kjeldahl Nitrogen in Water	SKAL	5542022	2018/05/22	2018/05/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5545398	2018/05/24	2018/05/24	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5538781	2018/05/18	2018/05/19	Nusrat Naz

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
Package 2	1.7°C
Package 3	4.7°C
Package 4	5.7°C

Sample GSK728 [MW3A] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSK729 [MW3B] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSK731 [MW5] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSK735 [MW9] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample GSK740 [MW10A] : ortho-Phosphate > Total Phosphorus: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5538047	Total BOD	2018/05/23					<2	mg/L	NC	30	98	80 - 120
5538488	Dissolved Organic Carbon	2018/05/18	93	80 - 120	95	80 - 120	<0.50	mg/L	0.27	20		
5538781	Total Suspended Solids	2018/05/19					<1	mg/L	0	25	96	85 - 115
5538811	Total Dissolved Solids	2018/05/19					<10	mg/L	0.69	25	100	90 - 110
5538830	Alkalinity (Total as CaCO3)	2018/05/19			95	85 - 115	<1.0	mg/L	0.49	20		
5538838	Conductivity	2018/05/19			99	85 - 115	<1.0	umho/cm	0.38	25		
5538839	pH	2018/05/19			102	98 - 103			0.18	N/A		
5538861	Nitrate (N)	2018/05/18	91	80 - 120	94	80 - 120	<0.10	mg/L	NC	20		
5538861	Nitrite (N)	2018/05/18	98	80 - 120	100	80 - 120	<0.010	mg/L	NC	20		
5538873	Nitrate (N)	2018/05/18	94	80 - 120	95	80 - 120	<0.10	mg/L	0.36	20		
5538873	Nitrite (N)	2018/05/18	101	80 - 120	99	80 - 120	<0.010	mg/L				
5538876	Dissolved Chloride (Cl)	2018/05/22	112	80 - 120	103	80 - 120	<1.0	mg/L	2.5	20		
5538878	Dissolved Sulphate (SO4)	2018/05/22	NC	75 - 125	101	80 - 120	<1.0	mg/L	1.7	20		
5538879	Dissolved Chloride (Cl)	2018/05/22	105	80 - 120	102	80 - 120	<1.0	mg/L	NC	20		
5538882	Dissolved Sulphate (SO4)	2018/05/22	105	75 - 125	101	80 - 120	<1.0	mg/L	0.00012	20		
5538885	Orthophosphate (P)	2018/05/22	111	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5539836	Dissolved Aluminum (Al)	2018/05/22	103	80 - 120	97	80 - 120	<5.0	ug/L				
5539836	Dissolved Antimony (Sb)	2018/05/22	109	80 - 120	101	80 - 120	<0.50	ug/L				
5539836	Dissolved Arsenic (As)	2018/05/22	103	80 - 120	97	80 - 120	<1.0	ug/L				
5539836	Dissolved Barium (Ba)	2018/05/22	105	80 - 120	98	80 - 120	<2.0	ug/L				
5539836	Dissolved Beryllium (Be)	2018/05/22	100	80 - 120	98	80 - 120	<0.50	ug/L				
5539836	Dissolved Bismuth (Bi)	2018/05/22	101	80 - 120	96	80 - 120	<1.0	ug/L				
5539836	Dissolved Boron (B)	2018/05/22	103	80 - 120	94	80 - 120	<10	ug/L				
5539836	Dissolved Cadmium (Cd)	2018/05/22	106	80 - 120	98	80 - 120	<0.10	ug/L				
5539836	Dissolved Calcium (Ca)	2018/05/22	NC	80 - 120	98	80 - 120	<200	ug/L	2.2	20		
5539836	Dissolved Chromium (Cr)	2018/05/22	98	80 - 120	93	80 - 120	<5.0	ug/L				
5539836	Dissolved Cobalt (Co)	2018/05/22	99	80 - 120	94	80 - 120	<0.50	ug/L				
5539836	Dissolved Copper (Cu)	2018/05/22	101	80 - 120	96	80 - 120	<1.0	ug/L				
5539836	Dissolved Iron (Fe)	2018/05/22	106	80 - 120	101	80 - 120	<100	ug/L				
5539836	Dissolved Lead (Pb)	2018/05/22	99	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5539836	Dissolved Magnesium (Mg)	2018/05/22	106	80 - 120	98	80 - 120	<50	ug/L	2.0	20		
5539836	Dissolved Manganese (Mn)	2018/05/22	101	80 - 120	97	80 - 120	<2.0	ug/L				
5539836	Dissolved Molybdenum (Mo)	2018/05/22	106	80 - 120	99	80 - 120	<0.50	ug/L				
5539836	Dissolved Nickel (Ni)	2018/05/22	97	80 - 120	93	80 - 120	<1.0	ug/L				
5539836	Dissolved Potassium (K)	2018/05/22	103	80 - 120	98	80 - 120	<200	ug/L	0.88	20		
5539836	Dissolved Selenium (Se)	2018/05/22	101	80 - 120	95	80 - 120	<2.0	ug/L				
5539836	Dissolved Silicon (Si)	2018/05/22	105	80 - 120	94	80 - 120	<50	ug/L				
5539836	Dissolved Sodium (Na)	2018/05/22	106	80 - 120	97	80 - 120	<100	ug/L	1.7	20		
5539836	Dissolved Strontium (Sr)	2018/05/22	101	80 - 120	98	80 - 120	<1.0	ug/L				
5539836	Dissolved Thallium (Tl)	2018/05/22	98	80 - 120	94	80 - 120	<0.050	ug/L				
5539836	Dissolved Tin (Sn)	2018/05/22	106	80 - 120	98	80 - 120	<1.0	ug/L				
5539836	Dissolved Vanadium (V)	2018/05/22	100	80 - 120	94	80 - 120	<0.50	ug/L				
5539836	Dissolved Zinc (Zn)	2018/05/22	99	80 - 120	96	80 - 120	<5.0	ug/L				
5539837	Dissolved Aluminum (Al)	2018/05/24	103	80 - 120	102	80 - 120	<5.0	ug/L	7.9	20		
5539837	Dissolved Antimony (Sb)	2018/05/24	107	80 - 120	98	80 - 120	<0.50	ug/L	2.5	20		
5539837	Dissolved Arsenic (As)	2018/05/24	NC	80 - 120	98	80 - 120	<1.0	ug/L	0.26	20		
5539837	Dissolved Barium (Ba)	2018/05/24	106	80 - 120	98	80 - 120	<2.0	ug/L	0.62	20		
5539837	Dissolved Beryllium (Be)	2018/05/24	109	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
5539837	Dissolved Bismuth (Bi)	2018/05/24	98	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
5539837	Dissolved Boron (B)	2018/05/24	104	80 - 120	101	80 - 120	<10	ug/L	NC	20		
5539837	Dissolved Cadmium (Cd)	2018/05/24	107	80 - 120	99	80 - 120	<0.10	ug/L	13	20		
5539837	Dissolved Calcium (Ca)	2018/05/24	102	80 - 120	101	80 - 120	<200	ug/L	0.33	20		
5539837	Dissolved Chromium (Cr)	2018/05/24	108	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
5539837	Dissolved Cobalt (Co)	2018/05/24	108	80 - 120	102	80 - 120	<0.50	ug/L	0.11	20		
5539837	Dissolved Copper (Cu)	2018/05/24	104	80 - 120	102	80 - 120	<1.0	ug/L	0.34	20		
5539837	Dissolved Iron (Fe)	2018/05/24	109	80 - 120	103	80 - 120	<100	ug/L	NC	20		
5539837	Dissolved Lead (Pb)	2018/05/24	105	80 - 120	100	80 - 120	<0.50	ug/L	4.2	20		
5539837	Dissolved Magnesium (Mg)	2018/05/24	104	80 - 120	97	80 - 120	<50	ug/L	2.1	20		
5539837	Dissolved Manganese (Mn)	2018/05/24	104	80 - 120	98	80 - 120	<2.0	ug/L	5.2	20		
5539837	Dissolved Molybdenum (Mo)	2018/05/24	111	80 - 120	102	80 - 120	<0.50	ug/L	4.9	20		
5539837	Dissolved Nickel (Ni)	2018/05/24	103	80 - 120	97	80 - 120	<1.0	ug/L	0.38	20		

Maxxam Job #: B8B6788
Report Date: 2018/05/24

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5539837	Dissolved Potassium (K)	2018/05/24	106	80 - 120	100	80 - 120	<200	ug/L	1.4	20		
5539837	Dissolved Selenium (Se)	2018/05/24	105	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
5539837	Dissolved Silicon (Si)	2018/05/24	106	80 - 120	102	80 - 120	<50	ug/L	1.5	20		
5539837	Dissolved Sodium (Na)	2018/05/24	108	80 - 120	100	80 - 120	<100	ug/L	0.69	20		
5539837	Dissolved Strontium (Sr)	2018/05/24	106	80 - 120	96	80 - 120	<1.0	ug/L	1.7	20		
5539837	Dissolved Thallium (Tl)	2018/05/24	100	80 - 120	93	80 - 120	<0.050	ug/L	NC	20		
5539837	Dissolved Tin (Sn)	2018/05/24	105	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5539837	Dissolved Vanadium (V)	2018/05/24	106	80 - 120	96	80 - 120	<0.50	ug/L	9.5	20		
5539837	Dissolved Zinc (Zn)	2018/05/24	105	80 - 120	99	80 - 120	<5.0	ug/L	3.9	20		
5540054	Alkalinity (Total as CaCO3)	2018/05/20			94	85 - 115	<1.0	mg/L	0.65	20		
5540056	Conductivity	2018/05/20			99	85 - 115	<1.0	umho/cm	0.082	25		
5540057	pH	2018/05/20			102	98 - 103			0.53	N/A		
5540317	Dissolved Chloride (Cl)	2018/05/22	NC	80 - 120	101	80 - 120	<1.0	mg/L	0.69	20		
5540318	Dissolved Sulphate (SO4)	2018/05/22	98	75 - 125	95	80 - 120	<1.0	mg/L	4.0	20		
5540319	Orthophosphate (P)	2018/05/22	108	75 - 125	102	80 - 120	<0.010	mg/L	3.2	25		
5541256	Total Dissolved Solids	2018/05/22					<10	mg/L	0	25	100	90 - 110
5541390	Total Phosphorus	2018/05/23	104	80 - 120	101	80 - 120	<0.020	mg/L	7.7	20	101	80 - 120
5541456	Dissolved (0.2u) Aluminum (Al)	2018/05/23	85	80 - 120	101	80 - 120	<5	ug/L	2.5	20		
5541587	Total Suspended Solids	2018/05/22					<1	mg/L	0	25	97	85 - 115
5541636	Total Chemical Oxygen Demand (COD)	2018/05/22	100	80 - 120	102	80 - 120	<4.0	mg/L	4.5	20		
5541795	Phenols-4AAP	2018/05/22	95	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
5541847	Total Chemical Oxygen Demand (COD)	2018/05/22	101	80 - 120	103	80 - 120	<4.0	mg/L	1.2	20		
5542022	Total Kjeldahl Nitrogen (TKN)	2018/05/23	96	80 - 120	103	80 - 120	<0.10	mg/L	6.9	20	102	80 - 120
5542035	Total Chemical Oxygen Demand (COD)	2018/05/24	104	80 - 120	103	80 - 120	<4.0	mg/L	NC	20		
5542068	Total Ammonia-N	2018/05/23	96	75 - 125	101	80 - 120	<0.050	mg/L	19	20		
5542410	Total Dissolved Solids	2018/05/22					<10	mg/L	0	25	98	90 - 110
5542522	Phenols-4AAP	2018/05/23	92	80 - 120	95	80 - 120	<0.0010	mg/L	NC	20		
5542928	Total Antimony (Sb)	2018/05/23	103	80 - 120	100	80 - 120	<0.50	ug/L				
5542928	Total Arsenic (As)	2018/05/23	101	80 - 120	100	80 - 120	<1.0	ug/L				
5542928	Total Barium (Ba)	2018/05/23	94	80 - 120	97	80 - 120	<2.0	ug/L				

Maxxam Job #: B8B6788
Report Date: 2018/05/24

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5542928	Total Beryllium (Be)	2018/05/23	94	80 - 120	95	80 - 120	<0.50	ug/L				
5542928	Total Bismuth (Bi)	2018/05/23	95	80 - 120	99	80 - 120	<1.0	ug/L				
5542928	Total Boron (B)	2018/05/23	88	80 - 120	87	80 - 120	<10	ug/L				
5542928	Total Cadmium (Cd)	2018/05/23	100	80 - 120	101	80 - 120	<0.10	ug/L				
5542928	Total Calcium (Ca)	2018/05/23	NC	80 - 120	100	80 - 120	<200	ug/L				
5542928	Total Chromium (Cr)	2018/05/23	102	80 - 120	101	80 - 120	<5.0	ug/L				
5542928	Total Cobalt (Co)	2018/05/23	99	80 - 120	103	80 - 120	<0.50	ug/L				
5542928	Total Copper (Cu)	2018/05/23	101	80 - 120	102	80 - 120	<1.0	ug/L				
5542928	Total Iron (Fe)	2018/05/23	98	80 - 120	100	80 - 120	<100	ug/L				
5542928	Total Lead (Pb)	2018/05/23	100	80 - 120	100	80 - 120	<0.50	ug/L				
5542928	Total Magnesium (Mg)	2018/05/23	NC	80 - 120	99	80 - 120	<50	ug/L				
5542928	Total Manganese (Mn)	2018/05/23	96	80 - 120	98	80 - 120	<2.0	ug/L	0.26	20		
5542928	Total Molybdenum (Mo)	2018/05/23	109	80 - 120	102	80 - 120	<0.50	ug/L				
5542928	Total Nickel (Ni)	2018/05/23	96	80 - 120	100	80 - 120	<1.0	ug/L				
5542928	Total Potassium (K)	2018/05/23	96	80 - 120	99	80 - 120	<200	ug/L				
5542928	Total Selenium (Se)	2018/05/23	101	80 - 120	104	80 - 120	<2.0	ug/L				
5542928	Total Silicon (Si)	2018/05/23	NC	80 - 120	99	80 - 120	<50	ug/L				
5542928	Total Silver (Ag)	2018/05/23	98	80 - 120	102	80 - 120	<0.10	ug/L				
5542928	Total Sodium (Na)	2018/05/23	NC	80 - 120	99	80 - 120	<100	ug/L				
5542928	Total Strontium (Sr)	2018/05/23	NC	80 - 120	93	80 - 120	<1.0	ug/L				
5542928	Total Thallium (Tl)	2018/05/23	104	80 - 120	99	80 - 120	<0.050	ug/L				
5542928	Total Vanadium (V)	2018/05/23	100	80 - 120	97	80 - 120	<0.50	ug/L				
5542928	Total Zinc (Zn)	2018/05/23	NC	80 - 120	103	80 - 120	<5.0	ug/L	1.1	20		
5542983	Total Ammonia-N	2018/05/24	97	75 - 125	104	80 - 120	<0.050	mg/L	NC	20		
5543093	Mercury (Hg)	2018/05/23	101	75 - 125	99	80 - 120	<0.0001	mg/L	NC	20		
5543103	Mercury (Hg)	2018/05/23	116	75 - 125	113	80 - 120	<0.0001	mg/L	NC	20		
5543429	Total Antimony (Sb)	2018/05/23	102	80 - 120	103	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Arsenic (As)	2018/05/23	99	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5543429	Total Barium (Ba)	2018/05/23	98	80 - 120	97	80 - 120	<2.0	ug/L	NC	20		
5543429	Total Beryllium (Be)	2018/05/23	97	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Bismuth (Bi)	2018/05/23	90	80 - 120	91	80 - 120	<1.0	ug/L	NC	20		

Maxxam Job #: B8B6788
Report Date: 2018/05/24

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5543429	Total Boron (B)	2018/05/23	98	80 - 120	99	80 - 120	<10	ug/L	0.13	20		
5543429	Total Cadmium (Cd)	2018/05/23	98	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
5543429	Total Calcium (Ca)	2018/05/23	NC	80 - 120	96	80 - 120	<200	ug/L	8.1	20		
5543429	Total Chromium (Cr)	2018/05/23	95	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
5543429	Total Cobalt (Co)	2018/05/23	94	80 - 120	95	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Copper (Cu)	2018/05/23	95	80 - 120	96	80 - 120	<1.0	ug/L	NC	20		
5543429	Total Iron (Fe)	2018/05/23	98	80 - 120	98	80 - 120	<100	ug/L	0.46	20		
5543429	Total Lead (Pb)	2018/05/23	93	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Magnesium (Mg)	2018/05/23	88	80 - 120	97	80 - 120	<50	ug/L	5.4	20		
5543429	Total Manganese (Mn)	2018/05/23	96	80 - 120	96	80 - 120	<2.0	ug/L	7.0	20		
5543429	Total Molybdenum (Mo)	2018/05/23	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Nickel (Ni)	2018/05/23	93	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
5543429	Total Potassium (K)	2018/05/23	97	80 - 120	97	80 - 120	<200	ug/L	2.4	20		
5543429	Total Selenium (Se)	2018/05/23	95	80 - 120	100	80 - 120	<2.0	ug/L	NC	20		
5543429	Total Silicon (Si)	2018/05/23	93	80 - 120	96	80 - 120	<50	ug/L	3.7	20		
5543429	Total Silver (Ag)	2018/05/23	98	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
5543429	Total Sodium (Na)	2018/05/23	92	80 - 120	96	80 - 120	<100	ug/L	6.0	20		
5543429	Total Strontium (Sr)	2018/05/23	96	80 - 120	97	80 - 120	<1.0	ug/L	5.0	20		
5543429	Total Thallium (Tl)	2018/05/23	93	80 - 120	93	80 - 120	<0.050	ug/L	NC	20		
5543429	Total Vanadium (V)	2018/05/23	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5543429	Total Zinc (Zn)	2018/05/23	98	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		

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Maxxam Job #: B8B6788
Report Date: 2018/05/24

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5545398	Total Phosphorus	2018/05/24	90	80 - 120	99	80 - 120	<0.004	mg/L	NC	20	89	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: JZ

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

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INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #: B8B6788	Bottle Order #: 663249
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-OE	COC #: C#663249-01-01	Project Manager: Michelle Brescacin
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:			
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Geraldton Landfill		
				Sampled By:	JZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine; ☐ Table 2 ☐ Ind/Comm ☐ Coarse; ☐ Table 3 ☐ Agri/Other ☐ For RSC; ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw; ☐ Reg 558 ☐ Storm Sewer Bylaw; ☐ MISA Municipality ___; ☐ PWQO; ☑ Other GDWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - GW Comp. List	Hardness	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	GW Addition Metals					# of Bottles	Comments
1		MW1	May 14		GW	F	X	X	X	X	X	X					7	
2		MW2	May 14	12:55	GW	F	X	X	X	X	X	X					7	
3		MW 3A	May 14	14:19	GW	F	X	X	X	X	X	X					7	
4		MW 3B	May 14	14:10	GW	F	X	X	X	X	X	X					7	
5		MW4	May 14	15:08	GW	F	X	X	X	X	X	X					7	
6		MW5	May 14	13:07	GW	F	X	X	X	X	X	X					7	
7		MW6	May 14	17:35	GW	F	X	X	X	X	X	X					7	
8		MW7	May 14	15:10	GW	F	X	X	X	X	X	X					7	
9		MW8	May 14	19:25	GW	F	X	X	X	X	X	X					7	
10		MW9	May 14	17:09	GW	F	X	X	X	X	X	X					7	Reid in Thunder Bay

BOD
17-May-18 14:45
Michelle Brescacin
B8B6788
MIB THU-001

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Jay Zhang	18/05/17	2:04pm	MBrescacin Michelle Brescacin	18/05/17	14:45	
Jay Zhang				18/05/17	04:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	Cert to ACTR	Present / Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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CHAIN OF CUSTODY RECORD

Page 2 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #:	Bottle Order #: 663249
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-OE	COC #: C#663249-02-01	Project Manager: Michelle Brescacin
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:			
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Geraldton Landfill		
				Sampled By:	JZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☒ Other OPWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - GW Comp List	Hardness	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	GW Addition Metals				# of Bottles	Comments
1		MW10A	May 14/18	19:05	GW	F	X	X	X	X	X	X				7	
2		MW10B	May 14/18	19:45	GW	F	X	X	X	X	X	X				7	
3		MW11	May 14/18	16:30	GW	F	X	X	X	X	X	X				7	
4		MW12	May 14/18	16:20	GW	F	X	X	X	X	X	X				7	
5						-											
6																	
7																	
8																	
9																	
10																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
Jay Zhang	18/05/17	2:00pm	See page 1						Intact		
Jay Zhang			See page 1								

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 3 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #:	Bottle Order #: 663250
Attention:	accounts payable	Attention:	Jay Zhang	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-OE	COC #: C#663250-01-01	Project Manager: Michelle Brescacin
Tel:	(807) 623-9495 x Fax: (807) 623-8070 x	Tel:	(807) 623-9495 x Fax:	Project Name:			
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com	Site #:	Geraldton Landfill		
				Sampled By:	SZ/MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
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☐ Table 3 ☐ Agri/Other ☐ For RSC
☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☒ PWQO
☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / (Hg) Cr VI	Landfill Standards Sch 5 - SW Comp. List	Hardness (including Ca, Mg, Na, K)	Dissolved Aluminum (0.2 u, clay free)	Dissolved Organic Carbon (DOC)	Organic Nitrogen	SW Additional Metals				# of Bottles	Comments
1		SW1	May 14/18	20:15	SW	X	X	X	X	X	X	X				9	
2		SW2	May 14/18	20:00	SW	X	X	X	X	X	X	X				9	
3		SW3	~~May 14/18~~ May 15/18	13:20	SW	X	X	X	X	X	X	X				9	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal Present	Yes	No
Jay Zhang	18/05/17	2:00pm	See page 1						Intact		
Jay Zhang											

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 684818-01-01, 684818-02-01, 684819-01-01

Report Date: 2018/10/31
Report #: R5464379
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7437
Received: 2018/10/18, 13:00

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2018/10/22	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	1	N/A	2018/10/25	CAM SOP-00447	EPA 6020B m
Alkalinity	17	N/A	2018/10/21	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	3	2018/10/20	2018/10/25	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	1	N/A	2018/10/22	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	16	N/A	2018/10/23	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	17	N/A	2018/10/24	CAM SOP-00416	SM 23 5220 D m
Conductivity	17	N/A	2018/10/21	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	17	N/A	2018/10/21	CAM SOP-00446	SM 23 5310 B m
Hardness (calculated as CaCO3)	15	N/A	2018/10/24	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	2	N/A	2018/10/25	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	17	2018/10/22	2018/10/23	CAM SOP-00453	EPA 7470A m
Dissolved Calcium and Magnesium	2	2018/10/20	2018/10/22	CAM SOP-00408	EPA 6010D m
Dissolved Calcium and Magnesium	1	2018/10/23	2018/10/24	CAM SOP-00408	EPA 6010D m
Lab Filtered Metals by ICPMS	1	2018/10/30	2018/10/31	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	12	N/A	2018/10/23	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2018/10/24	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2018/10/22	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	12	N/A	2018/10/24		
Ion Balance (% Difference)	2	N/A	2018/10/25		
Total Ammonia-N	16	N/A	2018/10/25	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2018/10/29	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	5	N/A	2018/10/22	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (2)	12	N/A	2018/10/24	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Organic Nitrogen	17	N/A	2018/10/25		

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
Thunder Bay Branch
1142 Roland St
Thunder Bay, ON
CANADA P7B 5M4

Your C.O.C. #: 684818-01-01, 684818-02-01, 684819-01-01

Report Date: 2018/10/31
Report #: R5464379
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7437
Received: 2018/10/18, 13:00

Sample Matrix: Water
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
pH	17	N/A	2018/10/21	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	11	N/A	2018/10/22	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	6	N/A	2018/10/23	CAM SOP-00444	OMOE E3179 m
Orthophosphate	13	N/A	2018/10/22	CAM SOP-00461	EPA 365.1 m
Orthophosphate	1	N/A	2018/10/23	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	14	N/A	2018/10/22	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	3	N/A	2018/10/23	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	12	2018/10/22	2018/10/23	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	5	2018/10/23	2018/10/24	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	14	2018/10/23	2018/10/23	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	2	2018/10/23	2018/10/24	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2018/10/26	2018/10/26	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2018/10/22	2018/10/23	CAM SOP-00407	SM 23 4500 P B H m
Total Phosphorus (Colourimetric)	14	2018/10/22	2018/10/22	CAM SOP-00407	SM 23 4500 P B H m
Low Level Total Suspended Solids	3	2018/10/22	2018/10/23	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2018/10/23	CAM SOP-00226	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL

Attention: Jay Zhang

exp Services Inc
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Your C.O.C. #: 684818-01-01, 684818-02-01, 684819-01-01

Report Date: 2018/10/31
Report #: R5464379
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R7437
Received: 2018/10/18, 13:00

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Michelle Brescacin, Project Manager Assistant - National Accounts
Email: MBrescacin@maxxam.ca
Phone# (905) 817-5700

==========

This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ928			IBJ928			IBJ929		
Sampling Date		2018/10/17 10:20			2018/10/17 10:20			2018/10/17 11:05		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	4.4	0.050	5797589				0.57	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	39	4.0	5796497	39	4.0	5796497	20	4.0	5796497
Conductivity	umho/cm	1500	1.0	5794466				440	1.0	5794469
Total Dissolved Solids	mg/L	955	10	5793560				190	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	4.8	0.20	5797496				0.67	0.10	5797503
Dissolved Organic Carbon	mg/L	9.0	0.50	5793666	8.7	0.50	5793666	5.7	0.50	5793666
pH	pH	7.35		5794467				7.84		5794470
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406				<0.0010	0.0010	5795417
Total Phosphorus	mg/L	0.028	0.020	5795845				0.071	0.020	5795845
Dissolved Sulphate (SO4)	mg/L	35	1.0	5794476				<1.0	1.0	5794806
Alkalinity (Total as CaCO3)	mg/L	550	1.0	5794465				230	1.0	5794468
Dissolved Chloride (Cl-)	mg/L	150	2.0	5794475				4.7	1.0	5794805
Nitrite (N)	mg/L	0.015	0.010	5794518				<0.010	0.010	5794612
Nitrate (N)	mg/L	0.61	0.10	5794518				<0.10	0.10	5794612
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5796432				<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	9.7	5.0	5794754				13	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	26	1.0	5794754				2.0	1.0	5794754
Dissolved Barium (Ba)	ug/L	200	2.0	5794754				16	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	220	10	5794754				44	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754				<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	220000	200	5794754				76000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	25	0.50	5794754				2.2	0.50	5794754
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754				5.8	1.0	5794754
Dissolved Iron (Fe)	ug/L	31000	100	5794754				140	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	25000	50	5794754				8200	50	5794754
Dissolved Manganese (Mn)	ug/L	3300	2.0	5794754				1500	2.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ928			IBJ928			IBJ929		
Sampling Date		2018/10/17 10:20			2018/10/17 10:20			2018/10/17 11:05		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW1**	**RDL**	**QC Batch**	**MW1 Lab-Dup**	**RDL**	**QC Batch**	**MW2**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	1.2	0.50	5794754				<0.50	0.50	5794754
Dissolved Nickel (Ni)	ug/L	8.1	1.0	5794754				2.4	1.0	5794754
Dissolved Potassium (K)	ug/L	22000	200	5794754				1800	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754				<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	10000	50	5794754				4000	50	5794754
Dissolved Sodium (Na)	ug/L	64000	100	5794754				3700	100	5794754
Dissolved Strontium (Sr)	ug/L	420	1.0	5794754				66	1.0	5794754
Dissolved Thallium (Tl)	ug/L	0.23	0.050	5794754				0.058	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	1.6	0.50	5794754				0.94	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ930			IBJ930			IBJ931		
Sampling Date		2018/10/17 08:55			2018/10/17 08:55			2018/10/17 09:10		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW3A**	**RDL**	**QC Batch**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	9.4 (1)	0.050	5797589				7.4 (1)	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	36	4.0	5796497				34	4.0	5796497
Conductivity	umho/cm	1200	1.0	5794469				1200	1.0	5794469
Total Dissolved Solids	mg/L	605	10	5793560				700	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	9.3 (1)	0.50	5797503				7.1 (1)	0.50	5797496
Dissolved Organic Carbon	mg/L	8.0	0.50	5793666				9.1	0.50	5793484
pH	pH	7.40		5794470				7.38		5794470
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406				0.0010	0.0010	5795406
Total Phosphorus	mg/L	0.16	0.020	5795845				0.15	0.10	5795845
Dissolved Sulphate (SO4)	mg/L	28	1.0	5794806	28	1.0	5794806	39	1.0	5794806
Alkalinity (Total as CaCO3)	mg/L	500	1.0	5794468				560	1.0	5794468
Dissolved Chloride (Cl-)	mg/L	73	1.0	5794805	73	1.0	5794805	62	1.0	5794805
Nitrite (N)	mg/L	<0.010	0.010	5794612				0.028	0.010	5794612
Nitrate (N)	mg/L	<0.10	0.10	5794612				0.29	0.10	5794612
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5796432				<0.0001	0.0001	5796432
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	13	1.0	5794754				4.1	1.0	5794754
Dissolved Barium (Ba)	ug/L	140	2.0	5794754				140	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	320	10	5794754				400	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754				<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	150000	200	5794754				170000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	5.2	0.50	5794754				7.3	0.50	5794754
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754				2.9	1.0	5794754
Dissolved Iron (Fe)	ug/L	14000	100	5794754				3500	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	23000	50	5794754				30000	50	5794754
Dissolved Manganese (Mn)	ug/L	1200	2.0	5794754				1200	2.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ930			IBJ930			IBJ931		
Sampling Date		2018/10/17 08:55			2018/10/17 08:55			2018/10/17 09:10		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW3A**	**RDL**	**QC Batch**	**MW3A Lab-Dup**	**RDL**	**QC Batch**	**MW3B**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Nickel (Ni)	ug/L	5.4	1.0	5794754				8.8	1.0	5794754
Dissolved Potassium (K)	ug/L	12000	200	5794754				16000	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754				<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	7300	50	5794754				7700	50	5794754
Dissolved Sodium (Na)	ug/L	55000	100	5794754				46000	100	5794754
Dissolved Strontium (Sr)	ug/L	240	1.0	5794754				320	1.0	5794754
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794754				<0.050	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	0.55	0.50	5794754				<0.50	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ932			IBJ932			IBJ933		
Sampling Date		2018/10/17 12:00			2018/10/17 12:00			2018/10/17 11:20		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW4**	**RDL**	**QC Batch**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.14	0.050	5797589				2.5	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	5.7	4.0	5796497				28	4.0	5796497
Conductivity	umho/cm	1000	1.0	5794466				1300	1.0	5794466
Total Dissolved Solids	mg/L	545	10	5793560				780	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	0.21	0.10	5797503				2.6	0.10	5797503
Dissolved Organic Carbon	mg/L	2.2	0.50	5793666				6.6	0.50	5793484
pH	pH	7.51		5794467				7.61		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406				<0.0010	0.0010	5795406
Total Phosphorus	mg/L	0.23	0.10	5795845				0.065	0.020	5795845
Dissolved Sulphate (SO4)	mg/L	55	1.0	5796906	56	1.0	5796906	150	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	500	1.0	5794465				490	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	16	1.0	5796904	16	1.0	5796904	59	1.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794518				<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518				<0.10	0.10	5794518
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5796432				<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5794754				3.2	1.0	5794754
Dissolved Barium (Ba)	ug/L	54	2.0	5794754				120	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	320	10	5794754				1300	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754				<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	190000	200	5794754				150000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	2.9	0.50	5794754				0.68	0.50	5794754
Dissolved Copper (Cu)	ug/L	1.7	1.0	5794754				<1.0	1.0	5794754
Dissolved Iron (Fe)	ug/L	<100	100	5794754				6400	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	19000	50	5794754				50000	50	5794754
Dissolved Manganese (Mn)	ug/L	470	2.0	5794754				1300	2.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ932			IBJ932			IBJ933		
Sampling Date		2018/10/17 12:00			2018/10/17 12:00			2018/10/17 11:20		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW4**	**RDL**	**QC Batch**	**MW4 Lab-Dup**	**RDL**	**QC Batch**	**MW5**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Nickel (Ni)	ug/L	5.4	1.0	5794754				5.6	1.0	5794754
Dissolved Potassium (K)	ug/L	2200	200	5794754				15000	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754				<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	6100	50	5794754				5800	50	5794754
Dissolved Sodium (Na)	ug/L	10000	100	5794754				52000	100	5794754
Dissolved Strontium (Sr)	ug/L	160	1.0	5794754				340	1.0	5794754
Dissolved Thallium (Tl)	ug/L	0.15	0.050	5794754				<0.050	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ933			IBJ934			IBJ934		
Sampling Date		2018/10/17 11:20			2018/10/17 10:13			2018/10/17 10:13		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW5 Lab-Dup**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L				0.098	0.050	5797589			
Total Chemical Oxygen Demand (COD)	mg/L				26	4.0	5796497			
Conductivity	umho/cm				500	1.0	5794469			
Total Dissolved Solids	mg/L				275	10	5793560			
Total Kjeldahl Nitrogen (TKN)	mg/L	2.6	0.10	5797503	0.10	0.10	5797503			
Dissolved Organic Carbon	mg/L				2.7	0.50	5793666			
pH	pH				7.94		5794470			
Phenols-4AAP	mg/L				<0.0010	0.0010	5795406			
Total Phosphorus	mg/L	0.063	0.020	5795845	0.098	0.040	5795845			
Dissolved Sulphate (SO4)	mg/L				13	1.0	5794476			
Alkalinity (Total as CaCO3)	mg/L				260	1.0	5794468			
Dissolved Chloride (Cl-)	mg/L				1.4	1.0	5794475			
Nitrite (N)	mg/L				<0.010	0.010	5794612	<0.010	0.010	5794612
Nitrate (N)	mg/L				<0.10	0.10	5794612	<0.10	0.10	5794612
Metals										
Mercury (Hg)	mg/L				<0.0001	0.0001	5796432			
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794754	<5.0	5.0	5794754			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754			
Dissolved Arsenic (As)	ug/L	3.5	1.0	5794754	2.1	1.0	5794754			
Dissolved Barium (Ba)	ug/L	120	2.0	5794754	16	2.0	5794754			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754			
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754	<1.0	1.0	5794754			
Dissolved Boron (B)	ug/L	1300	10	5794754	21	10	5794754			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754	<0.10	0.10	5794754			
Dissolved Calcium (Ca)	ug/L	150000	200	5794754	86000	200	5794754			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754	<5.0	5.0	5794754			
Dissolved Cobalt (Co)	ug/L	0.66	0.50	5794754	2.2	0.50	5794754			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754	2.7	1.0	5794754			
Dissolved Iron (Fe)	ug/L	6500	100	5794754	<100	100	5794754			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754			
Dissolved Magnesium (Mg)	ug/L	50000	50	5794754	13000	50	5794754			
Dissolved Manganese (Mn)	ug/L	1300	2.0	5794754	620	2.0	5794754			

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ933			IBJ934			IBJ934		
Sampling Date		2018/10/17 11:20			2018/10/17 10:13			2018/10/17 10:13		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW5 Lab-Dup**	**RDL**	**QC Batch**	**MW6**	**RDL**	**QC Batch**	**MW6 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754	0.89	0.50	5794754			
Dissolved Nickel (Ni)	ug/L	5.3	1.0	5794754	4.7	1.0	5794754			
Dissolved Potassium (K)	ug/L	16000	200	5794754	1200	200	5794754			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754	<2.0	2.0	5794754			
Dissolved Silicon (Si)	ug/L	5800	50	5794754	6300	50	5794754			
Dissolved Sodium (Na)	ug/L	52000	100	5794754	5000	100	5794754			
Dissolved Strontium (Sr)	ug/L	340	1.0	5794754	83	1.0	5794754			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794754	0.11	0.050	5794754			
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754	<1.0	1.0	5794754			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754	8.3	5.0	5794754			

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Report Date: 2018/10/31

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Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ935			IBJ935			IBJ936		
Sampling Date		2018/10/17 12:15			2018/10/17 12:15			2018/10/17 14:36		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	7.1	0.050	5797589	7.1	0.050	5797589	0.23	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	22	4.0	5796497				14	4.0	5796497
Conductivity	umho/cm	1000	1.0	5794469				5100	1.0	5794466
Total Dissolved Solids	mg/L	535	10	5795752				2780	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	7.1	0.50	5797503				1.1	0.10	5797503
Dissolved Organic Carbon	mg/L	6.1	0.50	5793666				2.8	0.50	5793666
pH	pH	7.44		5794470				7.90		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406				<0.0010	0.0010	5795417
Total Phosphorus	mg/L	0.026	0.020	5795845				41	0.40	5795845
Dissolved Sulphate (SO4)	mg/L	29	1.0	5794476				35	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	470	1.0	5794468				390	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	46	1.0	5794475				1400	20	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794612				<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794612				1.91	0.10	5794518
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5796432				<0.0001	0.0001	5796432
Dissolved Aluminum (Al)	ug/L	5.4	5.0	5794754				<5.0	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	43	1.0	5794754				<1.0	1.0	5794754
Dissolved Barium (Ba)	ug/L	200	2.0	5794754				95	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	230	10	5794754				12	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754				<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	140000	200	5794754				220000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	12	0.50	5794754				<0.50	0.50	5794754
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754				1.6	1.0	5794754
Dissolved Iron (Fe)	ug/L	21000	100	5794754				<100	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	21000	50	5794754				19000	50	5794754
Dissolved Manganese (Mn)	ug/L	1700	2.0	5794754				2.1	2.0	5794754

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ935			IBJ935			IBJ936		
Sampling Date		2018/10/17 12:15			2018/10/17 12:15			2018/10/17 14:36		
COC Number		684818-01-01			684818-01-01			684818-01-01		
	UNITS	**MW7**	**RDL**	**QC Batch**	**MW7 Lab-Dup**	**RDL**	**QC Batch**	**MW8**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754				<0.50	0.50	5794754
Dissolved Nickel (Ni)	ug/L	8.5	1.0	5794754				<1.0	1.0	5794754
Dissolved Potassium (K)	ug/L	11000	200	5794754				3300	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754				<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	9700	50	5794754				2800	50	5794754
Dissolved Sodium (Na)	ug/L	38000	100	5794754				780000	500	5794754
Dissolved Strontium (Sr)	ug/L	210	1.0	5794754				270	1.0	5794754
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794754				<0.050	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754				<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	1.0	0.50	5794754				<0.50	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754				<5.0	5.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ938			IBJ939		
Sampling Date		2018/10/17 15:25			2018/10/17 16:45		
COC Number		684818-02-01			684818-02-01		
	UNITS	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.40	0.050	5797589	0.31	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	45	4.0	5796497	47	4.0	5796497
Conductivity	umho/cm	780	1.0	5794466	1300	1.0	5794466
Total Dissolved Solids	mg/L	470	10	5793560	815	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	0.65	0.10	5797503	0.64	0.10	5797503
Dissolved Organic Carbon	mg/L	13	0.50	5793666	16	0.50	5793666
pH	pH	7.28		5794467	7.52		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406	<0.0010	0.0010	5795406
Total Phosphorus	mg/L	0.54	0.10	5795845	0.50	0.10	5795845
Dissolved Sulphate (SO4)	mg/L	2.9	1.0	5794476	<1.0	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	250	1.0	5794465	340	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	100	1.0	5794475	200	2.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794518	<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518	<0.10	0.10	5794518
Metals							
Mercury (Hg)	mg/L	<0.0001	0.0001	5795858	<0.0001	0.0001	5795962
Dissolved Aluminum (Al)	ug/L	140	5.0	5794754	71	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	21	1.0	5794754	32	1.0	5794754
Dissolved Barium (Ba)	ug/L	26	2.0	5794754	33	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754	<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	<10	10	5794754	<10	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754	<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	74000	200	5794754	130000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754	<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754	<1.0	1.0	5794754
Dissolved Iron (Fe)	ug/L	1900	100	5794754	2800	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	15000	50	5794754	11000	50	5794754
Dissolved Manganese (Mn)	ug/L	70	2.0	5794754	95	2.0	5794754
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754	<0.50	0.50	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ938			IBJ939		
Sampling Date		2018/10/17 15:25			2018/10/17 16:45		
COC Number		684818-02-01			684818-02-01		
	UNITS	**MW10A**	**RDL**	**QC Batch**	**MW10B**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	1.1	1.0	5794754	<1.0	1.0	5794754
Dissolved Potassium (K)	ug/L	300	200	5794754	260	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754	<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	2700	50	5794754	1700	50	5794754
Dissolved Sodium (Na)	ug/L	41000	100	5794754	120000	100	5794754
Dissolved Strontium (Sr)	ug/L	72	1.0	5794754	100	1.0	5794754
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794754	<0.050	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754	<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	2.0	0.50	5794754	0.94	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754	<5.0	5.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ939			IBJ940			IBJ940		
Sampling Date		2018/10/17 16:45			2018/10/17 13:55			2018/10/17 13:55		
COC Number		684818-02-01			684818-02-01			684818-02-01		
	UNITS	**MW10B Lab-Dup**	**RDL**	**QC Batch**	**MW11**	**RDL**	**QC Batch**	**MW11 Lab-Dup**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L				0.27 (1)	0.050	5805240			
Total Chemical Oxygen Demand (COD)	mg/L				10	4.0	5796497			
Conductivity	umho/cm				450	1.0	5794466			
Total Dissolved Solids	mg/L				225	10	5795752			
Total Kjeldahl Nitrogen (TKN)	mg/L				0.23	0.10	5804544			
Dissolved Organic Carbon	mg/L				2.7	0.50	5793666			
pH	pH				7.91		5794467			
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406	<0.0010	0.0010	5795406			
Total Phosphorus	mg/L				1.8	0.40	5795845			
Dissolved Sulphate (SO4)	mg/L				<1.0	1.0	5794472			
Alkalinity (Total as CaCO3)	mg/L				250	1.0	5794465			
Dissolved Chloride (Cl-)	mg/L				1.1	1.0	5794471			
Nitrite (N)	mg/L				<0.010	0.010	5794518	0.018	0.010	5794518
Nitrate (N)	mg/L				<0.10	0.10	5794518	<0.10	0.10	5794518
Metals										
Mercury (Hg)	mg/L				<0.0001	0.0001	5795858			
Dissolved Aluminum (Al)	ug/L				5.4	5.0	5794754			
Dissolved Antimony (Sb)	ug/L				<0.50	0.50	5794754			
Dissolved Arsenic (As)	ug/L				1.0	1.0	5794754			
Dissolved Barium (Ba)	ug/L				28	2.0	5794754			
Dissolved Beryllium (Be)	ug/L				<0.50	0.50	5794754			
Dissolved Bismuth (Bi)	ug/L				<1.0	1.0	5794754			
Dissolved Boron (B)	ug/L				13	10	5794754			
Dissolved Cadmium (Cd)	ug/L				<0.10	0.10	5794754			
Dissolved Calcium (Ca)	ug/L				72000	200	5794754			
Dissolved Chromium (Cr)	ug/L				<5.0	5.0	5794754			
Dissolved Cobalt (Co)	ug/L				<0.50	0.50	5794754			
Dissolved Copper (Cu)	ug/L				<1.0	1.0	5794754			
Dissolved Iron (Fe)	ug/L				140	100	5794754			
Dissolved Lead (Pb)	ug/L				<0.50	0.50	5794754			
Dissolved Magnesium (Mg)	ug/L				14000	50	5794754			
Dissolved Manganese (Mn)	ug/L				120	2.0	5794754			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ939			IBJ940			IBJ940		
Sampling Date		2018/10/17 16:45			2018/10/17 13:55			2018/10/17 13:55		
COC Number		684818-02-01			684818-02-01			684818-02-01		
	UNITS	**MW10B Lab-Dup**	**RDL**	**QC Batch**	**MW11**	**RDL**	**QC Batch**	**MW11 Lab-Dup**	**RDL**	**QC Batch**
Dissolved Molybdenum (Mo)	ug/L				0.80	0.50	5794754			
Dissolved Nickel (Ni)	ug/L				<1.0	1.0	5794754			
Dissolved Potassium (K)	ug/L				710	200	5794754			
Dissolved Selenium (Se)	ug/L				<2.0	2.0	5794754			
Dissolved Silicon (Si)	ug/L				6400	50	5794754			
Dissolved Sodium (Na)	ug/L				6000	100	5794754			
Dissolved Strontium (Sr)	ug/L				80	1.0	5794754			
Dissolved Thallium (Tl)	ug/L				<0.050	0.050	5794754			
Dissolved Tin (Sn)	ug/L				<1.0	1.0	5794754			
Dissolved Vanadium (V)	ug/L				0.66	0.50	5794754			
Dissolved Zinc (Zn)	ug/L				<5.0	5.0	5794754			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ941		
Sampling Date		2018/10/17 07:30		
COC Number		684818-02-01		
	UNITS	**MW12**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	2.5	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	27	4.0	5796497
Conductivity	umho/cm	1300	1.0	5794466
Total Dissolved Solids	mg/L	735	10	5795752
Total Kjeldahl Nitrogen (TKN)	mg/L	2.6	0.10	5797503
Dissolved Organic Carbon	mg/L	6.6	0.50	5793484
pH	pH	7.63		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795417
Total Phosphorus	mg/L	0.056	0.020	5795845
Dissolved Sulphate (SO4)	mg/L	150	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	490	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	60	1.0	5794475
Nitrite (N)	mg/L	0.012	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518
Metals				
Mercury (Hg)	mg/L	<0.0001	0.0001	5796432
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5794754
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5794754
Dissolved Arsenic (As)	ug/L	3.1	1.0	5794754
Dissolved Barium (Ba)	ug/L	120	2.0	5794754
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5794754
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5794754
Dissolved Boron (B)	ug/L	1300	10	5794754
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5794754
Dissolved Calcium (Ca)	ug/L	150000	200	5794754
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5794754
Dissolved Cobalt (Co)	ug/L	0.64	0.50	5794754
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5794754
Dissolved Iron (Fe)	ug/L	6300	100	5794754
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5794754
Dissolved Magnesium (Mg)	ug/L	50000	50	5794754
Dissolved Manganese (Mn)	ug/L	1200	2.0	5794754
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - GW COMP. LIST (WATER)

