APPENDIX J

Biomonitoring Report

Clean Harbors Canada, Inc.

2016 Annual Landfill Report

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

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March 10, 2017

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Executive Summary

In 1991, Laidlaw Environmental Services Inc. initiated an annual Biomonitoring Program near their hazardous waste landfill and liquid-injection incinerator (the Lambton Facility) located on Lot 9, Concession 10, St. Clair Township in Lambton County, Ontario. The Lambton Facility is a hazardous waste management complex which includes a high temperature incinerator and a secure landfill and is currently owned and operated by Clean Harbors Canada Inc. (Clean Harbors). The Biomonitoring Program continues as one of the facility's ongoing monitoring programs required under condition 9 of its Environmental Compliance Approval (ECA No. A031806) dated September 5, 1997 and as amended. The Biomonitoring Program monitors baseline levels of selected chemicals in environmental media (soil, drainage ditch sediment, natural vegetation and agricultural crops) at selected locations (sites) within approximately 1.5 kilometers of the Lambton Facility and provides an indication of trends, through time, in the concentration of analytes of the sampled media.

In 2015, samples collected in summer and fall from 14 sites were analyzed for select metals, and organic chemicals. Increasing trends over time were identified in select metals, locations and various environmental media. Overall, the majority of exceedances and increasing trends were identified for metals that are part of the Group 1 Analytes[1] which are known to be ubiquitous in the environment. With a few exceptions, monitoring of metals will continue but do not warrant additional investigation at this time. A literature review is recommended to investigate the elevated concentrations of calcium in samples of soil collected from Site N5. Also, given the number of metals in sediment at Sites N2 and E2 with repeating upward trends, additional investigation is recommended.

Group 3 organic analytes[2] were not detected at concentrations representative of concern for ecological health during the 2015 Field Year.

The concentrations of the identified chemicals were within the expected range in comparison to baseline levels, with a few exceptions such as calcium concentrations in soil. The range of results indicates that the Biomonitoring Program continues to effectively meet its specific objectives of monitoring environmental concentrations and identifying the trends in concentrations over time.

Changes to the Biomonitoring Program have been proposed to the Ministry of the Environment and Climate Change to streamline the program and to accommodate the Landfill Expansion currently underway. Upon approval by the MOECC, these changes could be implemented during the next cycle of the Biomonitoring Program beginning in the 2017 Field Year.

[1] Group 1 Analytes are ubiquitous or required nutrients in the environment and are not expected to have harmful effects on plant, human, and animal health from chemical toxicity (Appendix A).
[2] Organic analytes with reported toxicity that are produced when certain waste streams are incinerated. These organic analytes are documented to accumulate in the environment (Appendix A).

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Technical Summary

The Biomonitoring Program is one of the Lambton Facility's ongoing monitoring programs, which are required under condition 9 of the Facility's Environmental Compliance Approval No. A031806 dated September 5, 1997, and as amended. The Biomonitoring Program provides an indication of trends, through time, in the concentration of analytes in several environmental media at a network of test sites located within approximately 1.5 km of the Lambton Facility boundary. Each year, samples from up to four environmental media (soil, drainage ditch sediment, natural vegetation, and agricultural crops) from each of the test sites are collected and submitted to the analytical laboratory to determine the concentration of selected metals, pesticides, chlorinated phenols, and dioxins and furans. In 2015, 14 test sites were monitored.

The review and comparison of the 2015 data relative to the upper control limits (UL15)[3] for each site and on a site-wide basis was completed for inorganic analytes. The concentrations of 21 inorganic analytes (15 Group 1[1] analytes and six Group 2 analytes[4]) exceeded their respective site-specific UL15 while four Group 1 analytes and one Group 2 analyte exceeded their site-wide UL15.

Concentrations of a limited number of inorganic chemicals in sediment, natural grasses, and soil collected and analyzed in 2015 exceeded the Ontario Typical Ranges for Rural Parkland Soil (rural parkland OTR_{98}) (Ministry of the Environment and Climate Change, MOECC, 2011), the rural Upper Limit of Normal (ULN) (MOECC, 1989), the MOECC O.Reg.153/04 Table 1 Sediment Site Condition Standard (SCS), the MOECC O.Reg.153/04 Table 1 Soil SCS (MOECC, 2011), or the Provincial Sediment Quality Guidelines (PSQG) (MOECC, 2008).

Overall, the majority of exceedances of the UL15 in the 2015 Field Year were identified for Group 1 inorganic analytes (barium, beryllium, boron, calcium, chloride, cobalt, iron, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, strontium and sulfur). With the exception of calcium concentrations in soil, the exceedances of the Group 1 analytes do not warrant additional investigation at this time. Based on the repeated exceedance of the UL15 by calcium in soil at Site N5, additional investigation is warranted.