Maxxam ID		IBJ941		
Sampling Date		2018/10/17 07:30		
COC Number		684818-02-01		
	UNITS	**MW12**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	5.8	1.0	5794754
Dissolved Potassium (K)	ug/L	15000	200	5794754
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5794754
Dissolved Silicon (Si)	ug/L	5900	50	5794754
Dissolved Sodium (Na)	ug/L	51000	100	5794754
Dissolved Strontium (Sr)	ug/L	330	1.0	5794754
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5794754
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5794754
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5794754
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5794754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL SCH 5 - GW COMP. (LAB FILTERED)

Maxxam ID		IBJ937		
Sampling Date		2018/10/17 12:45		
COC Number		684818-01-01		
	UNITS	**MW9**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	0.20	0.050	5797589
Total Chemical Oxygen Demand (COD)	mg/L	<4.0	4.0	5796497
Conductivity	umho/cm	880	1.0	5794466
Total Dissolved Solids	mg/L	610	10	5793560
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16	0.10	5797503
Dissolved Organic Carbon	mg/L	1.2	0.50	5793666
pH	pH	7.97		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795417
Total Phosphorus	mg/L	1.1	0.40	5795845
Dissolved Sulphate (SO4)	mg/L	7.5	1.0	5794476
Alkalinity (Total as CaCO3)	mg/L	260	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	130	1.0	5794475
Nitrite (N)	mg/L	<0.010	0.010	5794518
Nitrate (N)	mg/L	0.16	0.10	5794518
Metals				
Mercury (Hg)	mg/L	0.0002	0.0001	5796432
Dissolved Aluminum (Al)	ug/L	<5.0	5.0	5810873
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5810873
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5810873
Dissolved Barium (Ba)	ug/L	22	2.0	5810873
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5810873
Dissolved Bismuth (Bi)	ug/L	<1.0	1.0	5810873
Dissolved Boron (B)	ug/L	13	10	5810873
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5810873
Dissolved Calcium (Ca)	ug/L	100000	200	5810873
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5810873
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5810873
Dissolved Copper (Cu)	ug/L	<1.0	1.0	5810873
Dissolved Iron (Fe)	ug/L	<100	100	5810873
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5810873
Dissolved Magnesium (Mg)	ug/L	20000	50	5810873
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	5810873
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5810873

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL SCH 5 - GW COMP. (LAB FILTERED)

Maxxam ID		IBJ937		
Sampling Date		2018/10/17 12:45		
COC Number		684818-01-01		
	UNITS	**MW9**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5810873
Dissolved Potassium (K)	ug/L	1200	200	5810873
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5810873
Dissolved Silicon (Si)	ug/L	4800	50	5810873
Dissolved Sodium (Na)	ug/L	46000	100	5810873
Dissolved Strontium (Sr)	ug/L	98	1.0	5810873
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	5810873
Dissolved Tin (Sn)	ug/L	<1.0	1.0	5810873
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5810873
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5810873

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B8R7437
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exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ942			IBJ942			IBJ943		
Sampling Date		2018/10/17 17:05			2018/10/17 17:05			2018/10/17 16:25		
COC Number		684819-01-01			684819-01-01			684819-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Inorganics										
Total Ammonia-N	mg/L	0.087	0.050	5797589				0.083	0.050	5797589
Total BOD	mg/L	<2	2	5794415				<2	2	5794415
Total Chemical Oxygen Demand (COD)	mg/L	35	4.0	5796497				54	4.0	5796497
Conductivity	umho/cm	290	1.0	5794811	290	1.0	5794811	250	1.0	5794466
Total Dissolved Solids	mg/L	190	10	5793560				120	10	5795752
Total Kjeldahl Nitrogen (TKN)	mg/L	0.38	0.10	5797503				0.55	0.10	5797503
pH	pH	7.58		5794812	7.63		5794812	7.84		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795417				0.0011	0.0010	5795417
Total Phosphorus	mg/L	0.029	0.004	5796157				0.12	0.008	5796157
Total Suspended Solids	mg/L	13	1	5795780				33	1	5795780
Dissolved Sulphate (SO4)	mg/L	18	1.0	5794798				17	1.0	5794622
Alkalinity (Total as CaCO3)	mg/L	90	1.0	5794809	89	1.0	5794809	92	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	27	1.0	5794796				15	1.0	5794621
Nitrite (N)	mg/L	<0.010	0.010	5794518				<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518				<0.10	0.10	5794518
Metals										
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962				<0.0001	0.0001	5795962
Total Antimony (Sb)	ug/L	0.52	0.50	5795405				0.71	0.50	5795405
Total Arsenic (As)	ug/L	42	1.0	5795405				100	1.0	5795405
Total Barium (Ba)	ug/L	8.6	2.0	5795405				21	2.0	5795405
Total Beryllium (Be)	ug/L	<0.50	0.50	5795405				<0.50	0.50	5795405
Total Bismuth (Bi)	ug/L	<1.0	1.0	5795405				<1.0	1.0	5795405
Total Boron (B)	ug/L	<10	10	5795405				13	10	5795405
Total Cadmium (Cd)	ug/L	<0.10	0.10	5795405				<0.10	0.10	5795405
Total Calcium (Ca)	ug/L	31000	200	5795405				34000	200	5795405
Total Chromium (Cr)	ug/L	<5.0	5.0	5795405				<5.0	5.0	5795405
Total Cobalt (Co)	ug/L	<0.50	0.50	5795405				1.7	0.50	5795405
Total Copper (Cu)	ug/L	2.6	1.0	5795405				12	1.0	5795405
Total Iron (Fe)	ug/L	190	100	5795405				2300	100	5795405
Total Lead (Pb)	ug/L	<0.50	0.50	5795405				1.6	0.50	5795405
Total Lithium (Li)	ug/L	<5.0	5.0	5795405				<5.0	5.0	5795405
Total Magnesium (Mg)	ug/L	6400	50	5795405				7400	50	5795405

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ942			IBJ942			IBJ943		
Sampling Date		2018/10/17 17:05			2018/10/17 17:05			2018/10/17 16:25		
COC Number		684819-01-01			684819-01-01			684819-01-01		
	UNITS	**SW1**	**RDL**	**QC Batch**	**SW1 Lab-Dup**	**RDL**	**QC Batch**	**SW2**	**RDL**	**QC Batch**
Total Manganese (Mn)	ug/L	11	2.0	5795405				620	2.0	5795405
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5795405				<0.50	0.50	5795405
Total Nickel (Ni)	ug/L	<1.0	1.0	5795405				4.2	1.0	5795405
Total Potassium (K)	ug/L	620	200	5795405				820	200	5795405
Total Selenium (Se)	ug/L	<2.0	2.0	5795405				<2.0	2.0	5795405
Total Silicon (Si)	ug/L	1500	50	5795405				2500	50	5795405
Total Silver (Ag)	ug/L	<0.10	0.10	5795405				<0.10	0.10	5795405
Total Sodium (Na)	ug/L	14000	100	5795405				8500	100	5795405
Total Strontium (Sr)	ug/L	46	1.0	5795405				59	1.0	5795405
Total Thallium (Tl)	ug/L	<0.050	0.050	5795405				<0.050	0.050	5795405
Total Vanadium (V)	ug/L	<0.50	0.50	5795405				1.9	0.50	5795405
Total Zinc (Zn)	ug/L	<5.0	5.0	5795405				9.5	5.0	5795405

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ944		
Sampling Date		2018/10/17 16:00		
COC Number		684819-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	0.064	0.050	5797589
Total BOD	mg/L	<2	2	5794415
Total Chemical Oxygen Demand (COD)	mg/L	45	4.0	5796497
Conductivity	umho/cm	250	1.0	5794466
Total Dissolved Solids	mg/L	125	10	5795752
Total Kjeldahl Nitrogen (TKN)	mg/L	0.43	0.10	5797503
pH	pH	7.82		5794467
Phenols-4AAP	mg/L	<0.0010	0.0010	5795406
Total Phosphorus	mg/L	0.061	0.008	5797085
Total Suspended Solids	mg/L	37	1	5795780
Dissolved Sulphate (SO4)	mg/L	16	1.0	5794622
Alkalinity (Total as CaCO3)	mg/L	95	1.0	5794465
Dissolved Chloride (Cl-)	mg/L	14	1.0	5794621
Nitrite (N)	mg/L	<0.010	0.010	5794518
Nitrate (N)	mg/L	<0.10	0.10	5794518
Metals				
Mercury (Hg)	mg/L	<0.0001	0.0001	5795962
Total Antimony (Sb)	ug/L	0.61	0.50	5795405
Total Arsenic (As)	ug/L	73	1.0	5795405
Total Barium (Ba)	ug/L	12	2.0	5795405
Total Beryllium (Be)	ug/L	<0.50	0.50	5795405
Total Bismuth (Bi)	ug/L	<1.0	1.0	5795405
Total Boron (B)	ug/L	10	10	5795405
Total Cadmium (Cd)	ug/L	<0.10	0.10	5795405
Total Calcium (Ca)	ug/L	34000	200	5795405
Total Chromium (Cr)	ug/L	<5.0	5.0	5795405
Total Cobalt (Co)	ug/L	0.91	0.50	5795405
Total Copper (Cu)	ug/L	6.4	1.0	5795405
Total Iron (Fe)	ug/L	1200	100	5795405
Total Lead (Pb)	ug/L	0.78	0.50	5795405
Total Lithium (Li)	ug/L	<5.0	5.0	5795405
Total Magnesium (Mg)	ug/L	7500	50	5795405
Total Manganese (Mn)	ug/L	120	2.0	5795405

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

LANDFILL STANDARDS SCH 5 - SW COMP. LIST (WATER)

Maxxam ID		IBJ944		
Sampling Date		2018/10/17 16:00		
COC Number		684819-01-01		
	UNITS	**SW3**	**RDL**	**QC Batch**
Total Molybdenum (Mo)	ug/L	<0.50	0.50	5795405
Total Nickel (Ni)	ug/L	2.4	1.0	5795405
Total Potassium (K)	ug/L	810	200	5795405
Total Selenium (Se)	ug/L	<2.0	2.0	5795405
Total Silicon (Si)	ug/L	2200	50	5795405
Total Silver (Ag)	ug/L	<0.10	0.10	5795405
Total Sodium (Na)	ug/L	8100	100	5795405
Total Strontium (Sr)	ug/L	56	1.0	5795405
Total Thallium (Tl)	ug/L	<0.050	0.050	5795405
Total Vanadium (V)	ug/L	1.3	0.50	5795405
Total Zinc (Zn)	ug/L	<5.0	5.0	5795405

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

RESULTS OF ANALYSES OF WATER

Maxxam ID		IBJ928		IBJ929	IBJ930			IBJ930		
Sampling Date		2018/10/17 10:20		2018/10/17 11:05	2018/10/17 08:55			2018/10/17 08:55		
COC Number		684818-01-01		684818-01-01	684818-01-01			684818-01-01		
	UNITS	**MW1**	**QC Batch**	**MW2**	**MW3A**	**RDL**	**QC Batch**	**MW3A Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters										
Hardness (CaCO3)	mg/L	660	5792211	220	460	1.0	5792211			
Ion Balance (% Difference)	%	6.13	5792212	0.250	1.77	N/A	5792212			
Total Organic Nitrogen	mg/L	0.36	5792714	0.10	<0.10	0.10	5792714			
Inorganics										
Orthophosphate (P)	mg/L	<0.010	5794477	<0.010	<0.010	0.010	5794807	<0.010	0.010	5794807

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		IBJ931		IBJ932			IBJ932		
Sampling Date		2018/10/17 09:10		2018/10/17 12:00			2018/10/17 12:00		
COC Number		684818-01-01		684818-01-01			684818-01-01		
	UNITS	**MW3B**	**QC Batch**	**MW4**	**RDL**	**QC Batch**	**MW4 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	540	5792211	560	1.0	5792211			
Ion Balance (% Difference)	%	0.380	5792212	1.01	N/A	5792212			
Total Organic Nitrogen	mg/L	<0.10	5792714	<0.10	0.10	5792714			
Inorganics									
Orthophosphate (P)	mg/L	<0.010	5794807	<0.010	0.010	5796907	<0.010	0.010	5796907

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

RESULTS OF ANALYSES OF WATER

Maxxam ID		IBJ933	IBJ934	IBJ935	IBJ936	IBJ937	IBJ938		
Sampling Date		2018/10/17 11:20	2018/10/17 10:13	2018/10/17 12:15	2018/10/17 14:36	2018/10/17 12:45	2018/10/17 15:25		
COC Number		684818-01-01	684818-01-01	684818-01-01	684818-01-01	684818-01-01	684818-02-01		
	UNITS	**MW5**	**MW6**	**MW7**	**MW8**	**MW9**	**MW10A**	**RDL**	**QC Batch**
Calculated Parameters									
Hardness (CaCO3)	mg/L	580	270	440	610	340	250	1.0	5792211
Ion Balance (% Difference)	%	0.170	0.450	2.57	2.51	1.21	7.20	N/A	5792212
Total Organic Nitrogen	mg/L	<0.10	<0.10	<0.10	0.91	<0.10	0.25	0.10	5792714
Inorganics									
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5794477

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		IBJ939		IBJ940		IBJ941		
Sampling Date		2018/10/17 16:45		2018/10/17 13:55		2018/10/17 07:30		
COC Number		684818-02-01		684818-02-01		684818-02-01		
	UNITS	**MW10B**	**QC Batch**	**MW11**	**QC Batch**	**MW12**	**RDL**	**QC Batch**
Calculated Parameters								
Hardness (CaCO3)	mg/L	360	5793000	240	5793000	580	1.0	5793000
Ion Balance (% Difference)	%	0.310	5792212	0.00	5792212	0.220	N/A	5793001
Total Organic Nitrogen	mg/L	0.33	5792714	<0.10	5792714	<0.10	0.10	5792714
Inorganics								
Orthophosphate (P)	mg/L	<0.010	5794477	<0.010	5794473	<0.010	0.010	5794477

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		IBJ942	IBJ943		IBJ944		
Sampling Date		2018/10/17 17:05	2018/10/17 16:25		2018/10/17 16:00		
COC Number		684819-01-01	684819-01-01		684819-01-01		
	UNITS	**SW1**	**SW2**	**QC Batch**	**SW3**	**RDL**	**QC Batch**
Calculated Parameters							
Hardness (CaCO3)	mg/L	120	120	5793000	110	1.0	5793000
Total Organic Nitrogen	mg/L	0.29	0.47	5792714	0.37	0.10	5792714
Inorganics							
Dissolved Organic Carbon	mg/L	11	12	5793666	12	0.50	5793484

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		IBJ942		IBJ943	IBJ944		
Sampling Date		2018/10/17 17:05		2018/10/17 16:25	2018/10/17 16:00		
COC Number		684819-01-01		684819-01-01	684819-01-01		
	UNITS	**SW1**	**QC Batch**	**SW2**	**SW3**	**RDL**	**QC Batch**
Metals							
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	5798153	<5	<5	5	5794835
Dissolved Calcium (Ca)	mg/L	35	5798135	34	34	0.050	5794841
Dissolved Magnesium (Mg)	mg/L	7.0	5798135	7.4	7.2	0.050	5794841

RDL = Reportable Detection Limit
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ933		
Sampling Date		2018/10/17 11:20		
COC Number		684818-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	5793701
Benzene	ug/L	<0.10	0.10	5793701
Bromodichloromethane	ug/L	<0.10	0.10	5793701
Bromoform	ug/L	<0.20	0.20	5793701
Bromomethane	ug/L	<0.50	0.50	5793701
Carbon Tetrachloride	ug/L	<0.10	0.10	5793701
Chlorobenzene	ug/L	1.2	0.10	5793701
Chloroform	ug/L	<0.10	0.10	5793701
Dibromochloromethane	ug/L	<0.20	0.20	5793701
1,2-Dichlorobenzene	ug/L	<0.20	0.20	5793701
1,3-Dichlorobenzene	ug/L	0.21	0.20	5793701
1,4-Dichlorobenzene	ug/L	1.0	0.20	5793701
Dichlorodifluoromethane (FREON 12)	ug/L	<0.50	0.50	5793701
1,1-Dichloroethane	ug/L	0.21	0.10	5793701
1,2-Dichloroethane	ug/L	<0.20	0.20	5793701
1,1-Dichloroethylene	ug/L	<0.10	0.10	5793701
cis-1,2-Dichloroethylene	ug/L	<0.10	0.10	5793701
trans-1,2-Dichloroethylene	ug/L	<0.10	0.10	5793701
1,2-Dichloropropane	ug/L	<0.10	0.10	5793701
cis-1,3-Dichloropropene	ug/L	<0.20	0.20	5793701
trans-1,3-Dichloropropene	ug/L	<0.20	0.20	5793701
Ethylbenzene	ug/L	<0.10	0.10	5793701
Ethylene Dibromide	ug/L	<0.20	0.20	5793701
Hexane	ug/L	<0.50	0.50	5793701
Methylene Chloride(Dichloromethane)	ug/L	<0.50	0.50	5793701
Methyl Ethyl Ketone (2-Butanone)	ug/L	<5.0	5.0	5793701
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	5793701
Methyl t-butyl ether (MTBE)	ug/L	<0.20	0.20	5793701
Styrene	ug/L	<0.20	0.20	5793701
1,1,1,2-Tetrachloroethane	ug/L	<0.20	0.20	5793701
1,1,2,2-Tetrachloroethane	ug/L	<0.20	0.20	5793701
Tetrachloroethylene	ug/L	<0.10	0.10	5793701
Toluene	ug/L	<0.20	0.20	5793701

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B8R7437
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exp Services Inc
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IBJ933		
Sampling Date		2018/10/17 11:20		
COC Number		684818-01-01		
	UNITS	**MW5**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	<0.10	0.10	5793701
1,1,2-Trichloroethane	ug/L	<0.20	0.20	5793701
Trichloroethylene	ug/L	<0.10	0.10	5793701
Trichlorofluoromethane (FREON 11)	ug/L	<0.20	0.20	5793701
Vinyl Chloride	ug/L	<0.20	0.20	5793701
p+m-Xylene	ug/L	<0.10	0.10	5793701
o-Xylene	ug/L	<0.10	0.10	5793701
Total Xylenes	ug/L	<0.10	0.10	5793701
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	101		5793701
D4-1,2-Dichloroethane	%	98		5793701
D8-Toluene	%	97		5793701

RDL = Reportable Detection Limit
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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ928
Sample ID: MW1
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Ewa Pranjic
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797496	2018/10/23	2018/10/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ928 Dup
Sample ID: MW1
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh

Maxxam ID: IBJ929
Sample ID: MW2
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ929
Sample ID: MW2
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ930
Sample ID: MW3A
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Ewa Pranjic
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ930 Dup
Sample ID: MW3A
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ931
Sample ID: MW3B
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794805	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793484	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794807	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794806	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797496	2018/10/23	2018/10/24	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ932
Sample ID: MW4
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5796904	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5796907	N/A	2018/10/23	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5796906	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ932 Dup
Sample ID: MW4
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5796904	N/A	2018/10/23	Deonarine Ramnarine
Orthophosphate	KONE	5796907	N/A	2018/10/23	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5796906	N/A	2018/10/23	Alina Dobreanu

Maxxam ID: IBJ933
Sample ID: MW5
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793484	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal
Volatile Organic Compounds in Water	P&T/MS	5793701	N/A	2018/10/23	Michael Leschinsky

Maxxam ID: IBJ933 Dup
Sample ID: MW5
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

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TEST SUMMARY

Maxxam ID: IBJ934
Sample ID: MW6
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ934 Dup
Sample ID: MW6
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal

Maxxam ID: IBJ935
Sample ID: MW7
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794468	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794469	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794612	N/A	2018/10/22	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Ewa Pranjic

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Maxxam Job #: B8R7437
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Client Project #: THB-00006189-OE
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TEST SUMMARY

Maxxam ID: IBJ935
Sample ID: MW7
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5794470	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ935 Dup
Sample ID: MW7
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware

Maxxam ID: IBJ936
Sample ID: MW8
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/24	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/25	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

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TEST SUMMARY

Maxxam ID: IBJ937
Sample ID: MW9
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/25	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Lab Filtered Metals by ICPMS	ICP/MS	5810873	2018/10/30	2018/10/31	Arefa Dabhad
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/25	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ938
Sample ID: MW10A
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5792211	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ939
Sample ID: MW10B
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ939 Dup
Sample ID: MW10B
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram

Maxxam ID: IBJ940
Sample ID: MW11
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794471	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795858	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5792212	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5805240	N/A	2018/10/29	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk

Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ940
Sample ID: MW11
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Orthophosphate	KONE	5794473	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794472	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5804544	2018/10/26	2018/10/26	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

Maxxam ID: IBJ940 Dup
Sample ID: MW11
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal

Maxxam ID: IBJ941
Sample ID: MW12
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Chloride by Automated Colourimetry	KONE	5794475	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793484	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5796432	2018/10/22	2018/10/23	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5794754	N/A	2018/10/23	Thao Nguyen
Ion Balance (% Difference)	CALC	5793001	N/A	2018/10/24	Automated Statchk
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Ewa Pranjic
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Orthophosphate	KONE	5794477	N/A	2018/10/22	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5794476	N/A	2018/10/22	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5795845	2018/10/22	2018/10/22	Amanpreet Sappal

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ942
Sample ID: SW1
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5798153	N/A	2018/10/25	Arefa Dabhad
Alkalinity	AT	5794809	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5794415	2018/10/20	2018/10/25	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	5794796	N/A	2018/10/22	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794811	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5798135	2018/10/23	2018/10/24	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794812	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794798	N/A	2018/10/22	Deonarine Ramnarine
Total Dissolved Solids	BAL	5793560	2018/10/22	2018/10/23	Niket Kumar Patel
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5796157	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

Maxxam ID: IBJ942 Dup
Sample ID: SW1
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5794809	N/A	2018/10/21	Surinder Rai
Conductivity	AT	5794811	N/A	2018/10/21	Surinder Rai
pH	AT	5794812	N/A	2018/10/21	Surinder Rai

Maxxam ID: IBJ943
Sample ID: SW2
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5794835	N/A	2018/10/22	Thao Nguyen
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5794415	2018/10/20	2018/10/25	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	5794621	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793666	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

TEST SUMMARY

Maxxam ID: IBJ943
Sample ID: SW2
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5794841	2018/10/20	2018/10/22	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795417	N/A	2018/10/23	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794622	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5796157	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

Maxxam ID: IBJ944
Sample ID: SW3
Matrix: Water

Collected: 2018/10/17
Shipped:
Received: 2018/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	5794835	N/A	2018/10/22	Thao Nguyen
Alkalinity	AT	5794465	N/A	2018/10/21	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	5794415	2018/10/20	2018/10/25	Althea Gonzalez
Chloride by Automated Colourimetry	KONE	5794621	N/A	2018/10/23	Deonarine Ramnarine
Chemical Oxygen Demand	SPEC	5796497	N/A	2018/10/24	Viorica Rotaru
Conductivity	AT	5794466	N/A	2018/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5793484	N/A	2018/10/21	Nimarta Singh
Hardness (calculated as CaCO3)		5793000	N/A	2018/10/24	Automated Statchk
Mercury in Water by CVAA	CV/AA	5795962	2018/10/22	2018/10/23	Ron Morrison
Dissolved Calcium and Magnesium	ICP	5794841	2018/10/20	2018/10/22	Suban Kanapathippllai
Total Metals Analysis by ICPMS	ICP/MS	5795405	N/A	2018/10/22	Thao Nguyen
Total Ammonia-N	LACH/NH4	5797589	N/A	2018/10/25	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5794518	N/A	2018/10/24	Chandra Nandlal
Organic Nitrogen	CALC	5792714	N/A	2018/10/25	Automated Statchk
pH	AT	5794467	N/A	2018/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5795406	N/A	2018/10/22	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	5794622	N/A	2018/10/23	Alina Dobreanu
Total Dissolved Solids	BAL	5795752	2018/10/23	2018/10/24	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	5797503	2018/10/23	2018/10/23	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5797085	2018/10/22	2018/10/23	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5795780	2018/10/22	2018/10/23	Mandeep Kaur

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Maxxam Job #: B8R7437
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exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.0°C
Package 2	1.3°C
Package 3	0.0°C
Package 4	-1.7°C

Sample IBJ930 [MW3A] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample IBJ931 [MW3B] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample IBJ937 [MW9] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample IBJ940 [MW11] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Results relate only to the items tested.

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5793701	4-Bromofluorobenzene	2018/10/23	101	70 - 130	102	70 - 130	100	%				
5793701	D4-1,2-Dichloroethane	2018/10/23	98	70 - 130	98	70 - 130	99	%				
5793701	D8-Toluene	2018/10/23	100	70 - 130	100	70 - 130	98	%				
5793484	Dissolved Organic Carbon	2018/10/21	94	80 - 120	96	80 - 120	<0.50	mg/L	5.0	20		
5793560	Total Dissolved Solids	2018/10/23					<10	mg/L	0	25	100	90 - 110
5793666	Dissolved Organic Carbon	2018/10/21	96	80 - 120	97	80 - 120	<0.50	mg/L	3.6	20		
5793701	1,1,1,2-Tetrachloroethane	2018/10/23	114	70 - 130	113	70 - 130	<0.20	ug/L				
5793701	1,1,1-Trichloroethane	2018/10/23	111	70 - 130	110	70 - 130	<0.10	ug/L				
5793701	1,1,2,2-Tetrachloroethane	2018/10/23	114	70 - 130	111	70 - 130	<0.20	ug/L				
5793701	1,1,2-Trichloroethane	2018/10/23	106	70 - 130	104	70 - 130	<0.20	ug/L				
5793701	1,1-Dichloroethane	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	1,1-Dichloroethylene	2018/10/23	103	70 - 130	102	70 - 130	<0.10	ug/L				
5793701	1,2-Dichlorobenzene	2018/10/23	108	70 - 130	106	70 - 130	<0.20	ug/L				
5793701	1,2-Dichloroethane	2018/10/23	103	70 - 130	101	70 - 130	<0.20	ug/L				
5793701	1,2-Dichloropropane	2018/10/23	104	70 - 130	102	70 - 130	<0.10	ug/L				
5793701	1,3-Dichlorobenzene	2018/10/23	109	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	1,4-Dichlorobenzene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Acetone (2-Propanone)	2018/10/23	101	60 - 140	97	60 - 140	<10	ug/L				
5793701	Benzene	2018/10/23	105	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	Bromodichloromethane	2018/10/23	113	70 - 130	112	70 - 130	<0.10	ug/L				
5793701	Bromoform	2018/10/23	100	70 - 130	97	70 - 130	<0.20	ug/L				
5793701	Bromomethane	2018/10/23	67	60 - 140	61	60 - 140	<0.50	ug/L				
5793701	Carbon Tetrachloride	2018/10/23	116	70 - 130	115	70 - 130	<0.10	ug/L				
5793701	Chlorobenzene	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	Chloroform	2018/10/23	106	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	cis-1,2-Dichloroethylene	2018/10/23	107	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	cis-1,3-Dichloropropene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Dibromochloromethane	2018/10/23	118	70 - 130	115	70 - 130	<0.20	ug/L				
5793701	Dichlorodifluoromethane (FREON 12)	2018/10/23	102	60 - 140	109	60 - 140	<0.50	ug/L				
5793701	Ethylbenzene	2018/10/23	106	70 - 130	107	70 - 130	<0.10	ug/L	NC	30		
5793701	Ethylene Dibromide	2018/10/23	108	70 - 130	106	70 - 130	<0.20	ug/L				

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5793701	Hexane	2018/10/23	78	70 - 130	101	70 - 130	<0.50	ug/L				
5793701	Methyl Ethyl Ketone (2-Butanone)	2018/10/23	100	60 - 140	100	60 - 140	<5.0	ug/L				
5793701	Methyl Isobutyl Ketone	2018/10/23	109	70 - 130	106	70 - 130	<5.0	ug/L				
5793701	Methyl t-butyl ether (MTBE)	2018/10/23	106	70 - 130	102	70 - 130	<0.20	ug/L				
5793701	Methylene Chloride(Dichloromethane)	2018/10/23	101	70 - 130	101	70 - 130	<0.50	ug/L				
5793701	o-Xylene	2018/10/23	110	70 - 130	108	70 - 130	<0.10	ug/L				
5793701	p+m-Xylene	2018/10/23	109	70 - 130	110	70 - 130	<0.10	ug/L				
5793701	Styrene	2018/10/23	110	70 - 130	109	70 - 130	<0.20	ug/L				
5793701	Tetrachloroethylene	2018/10/23	104	70 - 130	106	70 - 130	<0.10	ug/L				
5793701	Toluene	2018/10/23	105	70 - 130	104	70 - 130	<0.20	ug/L				
5793701	Total Xylenes	2018/10/23					<0.10	ug/L				
5793701	trans-1,2-Dichloroethylene	2018/10/23	105	70 - 130	105	70 - 130	<0.10	ug/L				
5793701	trans-1,3-Dichloropropene	2018/10/23	111	70 - 130	112	70 - 130	<0.20	ug/L				
5793701	Trichloroethylene	2018/10/23	105	70 - 130	104	70 - 130	<0.10	ug/L				
5793701	Trichlorofluoromethane (FREON 11)	2018/10/23	107	70 - 130	107	70 - 130	<0.20	ug/L				
5793701	Vinyl Chloride	2018/10/23	101	70 - 130	101	70 - 130	<0.20	ug/L				
5794415	Total BOD	2018/10/25					<2	mg/L	NC	30	98	80 - 120
5794465	Alkalinity (Total as CaCO3)	2018/10/21			96	85 - 115	<1.0	mg/L	0.076	20		
5794466	Conductivity	2018/10/21			101	85 - 115	<1.0	umho/cm	0	25		
5794467	pH	2018/10/21			102	98 - 103			0.14	N/A		
5794468	Alkalinity (Total as CaCO3)	2018/10/21			96	85 - 115	<1.0	mg/L	0.20	20		
5794469	Conductivity	2018/10/21			100	85 - 115	<1.0	umho/cm	0.26	25		
5794470	pH	2018/10/21			102	98 - 103			0.84	N/A		
5794471	Dissolved Chloride (Cl-)	2018/10/23	111	80 - 120	104	80 - 120	<1.0	mg/L	0.39	20		
5794472	Dissolved Sulphate (SO4)	2018/10/22	NC	75 - 125	104	80 - 120	<1.0	mg/L	0.095	20		
5794473	Orthophosphate (P)	2018/10/22	102	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5794475	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	104	80 - 120	<1.0	mg/L	0.0098	20		
5794476	Dissolved Sulphate (SO4)	2018/10/22	104	75 - 125	105	80 - 120	<1.0	mg/L	0.73	20		
5794477	Orthophosphate (P)	2018/10/22	115	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5794518	Nitrate (N)	2018/10/24	103	80 - 120	102	80 - 120	<0.10	mg/L	NC	20		
5794518	Nitrite (N)	2018/10/24	104	80 - 120	102	80 - 120	<0.010	mg/L	NC	20		
5794612	Nitrate (N)	2018/10/22	103	80 - 120	104	80 - 120	<0.10	mg/L	NC	20		
5794612	Nitrite (N)	2018/10/22	92	80 - 120	96	80 - 120	<0.010	mg/L	NC	20		
5794621	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.2	20		
5794622	Dissolved Sulphate (SO4)	2018/10/23	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.0061	20		
5794754	Dissolved Aluminum (Al)	2018/10/23	105	80 - 120	106	80 - 120	<5.0	ug/L	NC	20		
5794754	Dissolved Antimony (Sb)	2018/10/23	114	80 - 120	106	80 - 120	<0.50	ug/L	NC	20		
5794754	Dissolved Arsenic (As)	2018/10/23	102	80 - 120	97	80 - 120	<1.0	ug/L	8.9	20		
5794754	Dissolved Barium (Ba)	2018/10/23	104	80 - 120	106	80 - 120	<2.0	ug/L	1.6	20		
5794754	Dissolved Beryllium (Be)	2018/10/23	106	80 - 120	104	80 - 120	<0.50	ug/L	NC	20		
5794754	Dissolved Bismuth (Bi)	2018/10/23	97	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
5794754	Dissolved Boron (B)	2018/10/23	NC	80 - 120	104	80 - 120	<10	ug/L	0.10	20		
5794754	Dissolved Cadmium (Cd)	2018/10/23	107	80 - 120	104	80 - 120	<0.10	ug/L	NC	20		
5794754	Dissolved Calcium (Ca)	2018/10/23	NC	80 - 120	103	80 - 120	<200	ug/L	0.38	20		
5794754	Dissolved Chromium (Cr)	2018/10/23	102	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
5794754	Dissolved Cobalt (Co)	2018/10/23	100	80 - 120	97	80 - 120	<0.50	ug/L	3.0	20		
5794754	Dissolved Copper (Cu)	2018/10/23	104	80 - 120	102	80 - 120	<1.0	ug/L	NC	20		
5794754	Dissolved Iron (Fe)	2018/10/23	105	80 - 120	101	80 - 120	<100	ug/L	0.31	20		
5794754	Dissolved Lead (Pb)	2018/10/23	99	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5794754	Dissolved Magnesium (Mg)	2018/10/23	NC	80 - 120	101	80 - 120	<50	ug/L	0.59	20		
5794754	Dissolved Manganese (Mn)	2018/10/23	NC	80 - 120	100	80 - 120	<2.0	ug/L	0.085	20		
5794754	Dissolved Molybdenum (Mo)	2018/10/23	112	80 - 120	105	80 - 120	<0.50	ug/L	NC	20		
5794754	Dissolved Nickel (Ni)	2018/10/23	99	80 - 120	98	80 - 120	<1.0	ug/L	5.4	20		
5794754	Dissolved Potassium (K)	2018/10/23	105	80 - 120	102	80 - 120	<200	ug/L	0.94	20		
5794754	Dissolved Selenium (Se)	2018/10/23	101	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
5794754	Dissolved Silicon (Si)	2018/10/23	101	80 - 120	103	80 - 120	<50	ug/L	0.33	20		
5794754	Dissolved Sodium (Na)	2018/10/23	NC	80 - 120	100	80 - 120	<100	ug/L	1.2	20		
5794754	Dissolved Strontium (Sr)	2018/10/23	103	80 - 120	101	80 - 120	<1.0	ug/L	0.74	20		
5794754	Dissolved Thallium (Tl)	2018/10/23	98	80 - 120	97	80 - 120	<0.050	ug/L	NC	20		
5794754	Dissolved Tin (Sn)	2018/10/23	110	80 - 120	104	80 - 120	<1.0	ug/L	NC	20		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5794754	Dissolved Vanadium (V)	2018/10/23	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5794754	Dissolved Zinc (Zn)	2018/10/23	101	80 - 120	97	80 - 120	<5.0	ug/L	NC	20		
5794796	Dissolved Chloride (Cl-)	2018/10/22	105	80 - 120	103	80 - 120	<1.0	mg/L	1.5	20		
5794798	Dissolved Sulphate (SO4)	2018/10/22	NC	75 - 125	100	80 - 120	<1.0	mg/L	5.4	20		
5794805	Dissolved Chloride (Cl-)	2018/10/23	NC	80 - 120	103	80 - 120	<1.0	mg/L	0.23	20		
5794806	Dissolved Sulphate (SO4)	2018/10/22	NC	75 - 125	103	80 - 120	<1.0	mg/L	0.85	20		
5794807	Orthophosphate (P)	2018/10/22	103	75 - 125	100	80 - 120	<0.010	mg/L	NC	25		
5794809	Alkalinity (Total as CaCO3)	2018/10/21			95	85 - 115	<1.0	mg/L	0.24	20		
5794811	Conductivity	2018/10/21			100	85 - 115	<1.0	umho/cm	0.35	25		
5794812	pH	2018/10/21			102	98 - 103			0.73	N/A		
5794835	Dissolved (0.2u) Aluminum (Al)	2018/10/22	103	80 - 120	101	80 - 120	<5	ug/L	12	20		
5794841	Dissolved Calcium (Ca)	2018/10/22	NC	80 - 120	95	80 - 120	<0.050	mg/L				
5794841	Dissolved Magnesium (Mg)	2018/10/22	NC	80 - 120	97	80 - 120	<0.050	mg/L				
5795405	Total Antimony (Sb)	2018/10/22	104	80 - 120	105	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Arsenic (As)	2018/10/22	98	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Barium (Ba)	2018/10/22	105	80 - 120	104	80 - 120	<2.0	ug/L	12	20		
5795405	Total Beryllium (Be)	2018/10/22	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Bismuth (Bi)	2018/10/22	92	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Boron (B)	2018/10/22	97	80 - 120	100	80 - 120	<10	ug/L	NC	20		
5795405	Total Cadmium (Cd)	2018/10/22	100	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
5795405	Total Calcium (Ca)	2018/10/22	97	80 - 120	97	80 - 120	<200	ug/L	1.7	20		
5795405	Total Chromium (Cr)	2018/10/22	96	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
5795405	Total Cobalt (Co)	2018/10/22	96	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Copper (Cu)	2018/10/22	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Iron (Fe)	2018/10/22	95	80 - 120	97	80 - 120	<100	ug/L	NC	20		
5795405	Total Lead (Pb)	2018/10/22	96	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Lithium (Li)	2018/10/22	102	80 - 120	101	80 - 120	<5.0	ug/L				
5795405	Total Magnesium (Mg)	2018/10/22	97	80 - 120	99	80 - 120	<50	ug/L	6.3	20		
5795405	Total Manganese (Mn)	2018/10/22	96	80 - 120	98	80 - 120	<2.0	ug/L	2.4	20		
5795405	Total Molybdenum (Mo)	2018/10/22	101	80 - 120	102	80 - 120	<0.50	ug/L	NC	20		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5795405	Total Nickel (Ni)	2018/10/22	95	80 - 120	97	80 - 120	<1.0	ug/L	NC	20		
5795405	Total Potassium (K)	2018/10/22	99	80 - 120	101	80 - 120	<200	ug/L	NC	20		
5795405	Total Selenium (Se)	2018/10/22	104	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
5795405	Total Silicon (Si)	2018/10/22	99	80 - 120	99	80 - 120	<50	ug/L	0.35	20		
5795405	Total Silver (Ag)	2018/10/22	98	80 - 120	99	80 - 120	<0.10	ug/L	NC	20		
5795405	Total Sodium (Na)	2018/10/22	96	80 - 120	98	80 - 120	<100	ug/L	3.8	20		
5795405	Total Strontium (Sr)	2018/10/22	98	80 - 120	99	80 - 120	<1.0	ug/L	0.77	20		
5795405	Total Thallium (Tl)	2018/10/22	95	80 - 120	96	80 - 120	<0.050	ug/L	NC	20		
5795405	Total Vanadium (V)	2018/10/22	97	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5795405	Total Zinc (Zn)	2018/10/22	99	80 - 120	101	80 - 120	<5.0	ug/L	6.1	20		
5795406	Phenols-4AAP	2018/10/22	98	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
5795417	Phenols-4AAP	2018/10/22	97	80 - 120	100	80 - 120	<0.0010	mg/L	NC	20		
5795752	Total Dissolved Solids	2018/10/24					<10	mg/L	1.9	25	97	90 - 110
5795780	Total Suspended Solids	2018/10/23					<1	mg/L	0	25	98	85 - 115
5795845	Total Phosphorus	2018/10/22	101	80 - 120	100	80 - 120	<0.020	mg/L	3.8	20	99	80 - 120
5795858	Mercury (Hg)	2018/10/23	90	75 - 125	92	80 - 120	<0.0001	mg/L	NC	20		
5795962	Mercury (Hg)	2018/10/23	90	75 - 125	93	80 - 120	<0.0001	mg/L	NC	20		
5796157	Total Phosphorus	2018/10/23	83	80 - 120	94	80 - 120	<0.004	mg/L	NC	20	95	80 - 120
5796432	Mercury (Hg)	2018/10/23	101	75 - 125	99	80 - 120	<0.0001	mg/L	NC	20		
5796497	Total Chemical Oxygen Demand (COD)	2018/10/24	95	80 - 120	103	80 - 120	<4.0	mg/L	0.20	20		
5796904	Dissolved Chloride (Cl-)	2018/10/23	99	80 - 120	102	80 - 120	<1.0	mg/L	2.6	20		
5796906	Dissolved Sulphate (SO4)	2018/10/23	NC	75 - 125	100	80 - 120	<1.0	mg/L	1.6	20		
5796907	Orthophosphate (P)	2018/10/23	101	75 - 125	99	80 - 120	<0.010	mg/L	NC	25		
5797085	Total Phosphorus	2018/10/23	97	80 - 120	97	80 - 120	<0.004	mg/L	NC	20	97	N/A
5797496	Total Kjeldahl Nitrogen (TKN)	2018/10/24	98	80 - 120	96	80 - 120	<0.10	mg/L	NC (1)	20	96	80 - 120
5797503	Total Kjeldahl Nitrogen (TKN)	2018/10/23	NC	80 - 120	101	80 - 120	<0.10	mg/L	1.5	20	94	80 - 120
5797589	Total Ammonia-N	2018/10/25	89	75 - 125	106	80 - 120	<0.050	mg/L	0.23	20		
5798135	Dissolved Calcium (Ca)	2018/10/24	NC	80 - 120	102	80 - 120	<0.050	mg/L				
5798135	Dissolved Magnesium (Mg)	2018/10/24	NC	80 - 120	101	80 - 120	<0.050	mg/L				
5798153	Dissolved (0.2u) Aluminum (Al)	2018/10/25	105	80 - 120	101	80 - 120	<5	ug/L	2.8	20		
5804544	Total Kjeldahl Nitrogen (TKN)	2018/10/26	91	80 - 120	98	80 - 120	<0.10	mg/L	NC (2)	20	95	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5805240	Total Ammonia-N	2018/10/29	99	75 - 125	104	80 - 120	<0.050	mg/L	NC	20		
5810873	Dissolved Aluminum (Al)	2018/10/31	105	80 - 120	100	80 - 120	<5.0	ug/L	NC	20		
5810873	Dissolved Antimony (Sb)	2018/10/31	110	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5810873	Dissolved Arsenic (As)	2018/10/31	104	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5810873	Dissolved Barium (Ba)	2018/10/31	101	80 - 120	98	80 - 120	<2.0	ug/L	3.4	20		
5810873	Dissolved Beryllium (Be)	2018/10/31	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5810873	Dissolved Bismuth (Bi)	2018/10/31	100	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
5810873	Dissolved Boron (B)	2018/10/31	100	80 - 120	100	80 - 120	<10	ug/L	3.7	20		
5810873	Dissolved Cadmium (Cd)	2018/10/31	106	80 - 120	100	80 - 120	<0.10	ug/L	NC	20		
5810873	Dissolved Calcium (Ca)	2018/10/31	NC	80 - 120	97	80 - 120	<200	ug/L	0.50	20		
5810873	Dissolved Chromium (Cr)	2018/10/31	100	80 - 120	95	80 - 120	<5.0	ug/L	NC	20		
5810873	Dissolved Cobalt (Co)	2018/10/31	102	80 - 120	96	80 - 120	<0.50	ug/L	NC	20		
5810873	Dissolved Copper (Cu)	2018/10/31	99	80 - 120	96	80 - 120	<1.0	ug/L	2.4	20		
5810873	Dissolved Iron (Fe)	2018/10/31	104	80 - 120	98	80 - 120	<100	ug/L	NC	20		
5810873	Dissolved Lead (Pb)	2018/10/31	102	80 - 120	97	80 - 120	<0.50	ug/L	NC	20		
5810873	Dissolved Magnesium (Mg)	2018/10/31	NC	80 - 120	100	80 - 120	<50	ug/L	3.2	20		
5810873	Dissolved Manganese (Mn)	2018/10/31	102	80 - 120	97	80 - 120	<2.0	ug/L	0.90	20		
5810873	Dissolved Molybdenum (Mo)	2018/10/31	106	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
5810873	Dissolved Nickel (Ni)	2018/10/31	100	80 - 120	95	80 - 120	<1.0	ug/L	5.0	20		
5810873	Dissolved Potassium (K)	2018/10/31	109	80 - 120	102	80 - 120	<200	ug/L	2.6	20		
5810873	Dissolved Selenium (Se)	2018/10/31	106	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
5810873	Dissolved Silicon (Si)	2018/10/31	102	80 - 120	100	80 - 120	<50	ug/L	2.2	20		
5810873	Dissolved Sodium (Na)	2018/10/31	103	80 - 120	99	80 - 120	<100	ug/L	3.8	20		
5810873	Dissolved Strontium (Sr)	2018/10/31	NC	80 - 120	100	80 - 120	<1.0	ug/L	1.9	20		
5810873	Dissolved Thallium (Tl)	2018/10/31	103	80 - 120	99	80 - 120	<0.050	ug/L	NC	20		
5810873	Dissolved Tin (Sn)	2018/10/31	109	80 - 120	101	80 - 120	<1.0	ug/L	NC	20		
5810873	Dissolved Vanadium (V)	2018/10/31	100	80 - 120	95	80 - 120	<0.50	ug/L	3.2	20		

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Maxxam Job #: B8R7437
Report Date: 2018/10/31

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5810873	Dissolved Zinc (Zn)	2018/10/31	101	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

(2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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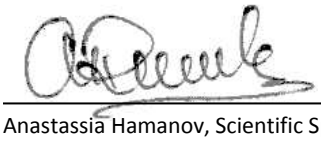
Maxxam Job #: B8R7437
Report Date: 2018/10/31

exp Services Inc
Client Project #: THB-00006189-OE
Site Location: GERALDTON LANDFILL
Sampler Initials: KK

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #:	Bottle Order #: 684818
Attention:	accounts payable	Attention:	Jay Zhang ; Kristof Karpiuk	P.O. #:			
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-OE		
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Project Name:		COC #: C#684818-01-01	Project Manager: Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.Karpiuk@exp.com	Site #:	Geraldton Landfill		
				Sampled By:	KK / MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☒ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals / Hg / Cr VI)	Landfill Standards Sch 5 - GW Comp. List	Hardness	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	GW Addition Metals	Volatile Organic Compounds in Water				# of Bottles	Comments
1		MW1	Oct 17 18	10:20am	GW	X	X	X	X	X	X	X					7	18-Oct-18 13:00
2		MW2	Oct 17 18	11:05am	GW	X	X	X	X	X	X	X					7	Michelle Brescacin
3		MW3A	Oct 17 18	8:55am	GW	X	X	X	X	X	X	X					7	B8R7437
4		MW3B	Oct 17 18	9:10am	GW	X	X	X	X	X	X	X					7	GK1 ENV-1263
5		MW4	Oct 17 18	12:00pm	GW	X	X	X	X	X	X	X					7	
6		MW5	Oct 17 18	11:20am	GW	X	X	X	X	X	X	X	X				10	
7		MW6	Oct 17 18	10:13am	GW	X	X	X	X	X	X	X					7	
8		MW7	Oct 17 18	12:15pm	GW	X	X	X	X	X	X	X					7	RECEIVED TBay
9		MW8	Oct 17 18	2:36pm	GW	X	X	X	X	X	X	X					7	
10		MW9	Oct 17 18	12:45pm	GW	X	X	X	X	X	X	X					7	Metals + Mercury need to be lab filtered.

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Laboratory Use Only *			
Kristof Karpiuk	18/10/18	11:00am	MBrescacin Michelle Brescacin	18/10/18	13:00			Temperature (°C) on Receipt: -1/0/1 2/1/1 -1/0/1 01-4/-1	Custody Seal Present	Yes	No
			[illegible]	2018/10/19	09:28				Intact		N/A

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS. REFER TO ACTR

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

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CHAIN OF CUSTODY RECORD

Page 2 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #:	Bottle Order #:
Attention:	accounts payable	Attention:	Jay Zhang c Kristof Karpiuk	P.O. #:			684818
Address:	1142 Roland St Thunder Bay ON P7B 5M4	Address:		Project:	THB-00006189-OE	COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Project Name:		C#684818-02-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.karpiuk@exp.com	Site #:	Geraldton Landfill		
				Sampled By:	KK / MS		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
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☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☐ PWQO
☒ Other ODWS

Special Instructions

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Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
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Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - GW Comp. List	Hardness	Ion Balance (% Difference)	Organic Nitrogen	Orthophosphate	GW Addition Metals	Volatile Organic Compounds in Water	# of Bottles	Comments
1		MW 10A	Oct 17/18	3:25pm	GW	X	X	X	X	X	X	X		7	
2		MW 10B	Oct 17/18	4:45pm	GW	X	X	X	X	X	X	X		7	
3		MW 11	Oct 17/18	1:55pm	GW	X	X	X	X	X	X	X		7	
4		MW 12	Oct 17/18	7:30am	GW	X	X	X	X	X	X	X		7	
5															
6															
7															
8															
9															
10															

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Kristof Karpiuk	18/10/18	4:00pm	Del page! See page one				Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
									Present		
									Intact		

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CHAIN OF CUSTODY RECORD

Page 3 of 3

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17501 exp Services Inc	Company Name:		Quotation #:	B75390	Maxxam Job #:	Bottle Order #: 684819
Attention:	accounts payable	Attention:	Jay Zhang & Kristof Karpiuk	P.O. #:			
Address:	1142 Roland St	Address:		Project:	THB-00006189-OE		
	Thunder Bay ON P7B 5M4			Project Name:		COC #:	Project Manager:
Tel:	(807) 623-9495 Fax: (807) 623-8070	Tel:	(807) 623-9495 Fax:	Site #:	Geraldton Landfill	C#684819-01-01	Michelle Brescacin
Email:	thunderbay@exp.com; Karen.Burke@exp.com;AP@ex	Email:	jay.zhang@exp.com Kristof.Karpiuk@exp.com	Sampled By:	KK / MS		

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Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Landfill Standards Sch 5 - SW Comp. List	Hardness (including Ca, Mg, Na, K)	Dissolved Aluminum (0.2 u, clay free)	Dissolved Organic Carbon (DOC)	Organic Nitrogen	SW Additional Metals					# of Bottles	Comments
1		SW1	Oct 17/18	5:05pm	SW	X	X	X	X	X	X	X					9	
2		SW2	Oct 17/18	4:25pm	SW	X	X	X	X	X	X	X					9	
3		SW3	Oct 17/18	4:00pm	SW	X	X	X	X	X	X	X					9	
4																		
5																		
6																		
7																		
8																		
9																		
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Kristof Karpiuk	18/10/18	11:00am	See page one						Present		
									Intact		

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APPENDIX G-

Data Tables

List of Tables

Note – Table 1 is found in the report text. Tables 2, 3, 4, 5 and 6 are in Appendix G.

Table 1: Saturated Coefficient of Permeability (k) Estimated from Grain Size Analysis

Table 2: Summary of Groundwater Elevations

Table 3: Groundwater Data

Table 4: Volatile Organic Compounds Results

Table 5: Surface Water Data

Table 6: 2018 Trigger Concentrations

General Notes for Tables 3, 4 & 5

1. ODWS: Criteria from *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines* (revised 2006). Exceedances indicated in **bold** typeface.

2. *Guideline B-7, Incorporation of the Reasonable Use Concept Into MOE Ground Water Management Activities* (1994). Criteria calculated on the basis of arithmetic means of most recent two years' results for MW6 being representative of background conditions. Underlining indicates exceedance (current year results only). *Asterisk indicates that background exceeds ODWS; therefore, B-7 criterion = background.

3. PWQO: Provincial Water Quality Objectives, from *Water Management: Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy* (1994). Exceedances indicated in **bold** typeface. PWQO exceedances at MW10A/10B are marked by a dark border. Interim PWQO values are bracketed.

4. APV: Aquatic Protection Value, from Table 3.1 of *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* (2011). Exceedances (MW10A/10B only) are *italicized*.

5. All units are in mg/L unless otherwise indicated, except for pH which is unitless.

6. All tables to be read in conjunction with accompanying report.

Table 2: Summary of Groundwater Elevations (m)

Monitoring Well No.	Ground Surface Elevation	Top of Pipe Elevation	Depth to Groundwater and Elevations																			
			Aug. 19, 2006		Nov. 21, 2006		Nov. 7, 2007		June 20, 2008		Oct. 20, 2008		June 18, 2009		Oct. 27, 2009		June 11, 2010		Oct. 29, 2010		May 27, 2011		Oct. 13, 2011	
			GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.
MW1	335.58	336.50	4.90	331.60	5.13	331.37	4.38	332.12	4.24	332.26	4.29	--	4.63	331.87	5.00	331.50	5.3	331.20	5.12	331.38	4.77	331.73	5.14	331.36
MW2	337.68	338.54	7.20	331.34	7.37	331.17	6.68	331.86	6.53	332.01	6.62	331.92	6.88	331.66	7.25	331.29	7.52	331.02	7.36	331.18	6.98	331.56	7.38	331.16
MW3A	335.13	336.27	5.43	330.84	5.45	330.82	4.91	331.36	4.75	331.52	4.92	331.35	5.04	331.23	5.37	330.90	5.54	330.73	5.39	330.88	5.08	331.19	5.51	330.76
MW3B	335.42	336.38	5.50	330.88	5.51	330.87	4.97	331.41	4.81	331.57	4.98	331.40	5.11	331.27	5.43	330.95	5.60	330.78	5.44	330.94	5.14	331.24	5.56	330.82
MW4	332.20	333.11	2.13	330.98	2.12	330.99	1.59	331.52	1.54	331.57	1.58	331.53	1.77	331.34	2.05	331.06	2.24	330.87	2.04	331.07	1.81	331.30	2.18	330.93
MW5	337.92	339.00	7.64	331.36	7.76	331.24	7.03	331.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5 (new)	339.17	340.59	--	--	--	--	--	--	--	--	--	--	--	--	8.33	332.26	8.56	332.03	8.35	332.24	8.02	332.57	8.45	332.14
MW6	336.39	337.24	4.01	333.23	4.01	333.23	3.88	333.36	3.79	333.45	3.89	333.35	3.99	333.25	4.04	333.20	4.04	333.20	3.99	333.25	3.91	333.33	4	333.24
MW7	334.06	335.01	--	--	--	--	--	--	--	--	3.89	331.12	--	--	4.27	330.74	4.39	330.62	4.24	330.77	4	331.01	4.37	330.64
MW8	346.45	347.38	15.72	331.66	15.96	331.42	15.29	332.09	15.20	332.18	15.13	332.25	15.50	331.88	15.82	331.56	16.12	331.26	16.01	331.37	16.32	331.06	16.05	331.33
MW9	341.17	342.14	9.89	332.25	10.41	331.73	9.3	332.84	9.32	332.82	9.26	332.88	9.75	332.39	10.10	332.04	10.60	331.54	10.42	331.72	10.14	332.00	10.24	331.90
MW10A	330.43	331.27	1.31	329.96	1.09	330.18	0.91	330.36	0.82	330.45	1.04	330.23	0.97	330.30	1.18	330.09	1.17	330.10	1.09	330.18	0.95	330.32	1.23	330.04
MW10B	330.46	331.28	1.30	329.98	1.04	330.24	0.91	330.37	0.82	330.46	1.32	329.96	0.88	330.40	1.14	330.14	1.23	330.05	1.01	330.27	0.85	330.43	1.18	330.10
MW11	330.29	331.13	--	--	--	--	--	--	--	--	--	--	--	--	1.10	330.03	1.03	330.10	0.98	330.15	0.97	330.16	1.18	329.95

Notes:

1. Ground surface and top of pipe elevations at MW1 to MW5, MW6, MW8 to MW10 surveyed by Delta Survey Inc., Nov. 20-23, 2006. MW7 surveyed by Delta Survey Inc., July 30, 2008 . MW5 (new) and MW11 surveyed by Trow, Sept. 23, 2009.
2. Depths to groundwater measured from top of riser pipe (cap removed).

Table 2: Summary of Groundwater Elevations (m)

Monitoring Well No.	2012 Ground Surface	2012 Top of Pipe Elevation	2015 Ground Surface	2015 Top of Pipe Elevation	2018 Top of Ground Surface	2018 Top of Pipe Elevation	Depth to Groundwater and Elevations																					
							May 29, 2012		October 16, 2012		May 28, 2013		October 28, 2013		May 20, 2014		October 25, 2014		May 25, 2015		October 19, 2015		Spring 2016		Fall 2016		Spring 2017		Fall 2017		Spring 2018		Fall 2018	
							GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.	GW Depth	GW Elev.
MW1	335.55	336.47	335.55	336.47	335.53	336.49	4.961	331.51	5.22	331.25	4.95	331.52	4.9	331.57	4.81	331.66	4.46	332.01	4.54	331.93	4.9	331.57	4.98	331.49	5.2	331.27	5.02	331.45	4.89	331.58	4.8	331.69	5.03	331.46
MW2	337.71	338.60	337.69	338.65	337.62	338.57	7.166	331.43	7.47	331.13	7.19	331.41	7.16	331.44	7.04	331.56	6.77	331.83	6.81	329.66	7.16	331.49	7.2	329.27	7.47	331.18	7.21	329.26	7.16	331.49	7.04	329.45	7.26	331.31
MW3A	335.44	336.36	335.48	336.44	335.44	336.36	5.184	331.18	5.59	330.77	5.2	331.16	5.25	331.11	5.07	331.29	4.96	331.40	4.94	331.53	5.3	331.14	5.27	331.20	5.59	330.85	5.21	331.26	5.18	331.26	5.09	331.40	5.33	331.03
MW3B	335.44	336.40	335.41	336.39	335.40	336.42	5.247	331.15	5.64	330.76	5.26	331.14	5.31	331.09	5.14	331.26	5.03	331.37	5	331.47	5.37	331.02	5.33	331.14	5.66	330.73	5.26	331.21	5.23	331.16	5.14	331.35	5.39	331.03
MW4	332.20	333.14	332.04	333.13	332.22	333.14	1.76	331.38	2.28	330.86	1.88	331.26	1.93	331.21	1.76	331.38	1.65	331.49	1.67	334.80	2	331.13	1.98	334.49	2.3	330.83	1.88	334.59	1.82	331.31	1.8	334.69	2.02	331.12
MW5	N/A	N/A	N/A	N/A	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5 (new)	338.30	339.66	338.22	339.63	338.29	339.61	8.164	331.50	8.56	331.10	8.2	331.46	8.15	331.51	7.99	331.67	7.74	331.92	7.78	328.69	8.18	331.45	8.2	328.27	8.5	331.13	8.16	328.31	8.09	331.54	7.99	328.50	8.25	331.36
MW6	336.52	337.23	336.46	337.23	336.53	337.23	3.907	333.32	4.04	333.19	3.92	333.31	3.97	333.26	3.86	333.37	3.86	333.37	3.89	332.58	4.02	333.21	3.98	332.49	4.04	333.19	3.88	332.59	3.85	333.38	3.9	332.59	3.96	333.27
MW7	334.06	335.01	334.01	334.99	334.08	335.04	4.06	330.95	4.47	330.54	4.05	330.96	4.15	330.86	3.97	331.04	3.95	331.06	3.89	332.58	4.22	330.77	4.15	332.32	4.49	330.50	4.06	332.41	4.06	330.93	3.97	332.52	4.22	330.82
MW8	346.45	347.38	346.39	347.36	346.37	347.32	15.905	331.48	16.13	331.25	15.97	331.41	15.85	331.53	15.98	331.40	15.42	331.96	15.59	320.88	15.7	331.66	15.85	320.62	16.09	331.27	16.04	320.43	15.98	331.38	15.76	320.73	15.89	331.43
MW9	341.17	342.14	341.06	342.17	341.11	342.12	10.243	331.90	10.45	331.69	10.64	331.50	10.28	331.86	10.43	331.71	9.66	332.48	9.94	326.53	9.9	332.27	10.37	326.10	10.35	331.82	10.54	325.93	10.21	331.96	10.12	326.37	10.07	332.05
MW10A	330.43	331.27	330.44	331.30	330.47	331.34	0.807	330.46	1.34	329.93	0.85	330.42	0.99	330.28	0.79	330.48	0.97	330.30	0.83	335.64	1.16	330.14	1.08	335.39	1.37	329.93	0.87	335.60	0.77	330.53	0.87	335.62	1.04	330.30
MW10B	330.46	331.28	330.47	331.24	330.45	331.27	0.778	330.50	1.25	330.03	0.84	330.44	1.02	330.26	0.72	330.56	0.86	330.42	0.81	335.66	1.1	330.14	0.96	335.51	1.37	329.87	0.85	335.62	0.76	330.48	0.82	335.67	0.97	330.30
MW11	330.29	331.13	330.29	331.16	330.25	331.15	0.938	330.19	1.4	329.73	0.96	330.17	0.99	330.14	0.93	330.20	0.99	330.14	0.98	335.49	1.05	330.11	0.98	335.49	1.54	329.62	0.94	335.53	0.96	330.20	0.97	335.52	1	330.15

Notes:

1. Ground surface and top of pipe elevations at MW1 to MW6 resurveyed by Delta Survey Inc., May 29, 2012. 2012, 2013 and 2014 groundwater elevations calculated using 2012 survey.
   MW8 to MW10 surveyed by Delta Survey Inc., Nov. 20-23, 2006.
   MW7 surveyed by Delta Survey Inc., July 30, 2008.
   MW11 surveyed by EXP (formerly Trow), Sept. 23, 2009.
2. Depths to groundwater measured from top of riser pipe (cap removed).
3. Ground surface and top of pipe elevations resurveyed by Delta Survey Inc, Aug 18, 2015. 2015, 2016 and 2017 groundwater elevations calculated using 2015 survey.
4. Ground surface and top of pipe elevations resurveyed by Delta Survey Inc, Aug 23, 2018. 2018 groundwater elevations calculated using 2018 survey.

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Table 3: Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW1																									
				Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																													
pH	6.5 to 8.5	8.0	--	7.3	7.8	8.0	8.0	8.0	7.9	7.7	7.6	7.8	7.75	7.35	7.57	7.75	7.43	7.77	7.64	7.59	7.47	7.52	7.41	7.65	7.46	7.72	7.59	7.26	7.35
Field pH	--	--	--	--	7.14	7.54	6.08	7.04	7.04	6.91	6.85	6.85	6.83	6.67	6.85	7.03	7.12	6.84	6.61	6.43	7.00	6.83	7.18	6.86	7	7.23	7.16	8.96	NV
Conductivity (uS/cm)	--	--	--	1,235	1,060	992	1,080	1,060	1,010	889	922	859	881	1,010	1,020	970	970	990	950	1,000	1,100	1,100	1,300	1,200	1,200	760	1,200	1,400	1,500
Field Conductivity (uS/cm)	--	--	--	--	1,110	988	1,078	>3,999	1,034	816	842	881	849	949	963	849	946	804	720	754	1,120	1,118	1,147	1,220	1,184	735	1,077	1,390	NV
Field Temperature (°C)	--	--	--	--	9.5	4.2	6.3	9	6.4	15	5.1	8.3	5.9	6.8	7.9	5.7	6.1	7.5	6.1	6.5	7.4	10.3	3.1	8.4	10	9.2	8.7	10.7	NV
Total Dissolved Solids (mg/L)	500	297	398	**775**	**594**	**649**	481	**744**	**615**	**575**	**600**	**550**	**538**	**628**	**620**	**584**	**590**	**594**	**554**	**624**	**654**	**728**	**722**	**754**	**726**	432	**745**	**720**	**955**
Total Suspended Solids (mg/L)	--	--	--	--	--	--	280	170	270	--	--	--	--	--	--	--	--	--	--	150	160	55	270	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**565**	**550**	**520**	**570**	**570**	**530**	**440**	**450**	**470**	**440**	**550**	**530**	**500**	**480**	**530**	**460**	**550**	**540**	**570**	**540**	**620**	**580**	**370**	**550**	**630**	**660**
Organics (mg/L)																													
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**12.85**	**17.9**	**12.1**	**10.1**	**9.4**	**9.4**	**6.9**	**6.2**	**7.4**	**5.6**	**6.1**	**6**	**7.2**	**7**	**8.8**	**5.8**	**6.2**	**8.3**	**9**	**13**	**9.8**	**10**	4.3	**9.9**	**8.5**	**9**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	4	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	32	27	29	25	--	--	18	--	33	--	14	--	--	15	24	37	42	43	41	14	39	31	39
Phenols	--	0.0005	--	0.001	<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0019	<0.001	0.0011	0.0033	0.0024	<0.001	0.0024	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	1.2	--	1	1.2	1.2	1.5	1.1	1.2	1.2	1.3	1.3	0.84	1.4	1.1	1.4	1.1	1.6	1.7	2.4	2.2	2.1	0.57	2.7	2.8	4.8
Ammonia-N	--	0.043	--	0.05	0.18	0.28	0.31	0.39	0.67	0.82	0.87	0.87	0.71	0.66	0.78	0.6	1	0.95	0.96	0.73	1	1	1.7	1.6	1.8	0.35	2.2	2.5	4.4
Organic Nitrogen	0.15	0.10	0.12	--	**1.02**	--	**0.69**	**0.81**	**0.53**	**0.68**	**0.23**	**0.4**	**0.5**	**0.64**	**0.52**	**0.24**	**0.4**	0.15	**0.50**	**0.30**	**0.60**	**0.65**	**0.75**	**0.59**	**0.28**	**0.22**	**0.59**	**0.32**	**0.36**
Cations (mg/L)																													
Sodium	200	7.3	104	56.15	50	36	19	19	15	16	14	11	10	10	11	12	14	17	14	15	18	20	21	29	32	8.4	25	42	64
Potassium	--	1.3	--	2.4	2.9	3.4	3.6	5.3	5.1	4.9	5.2	5.5	4.8	7.5	6.5	6.4	7.1	7.2	7.5	7.2	7.9	6.7	7.6	7.6	8.8	4.2	11	17	22
Calcium	--	92	--	175.5	170	170	180	180	170	140	140	150	140	180	160	160	150	170	150	180	170	180	170	200	190	130	190	220	220
Magnesium	--	15.8	--	30.95	28	24	27	28	25	21	22	25	22	25	29	24	25	25	22	22	25	26	25	28	26	12	20	23	25
Anions (mg/L)																													
Chloride	250	1	126	62.85	21	14	17	14	15	7	8	7	6	7	10	10	11	9	10	12	15	26	42	37	39	7.8	39	88	150
Nitrate	10	0.3	2.7	<0.2	0.1	0.6	1.8	1.5	<0.1	0.2	0.3	0.1	<0.1	3.2	0.4	0.19	0.38	0.11	0.14	0.11	0.34	0.36	0.15	0.15	0.21	0.12	0.75	0.68	0.61
Nitrite	1	0.005	0.25	<0.2	0.03	--	0.04	0.06	<0.01	0.02	0.02	0.01	<0.01	0.1	0.01	<0.01	<0.01	<0.01	0.022	<0.010	0.011	0.029	<0.1	<0.010	<0.010	0.027	0.016	0.022	0.015
Orthophosphate	--	0.005	--	--	<0.01	--	<0.01	--	<0.01	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	76.5	91	61	87	112	94	55	87	54	63	55	90	47	39	49	66	55	52	27	18	15	13	8.8	29	53	35
Alkalinity as $CaCO_3$	30-500	293	396	**594**	**557**	**518**	**505**	490	467	428	420	416	420	476	465	470	480	490	460	500	**520**	**550**	**620**	**640**	**630**	390	**620**	**600**	**550**
Ion Balance (%)	--	2	--	4.985	0.183	1.83	0.59	0.43	0.66	0.07	1.96	4.13	1.93	2.5	0.88	1.65	0.98	3.23	2.07	2.98	0.98	1.75	6.5	1.88	--	--	--	0.28	6.13
Metals (mg/L)																													
Aluminum	0.1	0.0025	0.05	0.007	0.023	0.016	0.013	0.009	0.01	0.006	0.008	0.007	<0.005	0.007	0.007	0.007	0.0097	0.0073	0.0079	0.0083	0.0089	0.0058	<0.005	0.0081	0.009	<0.005	0.0077	0.0084	0.0097
Antimony	0.006	0.00025	0.0031	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00053	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	0.006	0.023	**0.029**	0.017	0.017	0.02	0.009	0.022	0.019	0.008	0.002	0.013	0.02	0.023	0.018	0.013	0.017	0.019	0.016	0.0033	0.025	0.025	0.0051	0.015	0.015	**0.026**
Barium	1	0.018	0.26	0.033	0.055	0.054	0.06	0.063	0.067	0.048	0.059	0.053	0.043	0.066	0.073	0.06	0.07	0.068	0.064	0.071	0.079	0.073	0.081	0.094	0.11	0.041	0.097	0.13	0.2
Beryllium	--	0.00025	--	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.975	0.22	0.18	0.22	0.21	0.20	0.20	0.18	0.18	0.19	0.15	0.21	0.20	0.21	0.19	0.19	1	0.2	0.22	0.2	0.23	0.23	0.068	0.2	0.19	0.22
Cadmium	0.005	0.00005	0.0013	<0.0001	0.0009	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.1255	0.013	0.011	0.011	0.011	0.011	0.0069	0.0078	0.0077	0.0051	0.0056	0.009	0.0073	0.0084	0.0096	0.0075	0.0087	0.011	0.012	0.017	0.016	0.016	0.0038	0.015	0.018	0.025
Copper	1	0.002	0.25	0.1585	0.002	0.003	0.003	0.009	0.003	0.003	0.002	0.004	0.001	0.005	0.001	0.002	0.0017	0.0017	0.0019	0.0016	0.002	0.0013	0.0022	0.0014	0.0011	0.0017	0.0015	0.0017	<0.001
Iron	0.3	0.05	0.18	<0.03	**12**	**13**	**9.9**	**8**	**14**	**4.7**	**9.6**	**8.9**	**1.2**	**0.58**	**11**	**7.7**	**11**	**8.4**	**8.1**	**8.4**	**14**	**10**	**8.4**	**18**	**20**	**1.9**	**15**	**15**	**31**
Lead	0.01	0.00025	0.005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**1.02**	**1.7**	**1.7**	**1.8**	**1.6**	**1.7**	**1.3**	**1.4**	**1.5**	**1.2**	**0.91**	**1.8**	**1.4**	**1.7**	**1.5**	**1.7**	**1.5**	**2**	**2.1**	**2.7**	**2.5**	**2.6**	**0.61**	**2.2**	**2.5**	**3.3**
Mercury	0.001	0.00005	0.0003	0.00021	<0.0001	--	<0.0001	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.003	<0.001	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.002	0.001	0.0027	0.0019	0.0022	0.0017	0.0017	0.0013	0.0018	0.0013	0.0016	0.0015	0.0013	<0.0005	0.00086	0.00091	0.012
Nickel	--	0.007	--	0.01	0.002	0.007	0.006	0.004	0.004	0.004	0.004	0.002	0.003	0.005	0.003	0.0037	0.0043	0.0029	0.003	0.0044	0.0042	0.0057	0.0052	0.0042	0.0073	0.0022	0.0073	0.0075	0.081
Phosphorus (Total)	--	0.0555	--	<0.05	0.21	<0.050	0.06	<0.100	0.11	--	0.06	0.06	0.07	0.03	0.07	0.051	0.038	0.056	0.15	0.042	0.053	0.035	<0.1	0.065	0.031	0.036	0.042	0.049	0.028
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	15	13	12	11	11	10	11	12	9.6	8.5	11	10	11	10	9.8	9.9	10	9.7	10	10	10	5	8.8	9.8	10
Silver	--	--	--	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.1385	0.240	0.23	0.27	0.27	0.27	0.21	0.22	0.24	0.2	0.25	0.27	0.23	0.23	0.24	0.21	0.23	0.24	0.23	0.27	0.27	0.27	0.13	0.28	0.33	0.42
Thallium	--	0.0001	--	0.000155	0.00033	0.00031	0.00033	0.00034	0.0004	0.0003	0.00033	0.00027	0.00023	0.00036	0.00028	0.00026	0.00026	0.00023	0.00021	0.00019	0.00024	0.00025	0.00036	0.00028	0.00024	0.00019	0.00017	0.0002	0.00023
Tin	--	0.0005	--	<0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.00395	0.005	0.003	0.003	0.002	0.002	0.001	0.002	0.002	<0.001	0.001	0.0017	0.0014	0.0019	0.0013	0.0017	0.00091	0.0012	0.0013	<0.0005	0.0016	0.0018	<0.0005	0.0012	0.001	0.0016
Zinc	5	0.004	2.5	0.005	0.01	0.016	<0.005	0.019	<0.005	0.007	0.011	0.01	<0.005	<0.005	<0.005	0.0055	0.0051	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