A select number of Group 2 analytes were found to have exceeded the site-specific UL15 (aluminum, arsenic, copper, lead, mercury and zinc). However, the concentrations of these analytes were below levels associated with potential phytotoxicity. Consequently, continued monitoring is recommended but additional investigation is not warranted at this time.

[3] The Upper Control Limits (UL) is the mean concentration of the analyte plus three standard deviations of the sample population. Site-specific and site-wide UL15 values were calculated using data collected from 1991-2014.
[4] Group 2 Analytes are known to have toxicological effects (Appendix A).

Concentration trend lines using linear regression statistics were updated on a site-specific basis for inorganic analytes. The purpose was to identify trends in the concentration of analytes (i.e. downward, upward, no change) over time. In summary, 99 regressions (upward and downward trends) were significant at $p<0.003$ based on detected concentrations; 15 showed a downward trend, and 84 showed an upward trend. Twenty five (25) of the 84 increasing trends had 2015 Field Year concentrations measure above their applicable guidelines, and 39 of the 84 increasing trends are repeated trends from the previous reporting cycle in the 2012 Field Year. The majority of the upward trends were Group 1 analytes. Group 2 analytes with upward trends included aluminum, arsenic, cadmium, lead, vanadium and zinc. Given the number of inorganic parameters in sediment at Sites N2 and E2 with repeating upward trends, additional investigation into the health of the benthic communities at these sites is recommended.

Group 3 organic analytes[5] were not detected at concentrations representative of concern for ecological health during the 2015 Field Year.

A select number of organochlorine pesticides (OCP) analytes were measured at concentrations above their applicable reporting detection limit (RDL)[6]. However, all detected concentrations of OCPs were below the applicable rural parkland OTR_{98} and MOECC 153/04 Table 1 SCS, where available for comparison.

Polychlorinated biphenyls (PCBs) were not identified at concentrations greater than their respective RDLs. Pentachlorophenols (PCPs) were detected at low levels in three agricultural crop samples. Monitoring should continue but no additional examination is warranted.

Dioxins/furans (PCDD/DF) were not reported at concentrations greater than the rural parkland OTR_{98}.

[5] Organic analytes with reported toxicity that are produced when certain waste streams are incinerated. These organic analytes are documented to accumulate in the environment (Appendix A).
[6] The low concentration at which laboratory analyses will consistently detect the analytes when present.

Abbreviations

CCME	Canadian Council of Ministers of the Environment
CEC	Cation exchange capacity
conc	Concentration
ECD	Electron capture detection (see Appendix A)
GC	Gas chromatography (See Appendix A)
GLP	Good Laboratory Practice (See Appendix A)
H^+	Hydrogen ion (See Appendix B)
HRGC	High resolution gas chromatography
ICP-MS	Inductively coupled plasma – mass spectrophotometry (see Appendix A)
ICP-OES	Inductively coupled plasma - optical emission spectroscopy (See Appendix A)
LEL	Lowest effect level
MDL	Method detection limit
meq	Milliequivalent
MOECC	Ministry of the Environment and Climate Change (formerly the Ministry of the Environment (MOE))
MS	Mass spectrometry (See Appendix A)
ND	Not detected
OCDD	Octachlorodibenzodioxin
OCP	Organochlorinated pesticide
OM	Organic matter
OECD	Organization for Economic Cooperation and Development (see Appendix A)
OTR_{98}	Ontario Typical Range
PCB	Polychlorinated biphenyls
PCDD	Polychlorodibenzo-p-dioxin
PCDF	Polychlorodibenzo-furan
PCP	Pentachlorophenol

Abbreviations
March 10, 2017

pH	-log[H+]
pg	Picograms
ppm	Parts per million
PSQG	Provincial Sediment Quality Guidelines
RDL	Reporting Detection Limit
QA/QC	Quality assurance/quality control
RDFN	Raw data file notebook
RPD	Relative Percent Difference
SCC	Standards Council of Canada (see Appendix A)
SCS	Site Condition Standard
SD	Standard deviation
SEL	Severe effect level
TEF	Toxic equivalency factor
TEQ	Toxicity equivalents
UL	Upper control limit
ULN	Upper Limit of Normal
US EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

In 1991, Laidlaw Environmental Services Inc. initiated an annual Biomonitoring Program near their hazardous waste landfill and liquid-injection incinerator (the Lambton Facility) located on lot 9, concession 10, St. Clair Township in Lambton County, Ontario. The Lambton Facility is a hazardous waste management complex which includes a high temperature incinerator and a secure landfill and is currently owned and operated by Clean Harbors Canada Inc. (Clean Harbors). The Biomonitoring Program continues as one of the facility's ongoing monitoring programs required under condition 9 of its Environmental Compliance Approval (ECA No. A031806) dated September 5, 1997 and as amended. The Biomonitoring Program establishes baseline levels of selected chemicals in environmental media (soil, drainage ditch sediment, natural vegetation and agricultural crops) at selected locations (sites) within approximately 1.5 kilometers of the Lambton Facility and provides an indication of trends, through time, in the concentration of analytes of the sampled media.