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Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW2																																		
				Jun-03	Jun-03†	Aug-06	Aug-06†	Nov-06	Nov-07	Jun-08	Jun-08†	Oct-08	Jun-09	Jun-09†	Oct-09	Oct-09†	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	May-13†	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																																						
pH	6.5 to 8.5	8.0	--	7.47	7.46	8.0	8.0	8.2	8.2	8.1	8.1	8	7.4	7.5	7.6	7.7	7.7	7.98	7.73	7.87	7.92	7.7	8.01	8.05	7.93	7.89	7.83	7.73	7.79	7.9	7.76	7.98	7.94	7.67	7.84
Field pH	--	--	--	--	--	7.5	7.5	8	6.6	7.35	--	7.66	6.88	6.88	6.97	--	7.11	7.22	7.25	7.36	7.52	7.23	7.46	7.46	7.29	6.72	7.51	7.06	7.53	7.32	7.5	7.52	7.53	9.25	NV
Conductivity (uS/cm)	--	--	--	496	496	454	454	416	509	600	599	507	671	677	492	492	440	468	530	429	470	440	440	450	470	500	500	760	470	520	480	490	460	540	440
Field Conductivity (uS/cm)	--	--	--	--	--	466	466	>3,999	512	589	--	535	630	630	451	--	441	456	524	421	435	441	386	389	399	432	536	766	483	551	489	461	449	742	NV
Field Temperature (°C)	--	--	--	--	17.4	7.9	7.9	4.8	3.7	7.4	--	3.1	13.2	13.2	3.9	--	6.6	5.6	5.3	8.5	4.6	5	6.9	6.9	4.4	6	5.8	9.3	4.5	7.4	8.3	7.9	7.2	10.2	NV
Total Dissolved Solids (mg/L)	500	297	398	279	277	274	278	265	298	395	382	310	420	450	315	325	280	312	332	246	254	260	236	270	256	284	288	468	262	332	276	242	295	245	190
Total Suspended Solids (mg/L)	--	--	--	--	--	--	--	--	68	180	120	260	--	--	--	--	--	--	--	--	--	--	--	--	--	50	57	57	43	--	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**240**	**249**	**250**	**250**	**230**	**250**	**310**	**310**	**250**	**340**	**330**	**220**	**240**	**230**	**230**	**270**	**200**	**230**	**210**	**240**	**240**	**240**	**270**	**250**	**390**	**230**	**280**	**230**	**240**	**220**	**270**	**220**
Organics (mg/L)																																						
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**7**	**7.1**	**8.7**	**8.7**	**5.8**	**6**	**6.3**	**6.1**	**9.4**	**8.6**	**8.9**	**10.3**	**10.7**	**9.1**	**6**	5	**5.8**	4.4	**7.2**	**5.9**	**5.9**	3.8	3.7	**6.6**	**5.7**	**7.6**	**7.3**	**8.7**	4.7	**6.2**	**5.9**	**5.7**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	--	--	<2	3	2	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	<2	<2	--	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	--	--	18	17	18	29	18	22	--	--	--	18	--	38	--	16	--	--	--	12	14	15	36	27	25	17	21	17	20
Phenols	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	--	--	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	--	0.6	0.7	--	0.7	0.7	0.7	0.9	0.9	0.9	1	0.9	0.8	0.8	0.6	0.4	0.34	0.87	0.52	0.45	0.61	0.62	0.63	0.66	0.84	0.62	0.48	0.36	0.42	0.56	0.67
Ammonia-N	--	0.043	--	0.07	0.06	0.29	0.33	0.32	0.26	0.31	0.29	0.34	0.39	0.39	0.44	0.44	0.36	0.32	0.39	0.29	0.25	0.46	0.42	0.42	0.31	0.33	0.33	0.28	0.37	0.3	0.28	0.25	0.33	0.47	0.57
Organic Nitrogen	0.15	0.10	0.12	--	--	**0.31**	**0.37**	--	**0.44**	**0.39**	**0.41**	**0.56**	**0.51**	**0.51**	**0.56**	**0.46**	**0.5**	**0.5**	**0.21**	0.11	0.09	**0.41**	0.10	0.03	**0.30**	**0.3**	**0.3**	**0.38**	**0.47**	**0.32**	**0.2**	0.11	<0.1	<0.1	0.1
Cations (mg/L)																																						
Sodium	200	7.3	104	8.3	8.5	9.7	10	9.3	7.6	13	13	8.1	14	13	9.2	11	5.5	5.8	5.7	4	3.8	4.5	3.6	3.6	3.4	4.5	3.8	7	6	6	5.1	4.5	3.8	5.5	3.7
Potassium	--	1.3	--	1.1	1.1	1.5	1.5	1.9	1.5	1.9	1.9	1.6	1.5	1.4	1.3	1.3	1.3	1.4	1.5	1.3	1.4	1.3	1.3	1.3	1.4	1.6	1.3	1.8	1.7	1.6	1.5	1.4	1.5	2.1	1.8
Calcium	--	92	--	79.4	82.4	82	85	77	85	100	100	84	110	110	76	80	77	77	89	67	79	72	80	80	81	88	81	120	76	94	76	80	74	91	76
Magnesium	--	15.8	--	10.2	10.2	9.7	9.8	8.1	9.8	14	14	11	14	13	8.5	9.6	9.3	9.7	11	8.1	8.9	8.2	9.9	9.9	10	12	12	19	9.1	10	9.6	9.4	8.5	10	8.2
Anions (mg/L)																																						
Chloride	250	1	126	13	13.6	10	10	6	8	9	9	5	9	8	4	3	4	5	3	3	4	5	4	4	4	3	5	12	4.4	7.4	5.6	4.6	7.2	8.1	4.7
Nitrate	10	0.3	2.7	0.2	0.2	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.25	<0.2	<0.2	<0.01	<0.01	--	0.09	0.05	0.07	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	--	--	<0.01	<0.01	--	<0.01	--	--	<0.01	--	--	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.010	<0.10	<0.010	<0.010
Sulphate	500	20	260	15.5	16	6	7	7	5	7	6	<1	<10	8	<1	<1	10	7	48	30	8	25	6	6	8	7	<1	9	<1	<5.0	<1.0	<1.0	7.1	<1.0	<1.0
Alkalinity as $CaCO_3$	30-500	293	396	242	232	249	246	220	261	312	312	276	354	358	259	260	220	236	218	193	240	200	220	220	250	260	260	390	240	280	240	250	230	280	230
Ion Balance (%)	--	2	--	3.21	0.08	0.111	1.52	3.00	0.99	2.00	1.42	1.29	0.37	2.87	3.17	0.59	1.66	0.33	1.72	3.56	1.49	1.98	3.31	3.68	1.14	2.22	1.69	1.17	0.03	0.2	--	--	--	1.39	0.25
Metals (mg/L)																																						
Aluminum	0.1	0.0025	0.05	0.008	<0.005	0.019	0.013	0.010	0.017	0.049	0.01	0.014	0.017	0.017	0.018	0.023	0.015	0.013	0.008	0.011	0.0079	0.0095	0.0051	0.0056	0.0075	0.0069	0.0069	0.0086	0.0091	0.0140	0.0170	0.01	0.0086	0.0092	0.013
Antimony	0.006	0.00025	0.0031	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	<0.002	<0.002	0.002	0.002	<0.001	<0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	0.0011	0.0017	0.0036	0.0016	0.0045	0.0039	0.0026	0.0021	0.0026	0.002
Barium	1	0.018	0.26	0.01	0.009	0.015	0.015	0.015	0.016	0.02	0.021	0.017	0.024	0.024	0.016	0.017	0.015	0.016	0.019	0.015	0.016	0.015	0.014	0.014	0.015	0.016	0.016	0.026	0.0096	0.021	0.016	0.016	0.017	0.019	0.016
Beryllium	--	0.00025	--	0.001	<0.001	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.006	0.006	<0.01	<0.01	<0.01	0.011	0.011	0.011	0.037	0.013	0.011	0.02	0.019	0.053	0.044	0.025	0.038	0.034	0.041	0.028	0.026	0.027	0.026	0.028	0.039	0.026	0.074	0.059	0.033	0.031	0.037	0.044
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	0.0009	0.004	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00034	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0008	0.0008	0.0058	0.0058	0.0034	0.004	0.007	0.0076	0.0078	0.01	0.01	0.007	0.0072	0.0047	0.0042	0.0047	0.0035	0.0033	0.0032	0.0029	0.003	0.0027	0.003	0.0029	0.0065	0.0012	0.004	0.003	0.0025	0.0026	0.0029	0.0022
Copper	1	0.002	0.25	0.0029	0.0028	0.009	0.008	0.006	0.005	0.006	0.006	0.009	0.005	0.007	0.007	0.007	0.007	0.006	0.004	0.005	0.0038	0.0046	0.0021	0.0022	0.0029	0.0022	0.0033	0.0036	0.0087	0.0072	0.0051	0.003	0.0021	0.0031	0.0058
Iron	0.3	0.05	0.18	<0.03	<0.03	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.1	0.26	0.2	0.13	0.12	0.16	0.14
Lead	0.01	0.00025	0.005	0.0006	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**0.323**	**0.32**	**1.8**	**1.8**	**1.4**	**1.4**	**1.9**	**1.9**	**1.9**	**2.9**	**2.9**	**2.1**	**2.2**	**2.1**	**2.1**	**2.3**	**1.7**	**1.8**	**1.6**	**1.7**	**1.7**	**1.7**	**1.8**	**1.5**	**2.4**	**1.1**	**2**	**1.7**	**1.7**	**1.6**	**1.9**	**1.5**
Mercury	0.001	0.00005	0.0003	<0.00005	<0.00005	0.0001	<0.0001	--	0.0002	--	--	0.0002	--	--	0.0004	0.0002	0.0003	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0007	0.00064	0.0005	0.00061	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	0.00055	0.00053	0.00053	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--	0.002	0.002	0.008	0.008	0.006	0.004	0.01	0.009	0.011	0.014	0.014	0.011	0.01	0.007	0.007	0.006	0.005	0.0041	0.0037	0.0026	0.0026	0.003	0.0031	0.0036	0.0057	0.0042	0.0034	0.0036	0.0026	0.0031	0.0034	0.0024
Phosphorus (Total)	--	0.0555	--	<0.05	<0.05	<0.050	<0.050	<0.050	0.03	<0.100	<0.1	0.14	--	--	0.03	0.03	0.03	0.02	0.02	0.07	0.031	0.035	0.021	<0.020	<0.02	0.045	0.028	0.02	0.026	0.025	<0.02	0.027	<0.02	0.054	0.071
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	--	4.2	4.3	3.9	3.8	4.4	4.4	4.4	5.6	5.3	4.6	4.8	4.9	4.6	4.2	3.8	3.8	3.5	3.8	3.8	3.5	3.8	3.5	5	4.2	5	4.6	4.6	4.2	4.5	4
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--
Strontium	--	0.1	--	0.053	0.051	0.066	0.065	0.065	0.073	0.086	0.086	0.07	0.08	0.082	0.055	0.06	0.054	0.06	0.076	0.059	0.064	0.062	0.069	0.07	0.068	0.073	0.068	0.1	0.069	0.076	0.062	0.063	0.063	0.077	0.066
Thallium	--	0.0001	--	0.00006	0.00005	0.00016	0.00016	0.00014	0.00012	0.00016	0.00016	0.00014	0.0001	0.0002	0.00015	0.00016	0.0001	0.00007	0.00016	0.00012	0.00012	0.00007	0.000086	0.000099	0.00013	0.00064	0.000071	0.00008	0.000051	0.000063	0.000074	0.000079	0.000092	0.000078	0.000058
Tin	--	0.0005	--	<0.001	<0.001	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.0014	0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	0.002	0.002	0.002	<0.001	0.001	0.001	0.0013	0.0007	<0.0005	<0.0005	0.00092	<0.0005	0.0006	0.00067	0.00086	0.0016	0.0021	0.00083	0.00085	0.00072	0.00094
Zinc	5	0.004	2.5	0.013	0.005	0.006	0.008	0.011	0.012	0.007	0.007	0.006	<0.005	0.01	<0.005	<0.005	0.008	0.005	0.006	0.013	0.0057	<0.005	<0.005	<0.005	<0.005	0.0053	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW3A																							
				May-97	Jun-03	Aug-06	Nov-06	Nov-06†	Nov-07	Nov-07†	Jun-08	Oct-08	Oct-08†	Jun-09	Oct-09	Jun-10	Jun-10†	Oct-10	Oct-10†	May-11	May-11†	Oct-11	Oct-11†	May-12	May-12†	Oct-12	Oct-12†
General																											
pH	6.5 to 8.5	8.0	--	7.57	6.94	7.7	8.0	8	7.9	8	7.9	7.9	7.6	7.6	7.3	7.8	7.4	7.71	7.72	7.51	7.53	7.62	7.56	7.66	7.7	7.35	7.25
Field pH	--	--	--	6.8	--	7.0	7.44	--	6.2	--	7	5.58	5.58	6.72	6.69	6.67	--	7.06	--	6.45	--	6.61	--	6.77	--	7.18	--
Conductivity (uS/cm)	--	--	--	1,100	1,070	1,130	1,180	1,180	1,130	1,140	1,220	1,230	1,250	1,160	1,100	1,090	1,090	1,070	1,070	1,160	1,160	1,090	1,090	1,100	1,100	1,100	1,100
Field Conductivity (uS/cm)	--	--	--	867	--	1,201	1,134	>3,999	1,159	--	1,201	1,301	1,301	1,091	1,010	1,093	--	1,006	--	1,072	--	1,016	--	952	--	903	--
Field Temperature (°C)	--	--	--	8.4	--	9.8	4.1	--	4.6	--	8.8	6.6	6.6	16.5	4.5	7.1	--	5.5	--	7.9	--	8	--	5.7	--	6.6	--
Total Dissolved Solids (mg/L)	500	297	398	**562**	**641**	**629**	**702**	**717**	**543**	**559**	**780**	**770**	**750**	**690**	**720**	**700**	**700**	**680**	**682**	**732**	**732**	**770**	**768**	**566**	**548**	**572**	**614**
Total Suspended Solids (mg/L)	--	--	--		--	--	--	--	110	110	200	430	360	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**520**	**491**	**600**	**560**	**580**	**490**	**490**	**590**	**570**	**590**	**550**	**470**	**530**	**530**	**480**	**480**	**580**	**550**	**480**	**490**	**490**	**490**	**480**	**490**
Organics (mg/L)																											
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**10.7**	**7.2**	**8.7**	**8.1**	**8.3**	**8.4**	**8.5**	**10.1**	**8.9**	**8.8**	**9.6**	**7.7**	**9.3**	**9.5**	**7.6**	**7.7**	**8.2**	**8.2**	**6.8**	**6.8**	**7.6**	**7.5**	**7.8**	**7.6**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	--	--	4	2	3	3	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	--	--	32	34	30	29	27	43	--	--	--	26	31	--	--	37	39	--	--	28	25
Phenols	--	0.0005	--	<0.001	<0.001	<0.001	--	--	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	0.004	<0.001	<0.001	<0.001	<0.001
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	8.1	--	5.6	--	--	7.8	8.1	7.2	6.1	6.6	6.9	6.5	7.2	7.6	8.4	8.2	9.3	9.2	7.8	7.9	7.9	8.2	8.5	9.2
Ammonia-N	--	0.043	--	8.6	4.93	4.90	5.7	6.29	8.07	7.66	6.9	7.1	6.9	7.9	7.3	7.4	7.7	8	8.2	9.4	9.5	8.1	8.2	7.6	8.2	8.2	8.1
Organic Nitrogen	0.15	0.10	0.12	~0	--	**0.70**	--	--	0	**0.44**	**0.3**	~0	~0	~0	~0	~0	~0	**0.4**	~0	~0	~0	~0	~0	**0.3**	~0	**0.3**	**1.1**
Cations (mg/L)																											
Sodium	200	7.3	104	26	18.1	29	22	26	24	22	31	32	32	29	26	28	29	25	25	26	26	26	26	23	24	25	26
Potassium	--	1.3	--	13	11.4	15	13	14	13	13	14	13	13	13	12	13	13	12	12	15	14	13	14	12	12	13	13
Calcium	--	92	--	170	147	180	180	180	150	150	180	170	180	170	140	160	160	150	150	180	170	150	150	150	150	150	150
Magnesium	--	15.8	--	27	30.4	37	29	33	29	28	34	35	36	32	28	31	31	27	27	31	30	27	27	25	26	25	27
Anions (mg/L)																											
Chloride	250	1	126	32	35.2	40	50	45	38	38	42	47	45	37	38	33	33	31	32	34	33	33	33	28	28	31	30
Nitrate	10	0.3	2.7	<0.1	<0.2	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite	1	0.005	0.25	<0.01	<0.2	<0.01	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Orthophosphate	--	0.005	--	<0.01	--	<0.1	--	--	<0.01	<0.01	--	<0.01	<0.01	--	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	500	20	260	26	53.7	72	88	87	38	38	35	77	76	40	48	32	31	25	25	19	19	41	41	25	25	33	33
Alkalinity as $CaCO_3$	30-500	293	396	**510**	**543**	**572**	**538**	**538**	**542**	**542**	**586**	**559**	**561**	**542**	**521**	**511**	**514**	**522**	**518**	**561**	**561**	495	500	**520**	**520**	500	500
Ion Balance (%)	--	2	--	6.37	7.11	0.500	2.45	0.396	2.11	0.88	3.01	0.07	1.34	3.39	2.54	5.6	5.8	0.72	0.69	6.82	4.38	2.41	2.74	2.12	1.89	2.37	3.33
Metals (mg/L)																											
Aluminum	0.1	0.0025	0.05	<0.005	<0.005	0.030	<0.005	<0.005	0.007	0.1	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.005	0.005	<0.005	<0.005	<0.005	<0.005
Antimony	0.006	0.00025	0.0031	0.00059	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0014	<0.0005
Arsenic	0.025	0.0028	0.0083	0.018	0.011	0.005	0.017	0.017	0.017	0.018	0.016	0.02	0.016	0.018	0.015	0.018	0.019	0.008	0.007	0.02	0.018	0.017	0.016	0.018	0.017	0.017	0.017
Barium	1	0.018	0.26	0.14	0.114	0.13	0.14	0.15	0.15	0.15	0.16	0.067	0.150	0.140	0.12	0.13	0.13	0.10	0.099	0.16	0.16	0.14	0.15	0.13	0.13	0.14	0.14
Beryllium	--	0.00025	--	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.24	0.205	0.28	0.28	0.26	0.25	0.26	0.31	0.2	0.37	0.32	0.31	0.26	0.26	0.26	0.24	0.24	0.25	0.22	0.23	0.23	0.23	0.26	0.26
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0073	0.0105	0.0097	0.0091	0.0091	0.0087	0.0088	0.0088	0.011	0.0085	0.0071	0.0068	0.007	0.0073	0.0072	0.007	0.0084	0.0086	0.0077	0.0079	0.0068	0.0066	0.0074	0.0076
Copper	1	0.002	0.25	<0.001	0.0005	0.001	<0.001	0.001	<0.001	<0.001	0.003	0.003	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.05	0.18	**17**	**7.52**	**1.0**	**14**	**14.0**	**14.0**	**14.0**	**15.0**	**14.0**	**14.0**	**15.0**	**12.0**	**15.0**	**15.0**	**4.5**	**4.1**	**19.0**	**18.0**	**15**	**15**	**16**	**16**	**15**	**15**
Lead	0.01	0.00025	0.005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**1.4**	**1.43**	**1.5**	**1.5**	**1.5**	**1.4**	**1.4**	**1.5**	**1.3**	**1.4**	**1.3**	**1.2**	**1.4**	**1.4**	**1.3**	**1.3**	**1.5**	**1.5**	**1.4**	**1.4**	**1.3**	**1.3**	**1.4**	**1.4**
Mercury	0.001	0.00005	0.0003	<0.0001	<0.00005	<0.0001	--	--	0.0001	<0.0001	--	<0.0001	<0.0001	--	<0.0001	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.00069	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	0.001	<0.0005	<0.0005	<0.0005	0.00061	<0.0005
Nickel	--	0.007	--	0.0029	0.008	0.005	0.005	0.006	0.004	0.004	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.007	0.006	0.004	0.006	0.006	0.005	0.0043	0.0045	0.0034	0.0038
Phosphorus (Total)	--	0.0555	--	0.05	<0.05	<0.050	<0.050	0.055	0.13	0.18	<0.100	0.4	0.4	--	0.07	0.08	0.08	0.08	0.08	0.06	0.05	0.08	0.09	0.52	0.049	0.055	0.071
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	8.1	--	8.2	7.7	7.9	7.5	7.4	8.3	8	8.1	8	7.5	8.4	8.5	7.4	7.3	8.8	8.4	7.8	7.9	7.6	7.7	7.7	7.9
Silver	--	--	--	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium	--	0.1	--	0.27	0.211	0.074	0.250	0.25	0.26	0.25	0.29	0.29	0.29	0.26	0.23	0.25	0.25	0.24	0.24	0.28	0.29	0.26	0.26	0.24	0.24	0.26	0.26
Thallium	--	0.0001	--	0.000056	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--	<0.001	<0.001	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	--	0.0003	--	<0.00055	0.0041	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.0006	0.001	<0.0005	0.00076	<0.0005	0.00054
Zinc	5	0.004	2.5	<0.005	0.008	0.009	<0.005	<0.005	0.016	<0.005	0.019	<0.005	<0.005	0.007	0.007	0.005	0.007	0.007	0.005	0.012	0.012	<0.005	<0.005	0.0056	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW3A Continued																		
				May-13	Oct-13	Oct-13†	May-14	May-14†	Oct-14	Oct-14†	May-15	May-15†	Oct-15	May-16	May-16†	Oct-16	Oct-16†	May-17	May-17†	Sep-17	Sep-17†	May-18	Oct-18
General																							
pH	6.5 to 8.5	8.0	--	7.57	7.53	7.61	7.49	7.57	7.39	7.47	7.45	7.49	7.57	7.41	7.44	7.49	7.55	7.68	7.64	7.68	7.66	7.35	7.4
Field pH	--	--	--	6.8	6.81	--	6.3	--	6.99	--	6.8	--	7.06	6.89	--	7	--	7.6	--	7.01	--	6.95	NV
Conductivity (uS/cm)	--	--	--	1,100	1,000	1,100	1,100	1,100	1,100	1,100	1200	1,200	1,100	1,200	1200	1,200	1,200	1,300	1,300	1,200	1,200	1,400	1,200
Field Conductivity (uS/cm)	--	--	--	867	810	--	828	--	1,171	--	1,261	--	1,116	1,233	--	1,124	--	1,229	--	1,073	--	1,370	NV
Field Temperature (°C)	--	--	--	8.4	5.3	--	7.4	--	7.3	--	11.2	--	4.4	9.7	--	10.4	--	8.9	--	7.9	--	12.1	NV
Total Dissolved Solids (mg/L)	500	297	398	**562**	**568**	**540**	**604**	**602**	**606**	**602**	**726**	**728**	**626**	**692**	**692**	**614**	**628**	**708**	**688**	**655**	**635**	**655**	**605**
Total Suspended Solids (mg/L)	--	--	--		--	--	78	52	79	55	82	77	56	--	--	--	--	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**520**	**450**	**460**	**530**	**530**	**490**	**490**	**530**	**540**	**450**	**500**	**500**	**460**	**440**	**460**	**480**	**430**	**440**	**500**	**460**
Organics (mg/L)																							
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**10.7**	**6.8**	**6.6**	**8.1**	**7.9**	**8.1**	**8.1**	**8.2**	**8.7**	**9.2**	**7.3**	**7.3**	**8.2**	**8.4**	**6.4**	**6.4**	**6.6**	**6.6**	**7.4**	**8**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	--	--	2	<2	2	<2	<2	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	27	30	26	29	29	30	28	33	35	31	32	25	26	27	24	31	36
Phenols	--	0.0005	--	<0.001	<0.001	0.0017	0.0022	0.0016	0.0025	0.002	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0021	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	8.1	9.3	9.3	8.2	8.6	8.3	8.9	9.4	9.8	8.9	9.6	8.9	9.9	9.8	9.5	9.5	9.4	9	9	9.3
Ammonia-N	--	0.043	--	8.6	8.6	8.5	8.9	8.9	9.3	9.1	8.1	8.3	8.8	9.4	9.3	10	10	9.1	8.8	9.3	9.2	9.3	9.4
Organic Nitrogen	0.15	0.10	0.12	~0	**0.7**	**0.8**	~0	~0	~0	~0	**1.2**	**1.5**	0.12	**0.18**	<0.10	<0.10	<0.10	**0.4**	**0.73**	0.13	<0.1	<0.10	<0.10
Cations (mg/L)																							
Sodium	200	7.3	104	26	24	24	28	28	28	29	37	37	33	50	49	45	45	68	71	60	61	65	55
Potassium	--	1.3	--	13	12	13	14	14	13	13	14	13	12	13	14	13	13	13	13	12	13	13	12
Calcium	--	92	--	170	140	150	170	170	160	160	160	170	140	150	150	140	140	140	150	140	140	160	150
Magnesium	--	15.8	--	27	24	24	26	26	26	25	28	29	24	26	26	25	24	24	25	22	23	26	23
Anions (mg/L)																							
Chloride	250	1	126	32	31	32	35	34	35	34	61	62	46	89	91	64	65	130	130	92	91	110	73
Nitrate	10	0.3	2.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	26	27	26	24	24	36	36	31	32	38	25	26	27	27	16	17	20	19	23	28
Alkalinity as $CaCO_3$	30-500	293	396	**510**	500	**520**	**530**	**520**	**510**	**510**	**520**	**520**	490	500	500	**510**	**510**	480	480	490	490	**540**	500
Ion Balance (%)	--	2	--	6.37	0.21	0.05	5.39	5.45	2.65	2.61	3	3.87	0.13	2.41	1.81	--	--	--	--	--	--	0.15	1.77
Metals (mg/L)																							
Aluminum	0.1	0.0025	0.05	<0.005	0.005	<0.005	0.035	0.0056	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	<0.005	0.0054	<0.005
Antimony	0.006	0.00025	0.0031	0.00059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	0.018	0.017	0.017	0.018	0.018	0.017	0.017	0.017	0.017	0.0087	0.017	0.017	0.016	0.017	0.017	0.017	0.018	0.017	0.017	0.013
Barium	1	0.018	0.26	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.13	0.15	0.15	0.14	0.14	0.15	0.15	0.14	0.14	0.14	0.14
Beryllium	--	0.00025	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.24	0.24	0.23	0.25	0.25	0.28	0.27	0.32	0.31	0.28	0.28	0.27	0.29	0.29	0.22	0.23	0.23	0.23	0.27	0.32
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0073	0.0063	0.0063	0.0069	0.007	0.0068	0.0066	0.0075	0.0071	0.0064	0.0061	0.006	0.0051	0.0054	0.0057	0.0056	0.0051	0.0052	0.0056	0.0052
Copper	1	0.002	0.25	<0.001	<0.001	<0.001	0.0012	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.05	0.18	**17**	**15**	**15**	**17**	**18**	**16**	**16**	**17**	**16**	**12**	**16**	**16**	**14**	**14**	**15**	**16**	**15**	**15**	**17**	**14**
Lead	0.01	0.00025	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**1.4**	**1.4**	**1.4**	**1.5**	**1.5**	**1.4**	**1.4**	**1.4**	**1.4**	**1.3**	**1.3**	**1.3**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**	**1.2**
Mercury	0.001	0.00005	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.00069	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00058	0.00055	0.00064	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--	0.0029	0.0035	0.0039	0.0054	0.0056	0.0058	0.0059	0.0066	0.0063	0.0048	0.0036	0.0037	0.0048	0.005	0.0043	0.0048	0.0045	0.0044	0.0051	0.0054
Phosphorus (Total)	--	0.0555	--	0.05	0.06	0.061	0.054	0.05	0.072	0.075	0.042	0.041	0.046	0.06	<0.1	0.039	<0.1	0.04	0.036	0.039	0.035	0.039	0.16
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	8.1	7.5	7.6	8.4	8.5	8.3	8.4	7.6	7.7	7.1	7.6	7.6	7.2	7	7.2	7.6	7.2	7.3	7.8	7.3
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--	--	--
Strontium	--	0.1	--	0.27	0.24	0.24	0.26	0.26	0.26	0.26	0.28	0.27	0.26	0.27	0.27	0.24	0.24	0.24	0.24	0.23	0.23	0.25	0.24
Thallium	--	0.0001	--	0.000056	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
Vanadium	--	0.0003	--	<0.00055	0.00098	0.001	0.00059	0.00066	0.0007	0.00066	0.00069	0.00052	<0.0005	0.00069	0.00083	0.00057	0.00055	<0.0005	0.00055	0.00066	0.00073	0.00063	0.00055
Zinc	5	0.004	2.5	<0.005	<0.005	<0.005	0.01	0.006	0.03	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW3B																									
				Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																													
pH	6.5 to 8.5	8.0	--	7.18	7.8	8.0	8.0	8.0	7.9	7.4	7.6	7.7	7.68	7.3	7.6	7.68	7.47	7.79	7.56	7.58	7.43	7.47	7.62	7.86	7.57	7.63	7.66	7.37	7.38
Field pH	--	--	--			--	7.05	7.13	7.2	7.03	5.39	6.63	6.71	6.48	6.64	6.79	6.86	6.74	6.67	6.54	7.27	6.83	7.8	6.89	7.04	7.1	7.02	8.12	NV
Conductivity (uS/cm)	--	--	--	990	1,090	1,310	1,150	1,210	1,370	1,240	1,190	1,140	1,160	1,180	1,210	1,200	1,100	1,000	1,200	920	1,200	1,200	1,200	1,200	1,100	1,300	1,300	1,200	1,200
Field Conductivity (uS/cm)	--	--	--	--	1,126	1,235	1,102	>3,999	1,379	1,121	1,076	1,120	1,065	1,070	1,065	989	919	775	856	672	1,258	1,250	1,216	1,166	1,038	1,161	1,148	1,185	NV
Field Temperature (°C)	--	--	--	--	9.1	5.6	4.1	7.3	5.5	12.5	5.6	6.6	5.9	6.7	8	5.5	7.3	6.6	5.2	5.7	7.8	9.2	3.8	8.3	10.5	7.4	8.2	16	NV
Total Dissolved Solids (mg/L)	500	297	398	**604**	**652**	**838**	476	**768**	**850**	**800**	**800**	**750**	**752**	**724**	**816**	**646**	**626**	**538**	**622**	**552**	**704**	**742**	**670**	**668**	**640**	**648**	**715**	**680**	**700**
Total Suspended Solids (mg/L)	--	--	--	--	--	--	4,800	2,900	2,600	--	--	--	--	--	--	--	--	--	--	1100	2100	290	200	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**470**	**580**	**640**	**510**	**600**	**670**	**590**	**560**	**580**	**540**	**550**	**550**	**540**	**530**	**450**	**520**	**450**	**550**	**530**	**530**	**530**	**460**	**500**	**520**	**540**	**540**
Organics (mg/L)																													
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**6.9**	**6.6**	**9.0**	**8.4**	**9.1**	**8.1**	**8.4**	**7.2**	**8.2**	**7.8**	**8.1**	**7.1**	**8.5**	**7.0**	**7.7**	**7.1**	**7**	**8.6**	**8.9**	**9.3**	**7.7**	**6.3**	**8.2**	**9.2**	**8.1**	**9.1**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--		--	
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	12.0	21.0	27.0	45.0	--	--	25	--	31	--	22	--	--	25	19	26	24	27	27	28	34	26	34
Phenols	--	0.0005	--	<0.001	<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.0014	0.0017	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	0.001
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	1.9	--	4.7	4.7	2.9	6	2.9	4.3	5.2	5.8	4.2	5.9	4.6	6.1	6	6.2	6.7	7.1	5.7	6.4	4.2	8	8.7	6.3	7.1
Ammonia-N	--	0.043	--	1.68	1.58	2.77	3.22	3.7	1.9	3.3	2.5	3.7	4.3	6	3.7	6.2	4	6.7	5	6.8	6.6	6	5.3	5.9	3.9	7	8.4	6.5	7.4
Organic Nitrogen	0.15	0.10	0.12	**--**	**0.32**	**--**	**1.48**	**1**	**1**	**2.7**	**0.4**	**0.6**	**1**	~0	**0.5**	~0	**0.6**	~0	**1**	<0.1	0.1	**1.1**	**0.36**	**0.51**	**0.22**	**0.92**	**0.28**	<0.10	<0.10
Cations (mg/L)																													
Sodium	200	7.3	104	19.2	28	29	26	33	43	35	37	33	30	35	28	30	30	31	30	29	33	37	36	39	33	46	56	46	46
Potassium	--	1.3	--	9.7	11	14	12	14	13	13	12	14	14	14	14	14	13	14	13	13	14	15	14	15	13	15	17	14	16
Calcium	--	92	--	139	170	200	150	180	190	170	160	170	160	170	160	170	160	140	160	140	170	160	160	160	140	160	160	170	170
Magnesium	--	15.8	--	30.2	38	36	33	38	49	40	41	38	33	33	35	29	32	24	29	23	30	30	30	29	28	27	29	27	30
Anions (mg/L)																													
Chloride	250	1	126	32.8	49	59	42	42	57	44	41	39	40	43	39	37	34	41	39	37	42	49	45	48	39	81	83	68	62
Nitrate	10	0.3	2.7	2.5	<0.1	0.2	<0.1	0.2	<0.1	0.1	0.2	0.2	<0.1	0.6	0.1	0.26	0.4	0.66	<0.1	0.42	0.1	0.29	<0.1	0.29	0.38	0.22	<0.10	0.94	0.29
Nitrite	1	0.005	0.25	<0.2	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.017	--	<0.01	<0.01	0.011	<0.01	0.024	0.011	0.028	<0.010	0.013	<0.010	0.028
Orthophosphate	--	0.005	--	--	<0.01	--	<0.01	--	<0.001	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	69.5	99	112	35	50	143	73	89	55	33	26	59	36	56	29	36	25	50	36	57	37	40	21	21	24	39
Alkalinity as $CaCO_3$	30-500	293	396	466	**508**	**585**	**558**	**576**	**568**	**556**	**519**	**514**	**544**	**549**	**540**	**540**	**510**	440	**540**	450	**560**	**540**	**520**	**520**	490	**530**	**570**	**550**	**560**
Ion Balance (%)	--	2	--	5.62	1.79	3.22	4.77	1.43	0.56	0.19	0.19	4.32	0.06	2.22	0.9	1.57	1.4	3.23	0.6	2.22	0.4	1.42	0.03	2.46	--	--	--	0.35	0.38
Metals (mg/L)																													
Aluminum	0.1	0.0025	0.05	0.008	0.02	<0.005	0.006	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0059	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0086	<0.005
Antimony	0.006	0.00025	0.0031	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00079	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	<0.002	<0.001	<0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.0028	0.003	0.0027	0.0046	0.003	0.0027	0.0051	<0.001	0.0059	0.0035	0.0044	0.0042	0.0043	0.0041
Barium	1	0.018	0.26	0.07	0.093	0.11	0.10	0.11	0.11	0.11	0.096	0.099	0.11	0.11	0.11	0.12	0.11	0.1	0.12	0.1	0.13	0.13	0.12	0.13	0.1	0.13	0.14	0.13	0.14
Beryllium	--	0.00025	--	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.205	0.32	<0.370	0.29	0.35	0.6	0.46	0.48	0.36	0.32	0.28	0.29	0.28	0.32	0.23	0.3	0.22	0.32	0.37	0.38	0.36	0.35	0.3	0.33	0.29	0.4
Cadmium	0.005	0.00005	0.0013	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0169	0.0075	0.009	0.0073	0.0076	0.0081	0.0077	0.0085	0.0087	0.0092	0.0083	0.0087	0.0093	0.0087	0.0076	0.0095	0.0076	0.0073	0.0087	0.01	0.0087	0.0067	0.0094	0.0091	0.0076	0.0073
Copper	1	0.002	0.25	0.0044	0.008	0.004	0.005	0.008	0.007	0.004	0.005	0.005	0.005	0.008	0.006	0.0049	0.0042	0.0018	0.003	0.0024	0.005	0.0035	0.0082	0.0032	0.0036	0.0031	0.0014	0.0033	0.0029
Iron	0.3	0.05	0.18	<0.03	<0.05	**0.66**	**1.20**	**1.10**	**0.86**	**2.30**	**1.20**	**1.50**	**0.93**	<0.1	**1.3**	**2.7**	**1.9**	**3.5**	**3.5**	**2.6**	**2.6**	**4.6**	**0.72**	**4.3**	**2**	**3.8**	**5.2**	**3.9**	**3.5**
Lead	0.01	0.00025	0.005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**1.02**	**0.84**	**1.0**	**1.0**	**0.93**	**0.91**	**1.20**	**1.1**	**1.3**	**1.3**	**1.1**	**1.3**	**1.4**	**1.2**	**1.4**	**1.4**	**1.1**	**1.2**	**1.2**	**1.4**	**1.3**	**1**	**1.3**	**1.4**	**1.2**	**1.2**
Mercury	0.001	0.00005	0.0003	<0.00005	<0.0001	--	0.0004	--	<0.0001	--	**0.0011**	0.0005	0.0005	0.0002	<0.0001	0.00036	0.00039	0.00019	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	0.00052	0.00058	0.00052	<0.0005	0.57	<0.0005	<0.0005	0.00053	<0.0005	<0.0005	0.00054	0.00056	<0.0005	<0.0005
Nickel	--	0.007	--	0.014	0.006	0.009	0.004	0.007	0.009	0.008	0.009	0.008	0.008	0.009	0.008	0.0072	0.0063	0.0045	0.0064	0.0059	0.0076	0.0081	0.0093	0.0061	0.0071	0.0085	0.0083	0.0084	0.0088
Phosphorus (Total)	--	0.0555	--	<0.05	<0.050	<0.050	2.0	<0.100	1.3	--	0.3	0.26	0.14	0.05	0.09	0.096	0.21	0.11	0.13	0.82	0.99	0.082	0.048	0.1	0.055	0.086	0.031	0.059	0.15
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	6.5	7.1	6.3	7.1	7.4	7.6	7.7	8.1	7.8	7.7	7.5	7.6	7.5	7.4	7.4	7	7.8	7.1	7.2	7.4	6.6	7.2	7.9	6.8	7.7
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.207	0.260	0.300	0.260	0.300	0.320	0.290	0.260	0.270	0.28	0.28	0.29	0.28	0.29	0.26	0.28	0.23	0.31	0.3	0.31	0.31	0.27	0.28	0.32	0.28	0.32
Thallium	--	0.0001	--	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	0.00006	<0.00005	<0.00005	0.00006	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	0.000074	0.0001	<0.00005	0.000067	0.000063	<0.00005	0.000065	<0.00005	0.000061	<0.00005
Tin	--	0.0005	--	<0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.0036	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.00084	<0.0005	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5	0.018	0.014	0.015	0.017	0.019	0.005	0.01	0.014	0.009	0.006	<0.005	0.006	0.006	0.013	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW4																									
				Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																													
pH	6.5 to 8.5	8.0	--	7.34	7.8	7.9	8.0	7.8	7.8	7.3	7.5	7.8	7.57	7.5	7.63	7.79	7.31	7.88	7.69	7.55	7.41	7.44	7.57	7.41	7.6	7.62	7.82	7.4	7.51
Field pH	--	--	--	6.86	6.74	--	7.05	7.1	7.1	6.95	6.79	6.80	6.84	6.77	7.07	7.10	6.59	7.26	6.76	6.52	8.03	6.67	6.95	6.86	6.92	7.22	7.35	8.43	NV
Conductivity (uS/cm)	--	--	--	580	957	1,020	1,030	939	1,080	920	877	775	758	846	837	790	910	790	870	980	1,200	1,100	1,200	1,000	1,100	770	790	1,100	1,000
Field Conductivity (uS/cm)	--	--	--	--	1,003	925	945	>3,999	1,070	836	794	803	696	808	747	714	788	649	659	743	1,207	1,111	1,126	980	1,065	734	760	1,027	NV
Field Temperature (°C)	--	--	--	--	9.7	5.7	4.2	6.2	8.2	11.6	7.6	6.5	7.7	4.1	9.5	4.7	8.6	6.4	6.7	4.4	8.8	8.3	3.3	6.7	11.4	7.7	9.3	10.7	NV
Total Dissolved Solids (mg/L)	500	297	398	319	**574**	**594**	**536**	**586**	**660**	**595**	**575**	500	466	**524**	**652**	448	486	466	488	**576**	**746**	**696**	**768**	**610**	**724**	428	**505**	**575**	**545**
Total Suspended Solids (mg/L)	--	--	--	--	--	--	1500	1100	1100	--	--	--	--	--	--	--	--	--	--	360	780	410	500	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**291**	**530**	**580**	**540**	**520**	**610**	**510**	**480**	**460**	**410**	**480**	**450**	**400**	**510**	**460**	**450**	**580**	**610**	**610**	**590**	**570**	**590**	**400**	**420**	**610**	**560**
Organics (mg/L)																													
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**8.1**	**5.5**	3.4	4.5	2.5	4.1	1.8	1.8	1.7	1.9	1.4	1.6	2.4	1.4	4.5	1.6	1.9	**6.4**	2.1	3.5	1.5	2.3	1.7	1.9	2.1	2.2
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	<2	<2	2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	17	<4	13	<4	--	--	7	--	16	--	8.3	--	--	<4	15	7.3	17	9.5	7.6	<4.0	8.7	8.4	5.7
Phenols	--	0.0005	--	0.002	<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	0.0015	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	0.4	--	0.9	0.4	1	0.5	0.6	0.4	0.2	0.3	0.5	<0.1	0.49	1	0.43	0.33	1	0.55	0.5	0.25	0.12	0.15	0.12	0.13	0.21
Ammonia-N	--	0.043	--	0.05	0.1	0.06	0.06	<0.05	0.29	0.22	0.22	0.15	0.06	0.06	<0.05	<0.05	0.13	0.092	<0.05	<0.05	0.14	<0.05	0.058	<0.050	<0.050	<0.050	<0.050	0.062	0.14
Organic Nitrogen	0.15	0.10	0.12	--	**0.3**	--	**0.84**	**0.38**	**0.71**	**0.28**	**0.38**	**0.3**	**0.2**	**0.24**	**0.5**	<0.1	**0.36**	**0.908**	**0.43**	**0.3**	**0.9**	**0.55**	**0.44**	**0.25**	0.12	0.15	0.12	<0.10	<0.10
Cations (mg/L)																													
Sodium	200	7.3	104	6	5.6	5.7	6.9	5.8	6.9	2.2	2.3	2.1	2.3	2.4	2.7	2.1	3.5	3.1	7.4	3.9	16	3.7	9.8	4	6	7	8.5	12	10
Potassium	--	1.3	--	1.5	1.8	2.5	2.7	2.5	3.6	2.3	2.5	1.7	1.7	1.5	1.6	1.3	1.7	1.4	1.8	1.6	2.2	1.8	2.3	1.9	2.3	1.6	1.9	2	2.2
Calcium	--	92	--	97.8	180	200	180	180	210	180	170	150	140	160	150	130	170	160	150	190	210	210	200	200	200	140	140	210	190
Magnesium	--	15.8	--	11.4	20	20	20	17	18	16	16	18	17	22	19	15	20	18	16	22	21	19	18	18	20	14	15	21	19
Anions (mg/L)																													
Chloride	250	1	126	15.9	8	5	5	3	16	5	4	5	10	6	2	14	2	10	32	9	29	9	16	9	20	11	9.4	13	16
Nitrate	10	0.3	2.7	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.2	0.1	<0.1	0.13	0.18	0.66	0.2	0.52	<0.1	<0.1	<0.1	<0.10	0.21	<0.10	0.22	0.26	<0.10
Nitrite	1	0.005	0.25	<0.2	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	--	<0.01	--	<0.01	--	<0.01	--	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	31.1	7	10	7	6	4	7	6	17	12	10	6	8	6	10	9	13	120	30	67	28	110	24	36	70	55
Alkalinity as $CaCO_3$	30-500	293	396	248	**601**	**606**	**585**	**525**	**605**	**514**	485	405	392	452	456	400	490	400	420	**540**	**540**	**580**	**580**	**530**	**500**	380	400	**540**	500
Ion Balance (%)	--	2	--	0.57	6.67	2.26	3.97	0.25	0.06	1.26	0.6	3.82	0.74	2.01	0.57	2.98	1.87	4.99	0.65	1.93	4.56	0.05	4.78	0.4	--	--	--	0.47	1.01
Metals (mg/L)																													
Aluminum	0.1	0.0025	0.05	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0064	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	0.006	0.00025	0.0031	<0.0005	<0.001	<0.001	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.018	0.26	0.02	0.042	<0.051	0.057	0.048	0.07	0.052	0.049	0.036	0.037	0.035	0.042	0.032	0.047	0.032	0.042	0.043	0.062	0.053	0.065	0.05	0.062	0.033	0.04	0.051	0.054
Beryllium	--	0.00025	--	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.01	0.01	<0.019	0.025	0.019	0.046	<0.01	0.015	0.012	0.013	0.011	0.011	0.012	0.015	<0.01	0.015	<0.01	0.1	0.027	0.16	0.032	0.092	0.057	0.066	0.41	0.32
Cadmium	0.005	0.00005	0.0013	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00019	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00015	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0024	0.007	0.0005	0.0007	0.0012	0.0024	0.0019	0.0015	0.0012	0.0006	0.0013	0.0011	0.0012	0.00095	0.00067	0.005	0.00075	0.0028	0.0042	0.0041	0.0032	0.0034	0.0022	0.0021	0.003	0.0029
Copper	1	0.002	0.25	0.0016	0.005	0.003	0.004	0.008	0.006	0.004	0.003	0.002	0.002	0.002	0.002	0.0023	0.0022	0.0012	0.0026	0.0011	0.0043	0.0019	0.0027	0.0016	0.0019	<0.001	0.0014	0.0014	0.0017
Iron	0.3	0.05	0.18	<0.03	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**0.247**	**0.4**	**0.43**	**0.81**	**0.95**	**1.4**	**1.3**	**0.84**	**0.79**	**0.59**	**0.61**	**0.58**	**0.34**	**0.43**	**0.28**	**0.18**	**0.32**	**0.94**	**0.99**	**0.85**	**0.61**	**0.64**	**0.39**	**0.39**	**0.49**	**0.47**
Mercury	0.001	0.00005	0.0003	<0.00005	<0.0001	--	<0.0001	--	0.0008	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--	0.003	<0.002	<0.005	0.004	0.006	0.009	0.008	0.006	0.005	0.004	0.004	0.003	0.0022	0.0019	0.001	0.0017	0.003	0.0064	0.0089	0.007	0.0037	0.0068	0.0039	0.0036	0.0048	0.0054
Phosphorus (Total)	--	0.0555	--	<0.05	0.87	<0.050	0.4	<0.100	0.5	--	0.23	0.23	0.25	0.18	0.59	0.15	0.21	1.2	0.46	0.35	0.61	0.14	0.087	0.073	0.32	0.13	0.16	0.24	0.23
Selenium	0.01	0.001	0.0033	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	6.2	7.2	6.7	6.1	7.5	5.9	6.2	5.5	5.7	5.4	5.6	4.5	6.2	5.2	5.5	6	6.4	5.8	6.2	5.6	5.8	4.8	5.2	5.4	6.1
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.084	0.140	0.16	0.17	0.16	0.2	0.15	0.14	0.12	0.11	0.13	0.12	0.12	0.15	0.13	0.13	0.15	0.18	0.17	0.19	0.17	0.18	0.11	0.12	0.16	0.16
Thallium	--	0.0001	--	0.00007	0.00012	0.00013	0.00017	0.00012	0.00033	0.00021	0.00025	0.00015	0.00014	0.00012	0.00015	0.00011	0.00015	0.000076	0.00011	0.000072	0.00019	0.00013	0.00019	0.00013	0.00017	0.00011	0.00014	0.00011	0.00015
Tin	--	0.0005	--	<0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5	<0.005	0.008	0.014	0.014	0.016	0.009	0.01	0.009	0.006	<0.005	<0.005	0.006	0.0069	0.0051	0.001	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW5																									
				Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	Oct-15†	May-16	Oct-16	May-17	Sep-17	May-18	May-18†	Oct-18	Oct-18†
General																													
pH	6.5 to 8.5	8.0	--	7.37	7.9	8.0	7.9	**Not**	7.3	7.8	7.72	7.6	7.69	7.76	7.36	7.53	7.77	7.64	7.57	7.65	7.77	7.81	7.79	7.62	7.74	7.77	7.63	7.5	7.61	7.63
Field pH	--	--	--	6.62	6.62	--	7.18	**Sampled**	7.2	6.79	6.85	6.79	6.89	7.2	6.9	6.83	6.85	6.52	7.09	6.95	7.17	--	7.03	7.16	7.17	7.25	7.02	--	NV	--
Conductivity (uS/cm)	--	--	--	757	1,540	1,590	1,110	**Well**	1,540	1,250	990	1,050	1,390	1,000	1,300	1,500	1,100	1,100	1,500	1,100	1,600	1,500	1,200	1,300	990	1,000	1,300	1,200	1,300	1,300
Field Conductivity (uS/cm)	--	--	--	--	1,592	1,490	1,014	**Destroyed**	1,399	1,225	965	972	1,168	403	1,069	1,140	794	825	1,535	1,271	1,586	--	1,226	1,221	914	958	1,598	--	NV	--
Field Temperature (°C)	--	--	--	--	10.2	6.6	4	**or**	7.6	9.2	7.4	9.7	10.1	8	7.7	10.7	7	10.5	8.3	12.5	3.1	--	10.6	11.1	11.5	8.7	14.3	--	NV	--
Total Dissolved Solids (mg/L)	500	297	398	439	**913**	**987**	480	**Buried**	**1000**	**800**	**640**	**664**	**1070**	**552**	**752**	**858**	**640**	**652**	**966**	**816**	**984**	**996**	**718**	**754**	**546**	**625**	**720**	**745**	**780**	**735**
Total Suspended Solids (mg/L)	--	--	--	--	--	--	2300		--	--	--	--	--	--	--	--	--	460	340	1,300	210	190	--	--	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	**293***	**339**	**820**	**840**	**620**		**650**	**580**	**430**	**500**	**610**	**430**	**580**	**650**	**510**	**500**	**680**	**560**	**630**	**630**	**540**	**550**	**420**	**490**	**530**	**530**	**580**	**580**
Organics (mg/L)																													
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**22.5**	**9.7**	**8.1**	**6.1**		**8.7**	**6.3**	4.5	4	**6.3**	5	**5.8**	**17.3**	4	5	**6.7**	**5.5**	**11**	**11**	**5.3**	**6.8**	4	**5.2**	**5.2**	**5.2**	**6.6**	**6.6**
Biochemical Oxygen Demand (BOD	--	--	--	--	--	--	<2		--	--	--	--	--	--	--	--	--	--	<2	<2	<2	<2	--	--	--	--	--	--	--	--
Chemical Oxygen Demand (COD	--	19.8	--	--	--	--	28		--	--	85	--	40	--	32	--	--	15	22	27	47	46	30	31	17	23	22	18	28	27
Phenols	--	0.0005	--	0.016	<0.001	--	<0.001		0.018	0.048	0.017	0.009	0.008	0.0023	<0.001	<0.001	<0.001	0.0034	<0.001	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	0.6	--	1.2		33	<30	7	6	3	4.8	2.1	9.7	1.8	5.6	2.1	2.6	2.4	2.6	3.5	2.5	3.5	1.8	2.7	1.7	2.6	2.6
Ammonia-N	--	0.043	--	3.18	0.15	0.14	0.33		1.5	1.4	2	2.9	1.3	4.7	1.8	10	1.2	5.6	1.6	1.8	2	2	2.7	2.3	3	1.5	2.7	1.6	2.5	2.5
Organic Nitrogen	0.15	0.10	0.12	--	**0.45**	--	**0.87**		**31.5**	**26.9**	**4.5**	**3.1**	**1.7**	0.1	**0.3**	~0	**0.6**	0	**0.4**	**0.78**	**0.4**	**0.59**	**0.77**	**0.23**	**0.42**	**0.26**	<0.10	0.1	<0.10	<0.10
Cations (mg/L)																													
Sodium	200	7.3	104	14.6	58	64	34		63	53	30	29	51	38	44	65	35	43	16	50	56	58	45	46	28	27	54	51	52	51
Potassium	--	1.3	--	9.9	13	13	9.9		24	28	22	19	18	20	19	25	14	18	15	19	18	18	20	22	17	16	16	15	15	15
Calcium	--	92	--	99.4	180	190	160		140	120	96	120	140	110	140	170	130	130	170	130	150	150	130	120	100	120	130	130	150	150
Magnesium	--	15.8	--	21.7	91	90	53		74	70	47	48	60	37	57	51	47	40	61	54	61	63	54	58	38	47	48	46	50	50
Anions (mg/L)																													
Chloride	250	1	126	27	92	90	40		77	40	26	29	66	26	45	67	36	32	62	38	87	89	42	62	29	32	42	41	59	60
Nitrate	10	0.3	2.7	<0.2	<0.1	0.4	0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.25	<0.2	<0.01	--	0.03		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	0.018	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012
Orthophosphate	--	0.005	--	--	<0.01	--	<0.01		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	51.8	299	281	157		220	200	140	150	170	90	140	120	130	120	250	160	210	210	160	120	81	91	150	150	150	150
Alkalinity as $CaCO_3$	30-500	293	396	341	**534**	**554**	418		**561**	448	400	382	496	420	470	**580**	420	430	490	410	**530**	**540**	450	**510**	400	440	480	480	490	490
Ion Balance (%)	--	2	--	4.82	0.75	0.965	5.53		3.46	2.26	3.31	3.18	0.72	2.14	3.08	5.52	1.17	4.18	0.21	5.79	5.24	5.23	0.38	--	--	--	0.85	1.45	0.17	0.22
Metals (mg/L)																													
Aluminum	0.1	0.0025	0.05	<0.005	0.012	<0.005	0.006		0.007	0.006	<0.005	<0.005	0.006	<0.005	0.0051	0.0085	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.1	<0.005	<0.005
Antimony	0.006	0.00025	0.0031	0.0005	<0.001	<0.001	<0.001		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	0.00075	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	0.006	<0.001	<0.001	0.002		0.007	0.004	0.005	0.004	0.003	0.0042	0.0039	0.0047	0.0044	0.0035	0.0046	0.0041	0.0023	0.0026	0.0035	0.0028	0.0026	0.0023	0.0027	0.0025	0.0032	0.0031
Barium	1	0.018	0.26	0.065	0.11	0.12	0.096		0.17	0.15	0.12	0.12	0.13	0.13	0.14	0.22	0.097	0.14	0.15	0.14	0.14	0.14	0.13	0.14	0.11	0.11	0.11	0.11	0.12	0.12
Beryllium	--	0.00025	--	<0.001	<0.005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.095	0.85	0.85	0.5		1	0.92	0.6	0.6	0.83	0.53	0.82	0.82	0.69	0.8	1.1	1	1.1	1.1	1.1	0.96	0.51	0.47	1.2	1.1	1.3	1.3
Cadmium	0.005	0.00005	0.0013	<0.0001	0.002	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0068	0.075	0.0033	0.0032		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	0.00089	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	0.00059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00068	0.00064
Copper	1	0.002	0.25	<0.0005	0.003	0.003	0.001		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.05	0.18	0.03	<0.050	**0.580**	**4.4**		**9.6**	**9.2**	**4.9**	**8.8**	**6.2**	**11.0**	**8.4**	**20**	**5.2**	**10**	**8.2**	**7.6**	**4.8**	**4.8**	**6.2**	**6.7**	**6.5**	**7.8**	**6.4**	**6.2**	**6.4**	**6.3**
Lead	0.01	0.00025	0.005	0.0009	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**0.634**	**1.1**	**0.62**	**1.1**		**0.96**	**0.77**	**0.93**	**0.91**	**1**	**1**	**1.1**	**1.6**	**1**	**1.1**	**1.2**	**1**	**1.3**	**1.3**	**0.93**	**0.9**	**0.7**	**0.84**	**0.95**	**0.87**	**1.3**	**1.2**
Mercury	0.001	0.00005	0.0003	<0.00005	--	--	<0.0001		0.0002	0.0003	0.0002	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	0.00016	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.006	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--	0.015	0.005	0.007	0.003		0.005	0.003	0.004	0.002	0.004	0.0018	0.0017	0.0052	0.0026	0.0036	0.0046	0.0049	0.0066	0.0076	0.004	0.004	0.0024	0.0022	0.0048	0.004	0.0056	0.0058
Phosphorus (Total)	--	0.0555	--	<0.05	<0.050	<0.050	0.6		19	8	2.3	2.8	1.9	0.32	0.43	<0.1	0.15	0.28	0.22	0.5	0.31	0.29	0.25	0.2	0.14	0.2	0.11	0.081	0.065	0.056
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	6.3	6.1	7		6.6	6.8	5.6	5.7	5.6	6	6	7.3	5.4	6.4	6.3	6	5.8	5.9	5.9	5.6	5.3	5.7	6	5.6	5.8	5.9
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--	--	--
Strontium	--	0.1	--	0.143	0.380	0.350	0.330		0.360	0.330	0.270	0.32	0.35	0.27	0.34	0.42	0.26	0.27	0.36	0.29	0.35	0.35	0.29	0.32	0.24	0.29	0.31	0.3	0.34	0.33
Thallium	--	0.0001	--	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--	<0.001	--	--	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
Vanadium	--	0.0003	--	0.0021	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0005	0.00078	0.00054	0.0011	0.00078	0.00061	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5	0.007	0.01	0.013	0.014		0.006	0.006	0.008	0.007	<0.005	0.0056	0.0051	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW6																									
				Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																													
pH	6.5 to 8.5	8.0	--	7.71	8.0	8.1	8	8.1	8	7.9	7.9	8	7.99	7.95	8.04	7.98	7.86	8.08	7.96	8.02	7.95	7.94	8	7.98	7.91	7.99	8.08	7.93	7.94
Field pH	--	--	--	7.6	6.95	--	7.66	--	6.57	7.73	8.03	7.61	7.53	7.54	7.47	7.84	7.4	7.49	7.09	6.95	7.89	7.67	7.66	7.76	7.6	7.7	7.75	11.9	NV
Conductivity (uS/cm)	--	--	--	631	867	728	1,070	900	807	723	561	543	677	826	574	690	530	470	560	540	630	660	540	540	510	610	530	650	500
Field Conductivity (uS/cm)	--	--	--	--	848	--	1,141	>3,999	837	684	514	774	661	798	548	651	496	409	475	455	683	676	578	593	480	549	515	1,066	NV
Field Temperature (°C)	--	--	--	--	17.4	--	5.5	13.6	7.6	16	7.1	11.4	6.6	7.1	11.6	7	8.2	10.1	5.3	8.9	8.5	12.9	5.8	9.8	8.1	11.2	10.3	9.3	NV
Total Dissolved Solids (mg/L)	500	297	398	385	**534**	496	407	**578**	**550**	475	380	350	456	**542**	**528**	452	324	264	362	326	380	432	308	344	396	306	330	275	275
Total Suspended Solids (mg/L)	--	--	--	--	--	--	1000	1100	1400	--	--	--	--	--	--	--	--	--	--	460	1,400	420	170	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**254**	**450**	**400**	**470**	**400**	**390**	**340**	**250**	**260**	**320**	**270**	**270**	**340**	**260**	**250**	**300**	**300**	**320**	**340**	**290**	**320**	**260**	**310**	**270**	**320**	**270**
Organics (mg/L)																													
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**7**	**9.6**	**7.3**	**11**	**10.7**	**6.9**	**6.1**	3.7	3.6	4.6	**9.3**	**5.6**	**8.1**	4.4	**6.1**	3.9	4.6	4.4	6	4.4	**5.7**	4.1	4.3	3.5	4.6	2.7
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	--	41	33	22	22	--	--	17	--	28	--	15	--	--	30	18	20	20	28	18	21	15	17	26
Phenols	--	0.0005	--	<0.001	<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	--	0.6	--	1	1	0.5	0.6	0.5	0.5	0.5	0.8	0.5	0.61	0.56	0.3	0.33	0.4	0.61	0.64	0.18	0.3	0.12	0.18	<0.10	<0.10	0.1
Ammonia-N	--	0.043	--	<0.03	0.08	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.069	0.11	<0.050	<0.05	0.067	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.098
Organic Nitrogen	0.15	0.10	0.12	--	**0.52**	--	**0.975**	**0.975**	**0.5**	**0.6**	**0.475**	**0.5**	**0.5**	0.08	**0.5**	**0.6**	**0.5**	**0.19**	**0.305**	**0.4**	**0.5**	**0.64**	**0.18**	**0.3**	0.12	**0.18**	<0.1	<0.10	<0.10
Cations (mg/L)																													
Sodium	200	7.3	104	34.4	40	32	49	73	39	38	18	23	43	73	32	40	21	9.5	16	10	11	14	8.8	9.9	6.1	10	6.4	7.6	5
Potassium	--	1.3	--	2.2	2.2	2.4	2.1	3	1.8	1.8	1.4	1.4	1.9	2	1.6	1.7	1.4	1.2	1.4	1.2	1.3	1.4	1.2	1.4	1.3	1.3	1.3	1.5	1.2
Calcium	--	92	--	77.9	140	130	150	120	120	100	79	80	99	77	84	100	81	79	95	94	100	110	91	100	80	96	86	100	86
Magnesium	--	15.8	--	14.5	24	21	26	22	20	18	13	14	17	19	14	19	13	14	16	16	17	18	15	17	13	18	14	18	13
Anions (mg/L)																													
Chloride	250	1	126	23.6	33	24	47	20	13	10	5	5	4	2	2	3	5	2	2	2	1	2	1.3	1.3	1.5	1.4	1.2	1.5	1.4
Nitrate	10	0.3	2.7	3.9	6.0	4.9	7.7	6.2	4.7	3.7	1.7	1.7	2.7	8.1	2.1	3.6	1.4	0.85	1.2	1.21	0.91	0.95	0.63	0.84	<0.10	0.66	<0.10	0.28	<0.10
Nitrite	1	0.005	0.25	<0.2	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	--	<0.01	--	<0.01	--	<0.01	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	57.3	75	54	101	73	59	44	24	25	31	56	31	45	23	18	25	28	24	36	22	30	19	22	16	28	13
Alkalinity as $CaCO_3$	30-500	293	396	247	370	303	381	372	355	324	271	258	330	347	267	310	250	230	280	260	320	320	260	270	260	300	280	330	260
Ion Balance (%)	--	2	--	3.27	2.78	7.15	0.31	6.29	2.52	2.9	3.04	2.19	4.54	0.59	4.27	7.54	3.31	4.6	3.92	4.31	0.76	0.97	3.19	5.65	--	--	--	3.47	0.45
Metals (mg/L)																													
Aluminum	0.1	0.0025	0.05	0.006	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	0.006	0.00025	0.0031	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0034	<0.001	0.0021
Barium	1	0.018	0.26	0.02	0.032	0.026	0.037	0.033	0.027	0.022	0.016	0.015	0.022	0.022	0.019	0.022	0.017	0.013	0.019	0.016	0.019	0.018	0.016	0.018	0.015	0.017	0.019	0.021	0.016
Beryllium	--	0.00025	--	<0.001	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.016	0.020	0.027	0.045	0.022	0.02	0.017	0.019	0.021	0.018	0.021	0.012	0.021	0.018	0.025	0.019	0.019	0.019	0.02	0.02	0.018	0.023	0.017	0.02	0.016	0.021
Cadmium	0.005	0.00005	0.0013	<0.0001	0.0004	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.0003	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<.0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.002	<0.0005	0.01	<0.0005	0.0022
Copper	1	0.002	0.25	0.0018	0.003	0.003	0.003	0.009	0.004	0.009	0.002	0.004	<0.003	0.002	0.003	0.0026	0.0027	0.0017	0.0016	0.0017	0.0018	0.0027	0.0017	0.0022	0.0015	0.0017	<0.001	0.0027	0.0027
Iron	0.3	0.05	0.18	<0.03	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	0.009	0.003	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0022	<0.002	**0.18**	<0.002	**1.5**	0.011	**0.62**
Mercury	0.001	0.00005	0.0003	<0.00005	<0.0001	--	<0.0001	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0024	<0.0005	0.00089
Nickel	--	0.007	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0035	<0.001	0.021	0.0031	0.0047
Phosphorus (Total)	--	0.0555	--	<0.05	0.40	<0.050	0.51	<0.1	0.2	--	0.23	0.53	0.24	0.14	0.14	0.065	0.072	0.12	0.29	0.29	0.25	0.1	0.09	0.029	0.033	0.053	0.036	0.035	0.098
Selenium	0.01	0.001	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	--	6.6	6.3	6.3	5.8	6.4	5.6	5.1	5.3	6	5.4	5.4	5.2	5.2	4.7	5.6	5.2	6.1	5.7	5.8	5.4	5.2	5.2	5.6	5.6	6.3
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.078	0.140	0.11	0.16	0.14	0.12	0.096	0.071	0.071	0.09	0.094	0.083	0.097	0.079	0.074	0.09	0.082	0.093	0.1	0.093	0.1	0.082	0.088	0.083	0.094	0.083
Thallium	--	0.0001	--	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00015	0.00011	0.00011
Tin	--	0.0005	--	<0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0007	0.00072	<0.0005	<0.0005	0.00076	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5	<0.005	0.01	0.011	0.006	<0.001	0.006	0.016	0.01	0.011	0.013	<0.005	0.006	0.0089	0.0053	0.012	<0.005	<0.005	0.007	0.0066	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0083

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018 Background	2018 B-7	MW7																			
				Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																								
pH	6.5 to 8.5	8.0	--	7.9	Not	7.5	7.7	7.38	7.5	7.56	7.66	7.33	7.7	7.58	7.5	7.47	7.5	7.42	7.38	7.48	7.46	7.62	7.23	7.44
Field pH	--	--	--	7.19	Sampled	6.8	6.65	6.62	6.61	7.94	6.65	6.56	6.81	6.75	6.59	7.49	6.9	7.75	6.9	7.05	7	7.25	6.01	NV
Conductivity (uS/cm)	--	--	--	905		955	1,070	1,020	954	909	980	900	1,000	920	920	860	890	950	1000	1000	1,100	1,100	1,100	1,000
Field Conductivity (uS/cm)	--	--	--	954		903	1,158	>3,999	946	860	870	810	855	819	8	>3,999	990	965	1,075	1,033	1,059	1,035	1,070	NV
Field Temperature (˚C)	--	--	--	3.5		4.8	5.8	6.3	4.7	7.4	4.8	6.5	6	5.7	5.6	6.6	7.3	2.3	7.9	9.2	7.9	7.2	9.9	NV
Total Dissolved Solids (mg/L)	500	297	398	**580**		**630**	**700**	**650**	**596**	**672**	**518**	**504**	**554**	480	**510**	478	506	522	**566**	**550**	**568**	**635**	**510**	**535**
Total Suspended Solids (mg/L)	--	--	--	2,500		--	--	--	--	--	--	--	--	--	1,000	930	430	230	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**420**		**410**	**520**	**480**	**440**	**410**	**450**	**420**	**490**	**430**	**460**	**400**	**430**	**410**	**470**	**420**	**480**	**490**	**470**	**440**
Organics (mg/L)																								
Dissolved Organic Carbon (DOC)	5	3.8	4.4	**7.2**		**7.3**	**10**	**7.5**	**5.6**	**5.7**	**5.7**	**6**	**9**	**5.4**	**5.8**	4.9	4.9	**6.3**	**6**	**5.8**	**5.8**	**7.2**	**6**	**6.1**
Biochemical Oxygen Demand (BOD)	--	--	--	<2		--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	28		--	--	40	--	37	--	18	--	--	23	14	16	19	26	28	26	32	27	22
Phenols	--	0.0005	--	<0.001		<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	8.2		10	11	14	47	8.8	9.6	7.9	8.5	8.5	7.1	6	7	7.6	7.9	7.4	8.3	7.2	6.7	7.1
Ammonia-N	--	0.043	--	8.4		9.2	12	12	11	9.3	9.2	7.9	8.8	7.2	7.6	6.6	6.1	6.4	7.5	7.7	7.3	7.4	6.6	7.1
Organic Nitrogen	0.15	0.10	0.12	~0		**0.8**	<0.1	**1.5**	**36**	~0	**0.4**	~0	~0	**1.3**	~0	~0	**0.86**	**1.1**	**0.4**	<0.10	**1**	<0.10	<0.10	<0.10
Cations (mg/L)																								
Sodium	200	7.3	104	17.0		17.0	21.0	18.0	14	16	15	15	18	15	17	15	15	20	24	30	22	27	32	38
Potassium	--	1.3	--	12		12	15	15	13	12	13	12	13	12	12	9.3	10	10	11	11	11	11	11	11
Calcium	--	92	--	130		130	170	150	140	130	140	130	160	140	150	130	140	130	150	130	150	160	150	140
Magnesium	--	15.8	--	22		21	27	25	21	20	22	20	24	21	21	19	21	21	23	20	23	23	22	21
Anions (mg/L)																								
Chloride	250	1	126	19		19	21	18	13	17	13	15	17	17	16	16	18	30	34	43	27	37	41	46
Nitrate	10	0.3	2.7	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.25	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	<0.001		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	32		23	16	14	11	21	13	18	15	17	15	20	17	24	19	21	26	27	29	29
Alkalinity as $CaCO_3$	30-500	293	396	449		477	**538**	**523**	480	446	500	450	500	470	470	430	450	440	500	460	**520**	**520**	**510**	470
Ion Balance (%)	--	2	--	1.93		0.06	7.55	3.08	5.32	4.43	3.77	4.02	6.75	2.9	6.53	2.33	3.86	0.95	3.51	--	--	--	1.77	2.57
Metals (mg/L)																								
Aluminum	0.1	0.0025	0.05	0.006		0.008	0.006	<0.005	0.013	0.011	0.0064	0.007	0.0055	0.006	0.0083	0.0057	0.0052	<0.005	<0.005	0.0054	0.0075	0.007	0.0063	0.0054
Antimony	0.006	0.00025	0.0031	<0.0005		<0.0005	<0.0005	0.0018	<0.0005	<0.0005	0.00072	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	**0.046**		**0.044**	**0.050**	0.018	**0.043**	**0.05**	**0.041**	**0.044**	**0.042**	**0.045**	**0.041**	**0.041**	**0.039**	**0.017**	**0.042**	**0.042**	**0.043**	**0.048**	**0.041**	**0.043**
Barium	1	0.018	0.26	0.19		0.20	0.25	0.22	0.23	0.21	0.21	0.20	0.21	0.20	0.2	0.17	0.18	0.16	0.22	0.19	0.22	0.22	0.19	0.2
Beryllium	--	0.00025	--	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001		<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.14		0.15	0.16	0.16	0.12	0.13	0.13	0.15	0.15	0.13	0.13	0.13	0.13	0.14	0.17	0.16	0.15	0.17	0.2	0.23
Cadmium	0.005	0.00005	0.0013	<0.0001		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00037	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	0.01		0.012	0.016	0.015	0.016	0.013	0.014	0.012	0.015	0.012	0.013	0.0098	0.011	0.012	0.014	0.012	0.016	0.017	0.014	0.012
Copper	1	0.002	0.25	0.002		0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.05	0.18	**18**		**20**	**28**	**9.3**	**23**	**23**	**23**	**20**	**24**	**21**	**22**	**18**	**19**	**14**	**24**	**22**	**26**	**27**	**23**	**21**
Lead	0.01	0.00025	0.005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**1.8**		**1.9**	**2.5**	**2.3**	**2.2**	**2**	**2.1**	**2**	**2.3**	**2**	**2.2**	**1.7**	**1.8**	**1.8**	**2.1**	**1.8**	**2.1**	**2.1**	**1.9**	**1.7**
Mercury	0.001	0.00005	0.0003	<0.0001		0.0001	0.0002	0.0003	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	<0.001		<0.001	<0.001	<0.001	<0.001	0.0006	<0.0005	0.00059	<0.0005	<0.0005	<0.0005	<0.0005	0.00053	0.00056	<0.0005	<0.0005	<0.0005	0.00053	<0.0005	<0.0005
Nickel	--	0.007	--	0.006		0.009	0.012	0.013	0.011	0.008	0.0082	0.0066	0.0089	0.0074	0.0087	0.0065	0.0072	0.0064	0.0086	0.008	0.01	0.011	0.0099	0.0085
Phosphorus (Total)	--	0.0555	--	1.4		0.8	0.99	4.7	1.7	1.1	0.19	0.55	0.4	0.45	0.39	0.2	0.14	0.073	0.1	0.082	0.073	0.098	0.048	0.026
Selenium	0.01	0.001	0.0033	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	9.3		9.4	11	10	10	10	10	10	11	10	10	9.8	9.7	9.1	9.9	9.2	10	11	10	9.7
Silver	--	--	--	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.21		0.19	0.24	0.24	0.23	0.21	0.23	0.21	0.25	0.21	0.21	0.19	0.2	0.2	0.23	0.2	0.23	0.24	0.21	0.21
Thallium	--	0.0001	--	<0.00005		<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.001		0.001	0.002	<0.001	0.002	0.0014	0.0012	0.0011	0.0012	0.0014	0.0011	0.0009	0.00086	<0.0005	0.001	0.001	0.001	0.001	0.00087	0.001
Zinc	5	0.004	2.5	0.01		0.01	0.009	0.01	0.005	0.005	0.0095	0.0091	<0.005	<0.005	0.0054	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater

Parameter	ODWS	2018	2018	MW8																							
	(mg/L)	Background	B-7	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																												
pH	6.5 to 8.5	8.0	--	Not	8.1	8.1	8.1	8	8	8	7.9	8.1	8.04	7.84	7.92	7.95	7.83	8.04	7.91	7.88	7.8	7.96	7.94	7.93	7.99	7.96	7.94	7.87	7.9
Field pH	--	--	--	Installed	7.62	7.93	6.2	7.55	7.69	7.67	7.46	7.54	7.35	7.2	7.34	7.43	7.18	7.19	7.12	6.93	7.49	7.41	7.69	7.45	7.68	7.64	7.6	6.93	NV
Conductivity (uS/cm)	--	--	--		3,090	3,490	3,080	4,200	3,850	2,480	3,270	2,450	2,390	3,230	3,720	3,400	3,300	3,500	4,000	4,500	5,600	4,200	3,600	3600	3,500	3,900	4,200	4,800	5,100
Field Conductivity (uS/cm)	--	--	--		3,250	3,266	3,059	>3,999	3,728	2,293	2,755	2,416	2,199	2,753	3,025	737	2,331	2,530	2,420	2,874	>3,999	>3,999	3,315	3,276	3,114	3,258	3,175	3,412	NV
Field Temperature (°C)	--	--	--		9	5	4	10	5	--	6	7	5	5	11	6	7	6	5	8	7	8	6	15	11	11.4	7.8	10.9	NV
Total Dissolved Solids (mg/L)	500	297	398		**1,630**	**2,280**	**1,070**	**2,620**	**2,420**	**1,600**	**2,100**	**1,580**	**1,460**	**1,980**	**2,640**	**1,800**	**1,660**	**1,860**	**2,110**	**3,000**	**3,300**	**2,270**	**1,900**	**1870**	--	**2,060**	**2,240**	**2,880**	**2,780**
Total Suspended Solids (mg/L)	--	--	--		--	--	14,000	12,000	48,000	--	--	--	--	--	--	--	--	--	--	12,000	13,000	11,000	6,400	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*		**440**	**430**	**400**	**560**	**420**	**260**	**400**	**360**	**430**	**610**	**570**	**490**	**440**	**430**	**520**	**620**	**810**	**450**	**420**	**410**	**370**	**430**	**490**	**620**	**610**
Organics (mg/L)																												
Dissolved Organic Carbon (DOC)	5	3.8	4.4		4.3	2.9	3.2	3.5	3.9	**5.1**	2.4	2.4	2.2	2.1	2.5	2.7	3.1	**5.7**	3	2.6	3.9	3.1	2.9	2.9	2.9	2.3	2.7	2.8	2.8
Biochemical Oxygen Demand (BOD)	--	--	--		--	--	<2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--		--	--	36	27	41	120	--	--	10	--	35	--	44	--	--	38	16	16	16	18	110	15	20	13	14
Phenols	--	0.0005	--		<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--		0.5	--	0.9	2	4	<10	1	0.3	0.8	0.7	<5	2.8	2.8	1.9	4.4	18	1.7	0.83	0.051	0.45	<0.20	0.46	0.88	0.48	1.1
Ammonia-N	--	0.043	--		0.15	0.16	0.07	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	0.09	0.069	0.081	0.11	<0.05	0.072	0.13	<0.05	<0.05	<0.050	<0.050	<0.050	0.052	0.077	0.23
Organic Nitrogen	0.15	0.10	0.12		**0.35**	--	**0.83**	**1.975**	**4**	**--**	**0.975**	**0.3**	**0.8**	**0.7**	<0.1	**2.731**	**2.719**	**1.8**	**0.4**	**17.7**	**1.6**	**0.8**	**0.5**	**0.45**	<0.10	**0.46**	**0.83**	**0.4**	**0.91**
Cations (mg/L)																												
Sodium	200	7.3	104		**570**	**570**	**520**	**570**	**650**	**450**	**530**	**380**	**320**	**400**	**530**	**520**	**490**	**590**	**630**	**680**	**860**	**730**	**570**	**580**	**580**	**600**	**530**	**690**	**780**
Potassium	--	1.3	--		5.8	4.8	3.4	4.5	3.3	3	2.7	2.3	2.2	2.7	2.9	2.8	2.7	2.7	3	3.5	3.2	3	2.7	2.9	2.9	2.7	2.9	3.2	3.3
Calcium	--	92	--		150	150	140	200	150	91	140	130	150	210	200	170	150	150	180	220	290	160	150	150	130	150	170	220	220
Magnesium	--	15.8	--		16	13	11	17	14	7.8	12	11	14	19	17	16	14	13	15	18	23	13	13	12	11	12	15	18	19
Anions (mg/L)																												
Chloride	250	1	126		**735**	**940**	**750**	**1,100**	**910**	**510**	**780**	**600**	**530**	**800**	**940**	**760**	**740**	**860**	**1,000**	**1,300**	**1,500**	**1,100**	**920**	**900**	**870**	**950**	**1,100**	**1,300**	**1,400**
Nitrate	10	0.3	2.7		2.2	1.6	1.9	2.6	2.5	1.8	1.3	0.8	1.2	1.5	2	2.1	1.8	1.5	2.4	2.1	2.65	1.75	1.4	1.35	1.32	1.19	1.45	1.86	1.91
Nitrite	1	0.005	0.25		<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.010	0.01	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--		<0.01	--	<0.01	--	<0.01	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260		25	24	26	33	32	20	17	18	19	18	25	24	26	24	31	35	39	30	24	27	24	22	29	28	35
Alkalinity as $CaCO_3$	30-500	293	396		438	364	389	439	496	383	331	282	308	316	337	370	440	340	420	360	480	410	380	400	390	340	360	420	390
Ion Balance (%)	--	2	--		5.47	1.37	1.5	0.74	0.49	4.75	3.22	2.08	1.69	0.11	0.72	4.57	0.34	4.17	0.49	3.53	0.12	1.27	1.15	0.770	--	--	--	2.21	2.51
Metals (mg/L)																												
Aluminum	0.1	0.0025	0.05		0.015	0.008	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.049	0.047	<0.005	<0.005	0.0064	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony	0.006	0.00025	0.0031		<0.001	<0.001	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	0.0011	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083		<0.0005	<0.005	<0.001	<0.005(1)	<0.01	0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.018	0.26		0.060	0.06	0.051	0.085	0.069	0.036	0.052	0.039	0.043	0.064	0.074	0.06	0.055	0.056	0.071	0.087	0.12	0.071	0.059	0.06	0.058	0.06	0.07	0.09	0.095
Beryllium	--	0.00025	--		<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--		<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3		0.013	<0.010	<0.01	<0.01	<0.1	0.01	<0.01	0.012	0.013	0.014	0.017	<0.01	0.011	<0.01	0.011	0.012	0.013	0.011	<0.01	<0.01	0.015	0.011	0.013	<0.01	0.012
Cadmium	0.005	0.00005	0.0013		<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014		<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.002	0.25		0.005	0.002	0.001	0.006	<0.01	0.002	0.002	0.002	0.001	<0.002	0.003	0.0034	0.0022	0.0084	0.003	<0.005	<0.005	0.0016	0.0024	0.0015	0.0017	0.0014	0.0016	0.0021	0.0016
Iron	0.3	0.05	0.18		<0.050	<0.050	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.005		<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*		0.044	0.019	0.015	0.005	<0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0078	0.008	0.0035	<0.002	<0.002	0.015	<0.002	0.0029	<0.002	0.0029	<0.002	<0.002	0.0064	0.0021
Mercury	0.001	0.00005	0.0003		<0.0001	--	<0.0001	--	<0.0001	--	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.00018	0.00021	0.00018	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--		0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00053	<0.0005	0.0005	0.00053	<0.001	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--		<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2.7	<0.001	<0.001	<0.001
Phosphorus (Total)	--	0.0555	--		<0.050	<0.050	<0.1	<0.1	24	--	1.9	0.53	1.2	1.4	11	8.4	3.3	6.1	3.5	8	4	3.3	4.2	6.7	33	2.6	11	0.51	41
Selenium	0.01	0.001	0.0033		<0.002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.002	<0.002	<0.002	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--		4.5	3.4	3.8	3.3	3.3	3.4	2.8	2.9	2.8	3.1	2.9	3.1	3.2	2.9	2.8	3.5	3.1	2.9	3	3	2.8	2.7	2.8	2.8	2.8
Silver	--	--	--		<0.001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--		0.190	0.170	0.160	0.250	0.190	0.100	0.160	0.140	0.170	0.25	0.24	0.2	0.18	0.19	0.21	0.25	0.34	0.19	0.19	0.18	0.16	0.18	0.21	0.26	0.27
Thallium	--	0.0001	--		<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--		-	--	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--		<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0065	0.0053	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--		<0.005	<0.005	<0.001	<0.005(1)	<0.01	<0.001	<0.001	<0.001	<0.005	<0.002	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5		0.013	0.006	<0.005	0.016	<0.05	<0.005	0.007	0.008	0.008	<0.005	0.008	0.0053	<0.005	0.021	<0.005	0.0058	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018	2018	MW9																							
	(mg/L)	Background	B-7	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																												
pH	6.5 to 8.5	8.0	--	Not	8.2	8.2	8.1	8.2	8	8	7.4	8	8.1	7.92	8.06	8	7.91	7.99	8.09	8.08	8	8.04	8.03	7.99	8	8.1	8.06	7.97	7.97
Field pH	--	--	--	Installed	7.84	8.38	7.2	7.82	7.79	7.62	7.69	7.39	7.71	7.34	7.33	7.43	7.47	7.4	7.21	7.03	7.8	7.6	7.87	7.48	7.75	7.72	7.76	6.52	NV
Conductivity (uS/cm)	--	--	--		540	537	590	572	794	772	814	839	787	799	816	880	740	850	640	630	730	750	900	910	930	1,100	990	980	880
Field Conductivity (uS/cm)	--	--	--		449	415	554	>3,999	696	745	351	833	953	771	705	737	768	713	461	473	754	750	862	862	820	1,107	916	1,457	NV
Field Temperature (°C)	--	--	--		11	3.9	3.9	11.8	6.3	20.4	1.5	13.3	4.9	7.1	9.3	6.3	3.3	10.6	--	8.5	6.5	10.9	4.1	10.8	10.7	10.3	7.5	16.1	NV
Total Dissolved Solids (mg/L)	500	297	398		350	349	355	392	495	**515**	**530**	**550**	496	**502**	**520**	**630**	**508**	**610**	356	394	424	476	**614**	**642**	--	**836**	**735**	**790**	**610**
Total Suspended Solids (mg/L)	--	--	--		--	--	810,000	450,000	660,000	--	--	--	--	--	--	--	--	--	--	18,000	2,400	400	39,000	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*		**260**	**330**	**270**	**290**	**340**	**330**	**300**	**350**	**320**	**320**	**330**	**360**	**320**	**380**	**290**	**300**	**300**	**320**	**340**	**390**	**350**	**420**	**430**	**360**	**340**
Organics (mg/L)																												
Dissolved Organic Carbon (DOC)	5	3.8	4.4		3.0	2.3	2.9	2.8	3	1.5	2.5	2.2	1.4	0.9	0.9	1	0.91	1.3	1.1	1	1.1	1.1	1.4	1.1	1	1.1	0.99	0.97	1.2
Biochemical Oxygen Demand (BOD)	--	--	--		--	--	<2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--		--	--	170	210	770	120	--	--	61	--	25	--	150	--	--	5.8	<4	8.3	380	<4.0	260	5.1	10	5.5	<4
Phenols	--	0.0005	--		<0.001	--	<0.001	--	<0.001	<0.001	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--		0.6	--	36	14	32	<10	48	2	5	6	<2	0.22	0.62	0.36	0.85	44	0.31	1.1	0.69	0.18	0.11	0.4	0.39	<0.10	0.16
Ammonia-N	--	0.043	--		0.14	0.83	0.08	<0.05	<0.05	0.11	<0.05	<0.05	0.05	0.05	<0.05	<0.05	0.11	0.093	<0.05	0.076	0.08	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	0.065	0.2
Organic Nitrogen	0.15	0.10	0.12		**0.46**	--	**35.9**	**14.0**	**32.0**	--	**48**	**2.3**	**4.5**	**5.95**	<0.1	**0.22**	**0.51**	**0.267**	**0.9**	**43.7**	**0.2**	**1.1**	**0.7**	**0.18**	0.11	**0.4**	**0.39**	<0.10	<0.10
Cations (mg/L)																												
Sodium	200	7.3	104		25	17	31	33	30	29	31	38	35	33	25	27	23	26	19	18	30	33	37	31	34	39	43	48	46
Potassium	--	1.3	--		2.5	2.5	3.3	4.1	1.6	1.4	1.2	1.4	1.1	1.1	1.1	1.1	0.95	1.1	0.86	1	0.86	1	1.1	1.1	1.4	2.4	1.2	1.3	1.2
Calcium	--	92	--		81	83	83	89	110	100	93	110	100	98	100	110	99	120	89	95	94	99	100	120	110	130	130	110	100
Magnesium	--	15.8	--		15	13	16	17	19	18	17	19	18	18	18	19	18	21	16	16	17	17	19	21	20	24	24	20	20
Anions (mg/L)																												
Chloride	250	1	126		25	24	36	35	120	100	110	140	120	120	120	130	91	140	57	60	80	96	150	140	140	190	170	140	130
Nitrate	10	0.3	2.7		0.7	0.8	<0.1	0.3	0.1	0.1	<0.1	0.1	0.1	0.2	0.2	0.34	0.25	0.42	0.23	<0.1	0.12	0.2	0.13	0.19	0.13	0.14	0.17	0.17	0.16
Nitrite	1	0.005	0.25		<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--		<0.01	--	<0.01	--	<0.01	--	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260		5	4	3	3	2	4	2	2	2	2	4	3	4	4	4	5	4	6	4.7	3.2	3.3	2.5	3.6	6.2	7.5
Alkalinity as $CaCO_3$	30-500	293	396		279	260	265	274	229	233	252	224	224	223	219	220	230	210	240	240	260	230	220	230	240	220	200	240	260
Ion Balance (%)	--	2	--		0.0466	1.03	3.67	5.83	0.81	1.97	4.97	1.67	1.54	0.27	0.08	2	0.89	3.59	0.06	2.25	1.32	1.87	1.15	2.97	--	--	--	1.42	1.21
Metals (mg/L)																												
Aluminum	0.1	0.0025	0.05		0.03	<0.005	0.008	0.016	0.006	<0.005	<0.005	0.006	<0.005	0.013	<0.005	0.0053	<0.005	0.0074	<0.005	<0.005	<0.005	<0.005	0.0056	<0.005	<0.005	<0.005	<0.005	0.0087	<0.005
Antimony	0.006	0.00025	0.0031		<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1	0.018	0.26		0.019	0.019	0.018	0.02	0.02	0.021	0.02	0.023	0.02	0.021	0.021	0.022	0.019	0.022	0.016	0.018	0.018	0.021	0.023	0.025	0.025	0.032	0.03	0.025	0.022
Beryllium	--	0.00025	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3		0.019	0.015	0.011	<0.01	<0.01	0.011	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.011	0.011	<0.01	0.013
Cadmium	0.005	0.00005	0.0013		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.002	0.25		0.003	0.002	0.003	0.01	0.005	0.001	0.002	0.002	0.003	0.002	0.002	0.002	0.0011	0.0015	0.0027	0.0012	0.0012	<0.001	0.0013	<0.001	<0.001	0.0011	0.0039	0.0057	<0.001
Iron	0.3	0.05	0.18		0.057	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	0.01	0.00025	0.005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00094	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*		0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.034	**0.081**	0.047	0.003	0.003	0.0027	0.0038	0.0015	<0.002	0.0021	<0.002	<0.002	<0.002	0.0042	0.0026	0.0034	<0.002	0.0044	<0.002
Mercury	0.001	0.00005	0.0003		<0.0001	--	<0.0001	--	<0.0001	--	**0.003**	0.0003	<0.0001	0.0009	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Molybdenum	--	0.0009	--		0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.007	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	0.0011	0.0011	<0.001
Phosphorus (Total)	--	0.0555	--		<0.05	<0.05	<0.1	<0.1	410	--	310	4.2	8.7	7.9	4.4	0.067	0.75	0.5	0.87	4	0.22	13	200	0.98	100	0.6	6.9	0.17	1.1
Selenium	0.01	0.001	0.0033		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--		5.5	5.2	5	5.2	4.8	5.2	4.9	5.5	4.8	4.9	4.6	4.8	4.6	4.8	4.7	5.3	4.5	4.5	4.4	5	4.6	4.8	4.9	4.9	4.8
Silver	--	--	--		<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--		0.074	0.073	0.11	0.11	0.12	0.1	0.081	0.084	0.076	0.084	0.087	0.086	0.081	0.097	<0.069	0.072	0.096	0.095	0.11	0.11	0.091	0.11	0.11	0.097	0.098
Thallium	--	0.0001	--		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--		--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--
Vanadium	--	0.0003	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.00057	<0.0005	0.00057	0.00093	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	5	0.004	2.5		0.010	0.009	0.031	0.014	0.012	<0.005	0.011	0.008	0.011	0.023	<0.005	0.0086	<0.005	<0.005	<0.005	0.0068	0.0084	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-ME Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater

Parameter	ODWS	PWQO	APV	2018	2018	MW10A																								
	(mg/L)	(mg/L)	(mg/L)	Background	B-7	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																														
pH	6.5 to 8.5	6.5 to 8.5	--	8	--	Not	7.8	8.0	8.0	7.9	7.8	7.5	7.1	7.2	7.62	7.4	7.38	7.72	7.17	7.62	7.45	7.59	7.29	7.48	7.21	7.52	7.33	7.52	7.48	7.33	7.28
Field pH	--	--	--	--	--	Installed	7.25	7.61	5.81	7.35	7.12	6.62	6.85	6.47	6.95	6.59	6.63	7.09	6.81	6.71	7.03	6.65	6.91	6.85	6.9	6.75	6.96	6.92	7.36	7.26	NV
Conductivity (uS/cm)	--	--	--	--	--		595	668	588	569	684	731	725	767	719	778	739	810	780	810	750	730	670	680	660	750	750	800	720	820	780
Field Conductivity (uS/cm)	--	--	--	--	--		659	652	>3,999	576	759	643	712	791	1,267	737	705	689	690	696	604	566	701	753	709	761	844	699	742	750	NV
Field Temperature (°c)	--	--	--	--	--		6.6	4.9	3.9	9.4	4.7	12.2	5.3	5.7	4.2	3.4	7.5	4.8	5.7	5.6	5.1	5.7	6.6	7.4	10.1	13.8	9.6	9.1	7.4	10.8	NV
Total Dissolved Solids (mg/L)	500	--	--	297	398		313	432	344	372	422	480	475	500	450	484	490	464	488	480	434	446	406	452	446	498	--	480	470	420	470
Total Suspended Solids (mg/L)	--	--	--	--	--		--	--	14,000	5,700	2,200	--	--	--	--	--	--	--	--	--	--	1,900	2,200	1,600	190	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	--	--	293	293*		**310**	**330**	**290**	**290**	**290**	**310**	**330**	**320**	**320**	**360**	**310**	**340**	**340**	**380**	**300**	**330**	**300**	**310**	**230**	**330**	**320**	**310**	**310**	**270**	**250**
Organics (mg/L)																														
Dissolved Organic Carbon (DOC)	5	--	--	3.8	4.4		**12.3**	**16.4**	**16.3**	**15.8**	**14.1**	**12.5**	**12.6**	**12.5**	**11.4**	**9**	**9.9**	**9.8**	**11**	**10.8**	**11**	**11**	**14**	**12**	**14**	**11**	**12**	**12**	**13**	**12**	**13**
Biochemical Oxygen Demand (BOD)	--	--	--	--	--		**--**	**--**	2	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	2	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	--	--	19.8	--		**--**	**--**	340	160	110	51	--	--	110	--	88	--	27	--	--	79	54	66	67	39	56	35	39	37	45
Phenols	--	0.001	0.961	0.0005	--		<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	--	--	0.1	--		1.7	--	7.5	4	3	1.4	4	2.2	4	1.2	2	1.4	1.1	1.2	1.6	<5	1.4	1.2	0.72	0.54	0.52	0.75	0.74	0.61	0.65
Ammonia-N	--	--	--	0.043	--		0.29	0.69	0.6	0.47	0.33	0.3	0.31	0.28	0.34	0.26	0.32	0.29	0.47	0.5	0.36	0.41	0.4	0.34	0.25	0.31	0.29	0.34	0.29	0.41	0.4
Organic Nitrogen	0.15	--	--	0.1	0.12		**1.41**	--	**6.9**	**3.53**	**2.67**	**1.1**	**3.69**	**1.9**	**3.2**	**0.94**	**1.68**	**1.11**	**0.63**	**0.7**	**1.3**	~0	**1**	**0.84**	**0.47**	**0.23**	**0.23**	**0.41**	**0.45**	**0.2**	**0.25**
Cations (mg/L)																														
Sodium	200	--	180	7.3	104.0		32	40	13	17	22	24	30	34	25	34	24	25	25	40	32	30	36	33	34	33	37	33	34	35	41
Potassium	--	--	--	1.3	--		1.5	1.4	0.42	1.3	0.69	0.3	0.34	0.23	0.28	0.33	0.32	0.34	0.35	0.38	0.39	0.34	0.26	0.33	0.23	0.34	0.33	0.3	0.35	0.39	0.3
Calcium	--	--	--	92	--		100	110	94	93	93	96	100	97	100	110	97	110	110	120	93	100	91	95	69	99	95	97	92	85	74
Magnesium	--	--	--	15.8	--		14	12	13	14	15	16	18	18	18	19	17	17	18	20	17	17	17	17	14	19	19	18	19	14	15
Anions (mg/L)																														
Chloride	250	--	180	1.4	126		24	32	32	36	60	73	66	95	63	62	76	55	68	65	82	69	73	64	100	78	90	68	78	79	100
Nitrate	10	--	--	0.3	2.7		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	--	--	0.005	0.250		<0.01	--	0.02	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	--	--	0.005	--		<0.01	--	<0.01	--	<0.01	--	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	0.011	0.010	<0.010	<0.010	<0.010	0.014	<0.010
Sulphate	500	--	--	20	260		6	6	<1	3	<1	<5	1	1	6	11	8	18	15	19	9	8	1	9	<1	10	8.2	10	5.9	8.5	2.9
Alkalinity as $CaCO_3$	30-500	narrative	--	293.00	396		310	325	271	247	272	267	283	247	268	299	253	310	290	310	250	270	260	250	170	270	250	300	260	300	250
Ion Balance (%)	--	--	--	2	--		4.43	5.45	0.88	5.62	1.71	1.23	3.38	1.81	2.37	4.73	0.08	1.28	0.56	6.05	0.05	2.32	6	4.34	0.23	1.98	--	--	--	8.27	7.2
Metals (mg/L)																														
Aluminum	0.1	(0.075)	--	0.0025	0.05		0.040	0.033	0.047	0.046	0.068	0.056	0.076	0.075	0.052	0.031	0.08	0.061	0.068	0.056	0.089	0.066	0.099	0.075	**0.11**	0.075	0.094	0.085	0.079	**0.12**	**0.14**
Antimony	0.006	(0.02)	1.6	0.00025	0.0031		<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.1 (0.005)	0.15	0.0028	0.0083		0.005	0.004	0.005	0.006	0.013	0.013	0.021	0.024	0.015	0.005	0.017	0.012	0.016	0.012	0.02	0.011	0.021	0.014	0.021	0.017	0.022	0.016	0.016	0.016	0.021
Barium	1	--	2.3	0.018	0.260		0.028	0.040	0.017	0.018	0.023	0.025	0.031	0.031	0.034	0.034	0.026	0.026	0.029	0.030	0.027	0.024	0.030	0.026	0.024	0.030	0.030	0.027	0.026	0.023	0.026
Beryllium	--	0.011	0.0053	0.00025	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	--	--	0.0005	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	(0.2)	3.55	0.019	1.3		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.005	0.0002 (0.0001)	0.00021	0.00005	0.0013		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.001	0.064	0.0019	0.014		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.0009	0.0052	0.00318	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.005	0.0069	0.002	0.25		<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.003	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.3	--	0.05	0.18		**1.6**	**2.3**	**1.3**	**1.1**	**1.2**	**1.4**	**1.3**	**1.7**	**0.87**	<0.1	**1.7**	**1.8**	**2**	**1.9**	**1.8**	**1.7**	**1.9**	**1.8**	**1.6**	**2.1**	**2.1**	**2**	**1.9**	**1.8**	**1.9**
Lead	0.01	0.01 (0.003)	0.002	0.00025	0.005		<0.0005	<0.0005	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	--	--	0.533	0.533*		**0.13**	**0.10**	**0.066**	**0.064**	**0.067**	**0.075**	**0.079**	**0.076**	**0.078**	**0.079**	**0.081**	**0.081**	**0.089**	**0.097**	**0.083**	**0.078**	**0.083**	**0.077**	**0.068**	**0.088**	**0.086**	**0.083**	**0.085**	**0.069**	**0.07**
Mercury	0.001	0.0002	0.00077	0.00005	0.0003		<0.0001	--	<0.0001	--	0.0008	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	(0.04)	0.73	0.0009	--		0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.025	0.039	0.007	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001	0.0013	<0.001	0.0012	0.0012	0.0015	0.0011
Phosphorus (Total)	--	(0.02)	--	0.0555	--		<0.05	<0.05	<0.1	<0.1	1.2	--	1.2	1.1	1.2	0.4	2.9	1.5	1.3	0.55	0.43	0.93	0.51	0.3	1.7	0.051	0.16	0.55	0.74	0.49	0.54
Selenium	0.01	0.1	0.005	0.001	0.003		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	--	--	5.7	--		4.5	4.6	3.7	3.9	3.4	3.2	3	3	3.1	3.4	3.1	3.3	3.3	3.5	3	4	3	3.3	2.6	3	2.8	2.9	2.9	3	2.7
Silver	--	0.0001	0.00012	--	--		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	--	--	0.1	--		0.100	0.110	0.084	0.087	0.084	0.076	0.078	0.072	0.078	0.082	0.076	0.082	0.090	0.097	0.078	0.080	0.077	0.078	0.065	0.085	0.083	0.083	0.084	0.074	0.072
Thallium	--	(0.0003)	0.04	0.0001	--		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	--	--	0.0005	--		--	--	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	--	--		<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	(0.006)	0.02	0.0003	--		0.002	0.001	0.002	0.002	0.003	0.002	0.002	0.001	0.003	0.002	0.0024	0.0021	0.002	0.0022	0.0025	0.0022	0.0021	0.0023	0.0022	0.0018	0.0019	0.002	0.0022	0.0019	0.002
Zinc	5	0.03 (0.02)	0.089	0.004	2.5		0.008	0.009	0.007	0.01	0.008	0.007	0.01	0.005	0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.0062	0.0053	<0.005	<0.0050	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Phase 100 - Geraldton Landfill

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	PWQO	APV	2018	2018	MW10B																							
	(mg/L)	(mg/L)	(mg/L)	Background	B-7	May-97	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																														
pH	6.5 to 8.5	6.5 to 8.5	--	8	--	Not	7.7	8.0	8	8.2	7.9	7.4	7.1	7.2	7.71	7.33	7.54	7.67	7.22	7.78	7.57	7.52	7.46	7.48	7.63	7.60	7.51	7.55	7.62	7.38	7.52
Field pH	--	--	--	--	--	Installed	7.02	7.94	5.93	7.35	7.04	6.84	6.53	6.5	6.71	6.75	6.53	6.86	6.57	7.05	6.77	6.73	7.22	6.8	6.93	6.81	6.91	7.02	7.09	6.03	NV
Conductivity (uS/cm)	--	--	--	--	--		817	1,030	1,060	1,190	1,160	1,390	1,230	1,150	1,210	1,190	1,280	1,300	1,200	1,200	1,200	1,200	1,300	1,200	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Field Conductivity (uS	--	--	--	--	--		828	996	>3,999	576	1,222	1,277	1,145	1,177	1,079	1,092	1,118	1,037	941	1,008	920	833	1,393	1,151	1,114	1,212	1,232	1,175	1,142	989	NV
Field Temperature (°c	--	--	--	--	--		7.1	3.4	3.9	9.4	3.6	10.5	5.2	7.4	4.2	3.4	6.5	4.8	6.5	6.2	4.5	5.2	6.3	6.7	9.1	11	8.6	7.5	6.9	7.8	NV
Total Dissolved Solids	500	--	--	297	398		450	**616**	492	**742**	**710**	**865**	**800**	**750**	**758**	**750**	**842**	**794**	**812**	**740**	**764**	**770**	**836**	**772**	**774**	**834**	**784**	**828**	**810**	**670**	**815**
Total Suspended Solids	--	--	--	--	--		--	--	1,100	3,600	3,600	--	--	--	--	--	--	--	--	--	--	1,100	1,900	150	4,900	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	--	--	293	**293***		**460**	**410**	**420**	**370**	**440**	**420**	**430**	**460**	**410**	**430**	**410**	**320**	**390**	**320**	**430**	**350**	**430**	**380**	**330**	**430**	**410**	**390**	**410**	**380**	**360**
Organics (mg/L)																														
Dissolved Organic Car	5	--	--	3.8	4.4		**24.8**	**17.6**	**15**	**16.2**	**15.3**	**12.2**	**13.7**	**14.2**	**14.1**	**12.4**	**13.2**	**15**	**18**	**18.1**	**15**	**15**	**15**	**14**	**15**	**12**	**15**	**16**	**15**	**15**	**16**
Biochemical Oxygen D	--	--	--	--	--		**--**	**--**	6	<2	<2	--	--	--	--	--	--	--	--	--	--	--	<2	<2	<2	--	--	--	--	--	--
Chemical Oxygen Den	--	--	--	19.8	--		**--**	**--**	100	140	160	58	--	--	62	--	130	--	58	--	--	85	110	66	78	47	51	50	48	52	47
Phenols	--	0.001	0.961	0.0005	--		<0.001	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.0024	<0.0010	<0.0010
Total Kjeldahl Nitroge	--	--	--	0.1	--		1.6	--	2.9	3	4.2	2	3	4	2.2	1.5	3	1.8	2	1.1	2.3	6.1	2.9	1.2	0.72	0.50	0.45	0.68	0.68	0.58	0.64
Ammonia-N	--	--	--	0.043	--		0.77	0.56	0.67	0.66	0.61	0.48	0.54	0.39	0.31	0.12	0.32	0.24	0.36	0.24	0.25	0.18	0.31	0.17	0.22	0.19	0.16	0.16	0.18	0.24	0.31
Organic Nitrogen	0.15	--	--	0.1	**0.12**		**0.83**	--	**2.23**	**2.34**	**3.59**	**1.52**	**2.46**	**3.8**	**1.9**	**1.38**	**2.68**	**1.56**	**1.64**	**0.86**	**2.05**	**5.9**	**2.6**	**1**	**0.5**	**0.31**	**0.29**	**0.52**	**0.45**	**0.35**	**0.33**
Cations (mg/L)																														
Sodium	200	--	180	7.3	104.0		14	66	44	120	62	120	75	77	72	93	83	98	91	99	88	94	93	88	97	95	100	97	97	110	120
Potassium	--	--	--	1.3	--		1.3	1.3	0.83	1.7	0.58	0.58	0.46	0.37	0.4	0.32	0.33	0.25	0.29	0.21	0.26	0.22	0.21	0.24	0.21	0.27	0.23	0.2	<0.2	0.25	0.26
Calcium	--	--	--	92	--		150	140	140	130	150	140	150	160	140	150	140	110	140	110	150	120	150	130	110	150	140	130	140	130	130
Magnesium	--	--	--	15.8	--		20	12	14	13	16	15	15	15	14	15	13	12	12	12	12	11	13	12	12	13	13	12	12	11	11
Anions (mg/L)																														
Chloride	250	--	180	1.4	126		39	130	110	130	170	170	180	170	190	180	180	160	190	180	190	190	180	170	200	190	210	180	210	*200*	*200*
Nitrate	10	--	--	0.3	2.7		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	--	--	0.005	0.250		<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	--	--	0.005	--		<0.01	--	<0.01	--	<0.01	--	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	0.011	<0.010	<0.010
Sulphate	500	--	--	20	260		2	<1	<1	4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity as $CaCO_3$	30-500	narrative	--	293.00	396		445	382	414	449	363	433	360	305	336	292	338	340	300	250	330	300	230	320	340	330	330	300	320	350	340
Ion Balance (%)	--	--	--	2	--		0.149	0.448	4.02	0.31	1.91	0.1	0.92	7.59	2.54	7.56	0.59	2.72	3.53	0.22	2.68	0.26	4	2.67	6.62	3.42	--	--	--	0.24	0.31
Metals (mg/L)																														
Aluminum	0.1	(0.075)	--	0.0025	0.05		0.042	0.01	0.03	0.024	0.047	0.034	0.051	0.045	0.022	0.022	0.052	0.065	0.067	0.082	0.053	0.1	0.054	0.069	0.065	0.055	0.068	0.068	0.059	0.077	0.071
Antimony	0.006	(0.02)	1.6	0.00025	0.0031		<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.1 (0.005)	0.15	0.0028	0.0083		0.005	0.01	0.011	0.017	0.021	0.019	0.023	**0.027**	0.018	0.005	0.025	0.017	**0.03**	0.021	0.023	**0.037**	**0.026**	**0.03**	0.018	**0.033**	**0.037**	**0.032**	**0.032**	**0.032**	**0.032**
Barium	1	--	2.3	0.018	0.260		0.036	0.042	0.031	0.029	0.034	0.034	0.031	0.03	0.031	0.029	0.032	0.026	0.029	0.022	0.029	0.026	0.028	0.028	0.026	0.029	0.030	0.026	0.027	0.028	0.033
Beryllium	--	0.011	0.0053	0.00025	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	--	--	0.0005	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	(0.2)	3.55	0.019	1.3		<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.005	0.0002 (0.0001)	0.00021	0.00005	0.0013		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.001	0.064	0.0019	0.014		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.0009	0.0052	0.00318	--		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.005	0.0069	0.002	0.25		<0.001	0.001	<0.001	0.001	0.002	0.001	0.003	0.003	<0.001	0.001	0.001	0.0016	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.0064	<0.001
Iron	0.3	0.3	--	0.05	0.18		**2.5**	**1.1**	**2.5**	**1.6**	**3.4**	**2.6**	**3**	**3.4**	**1.1**	0.22	**3.1**	**1**	**2.9**	**1.7**	**3**	**4.7**	**3.4**	**5.3**	**1.4**	**5.7**	**3.8**	**4.3**	**3.6**	**4.5**	**2.8**
Lead	0.01	0.01 (0.003)	0.002	0.00025	0.005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	<0.0005
Manganese	0.05	--	--	0.533	0.533*		**0.14**	**0.13**	**0.110**	**0.11**	**0.13**	**0.12**	**0.110**	**0.120**	**0.100**	**0.098**	**0.100**	**0.084**	**0.091**	**0.11**	**0.11**	**0.160**	**0.110**	**0.170**	**0.085**	**0.180**	**0.11**	**0.13**	**0.1**	**0.12**	**0.095**
Mercury	0.001	0.0002	0.00077	0.00005	0.0003		<0.0001	--	<0.0001	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	(0.04)	0.73	0.0009	--		0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	--	0.025	0.039	0.007	--		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001
Phosphorus (Total)	--	(0.02)	--	0.0555	--		<0.050	--	<0.1	<0.1	0.8	--	0.9	5.3	0.8	0.17	1	0.63	1.4	0.22	0.39	0.35	0.68	1.2	0.4	0.13	0.26	0.11	0.45	0.98	0.5
Selenium	0.01	0.1	0.005	0.001	0.003		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	--	--	5.7	--		4.8	2.1	2.8	2.9	2.8	2.5	2.4	2.3	2	2	2	1.6	1.8	1.5	1.8	1.9	1.8	2.1	1.7	1.9	1.7	1.7	1.7	1.9	1.7
Silver	--	0.0001	0.00012	--	--		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--
Strontium	--	--	--	0.1	--		0.14	0.11	0.14	0.13	0.14	0.12	0.12	0.12	0.12	0.11	0.12	0.093	0.12	0.094	0.12	0.096	0.120	0.110	0.100	0.120	0.110	0.1	0.11	0.1	0.1
Thallium	--	(0.0003)	0.04	0.0001	--		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	--	--	0.0005	--		--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	--	--		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--
Vanadium	--	(0.006)	0.02	0.0003	--		0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.00096	0.00057	<0.0007	0.0012	0.00099	0.00072	0.001	0.00053	0.00091	0.00067	0.00083	0.00087	0.00097	0.00094
Zinc	5	0.03 (0.02)	0.089	0.004	2.5		0.011	0.014	0.009	0.013	0.006	0.009	0.007	0.009	<0.005	<0.005	<0.005	<0.005	0.0085	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	0.019	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

Table 3 (cont'd): Groundwater Data

Parameter	ODWS	2018	2018	MW11																	
	(mg/L)	Background	B-7	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																						
pH	6.5 to 8.5	8	--	7.9	8	8.1	7.99	8.08	8.06	7.82	8.13	8.04	8.05	7.96	8.01	8.09	8.09	8.05	8.04	8.14	7.92	7.91
Field pH	--	--	--	7.5	7.33	7.57	7.27	7.66	7.6	6.95	7.47	7	6.9	7.79	7.62	7.69	7.68	7.72	7.66	7.76	6.7	NV
Conductivity (uS/cm)	--	--	--	499	464	491	477	469	480	470	480	460	460	470	470	470	460	470	490	470	490	450
Field Conductivity (uS/cm)	--	--	--	449	479	469	>3,999	447	434	422	416	403	397	505	498	482	469	479	467	462	550	NV
Field Temperature (°C)	--	--	--	4.5	5.4	5.6	5	7.9	4.4	7	4.5	5	4.5	7	6.9	7.7	8.4	10.1	6.9	8.9	10.5	NV
Total Dissolved Solids (mg/L)	500	297	398	325	300	320	296	334	264	262	260	254	264	274	272	268	278	--	238	290	285	225
Total Suspended Solids (mg/L)	--	--	--	--	--	--	--	--	--	--	--	--	17,000	7,100	12,000	4,700	--	--	--	--	--	--
Hardness (mg/L)	80 to 100	293	293*	**240**	**250**	**250**	**250**	**250**	**250**	**240**	**260**	**240**	**250**	**240**	**250**	**230**	**230**	**230**	**240**	**230**	**250**	**240**
Organics (mg/L)																						
Dissolved Organic Carbon (DOC)	5	3.8	4.4	3.1	2.9	2.5	2.2	2.9	2.4	1.9	2.9	2.6	1.8	2.1	1.5	2.4	1.5	1.9	1.3	1.8	1.6	2.7
Biochemical Oxygen Demand (BOD)	--	--	--	--	--	--	--	--	--	--	--	--	--		3	<2	--	--	--	--	--	--
Chemical Oxygen Demand (COD)	--	19.8	--	--	--	95	--	110	--	140	--	--	<4	68	51	24	150	57	6.9	14	7.7	10
Phenols	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen (TKN)	--	0.1	--	18	7	3	2	2	2.6	2.7	4.8	0.24	49	2.4	0.77	0.21	0.74	0.18	0.75	0.41	0.17	0.23
Ammonia-N	--	0.043	--	0.15	0.21	0.22	0.18	0.14	0.22	0.22	0.42	0.13	0.17	0.17	0.15	0.084	0.068	0.064	0.096	0.092	0.16	0.27
Organic Nitrogen	0.15	0.1	0.12	**17.9**	**7.1**	**3.1**	**1.82**	**1.86**	**2.38**	**2.48**	**4.38**	0.1	**49.3**	**2.3**	**0.62**	0.13	**0.68**	0.12	**0.66**	**0.32**	<0.10	<0.10
Cations (mg/L)																						
Sodium	200	7.3	104.0	7.6	5.2	7.1	6.3	5.9	7.6	6.9	3.6	6.9	7.4	6.8	7.1	6.9	6.5	7.1	6.8	7.1	7	6
Potassium	--	1.3	--	1.3	0.69	1.3	0.89	0.89	1.1	1.1	1.3	1.2	1.2	1	1	1	0.8	1.2	0.94	1.1	1	0.71
Calcium	--	92	--	73	77	73	74	75	73	73	80	73	76	73	74	69	70	68	71	69	75	72
Magnesium	--	15.8	--	13	15	16	15	15	16	15	9.9	14	15	15	15	15	14	15	15	15	15	14
Anions (mg/L)																						
Chloride	250	1.4	126	2	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	1.2	1	1.3	<1.0	1.1
Nitrate	10	0.3	2.7	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	1	0.005	0.250	<0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	0.014	0.012	<0.010	<0.010	<0.010	<0.010
Orthophosphate	--	0.005	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	500	20	260	7	4	<1	<1	2	<1	2	6	3	2	1	<1	<1	<1.0	1.3	<1.0	<1.0	<1.0	<1.0
Alkalinity as $CaCO_3$	30-500	293.00	396	268	247	268	257	249	260	250	220	250	250	260	250	250	250	260	260	260	270	250
Ion Balance (%)	--	2	--	4.03	2.25	0.46	1.26	2.32	1.09	0.69	4.4	0.66	3.55	0.05	3	0	0.710	--	--	--	1.67	0
Metals (mg/L)																						
Aluminum	0.1	0.0025	0.05	<0.005	<0.005	<0.005	<0.005	0.044	<0.005	<0.005	<0.005	<0.005	0.039	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054
Antimony	0.006	0.00025	0.0031	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	0.025	0.0028	0.0083	0.002	0.002	0.005	0.003	0.001	0.0026	0.0022	0.0024	0.002	0.0019	0.0012	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Barium	1	0.018	0.260	0.044	0.036	0.043	0.033	0.035	0.033	0.037	0.0036	0.0045	0.0046	0.0380	0.032	0.029	0.031	0.038	0.026	0.028	0.03	0.028
Beryllium	--	0.00025	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	5	0.019	1.3	0.012	0.011	0.014	<0.01	<0.01	0.014	0.014	<0.01	0.013	0.011	0.015	0.012	<0.01	0.011	0.018	0.012	0.015	<0.01	0.013
Cadmium	0.005	0.00005	0.0013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	0.0019	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	--	0.00318	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	1	0.002	0.25	<0.001	0.003	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.3	0.05	0.18	<0.1	0.19	<0.1	**0.34**	<0.1	**0.35**	0.19	**0.35**	0.1	0.13	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14
Lead	0.01	0.00025	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese	0.05	0.533	0.533*	**0.22**	**0.26**	**0.27**	**0.24**	**0.22**	**0.17**	**0.16**	**0.14**	**0.11**	**0.099**	**0.110**	**0.110**	**0.100**	**0.130**	**0.084**	**0.094**	**0.077**	**0.083**	**0.12**
Mercury	0.001	0.00005	0.0003	0.0003	0.0003	0.0002	0.0002	<0.0001	0.00023	0.00013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	--	0.0009	--	0.001	<0.001	0.001	<0.001	0.0009	0.00084	0.00094	0.00076	0.00082	0.00086	<0.0005	0.001	0.0013	0.00092	0.0009	0.0011	0.0011	0.0011	0.0008
Nickel	--	0.007	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (Total)	--	0.0555	--	10	4.6	3.4	2.5	5	7.1	7.2	10	6.2	11	4.5	9	2.7	8.8	4.5	0.54	5.3	2.6	1.8
Selenium	0.01	0.001	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	5.7	--	6.4	6.1	8.8	7.1	7	8.3	7.9	8.1	7.8	8.2	8.1	7.1	7.1	6.1	7	6.7	7	6.7	6.4
Silver	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	--	--	--
Strontium	--	0.1	--	0.096	0.08	0.099	0.092	0.087	0.1	0.095	0.1	0.094	0.1	0.1	0.090	0.089	0.084	0.093	0.084	0.087	0.085	0.08
Thallium	--	0.0001	--	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	0.0005	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0021	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--
Vanadium	--	0.0003	--	0.001	0.001	0.001	0.001	0.0018	<0.0005	<0.0005	<0.0005	0.0014	<0.0005	0.00065	0.0005	0.0006	0.00051	0.00084	<0.0005	<0.0005	<0.0005	0.00066
Zinc	5	0.004	2.5	0.013	0.009	0.008	<0.005	0.01	0.0051	0.0055	<0.005	<0.005	0.0071	<0.005	<0.005	0.0063	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
† - Denotes blind duplicate
NV - Denotes no value; handheld instrument was malfuntioning

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Table 4: Volatile Organic Compounds

Parameter	ODWS	MW1		MW2		MW3A				MW3B		MW4	
		Nov-07	Oct-08	Nov-07	Oct-08	Nov-07	Nov-07†	Oct-08	Oct-08†	Nov-07	Oct-08	Nov-07	Oct-08
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	0.005	0.0002	0.0001	<0.001	<0.0001	0.0012	0.0013	0.0009	0.0009	0.0003	0.0002	<0.0001	0.0003
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	0.005	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	0.2	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	0.005	<0.0002	<0.0002	<0.0002	<0.0002	0.002	0.0019	0.0018	0.0019	0.0007	0.0015	<0.0002	<0.0002
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	0.005	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	0.014	--	--	--	--	--	--	--	--	--	--	--	--
Cis-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--
Trans-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--	--
Cis-1,3-Dichloropropylene	--	--	--	--	--	--	--	--	--	--	--	--	--
Trans-1,3-Dichloropropylene	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylybenzene	0.0024	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene Dibromide	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride (Dichloromethane)	0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007
Methyl Isobutyl Ketone	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl-t-Butyl Ether	--	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	0.024	0.0003	<0.0002	0.0004	<0.0002	0.0034	0.0028	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002
Tetrachloroethylene	0.03	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (Trichloroethylene)	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0003	0.0003	<0.0002	<0.0002	0.0004	**0.0028**
m-xylene & p-xylene	0.3*	--	--	--	--	--	--	--	--	--	--	--	--
o-xylene	0.3*	--	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	0.3	--	--	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	--
Dioxane, 1,4-	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexane(n)	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropene (cis + trans)	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
* - Standard is for Total Xylenes
† - Denotes blind duplicate

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Table 4 (Cont'd): Volatile Organic Compounds

Parameter	ODWS	MW5														
		Jun-03	Aug-06	Nov-06	Nov-07	Oct-08	Oct-09	Oct-10	Oct-11	Oct-12	Oct-13	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18
Acetone	--	0.0243	--	--	--	Not Sampled Well Destroyed or Buried	--	--	--	--	Not Sampled	Not Sampled	Not Sampled	<0.01	<0.01	<0.01
Benzene	0.005	0.0004	<0.0001	--	<0.0001		<0.0001	<0.0001	<0.0002	<0.0005				<0.0001	0.00014	<0.0001
Bromodichloromethane	--	0.0014	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Bromoform	--	--	--	--	--		--	--	--	--				<0.00020	<0.00020	<0.00020
Bromomethane	--	--	--	--	--		--	--	--	--				<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	0.005	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Chlorobenzene	--	--	--	--	--		--	--	--	--				0.00071	0.0014	0.0012
Chloroform	--	0.035	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Dibromochloromethane	--	--	--	--	--		--	--	--	--				<0.00020	<0.00020	<0.00020
1,2-Dichlorobenzene	0.2	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
1,3-Dichlorobenzene	--	--	--	--	--		--	--	--	--				<0.0002	0.00029	0.00021
1,4-Dichlorobenzene	0.005	<0.0001	<0.0002	--	0.0002		<0.0002	<0.0002	0.0009	<0.0001				0.00089	0.0011	0.001
1,1-Dichloroethane	--	--	--	--	--		--	--	--	--				0.00023	0.00017	0.00021
1,2-Dichloroethane	0.005	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
1,1-Dichloroethylene	0.014	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Cis-1,2-Dichloroethylene	--	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Trans-1,2-Dichloroethylene	--	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
1,2-Dichloropropane	--	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Cis-1,3-Dichloropropylene	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Trans-1,3-Dichloropropylene	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Ethylybenzene	0.0024	0.0007	--	--	--		--	--	--	--				<0.0001	0.00043	<0.0001
Ethylene Dibromide	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Methyl Ethyl Ketone	0.007	--	--	--	--		--	--	--	--				<0.005	<0.005	<0.005
Methylene Chloride (Dichloromethane)	0.05	<0.0005	<0.0005	--	<0.0005		<0.0005	<0.0005	<0.001	<0.0025				<0.0005	<0.0005	<0.0005
Methyl Isobutyl Ketone	--	--	--	--	--		--	--	--	--				<0.005	<0.005	<0.005
Methyl-t-Butyl Ether	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Styrene	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
1,1,1,2-Tetrachloroethane	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
1,1,2,2-Tetrachloroethane	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Toluene	0.024	0.0017	<0.0002	--	0.0031		<0.0002	<0.0002	<0.0004	<0.001				<0.0002	<0.0002	<0.0002
Tetrachloroethylene	0.03	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
1,1,1-Trichloroethane	--	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
1,1,2-Trichloroethane	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
Trichloroethene (Trichloroethylene)	0.0002	--	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
														<0.0001	<0.0001	<0.0001
Vinyl Chloride	0.002	<0.0002	<0.0002	--	<0.0002		<0.0002	<0.0002	<0.0004	<0.001				<0.0002	<0.0002	<0.0002
m-xylene & p-xylene	0.3*	0.0017	--	--	--		--	--	--	--				<0.0001	0.00046	<0.0001
o-xylene	0.3*	0.0009	--	--	--		--	--	--	--				<0.0001	<0.0001	<0.0001
Total Xylenes	0.3	--	--	--	--		--	--	--	--				<0.0001	0.00058	<0.0001
Dichlorodifluoromethane	--	--	--	--	--		--	--	--	--				<0.0005	<0.0005	<0.0005
Dioxane, 1,4-	--	--	--	--	--		--	--	--	--				--	--	--
Hexane(n)	--	--	--	--	--		--	--	--	--				<0.0005	<0.0005	<0.0005
Trichlorofluoromethane	--	--	--	--	--		--	--	--	--				<0.0002	<0.0002	<0.0002
1,3-Dichloropropene (cis + trans)	--	--	--	--	--		--	--	--	--				--	--	--

Notes:
* - Standard is for Total Xylenes

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Table 4 (Cont'd): Volatile Organic Compounds

Parameter	ODWS	MW6		MW7	MW8		MW9		MW10A		MW10B		MW11
		Nov-07	Oct-08	Oct-08	Nov-07	Oct-08	Nov-07	Oct-08	Nov-07	Oct-08	Nov-07	Oct-08	Oct-08
Acetone	--	--	--	--	--	--	--	--	--	--	--	--	Well Not Installed
Benzene	0.005	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	<0.0001	
Bromodichloromethane	--	--	--	--	--	--	--	--	--	--	--	--	
Bromoform	--	--	--	--	--	--	--	--	--	--	--	--	
Bromomethane	--	--	--	--	--	--	--	--	--	--	--	--	
Carbon Tetrachloride	0.005	--	--	--	--	--	--	--	--	--	--	--	
Chlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	
Chloroform	--	--	--	--	--	--	--	--	--	--	--	--	
Dibromochloromethane	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichlorobenzene	0.2	--	--	--	--	--	--	--	--	--	--	--	
1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	0.005	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichloroethane	0.005	--	--	--	--	--	--	--	--	--	--	--	
1,1-Dichloroethylene	0.014	--	--	--	--	--	--	--	--	--	--	--	
Cis-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	
Trans-1,2-Dichloroethylene	--	--	--	--	--	--	--	--	--	--	--	--	
1,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--	
Cis-1,3-Dichloropropylene	--	--	--	--	--	--	--	--	--	--	--	--	
Trans-1,3-Dichloropropylene	--	--	--	--	--	--	--	--	--	--	--	--	
Ethylybenzene	0.0024	--	--	--	--	--	--	--	--	--	--	--	
Ethylene Dibromide	--	--	--	--	--	--	--	--	--	--	--	--	
Methyl Ethyl Ketone	--	--	--	--	--	--	--	--	--	--	--	--	
Methylene Chloride (Dichloromethane)	0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Methyl Isobutyl Ketone	--	--	--	--	--	--	--	--	--	--	--	--	
Methyl-t-Butyl Ether	--	--	--	--	--	--	--	--	--	--	--	--	
Styrene	--	--	--	--	--	--	--	--	--	--	--	--	
1,1,1,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	
Toluene	0.024	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	0.0002	0.0011	0.0002	
Tetrachloroethylene	0.03	--	--	--	--	--	--	--	--	--	--	--	
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	
1,1,2-Trichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	
Trichloroethene (Trichloroethylene)	0.05	--	--	--	--	--	--	--	--	--	--	--	
Vinyl Chloride	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
m-xylene & p-xylene	0.3*	--	--	--	--	--	--	--	--	--	--	--	
o-xylene	0.3*	--	--	--	--	--	--	--	--	--	--	--	
Total Xylenes	0.3	--	--	--	--	--	--	--	--	--	--	--	
Dichlorodifluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	
Dioxane, 1,4-	--	--	--	--	--	--	--	--	--	--	--	--	
Hexane(n)	--	--	--	--	--	--	--	--	--	--	--	--	
Trichlorofluoromethane	--	--	--	--	--	--	--	--	--	--	--	--	
1,3-Dichloropropene (cis + trans)	--	--	--	--	--	--	--	--	--	--	--	--	

Notes:
* - Standard is for Total Xylenes

Table 5: Surface Water Data

THB-00006189-OE Phase 100 - Geraldton Landfill

Parameter	PWQO	SW1																								
		Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																											
pH	6.5 to 8.5	No	8.2	8.1	7.9	8.1	8	7.4	7.4	7.9	8.03	7.68	7.97	7.55	7.79	7.74	7.9	7.18	7.74	7.78	7.9	7.97	7.94	7.86	7.92	7.66	7.58
Field pH	6.5 to 8.5	Sample	8.23	8.1	6.17	7.76	8.28	>3,999	8.02	7.89	7.65	7.7	7.61	7.91	7.49	7.42	8.19	7.25	7.98	7.75	8.03	6.53	8.1	8.02	8.03	6.75	NV
Conductivity	--		389	437	212	270	259	162	355	241	263	129	285	200	410	170	230	150	340	150	330	280	260	210	250	230	290
Field Conductivity	--		287	407	299	266	272	149	525	247	563	130	338	175	402	196	208	103	203	191	326	275	283	392	248	267	NV
Field Temperature	narrative		22	1.9	0.8	23	0	23.7	3.3	15.7	2.1	8.4	14.2	10.7	6	15.6	0.5	9.7	8	16.9	8.8	23.1	17.4	17.7	13.7	13	NV
TSS	--		7	86	9	13	15	120	12	1	<10	2	15	5	83	7	5	5	21	5	6	8	52	63	6	8	13
BOD	--		<2	4	<2	<2	<2	5	5	<2	<2	<2	3	3	<2	<2	2	<2	2	2	<2	<2	<2	2	3	3	<2
COD	--		33	32	51	37	29	69	31	20	31	37	69	47	40	60	40	33	46	26	30	35	68	35	39	27	35
TDS	--		234	239	173	172	160	105	250	160	178	78	218	108	254	36	166	116	164	132	178	188	186	154	205	85	190
Hardness	--		140	160	96	100	110	68	130	110	120	67	110	82	140	72	120	58	120	65	130	110	110	110	100	76	120
Organics																											
DOC	--		--	--	--	--	--	--	9	10.4	12.2	11.6	9.8	13	11	14	14	11	14	11	12	8.3	12	10	15	9.7	11
Phenols	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002	0.0041	<0.001	<0.001	<0.001	<0.001	<0.001	0.0034	<0.0010	<0.0010
TKN	--		0.5	1.3	0.9	1.5	0.7	1.4	1.1	0.5	0.7	0.5	1.5	0.55	1.3	14	0.67	0.62	1	0.84	0.42	0.34	0.36	0.39	0.49	0.24	0.38
Ammonia-N	--		0.05	0.06	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.055	<0.05	<0.05	0.098	<0.05	<0.05	<0.050	<0.050	>0.050	<0.050	0.051	0.087
Cations (mg/L)																											
Sodium	--		32	26	7.3	15	12	4.4	3.4	7.7	12	3.6	13	8.7	27	9.6	6.4	8.1	22	4.8	18	14	11	27	13	16	14
Potassium	--		1	1.2	0.64	0.7	0.81	0.77	1.1	1	0.68	0.49	0.9	0.56	0.97	0.84	0.79	0.61	0.8	0.47	0.82	0.83	0.86	0.81	0.66	0.59	0.62
Calcium	--		47	58	32	32	36	23	49	33.9	35	18	36	26	44	22	34	15	36	18	35	32	33	38	30	22	31
Magnesium	--		9	12	7.2	6.6	81	5.4	9.9	6.84	6.8	3.9	7.2	5.6	8.8	4.6	7	3.3	6.9	4	7.4	6.6	7.2	7.4	6	4.5	6.4
Anions (mg/L)																											
Chloride	--		45	42	10	25	17	8	36	12	20	6	21	12	40	15	9	15	36	10	31	25	20	36	21	25	27
Nitrate	--		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	--		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	--		6	14	9	8	13	<5	12	11	5	<1	8	2	8	7	9	<1	8	1	9.6	10	<1.0	13	<1.0	2.3	18
Orthophosphate	--		--	--	--	--	--	--	<0.01	0.02	<0.01	0.02	0.01	0.017	0.012	<0.01	0.013	<0.01	<0.01	<0.01	--	0.011	--	--	--	--	--
Alkalinity as $CaCO_3$	narrative		134	151	85	93	96	64	120	93	96	49	103	69	130	54	90	42	100	52	110	100	100	97	85	66	90
Metals (mg/L)																											
Aluminum	(0.075)		0.052	0.16	0.16	0.056	0.061	0.49	0.095	0.019	0.066	0.035	0.057	0.058	0.31	0.052	0.039	0.037	0.11	0.008	0.047	<0.005	<0.005	<0.005	0.01	0.008	<0.005
Antimony	(0.02)		<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.0005	0.0008	0.0005	<0.0005	0.0008	<0.0005	0.00057	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00059	<0.0005	<0.0005	<0.0005	0.00052
Arsenic	0.1 (0.005)		0.066	0.049	0.04	0.024	0.044	0.038	0.032	0.025	0.028	0.022	0.046	0.027	0.052	0.022	0.038	0.013	0.035	0.018	0.033	0.015	0.11	0.048	0.04	0.011	0.042
Barium	--		0.017	0.024	0.011	0.011	0.011	0.009	0.016	0.01	0.011	0.006	0.016	0.0075	0.019	0.0095	0.011	0.0058	0.015	0.005	0.013	0.012	0.019	0.019	0.0094	0.007	0.0086
Beryllium	0.011		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005
Bismuth	--		--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(0.2)		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	0.016	<0.01	<0.01	<0.01
Cadmium	0.0002 (0.0001)		0.0001	0.0006	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00043	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Total)	0.001		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	0.0009		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00085	0.0006	<0.0005	<0.0005	<0.0005
Copper	0.005		0.004	0.004	0.004	0.002	0.004	0.005	0.003	0.003	0.002	0.002	0.004	0.0029	0.0058	0.0021	0.0037	0.0015	0.0026	0.0016	0.0035	0.0022	0.011	0.005	0.0062	<0.001	0.0026
Iron	0.3		0.17	0.92	0.74	0.43	0.28	1.1	0.42	<0.1	0.2	0.21	0.51	0.26	0.95	0.31	0.19	0.21	0.73	0.18	0.25	0.24	3.6	2.5	0.3	0.24	0.19
Lead	0.01 (0.003)		<0.0005	0.001	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00096	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	0.0009	<0.0005	<0.0005	<0.0005
Manganese	--		0.016	0.11	0.03	0.033	0.017	0.06	0.054	0.009	0.013	0.009	0.048	5.6	0.039	0.024	0.015	0.024	0.044	0.0098	0.075	0.019	0.14	0.15	0.019	0.013	0.011
Mercury	0.0002		<0.0001	--	<0.0001	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(0.04)		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	0.025		<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001	0.001	<0.001	0.0019	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	0.0035	0.0023	0.0019	<0.001	<0.001
Phosphorus	(0.02)		0.048	0.098	0.069	0.05	0.08	0.2	0.1	0.013	0.19	0.032	0.064	0.043	0.075	0.03	0.03	0.026	0.049	0.025	0.024	0.037	0.11	0.094	0.029	0.027	0.029
Selenium	0.1		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--		2.4	3.4	2.9	1.3	2.4	1.8	2.7	1.4	2.5	1.3	2.2	1.3	2.8	1.1	2.6	1.1	2.2	1.1	2.4	1.8	3.8	2.3	2.6	1.3	1.5
Silver	0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001
Strontium	--		--	--	0.044	0.045	0.055	0.031	0.057	0.046	0.044	0.027	0.049	0.039	0.054	0.031	0.047	0.025	0.051	0.032	0.048	0.043	0.042	0.054	0.045	0.035	0.046
Thallium	(0.0003)		<0.00005	<0.00005	<0.05	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00015	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--		--	--	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	--	--
Titanium	--		--	--	0.013	<0.005	0.005	0.043	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	<0.005	<0.005	<0.005	0.0054	<0.005	<0.005	0.0054	0.03	0.015	--	--	--
Vanadium	(0.006)		<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0011	0.0012	<0.0005	<0.0005	<0.0005	0.00069	<0.0005	<0.0005	<0.0005	0.0032	0.0016	<0.0005	<0.0005	<0.0005
Zinc	0.03 (0.02)		0.006	0.015	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.01	0.0076	<0.005	<0.005	<0.005

NV - Denotes no value; handheld instrument was malfuntioning

Table 5 (cont'd): Surface Water Data

THB-00006189-OE Phase 100 - Geraldton Landfill

Parameter	PWQO	SW2																									
		Jun-03	Aug-06	Nov-06	Nov-07	Jun-08	Oct-08	Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																											
pH	6.5 to 8.5	7.6	8.1	8.1	7.9	8	7.9	6.9	7.1	8	7.9	7.66	8.03	7.42	7.95	7.67	7.93	6.98	7.58	7.77	7.96	7.87	7.99	7.82	7.98	7.71	7.84
Field pH	6.5 to 8.5	--	8.14	8.25	6.16	8.27	8.42	>3,999	8.04	8.34	8.23	7.85	7.87	7.64	7.26	7.46	8.07	7.3	7.3	7.8	8.04	6.02	8.04	7.97	7.86	6.92	NV
Conductivity	--	171.5	209	229	206	145	211	162	226	244	203	135	226	180	230	130	220	100	190	150	250	270	210	210	190	180	250
Field Conductivity	--	--	298	236	228	144	164	151	208	247	205	134	213	157	300	132	208	104	104	185	130	265	230	230	204	315	NV
Field Temperature	narrative	--	21.7	0.9	0.5	20.1	0.6	22.4	3.4	16	3.2	10.1	14.8	10.5	5.6	19.4	0.4	8.1	8.1	16.7	5.6	19.1	16.8	15.2	14.7	13.4	NV
TSS	--	--	3	21	9	4	9	1	3	2	27	4	2	10	1	2	2	4	83	6	4	32	7	3	4	5	33
BOD	--	<0.5	<2	3	<2	2	<2	<2	<2	<2	<2	<2	<2	3	<2	<2	2	<2	<2	2	<2	<2.0	<2.0	<2.0	2	<2	<2
COD	--	--	42	31	48	38	22	27	29	27	38	38	89	42	28	59	35	31	48	33	32	25	33	35	45	33	54
TDS	--	93	134	141	181	100	140	102	141	160	132	86	130	94	156	106	162	90	82	138	182	178	144	124	190	35	120
Hardness	--	82.7	100	100	96	68	100	70	100	110	99	69	98	78	110	57	120	49	86	67	120	120	100	67	91	71	120
Organics																											
DOC	--	9.85	--	--	--	--	--	--	10.3	11.2	14.1	12.3	10	14	11	15	15	12	14	11	12	8.3	12	12	16	11	12
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.0024	0.0043	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.003	<0.0010	0.0011
TKN	--	--	0.7	1	0.8	0.6	0.6	0.6	0.5	0.6	0.7	0.6	0.6	0.48	1.5	0.56	0.67	0.58	0.96	0.83	0.41	0.3	0.34	0.32	0.52	0.19	0.55
Ammonia-N	--	<0.03	0.08	0.06	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.051	0.052	<0.05	<0.05	0.1	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.083
Cations (mg/L)																											
Sodium	--	5.2	4.9	4.6	6.1	4.1	5.5	4.9	5	7.4	6	4.7	5.6	6.3	4.9	5.1	7.3	4.1	5.5	8.6	6.7	10	6	12	6.8	6.2	8.5
Potassium	--	0.75	0.78	0.94	0.65	0.43	0.68	0.57	0.83	1	0.63	0.53	0.8	0.5	0.7	0.7	0.65	0.59	0.6	0.6	0.82	0.9	0.65	0.6	0.55	0.5	0.82
Calcium	--	24.1	33	34	33	21	29	20	30	32.9	32	20	33	24	33	18	33	13	26	24	31	35	29	28	27	21	34
Magnesium	--	5.31	6.9	7.1	7.5	4.6	6.9	4.4	6.4	6.87	7	4.3	6.9	5.3	6.9	4	7	3	5.9	5	7	7.1	6.3	5.6	5.6	4.1	7.4
Anions (mg/L)																											
Chloride	--	8.45	7	8	6	7	8	8	9	13	9	7	9	9	7	7	11	7	9	10	12	18	10	18	11	13	15
Nitrate	--	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	--	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	--	6.05	8	14	15	5	18	6	15	16	10	<1	12	1	9	<1	12	<1	1	<1	15	11	8.6	<1.0	<1.0	<1.0	17
Orthophosphate	--	--	--	--	--	--	--	--	0.02	0.02	<0.01	0.01	0.02	0.01	0.017	<0.01	0.013	<0.01	<0.01	<0.01	--	0.012	--	--	--	--	--
Alkalinity as $CaCO_3$	narrative	68.5	99	94	84	57	81	74	96	91	78	48	92	64	97	44	85	35	71	55	97	100	87	68	77	63	92
Metals (mg/L)																											
Aluminum	(0.075)	0.031	0.053	0.045	0.26	0.05	0.036	0.027	0.039	0.044	0.18	0.053	0.04	0.072	0.032	0.045	0.041	0.043	0.64	0.008	0.064	<0.005	<0.005	0.009	0.01	0.009	<0.005
Antimony	(0.02)	<0.0005	0.001	<0.001	<0.0005	<0.0005	0.0005	<0.0005	0.001	0.0008	<0.0005	<0.0005	0.0009	<0.0005	0.00061	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	0.00087	0.00055	0.00076	<0.0005	<0.0005	<0.0005	0.00071
Arsenic	0.1 (0.005)	0.0425	0.12	0.039	0.054	0.026	0.053	0.028	0.04	0.044	0.046	0.033	0.063	0.028	0.054	0.022	0.05	0.012	0.073	0.034	0.05	0.036	0.073	0.016	0.044	0.015	0.1
Barium	--	0.008	0.01	0.015	0.01	0.006	0.007	<0.005	0.009	0.006	0.010	0.005	0.009	0.0066	0.010	0.006	0.008	0.0063	0.0110	0.0094	0.0100	0.013	0.0091	0.0069	0.0079	0.0057	0.021
Beryllium	0.011	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	<0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(0.2)	0.0055	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	0.018	<0.01	<0.01	<0.01	<0.01	0.013
Cadmium	0.0002 (0.0001)	<0.0001	<0.0001	0.0008	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Total)	0.001	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	0.0009	<0.0001	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00095	<0.0005	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	<0.0005	0.0017
Copper	0.005	0.0044	0.004	0.005	0.004	0.002	0.004	0.004	0.004	0.004	0.004	0.002	0.004	0.003	0.004	0.0012	0.0038	0.0019	0.006	0.0029	0.0046	0.0046	0.0045	0.0017	0.0025	0.0013	0.012
Iron	0.3	0.0085	0.19	0.18	1.2	0.21	0.19	0.14	0.2	0.12	0.79	0.28	0.25	0.25	0.11	0.24	0.25	0.19	2	0.61	0.29	0.8	0.36	0.21	0.37	0.33	2.3
Lead	0.01 (0.003)	<0.0005	<0.005	0.0015	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	0.0022	<0.0005	<0.0005	0.0013	0.00083	<0.0005	0.00071	<0.0005	<0.0005	<0.0005	<0.0005	0.0016
Manganese	--	<0.0005	0.028	0.018	0.011	0.013	0.023	0.008	0.021	0.018	0.044	0.012	0.03	0.011	0.017	0.056	0.012	0.013	0.085	0.21	0.031	0.22	0.021	0.058	0.024	0.03	0.62
Mercury	0.0002	<0.00005	<0.0001	--	<0.0001	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(0.04)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	0.025	0.0005	0.001	0.003	0.005	<0.001	0.001	<0.001	<0.001	<0.001	0.002	0.001	0.001	<0.001	0.0011	<0.001	<0.001	<0.001	0.0025	0.0014	0.001	0.0023	0.0012	<0.001	<0.001	<0.001	0.0042
Phosphorus	(0.02)	<0.05	0.082	0.048	0.028	0.03	0.12	0.037	0.042	0.014	0.018	0.027	0.025	0.027	0.053	0.023	0.02	0.02	0.067	0.037	0.029	0.026	0.023	0.014	0.028	0.024	0.12
Selenium	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	--	2.2	2.6	2.9	1.0	2.2	0.79	2.4	1.4	3.0	1.3	2.5	1.4	2.0	1.1	2.6	1.2	2.9	1.4	2.7	2.0	2.8	1.5	2.6	1.6	2.5
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium	--	0.032	--	--	0.05	0.033	0.055	0.034	0.046	0.053	0.051	0.033	0.053	0.038	0.046	0.027	0.055	0.022	0.042	0.04	0.051	0.049	0.043	0.038	0.04	0.027	0.059
Thallium	(0.0003)	<0.001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005
Tin	--	0.001	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	--	--
Titanium	--	<0.005	--	--	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.032	0.01	<0.005	0.011	<0.005	<0.005	--	--	--
Vanadium	(0.006)	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0006	0.00083	<0.0005	<0.0005	<0.0005	<0.0005	0.0022	0.00083	<0.0005	0.00084	0.00095	<0.0005	0.00052	0.00063	0.0019
Zinc	0.03 (0.02)	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0086	0.0091	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0095

NV - Denotes no value; handheld instrument was malfuntioning

Table 5 (cont'd): Surface Water Data

THB-00006189-OE Phase 100 - Geraldton Landfill

Parameter	PWQO	SW3																			
		Jun-09	Oct-09	Jun-10	Oct-10	May-11	Oct-11	May-12	Oct-12	May-13	Oct-13	May-14	Oct-14	May-15	Oct-15	May-16	Oct-16	May-17	Sep-17	May-18	Oct-18
General																					
pH	6.5 to 8.5	7.4	7.2	8	8	7.68	8.11	7.45	8.06	7.64	8.05	6.98	7.56	7.78	7.95	7.83	8	7.78	7.97	7.65	7.82
Field pH	6.5 to 8.5	7.85	7.96	8.29	8.17	7.85	8.06	>3,999	7.72	7.58	8.04	7.21	7.21	7.82	7.78	6.26	7.91	8.17	7.91	8.45	NV
Conductivity	--	165	225	234	196	137	223	180	230	130	630	100	180	160	230	200	240	170	190	140	250
Field Conductivity	--	155	207	237	193	135	220	165	222	121	210	103	103	175	462	207	249	172	201	157	NV
Field Temperature	narrative	24.1	3.5	18.2	3	10.1	14.9	10.9	5.6	20.2	0.6	9.9	9.9	19.5	3.8	19.6	16.3	14.9	14.7	7.7	NV
TSS	--	1	4	1	44	3	<1	2	4	7	5	17	73	27	9	6	5	2	6	35	37
BOD	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	<2.0	<2.0	2	<2.0	<2	<2
COD	--	29	24	28	59	35	38	40	33	59	40	32	58	30	35	28	34	32	48	29	45
TDS	--	105	141	160	120	86	138	102	150	66	176	90	158	122	160	136	132	162	190	<10	125
Hardness	--	68	99	110	100	71	94	81	110	57	110	48	83	72	110	83	110	67	90	59	110
Organics																					
DOC	--	--	10.1	11.5	14.5	11.5	10.4	14	12	15	15	12	17	12	13	8.8	12	12	16	11	12
Phenols	0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.0025	0.0043	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.003	<0.0010	<0.0010
TKN	--	0.6	0.5	0.5	0.9	0.5	0.6	0.57	0.84	0.71	1.2	0.53	1.1	0.9	0.46	0.36	0.34	0.32	0.55	0.22	0.43
Ammonia-N	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	0.055	<0.050	<0.05	0.15	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.064
Cations (mg/L)																					
Sodium	--	4.6	5.4	7.5	5	4	6.4	6.5	6.1	4.7	7.5	3.9	5.3	5.1	6.8	7.7	6.9	7.1	7	4.4	8.1
Potassium	--	0.6	0.75	1.000	0.63	0.49	0.79	0.56	0.72	0.77	0.68	0.58	0.66	0.57	0.75	0.66	0.77	0.46	0.59	0.52	0.81
Calcium	--	21	27	32.8	31	19	31	26	30	19	32	13	25	20	30	23	32	21	29	19	34
Magnesium	--	4.5	6.2	6.83	7	4.1	6.7	5.7	6.7	4	6.8	2.9	6.2	4.2	6.8	5.2	7	4.4	5.9	3.9	7.5
Anions (mg/L)																					
Chloride	--	8	10	12	8	7	10	9	9	7	55	7	9	9	11	14	12	12	11	7.5	14
Nitrate	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.22	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	--	6	18	16	1	<1	14	1	14	<1	4	<1	<1	<1	15	10	11	<1	<1.0	<1.0	16
Orthophosphate	--	--	0.02	0.02	0.01	0.01	0.02	<0.01	0.023	<0.01	<0.01	0.011	<0.001	<0.01	--	0.013	--	--	--	--	--
Alkalinity as $CaCO_3$	narrative	61	91	86	80	50	85	65	89	45	240	35	67	59	85	69	96	58	76	51	95
Metals (mg/L)																					
Aluminum	(0.075)	0.042	0.056	0.049	0.21	0.061	0.035	0.086	0.057	0.071	0.05	0.0036	1	0.008	0.08	<0.005	<0.005	0.009	0.01	0.01	<0.005
Antimony	(0.02)	<0.0005	0.0012	0.0007	<0.0005	<0.0005	0.0011	<0.0005	0.00086	<0.0005	0.00073	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	0.0008	<0.0005	0.00053	<0.0005	0.00061
Arsenic	0.1 (0.005)	0.028	0.049	0.051	0.045	0.03	0.071	0.03	0.082	0.024	0.052	0.011	0.077	0.021	0.06	0.026	0.077	0.017	0.05	0.017	0.073
Barium	--	<0.005	0.008	0.006	0.008	0.006	0.009	0.007	0.0084	0.0063	0.0079	0.004	0.013	0.006	0.009	0.008	0.0098	0.0047	0.0084	0.007	0.012
Beryllium	0.011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	(0.2)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.1	<0.01	0.01
Cadmium	0.0002 (0.0001)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Total)	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00091
Copper	0.005	0.003	0.004	0.004	0.004	0.002	0.005	0.0031	0.0051	0.0022	0.0046	0.0018	0.0093	0.0023	0.006	0.0032	0.0049	0.0015	0.0028	0.0014	0.0064
Iron	0.3	0.17	0.25	0.15	0.74	0.27	0.13	0.28	0.22	0.34	0.26	0.16	2.8	0.2	0.39	0.24	0.34	0.21	0.42	0.49	1.2
Lead	0.01 (0.003)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	0.0022	<0.0005	<0.0005	<0.0005	0.00056	<0.0005	0.00068	<0.0005	0.00078
Manganese	--	0.013	0.023	0.011	0.026	0.012	0.01	0.016	0.0099	0.041	0.011	0.014	0.11	0.017	0.017	0.01	0.042	0.015	0.023	0.043	0.12
Mercury	0.0002	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	(0.04)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	0.025	<0.001	<0.001	0.001	0.001	<0.001	0.001	<0.001	0.0013	<0.001	<0.001	<0.001	0.0045	0.0013	0.0015	<0.001	0.0019	<0.001	0.011	<0.001	0.0024
Phosphorus	(0.02)	0.045	0.023	0.017	0.037	0.032	0.024	0.022	0.032	0.033	0.019	0.016	0.074	0.022	0.025	0.13	0.022	0.014	0.021	0.027	0.061
Selenium	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<.0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon	--	0.92	2.4	1.4	3.3	1.2	2.3	1.4	2.1	1.1	2.5	1.2	3.6	1.2	2.9	1.3	2.9	1.4	2.8	1.7	2.2
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Strontium	--	0.034	0.048	0.055	0.044	0.031	0.057	0.04	0.052	0.027	0.055	0.022	0.042	0.032	0.052	0.04	0.049	0.029	0.043	0.029	0.056
Thallium	(0.0003)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	--	--
Titanium	--	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.051	0.0055	<0.005	<0.005	<0.005	<0.005	--	--	--
Vanadium	(0.006)	<0.001	<0.001	<0.001	<0.001	<0.001	0.0005	0.00076	<0.0005	<0.0005	<0.0005	<0.0005	0.003	<0.0005	<0.0005	<0.00005	0.0009	<0.0005	0.00062	0.00096	0.0013
Zinc	0.03 (0.02)	0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	0.0052	<0.005	<0.005	0.014	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

NV - Denotes no value; handheld instrument was malfuntioning

THB-00006189-OE Geraldton Landfill

Table 6 - 2018 Trigger Concentrations (mg/L)

PARAMETER	PROVINCIAL WATER QUALITY OBJECTIVE	AQUATIC PROTECTION VALUE	ONTARIO DRINKING WATER STANDARD	SOURCE CONCENTRATION[1] (MW1, MW2, MW3A, MW3B, MW4 OR MW5)		BACKGROUND CONCENTRATION (MW6)[2]	2018 B-7	CALCULATED MW7 TRIGGER CONCENTRATION	MW7 MEASURED AVERAGE CONCENTRATION - 2018[++]	WEST ATTENUATION ZONE BOUNDARY MEASURED CONCENTRATION (MW11)[3]	SOUTHWEST ATTENUATION ZONE BOUNDARY MEASURED CONCENTRATION (MW10A or MW10B average)[3]
TDS			500	955	(MW1)	297	398	788	523	255	743 (>B-7)
Hardness			100	660	(MW1)	293	**293****	550	455	245	370 (>B-7)
DOC			5	9.1	(MW3B)	3.8	4.4	7.69	6.1	2.2	15.5 (>source & >B-7)+
Sodium		180	200	65	(MW3A)	7.3	104	n/a	35	6.5	115 (>source & >B-7)+
Chloride		180	250	150	(MW1)	1	126	142.8	43.5	1.1	200 (>source & >B-7)+
Nitrate			10*	0.94	(MW3B)	0.3	2.7	n/a	<0.1	<0.1	<0.1
Nitrite			1*	0.028	(MW3B)	0.005	0.25	n/a	<0.01	<0.01	<0.01
Organic Nitrogen			0.15	0.36	(MW1)	0.10	0.12	0.288	<0.1	<0.1	0.34 (>B-7)
Sulphate			500	150	(MW5)	20	260	n/a	29	<1	5.7
Alkalinity			500	600	(MW1)	293	396	538.8	490	260	345
Aluminum	(0.075)[4]		0.1	0.1	(MW5)	0.0025	0.05	0.085	0.0059	0.0054	0.13 (>source & >B-7)+
Antimony	(0.02)	1.6	0.006*	<0.0005	(all)	0.00025	0.0031	n/a	<0.0005	<0.0005	<0.0005
Arsenic	0.1 (0.005)	0.15	0.025*	0.026	(MW1)	0.0028	0.0083	0.021	**0.042 (> source)+**	0.001	0.032 (>source & >B-7)+
Barium		2.3	1*	0.2	(MW1)	0.018	0.26	n/a	0.195	0.029	0.0305
Boron	(0.2)	3.55	5*	1.3	(MW5)	0.019	1.3	n/a	0.215	0.013	<0.01
Cadmium	0.0002 (0.0001)	0.00021	0.005*	0.00015	(MW4)	0.00005	0.0013	n/a	<0.0001	<0.0001	<0.0001
Chromium	0.001	0.064	0.05*	<0.005	(all)	0.0019	0.014	n/a	<0.005	<0.005	<0.005
Copper	0.005	0.0069	1	0.0058	(MW2)	0.002	0.25	n/a	<0.001	<0.001	0.0064 (>source)+
Iron	0.3		0.3	31	(MW1)	0.05	0.18	21.75	**22.0**	0.14	3.65 (>B-7)
Lead	0.01 (0.003)	0.002	0.01*	<0.0005	(all)	0.00025	0.005	n/a	<0.0005	<0.0005	0.0012 (>source)+
Manganese			0.05	3.3	(MW1)	0.533	**0.533****	2.47	1.8	0.10	0.11
Mercury	0.0002	0.00077	0.001*	<0.0001	(all)	0.00005	0.0003	n/a	<0.0001	<0.0001	<0.0001
Phenols	0.001	0.961		0.001	(MW3B)	<0.001				<0.001	<0.001
Phosphorus	0.02			0.16	(MW3A)	0.05600			0.0370	2.2	0.74
Selenium	0.1	0.005	0.01*	<0.002	(all)	0.001	0.0033	n/a	<0.002	<0.002	<0.002
Zinc	0.03 (0.02)	0.089	5	0.005	(MW3B)	0.004	2.5	n/a	<0.005	<0.005	0.019 (>source)+
Approx. Distance from Source (Waste Footprint) to Trigger Point Well (m)								120			
Approx. Distance from Source to Downgradient Attenuation Zone Boundary (m)								400			

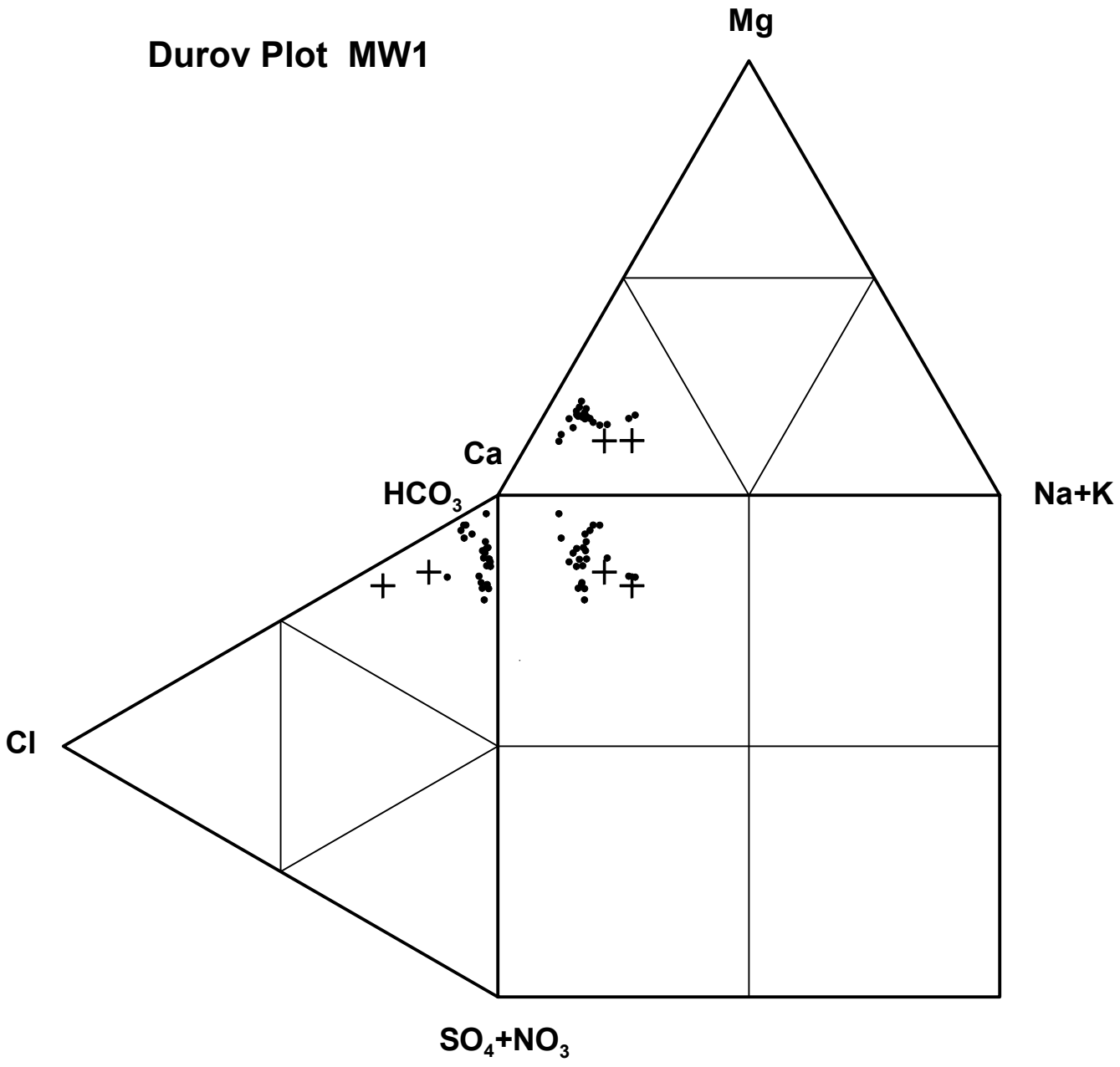
Notes:

1 - Source concentration based on highest concentration measured in indicated wells in 2018.
2 - Background concentration based on arithmetic mean of most recent two year results for MW6.
3 - Attenuation zone boundary concentrations based on the arithmetic mean of the two sampling events for MW11 in 2018, and the higher of the arithmetic mean of the two sampling events for MW10A and MW10B in 2018.
4 - Bracketed PWQO values represent interim criteria.
5 - n/a - not applicable (source concentration lower than or equal to B-7 criterion).
* - Indicates health-based standard.
** - Background exceeds ODWS; B-7 criterion defaults to background.
+ Value exceeds source concentration; therefore, additional source implicated.
++ **Bolded** MW7 concentrations exceed trigger.
Non-detectable concentrations are assumed equal to 1/2 the detection limit (when required for calculations).

APPENDIX H-

Durov Plots

Durov Plot MW1



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

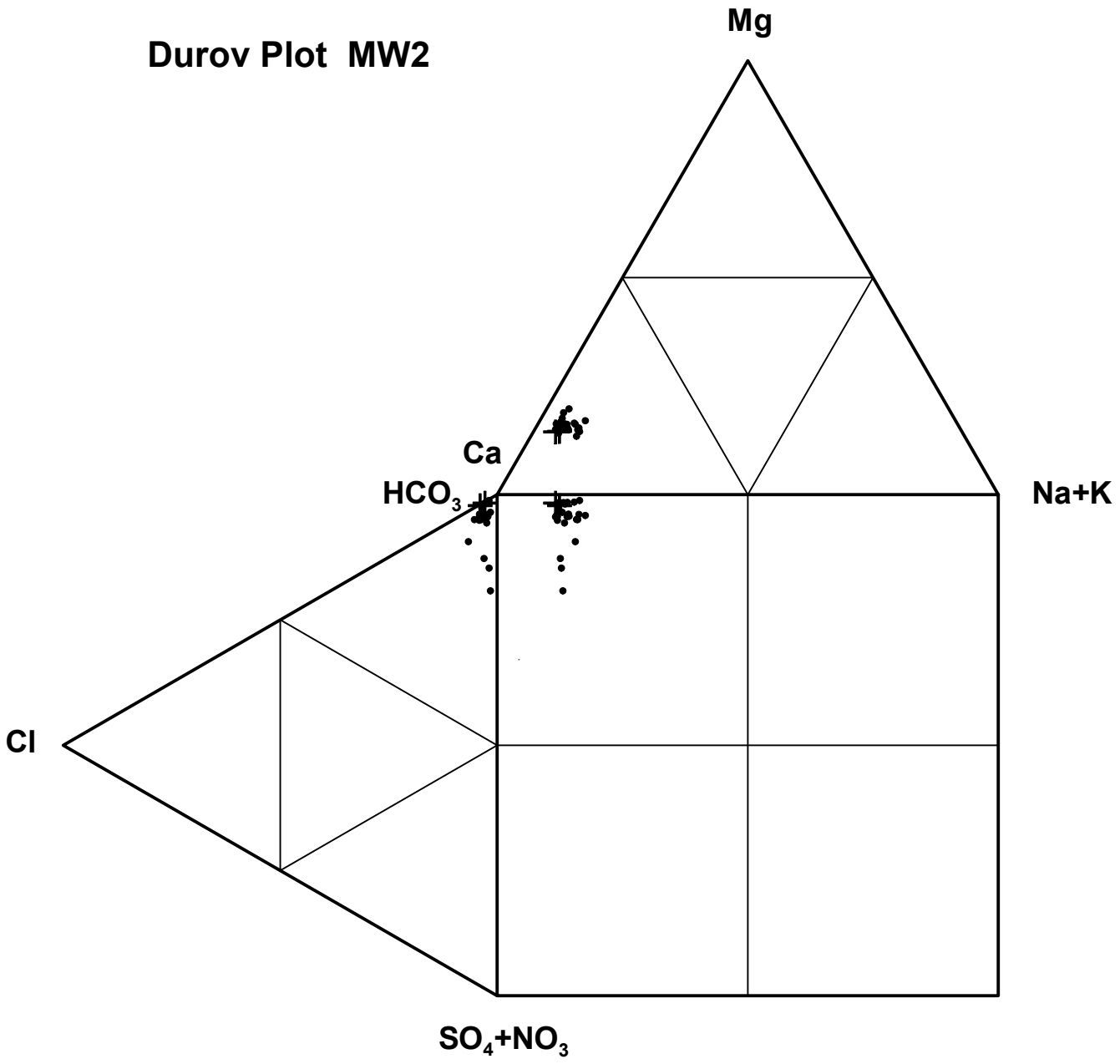
Figure H-1

Monitoring Well MW1

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW2



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

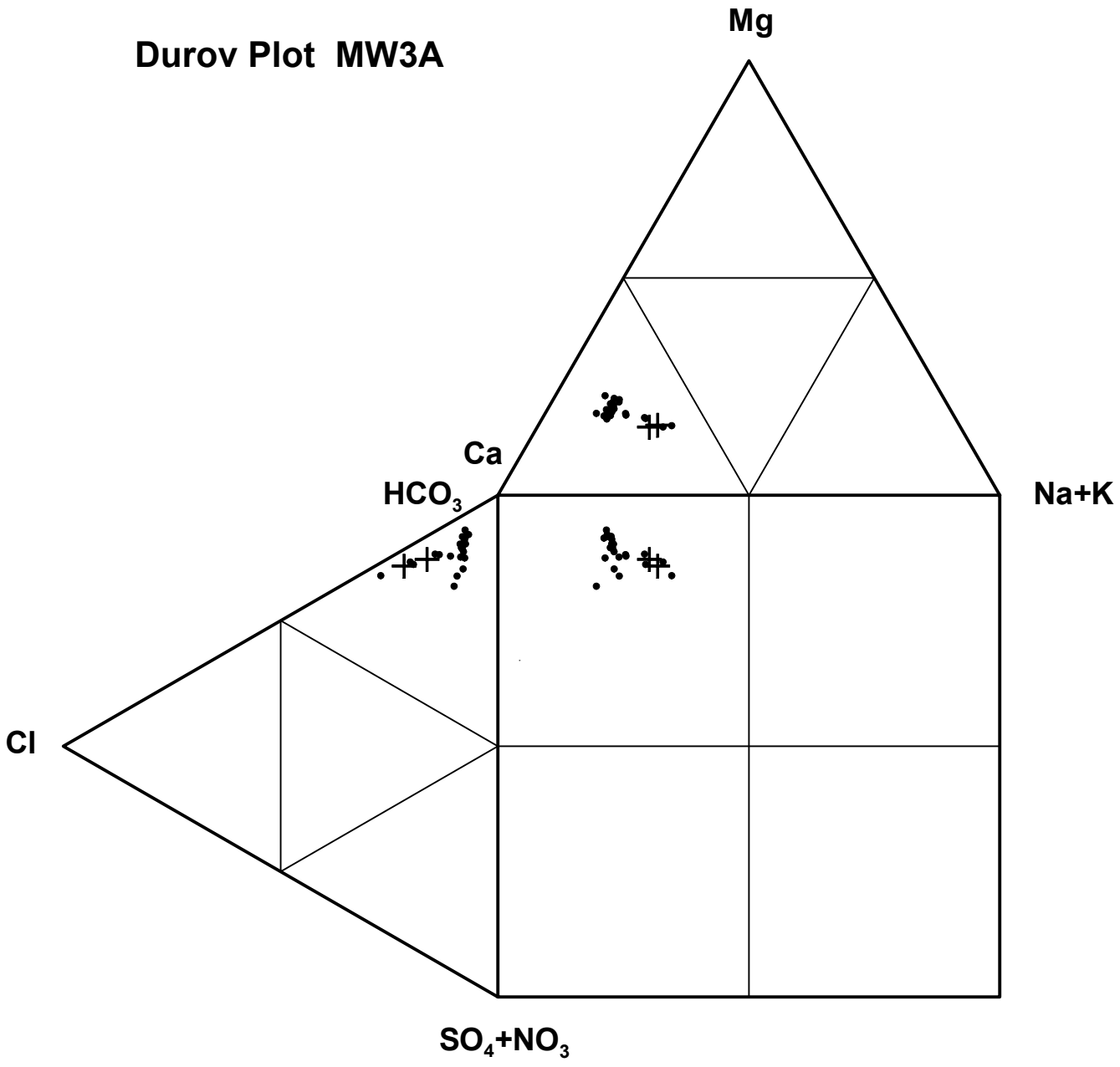
Figure H-2

Monitoring Well MW2

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW3A



Legend
- • Historical Data Point
- \+ 2018 Data

exp.

Thunder Bay, Ontario

Figure H-3

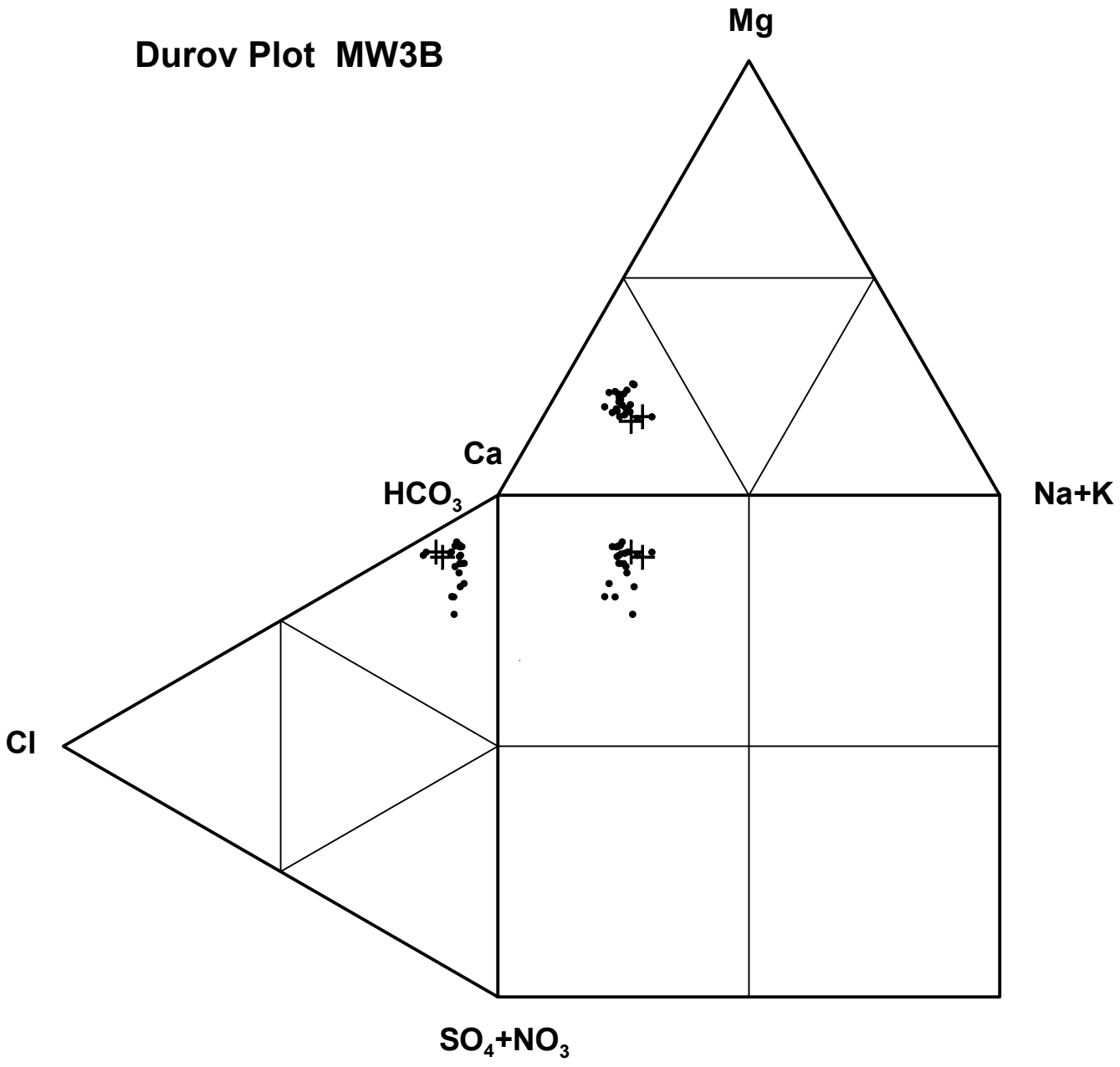
Monitoring Well MW3A

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Drawing to be read in conjunction with accompanying report.

Durov Plot MW3B



Legend

- Historical Data Point
+ 2018 Data

exp.

Thunder Bay, Ontario

Figure H-4

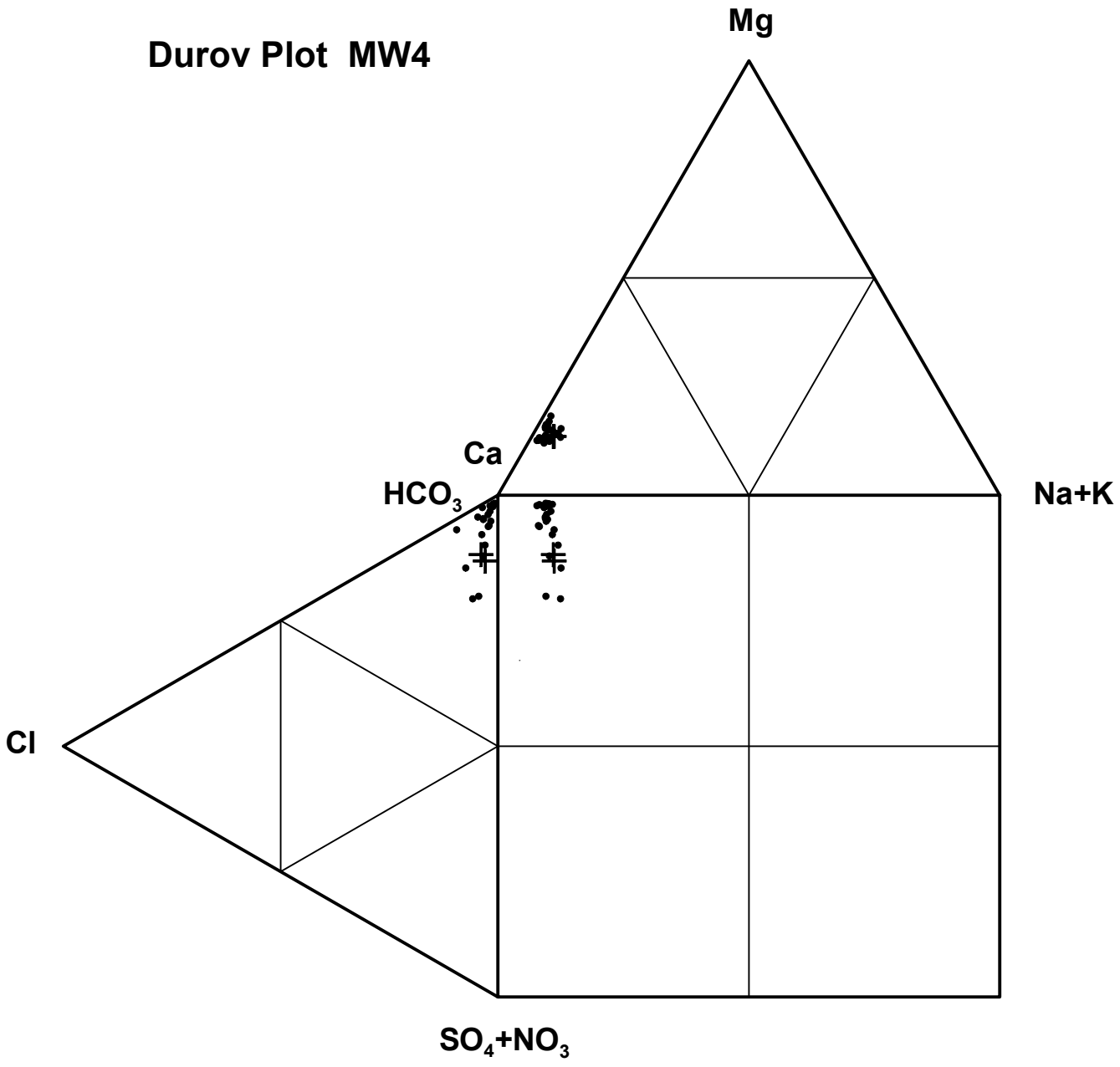
Monitoring Well MW3B

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Drawing to be read in conjunction with accompanying report.

Durov Plot MW4



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

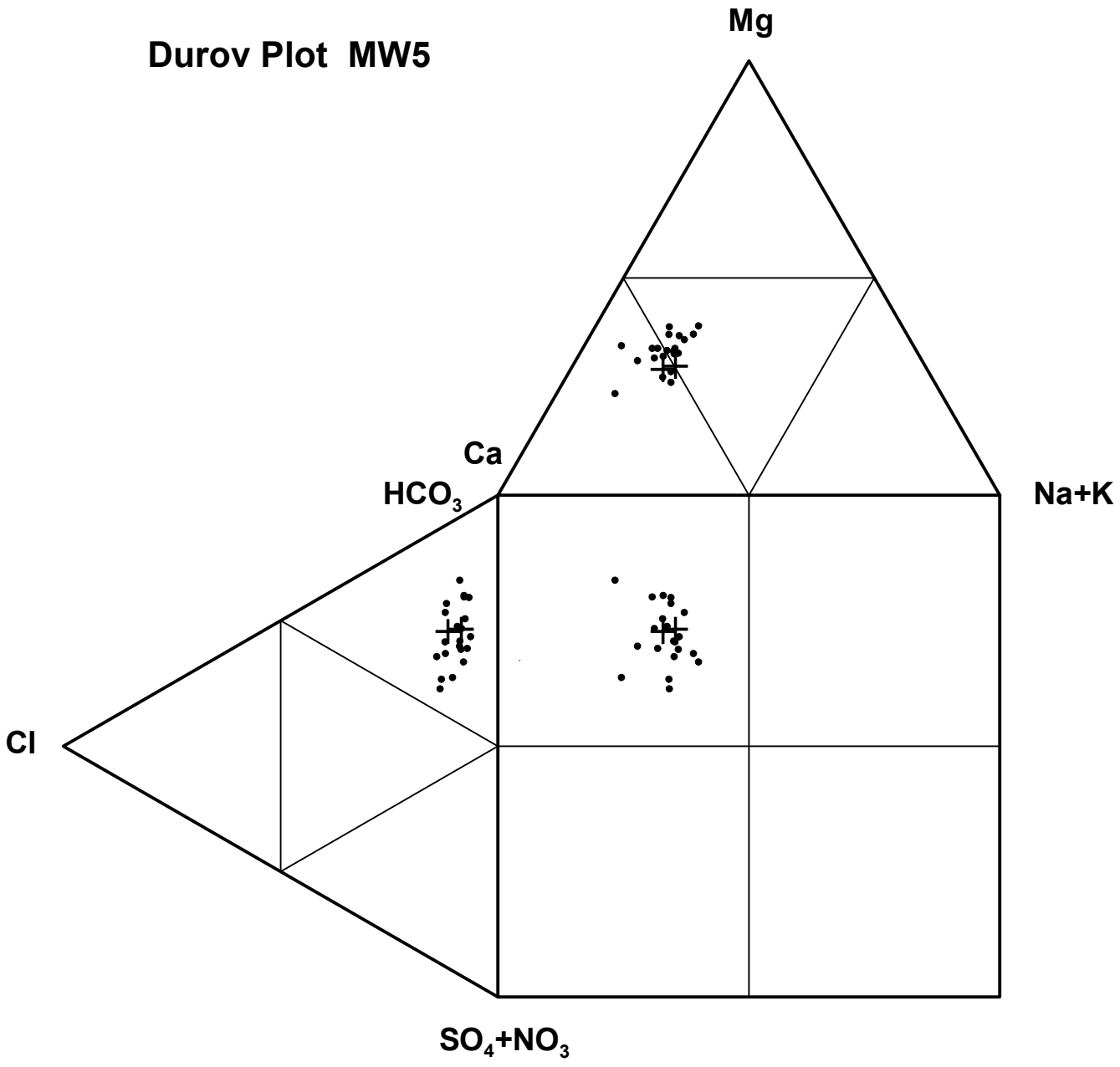
Figure H-5

Monitoring Well MW4

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW5



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

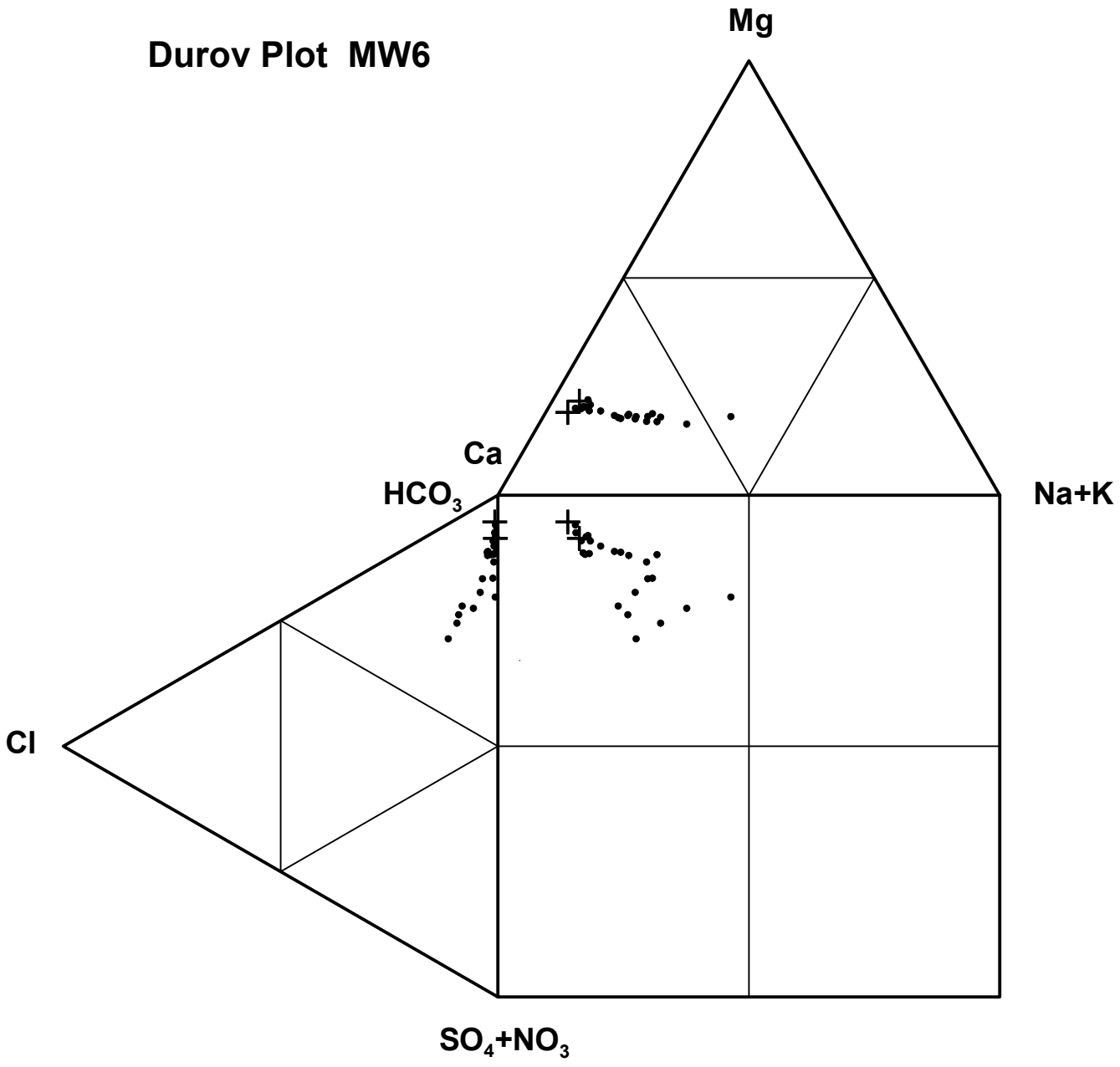
Figure H-6

Monitoring Well MW5

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW6



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

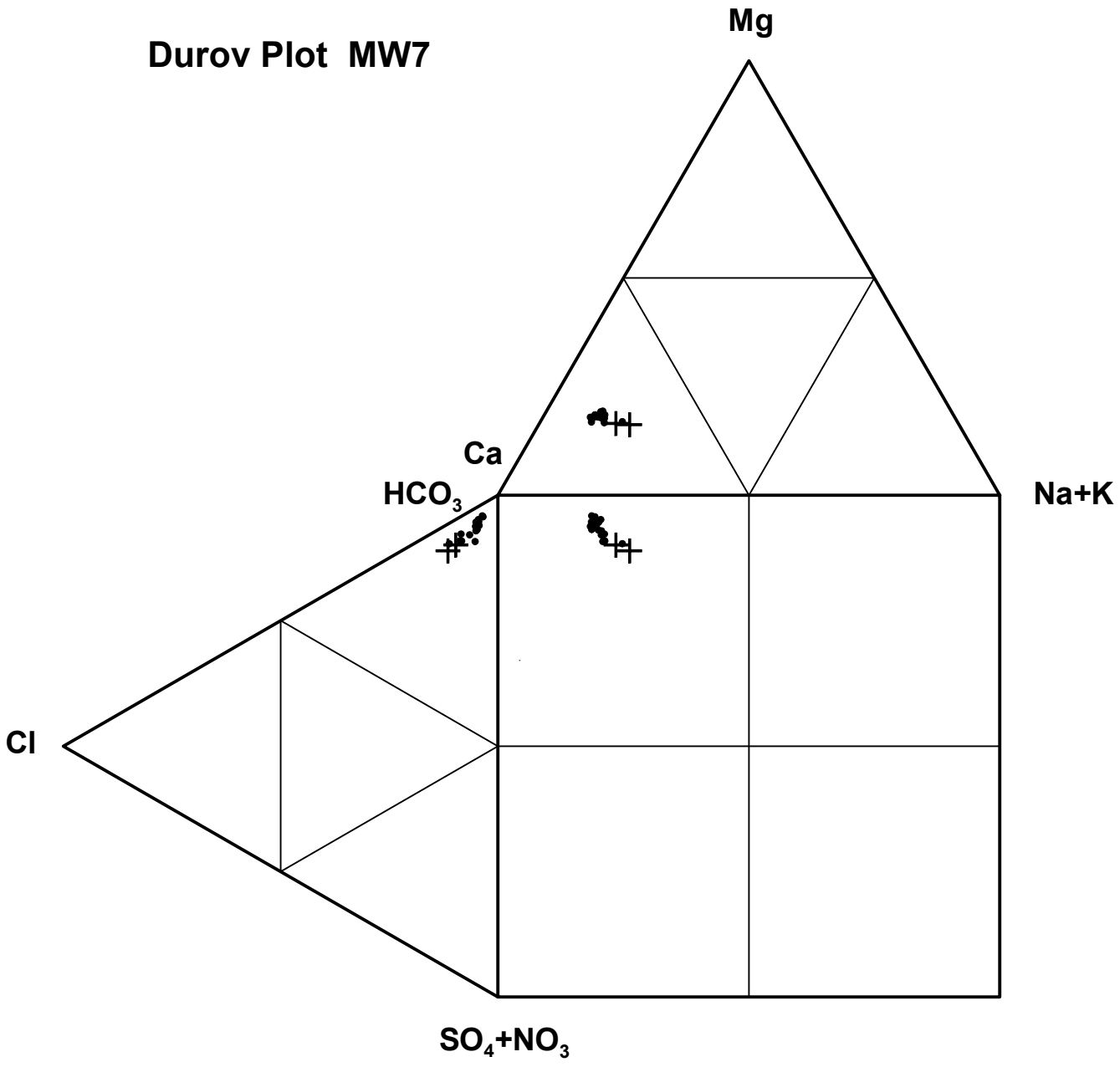
Figure H-7

Monitoring Well MW6

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW7



Legend

- Historical Data Point
+ 2018 Data

exp.

Thunder Bay, Ontario

Figure H-8

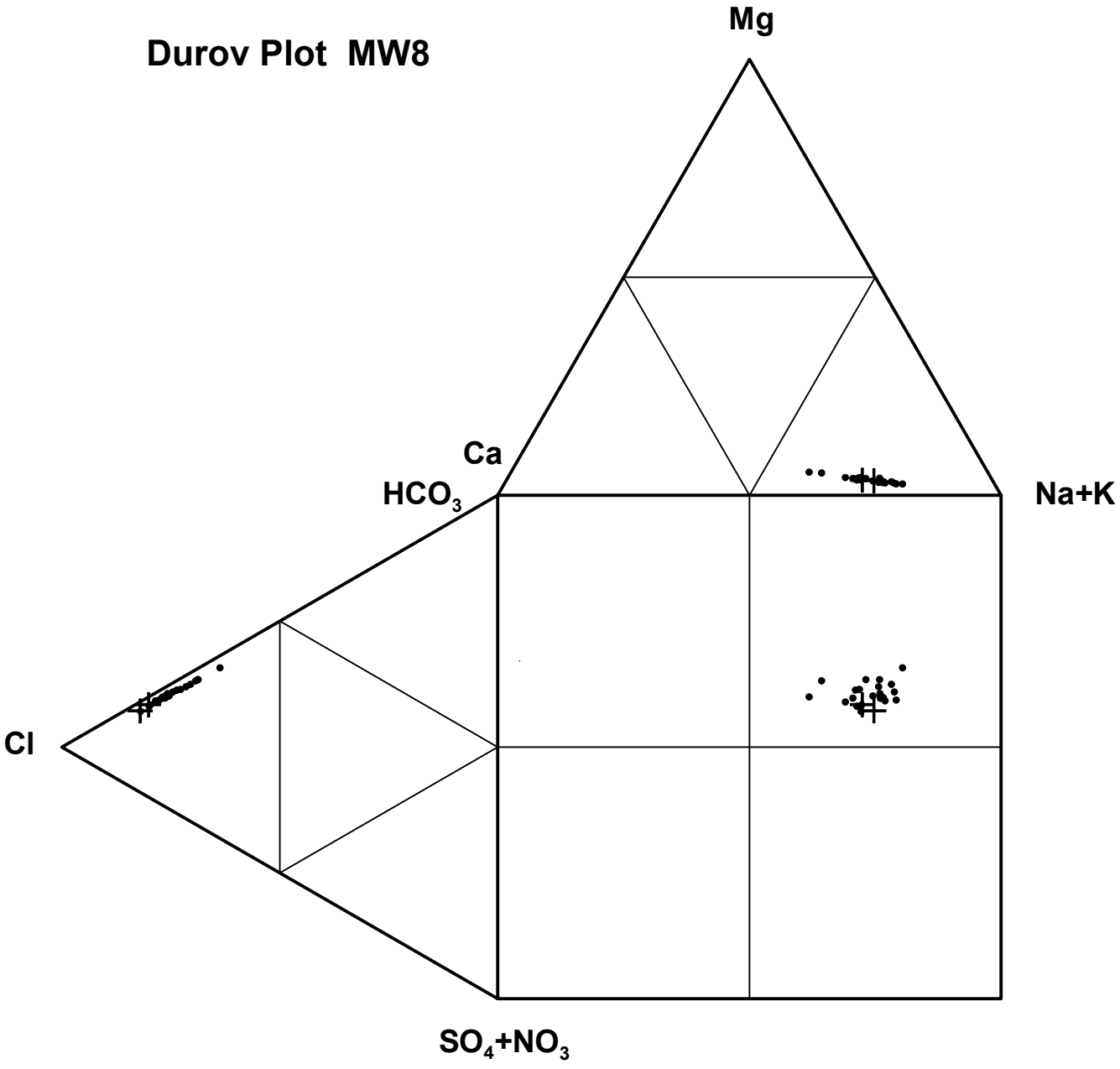
Monitoring Well MW7

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Drawing to be read in conjunction with accompanying report.

Durov Plot MW8



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

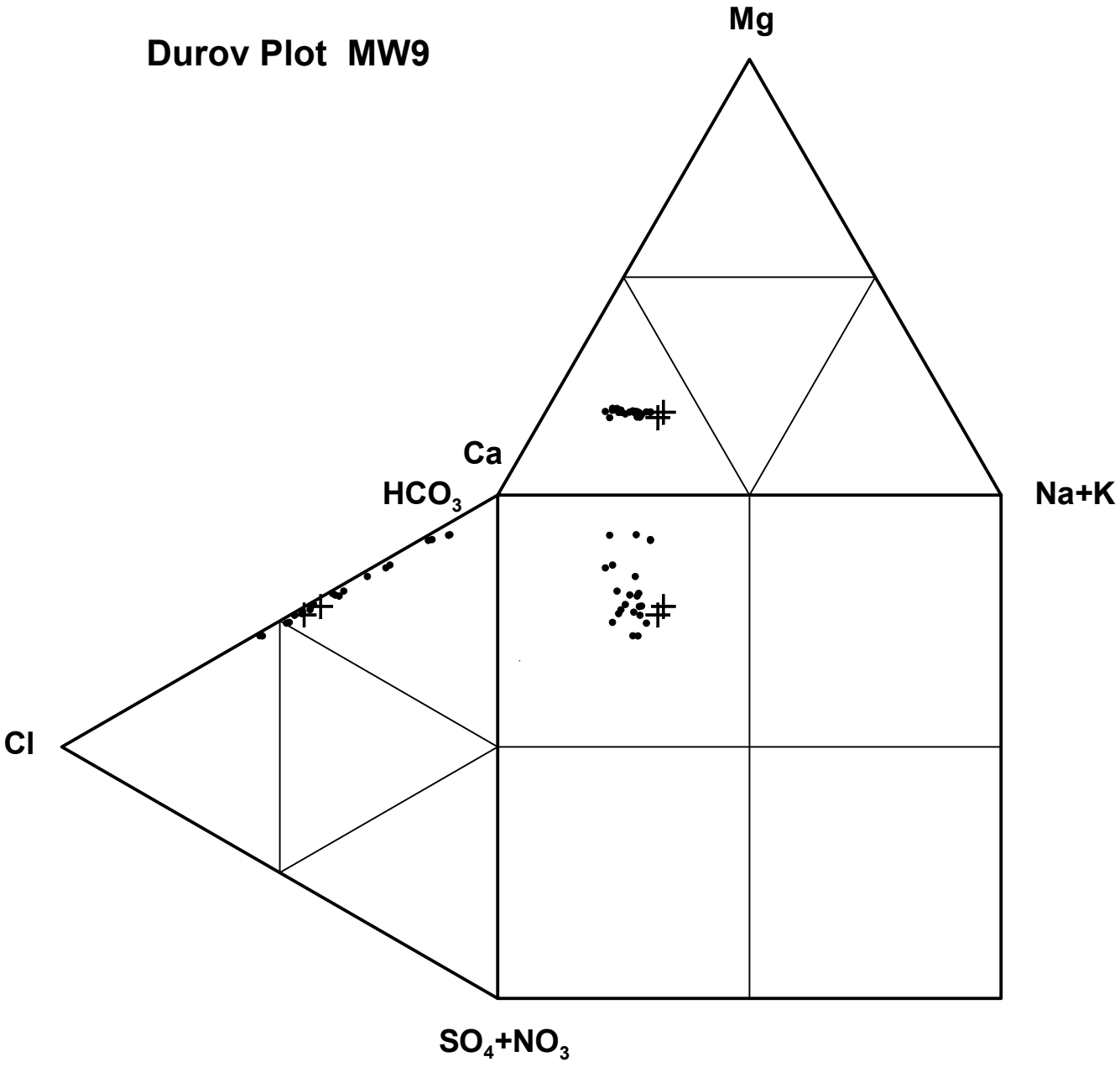
Figure H-9

Monitoring Well MW8

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW9



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

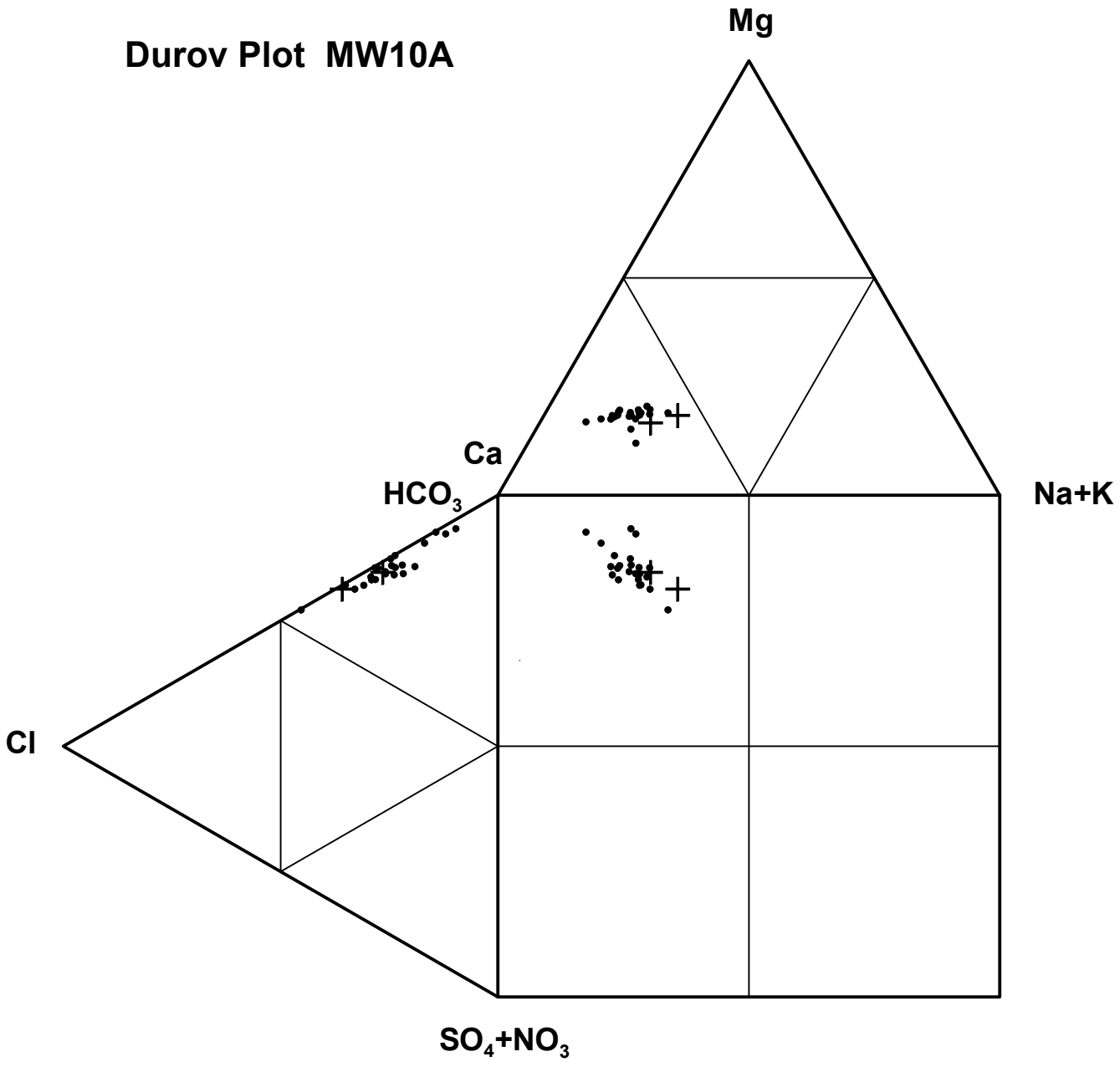
Figure H-10

Monitoring Well MW9

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW10A



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

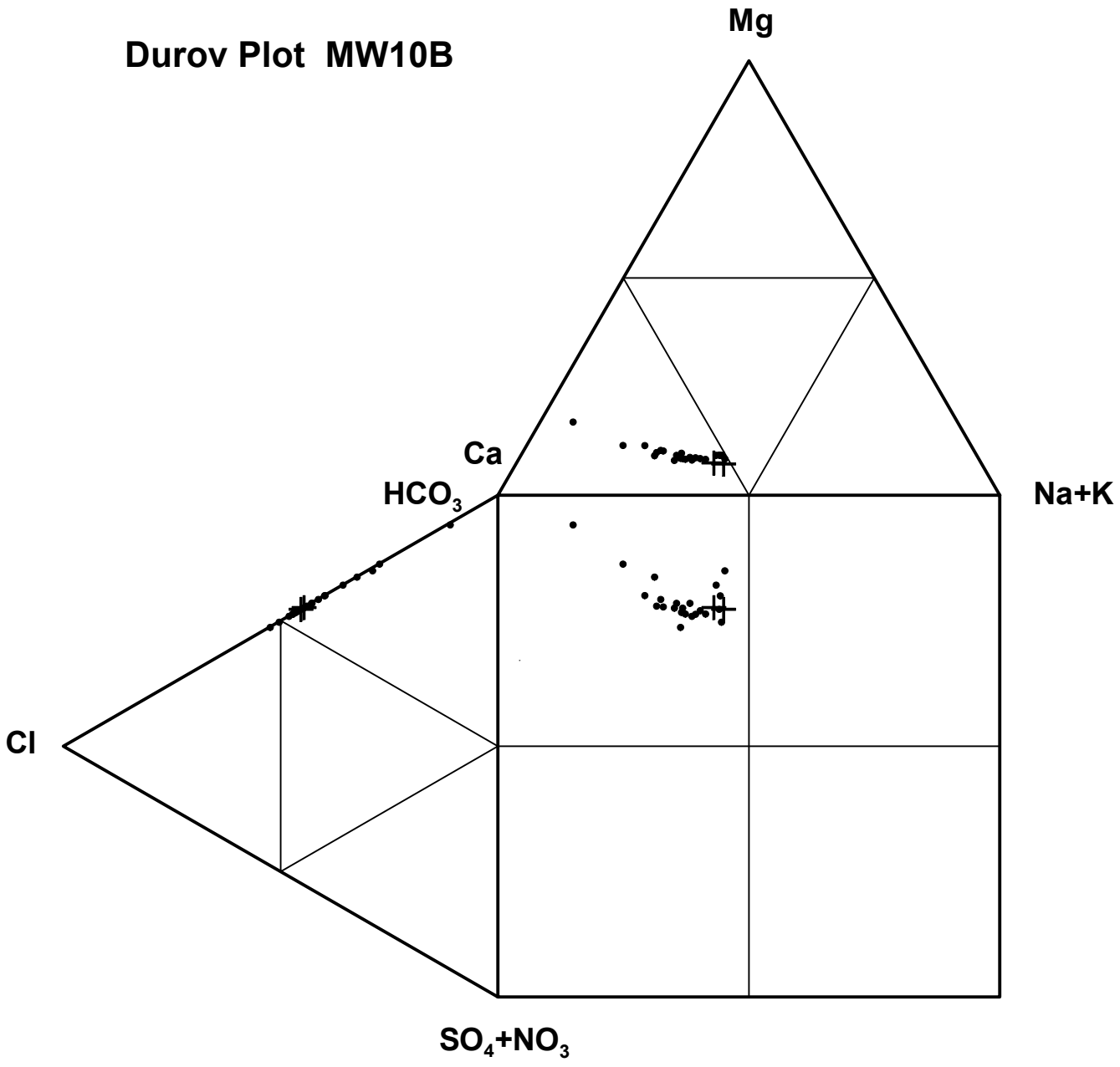
Figure H-11

Monitoring Well MW10A

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW10B



Legend

- Historical Data Point
+ 2018 Data

Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

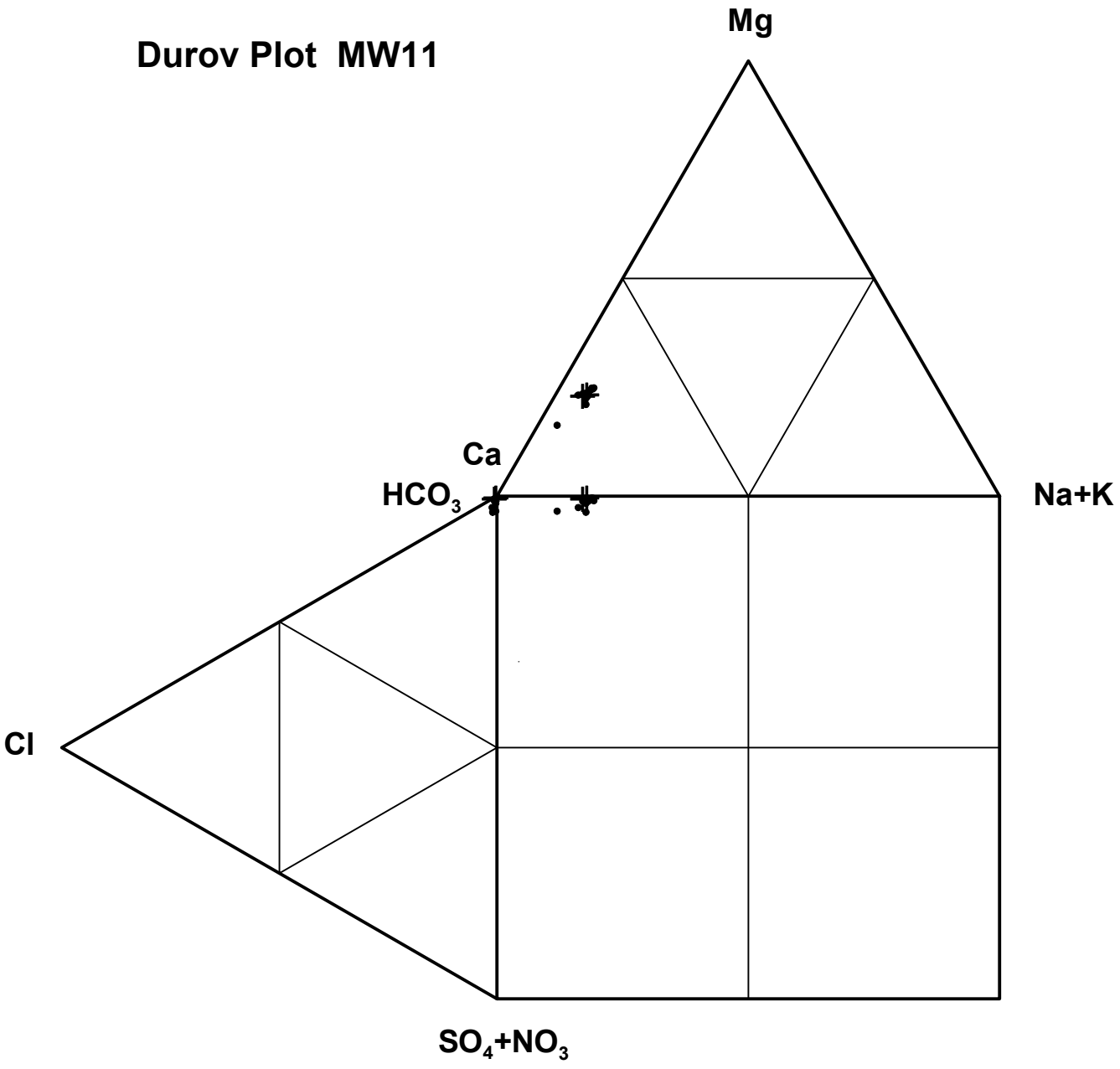
Figure H-12

Monitoring Well MW10B

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Durov Plot MW11



Legend

- Historical Data Point
+ 2018 Data

exp.

Thunder Bay, Ontario

Figure H-13

Monitoring Well MW11

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

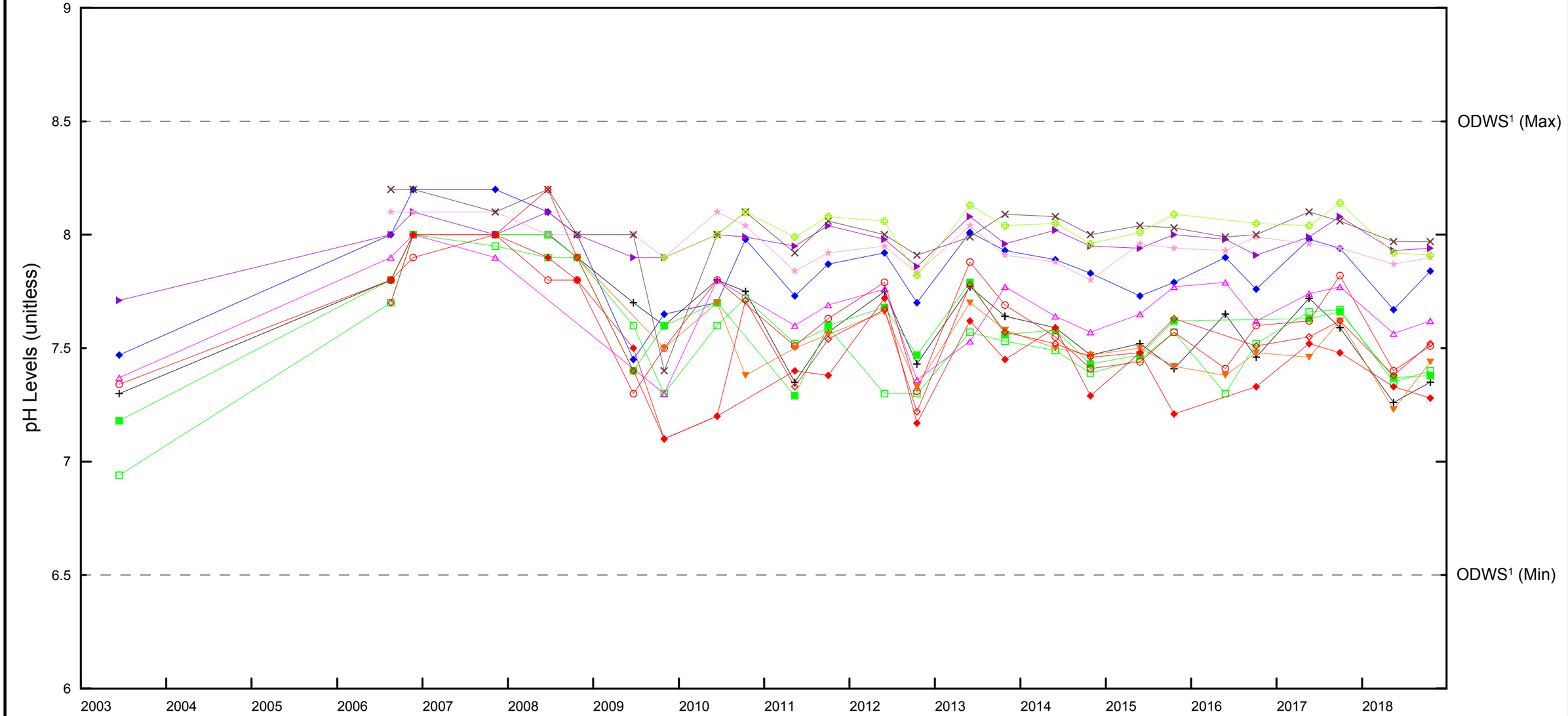
REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	February 4, 2019

Drawing to be read in conjunction with accompanying report.

APPENDIX I-

Time Series Graphs

pH



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

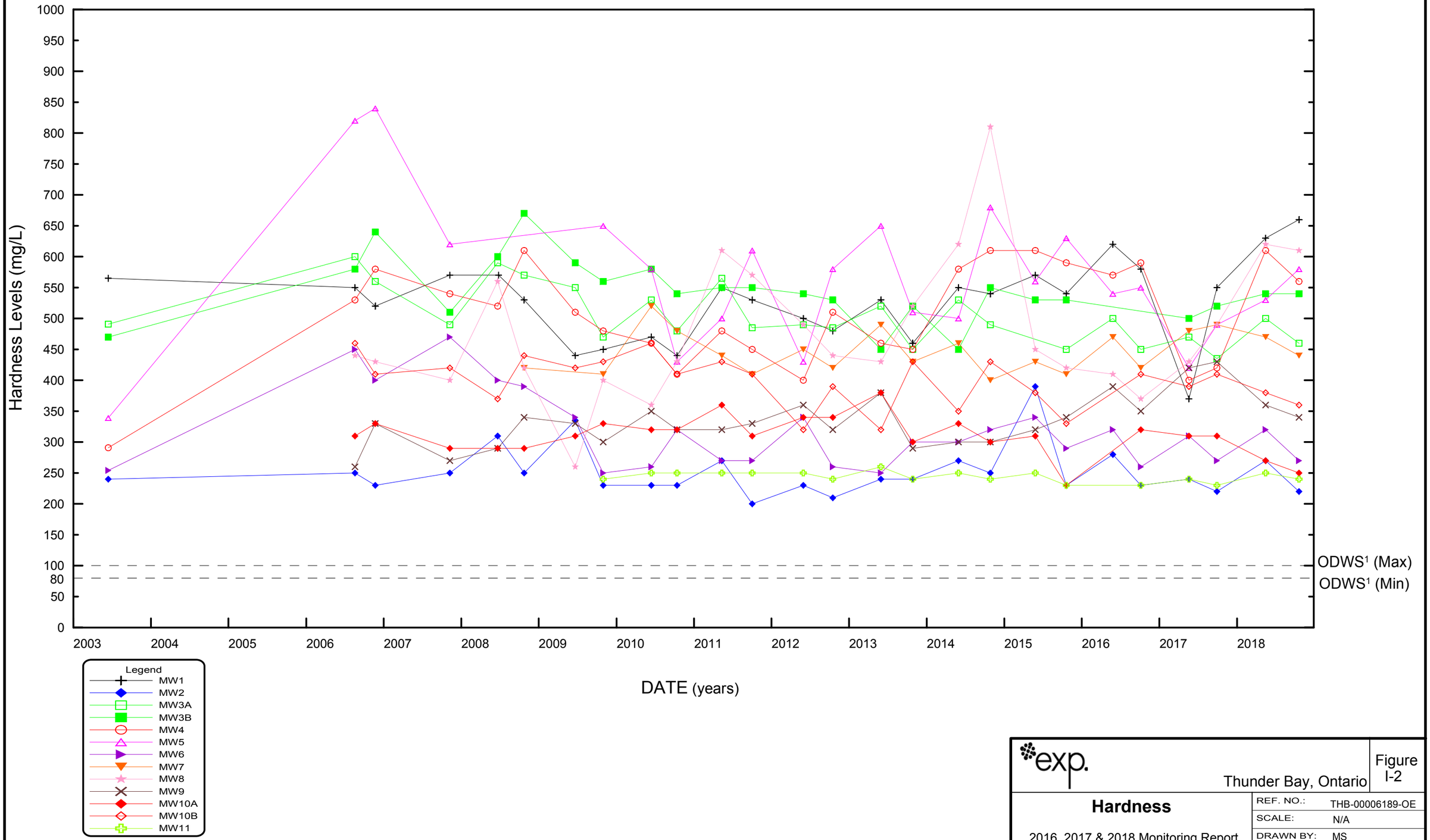
Figure I-1

pH

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

Hardness



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

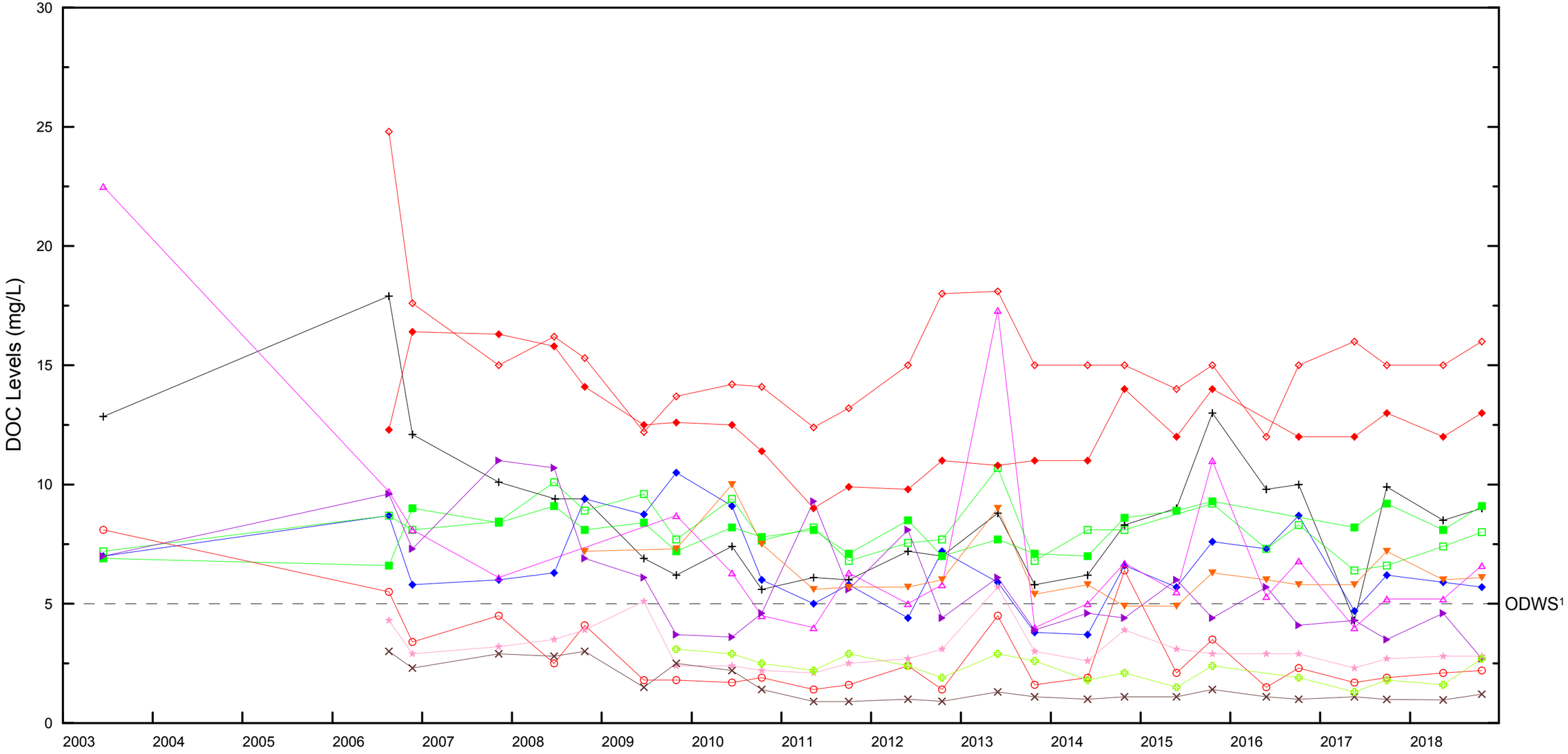
Figure I-2

Hardness

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

Dissolved Organic Carbon



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

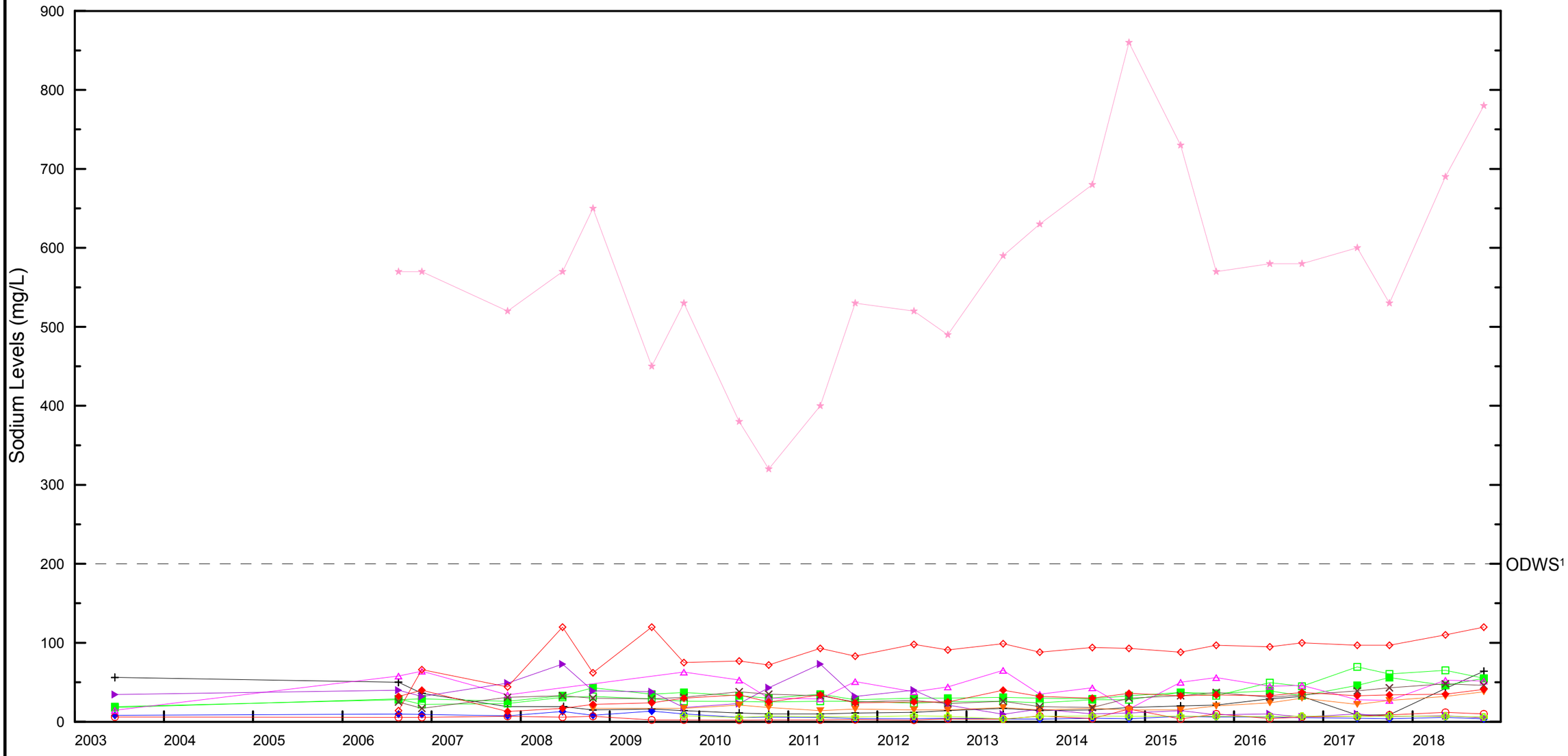
Figure I-3

DOC

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

Sodium



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp.

Thunder Bay, Ontario

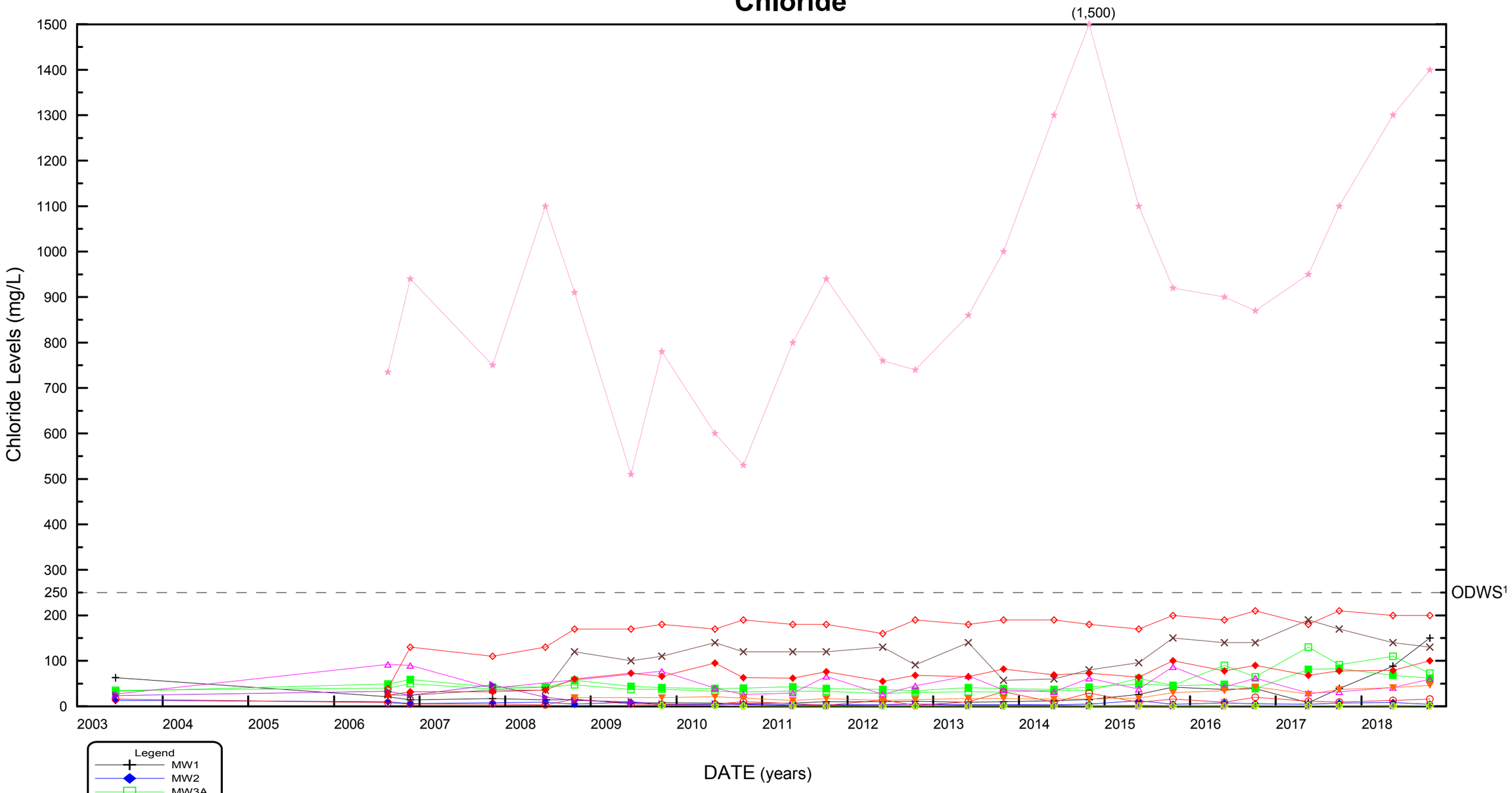
Figure I-4

Alkalinity

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 8, 2019

Chloride



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

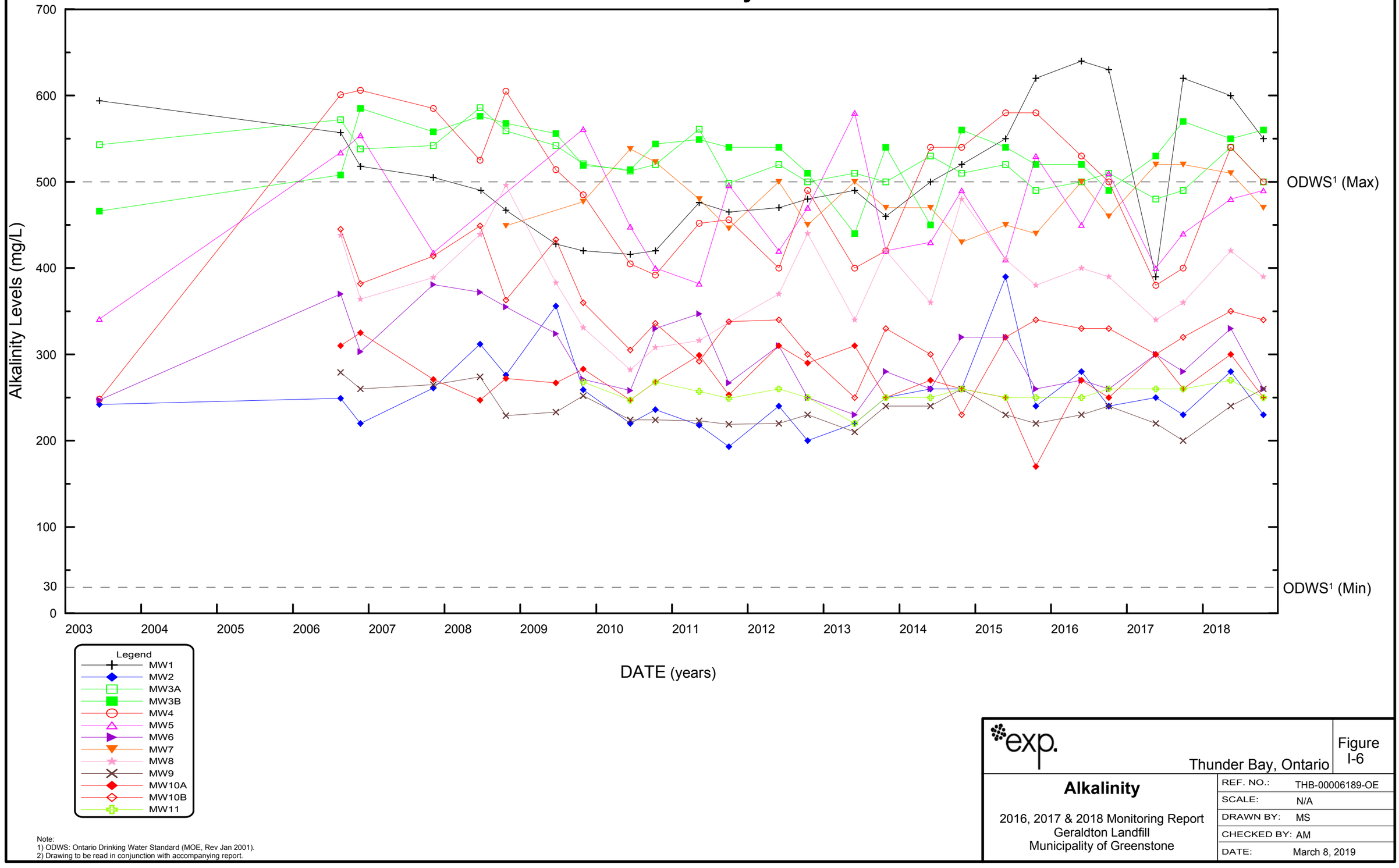
Figure I-5

Chloride

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 8, 2019

Alkalinity



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

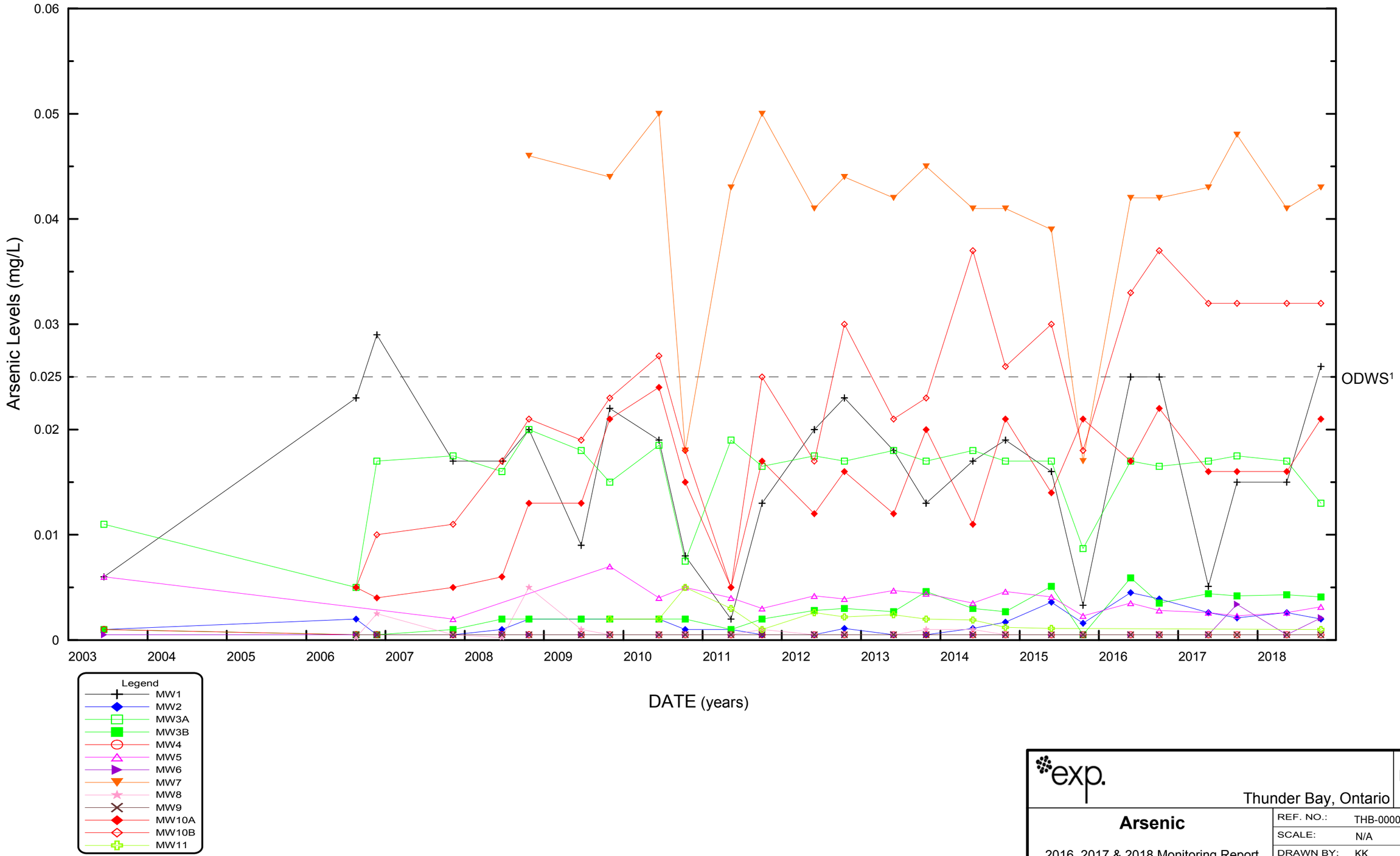
Figure I-6

Alkalinity

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

Arsenic



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

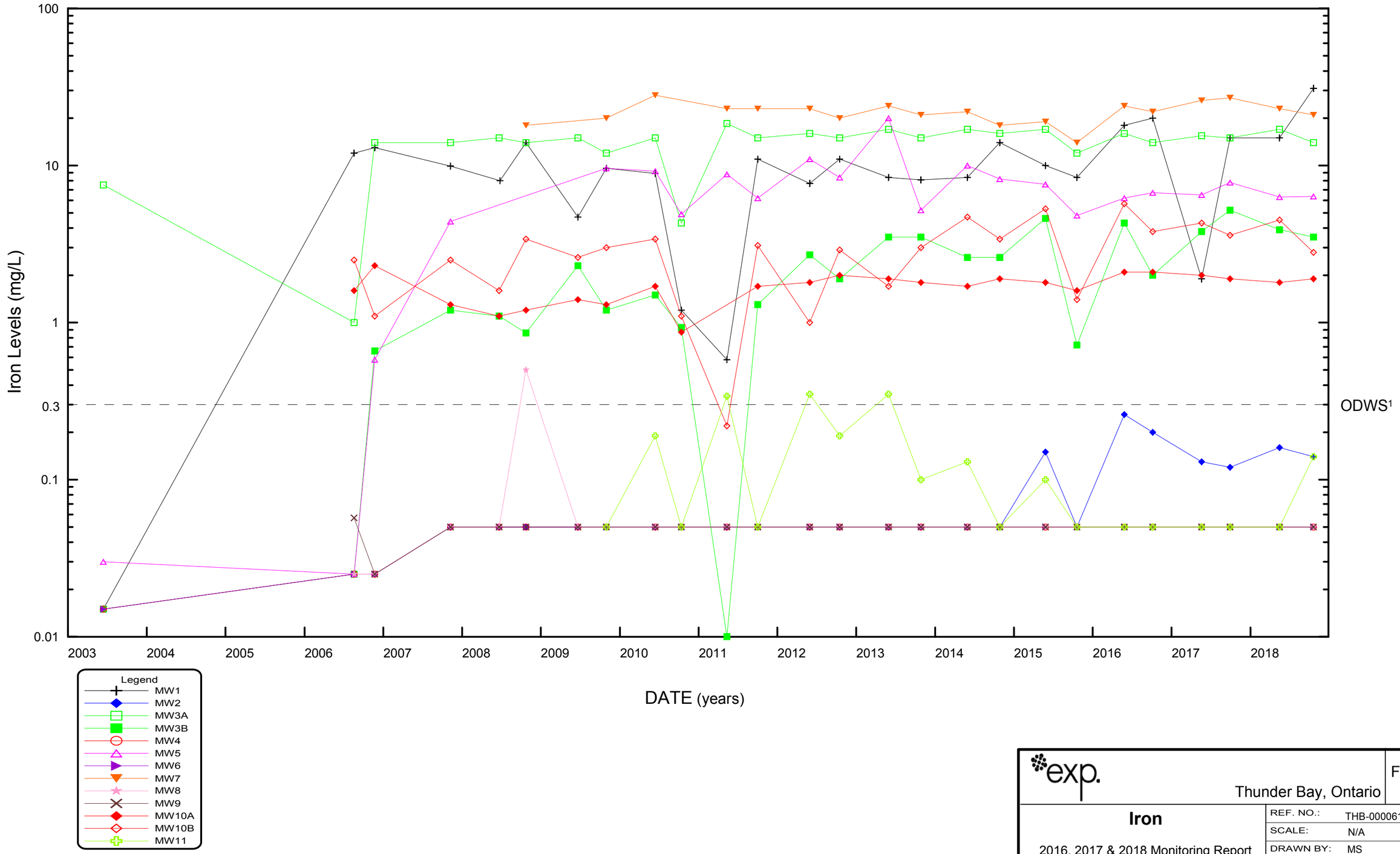
Figure I-7

Arsenic

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	KK
CHECKED BY:	AM
DATE:	March 8, 2019

Iron



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

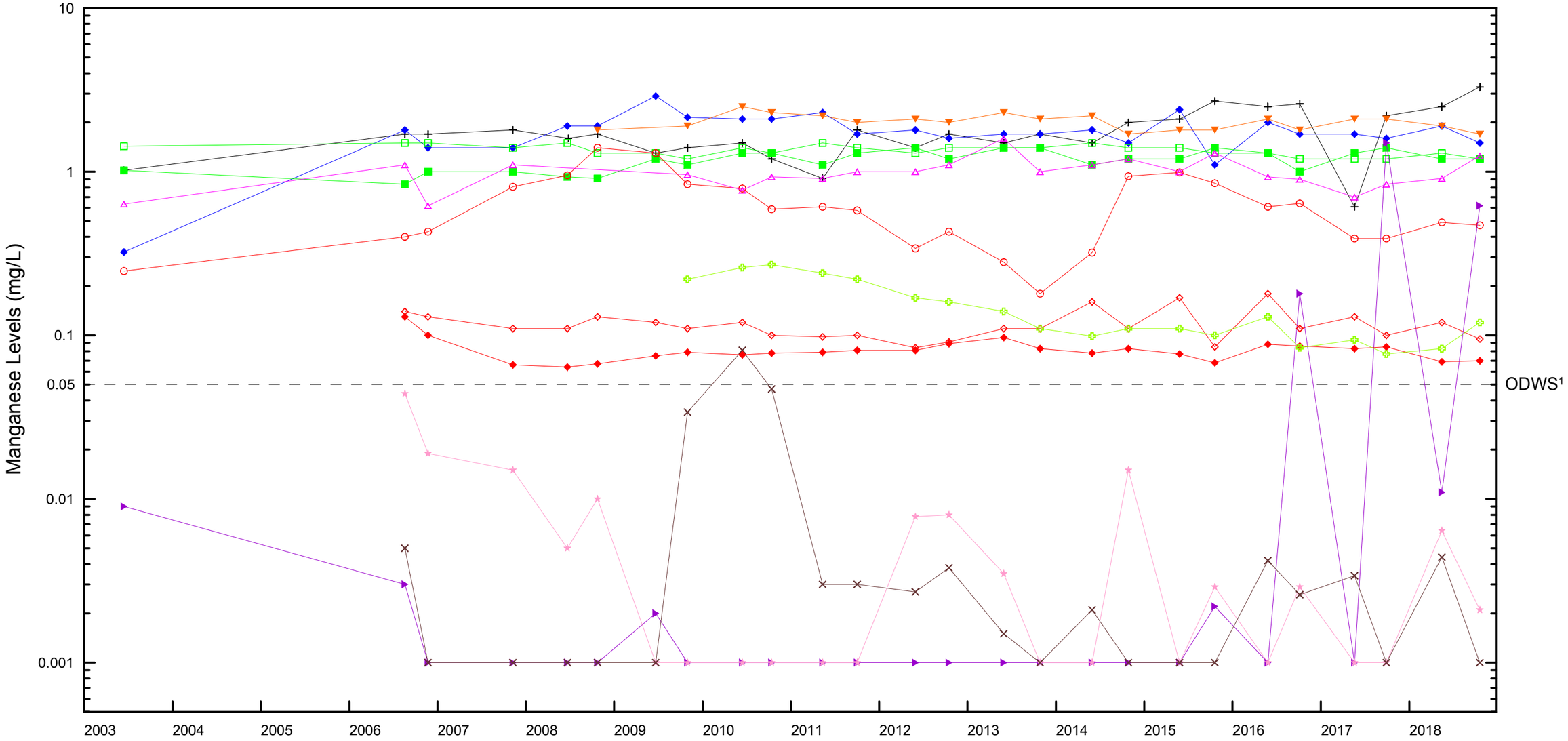
Figure I-8

Iron

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

Manganese



Note:
1) ODWS: Ontario Drinking Water Standard (MOE, Rev Jan 2001).
2) Drawing to be read in conjunction with accompanying report.

exp. Thunder Bay, Ontario

Figure I-9

Manganese

2016, 2017 & 2018 Monitoring Report
Geraldton Landfill
Municipality of Greenstone

REF. NO.:	THB-00006189-OE
SCALE:	N/A
DRAWN BY:	MS
CHECKED BY:	AM
DATE:	March 8, 2019

APPENDIX J-

Survey Plan

Legend

- Denotes Monitor Well
- Denotes Found Monument
- Denotes Utility Pole
- Denotes Overhead Wire
- Denotes Treeline
- Denotes Existing Property Line (As stated by landfill manager)

Indicates Apparent Fresh Garbage Deposits

Note

Coordinates are metric, low order UTM control.

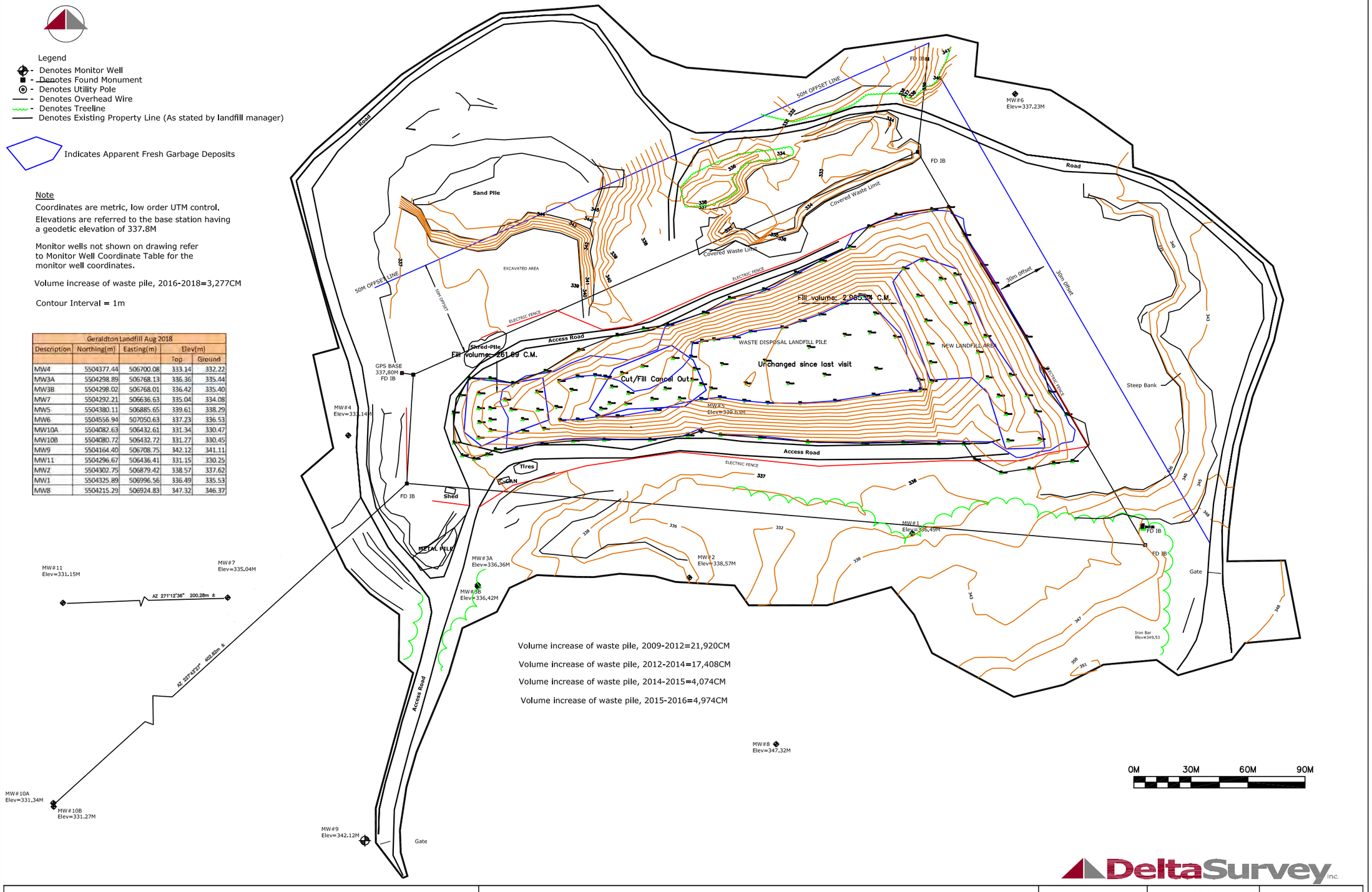
Elevations are referred to the base station having a geodetic elevation of 337.8M

Monitor wells not shown on drawing refer to Monitor Well Coordinate Table for the monitor well coordinates.

Volume increase of waste pile, 2016-2018=3,277CM

Contour Interval = 1m

Geraldton Landfill Aug 2018				
Description	Northing(m)	Easting(m)	Elev(m)	
			Top	Ground
MW4	5504377.44	506700.08	333.14	332.22
MW3A	5504298.89	506768.13	336.36	335.44
MW3B	5504298.02	506768.01	336.42	335.40
MW7	5504292.21	506636.63	335.04	334.08
MW5	5504380.11	506885.65	339.61	338.29
MW6	5504556.94	507050.63	337.23	336.53
MW10A	5504082.63	506432.61	331.34	330.47
MW10B	5504080.72	506432.72	331.27	330.45
MW9	5504164.40	506708.75	342.12	341.11
MW11	5504296.67	506436.41	331.15	330.25
MW2	5504302.75	506879.42	338.57	337.62
MW1	5504325.89	506996.56	336.49	335.53
MW8	5504215.29	506924.83	347.32	346.37



DeltaSurvey inc.

EXP	Topographic Survey of Geraldton Landfill Municipality of Greenstone	Scale As Plotted	Aug 23, 2018	DS17-39
		Rev 1	Oct 10th, 2018	Drawn By: TE/CF