Biomonitoring is used to monitor the concentration, or presence/absence, of selected chemicals in environmental media associated with a facility or operation. The use of biological monitors allows changes in the concentration of chemicals in environmental media to be tracked over time. This is particularly important if changes in the concentration of one or more chemicals indicate an upward trend such that unacceptable threshold concentrations may be approached or exceeded.

Stantec Consulting Limited (Stantec) carried out the Biomonitoring Program for the year 2015 and compared these data to the previous years (1991- 2014) of accumulated biomonitoring data. Analytical testing of the 2015 media samples was undertaken by ALS Laboratories.

1.1 OBJECTIVES

The overall purpose of the Biomonitoring Program is to document through time, the concentrations of selected analytes in environmental media (soil, sediment, natural vegetation and agricultural crops) in the vicinity of the Lambton Facility and evaluate if concentrations are changing relative to baseline or benchmark data.

The specific objectives of the program include:

1. Determine the concentrations of selected chemicals in environmental media at select sites within approximately 1.5 km of the Lambton Facility and compare with past Biomonitoring Program year's analyte concentrations and relevant published guidelines.
2. Identify trends in chemical concentration over time for environmental media at sites within approximately 1.5 km of the Lambton Facility, which, along with the results of other

monitoring programs, may be used to determine the need for mitigative action on facility outputs or to direct potential remediation in the areas surrounding the site.

3. Gather information (e.g. crop growth, sediment fertility & characterization[7] data) from the sites that could be used to assist in the assessment of impacts if upset conditions (e.g. potential release of chemicals) were to occur at the Lambton Facility.

1.2 RATIONALE FOR PROGRAM APPROACH

The rationale for the selection of chemicals analyzed, environmental media sampled, test site locations and the frequency of sampling for the Biomonitoring Program is provided in **Appendix A**. **Table 1-1**, presented below identifies the analytes monitored during the 2015 Biomonitoring Program**.**

Table 1-1: List of Analytes Monitored during the 2015 Biomonitoring Program, Lambton Facility

GROUP 1 ANALYTES		
Barium	Iron	Silicon
Beryllium	Magnesium	Silver
Boron	Manganese	Sodium
Calcium	Molybdenum	Strontium
Chloride	Nickel	Sulphur
Chromium	Phosphorus	Titanium
Cobalt	Potassium	Zirconium
GROUP 2 ANALYTES		
Aluminum	Copper	Thallium
Arsenic	Lead	Vanadium
Cadmium	Mercury	Zinc
GROUP 3 ANALYTES		
Dioxins/Furans (PCDD/DF) Organochlorinated Pesticides (OCP)	Total Polychlorinated Biphenyls (PCB)	Pentachlorophenol (PCP)

Group 1 and 2 analytes include inorganic chemicals of geological origin which lack carbon and hydrogen atoms (e.g., metals). Group 3 analytes include organic chemicals of biological origin which contain carbon atoms. Based on toxicity information in the scientific literature and on public perception of chemicals the analytes were grouped into three categories:

Group 1: Inorganic analytes representing the lowest potential threat to livestock or to the consuming public that eats crops from the area. At the time of establishing the Biomonitoring

[7] The influence of soil and sediment characterization/fertility is discussed in Section 2.2 and Appendix B.

Program in 1991, reports of toxic effects in either humans or livestock were not identified in the literature for exposures to the analyte at concentrations considered 'typical' in the environment.

Group 2: Inorganic analytes reported or theorized in the literature to have toxic effects on environmental receptors. However, at the time of establishing the Biomonitoring Program these analytes were not considered to be toxic contaminants that occur on a widespread or common basis.

Group 3: Organic analytes with reported toxicity that are produced when certain waste streams are incinerated. These organic analytes are documented to accumulate in the environment.

1.3 SCOPE OF WORK

The scope of work documented in this report includes the following tasks:

1. Collect samples of natural grasses, soil, sediment, and agricultural crops during the appropriate time of year using the appropriate sampling techniques as outlined in the Revised 2016 Biomonitoring Sampling Program (Stantec, 2016).
2. Send samples to analytical testing facility for sample processing and analysis.
3. Conduct quality assurance and quality control on the analytical data received from the laboratory.
4. Review and compare 2015 data to the upper control limits (UL15) for each site and on a site-wide basis. Results with concentrations above the UL15 (referred to as exceedances) have been reviewed and reported herein.
5. Review and compare the UL15 exceedances (inorganic analytes) or detections (organic analytes) in the 2015 data to applicable guidelines relevant for various media, which include the rural parkland Ontario Typical Range (OTR_{98}) (MOECC, 2011), Upper Limit of Normal (ULN) (MOECC, 1989), O. Reg. 153/04 Table 1 site condition standards[8] (SCS) (MOECC, 2011), and the Provincial Sediment Quality Guidelines (PSQG) (MOECC, 2008).
6. Develop site-specific trend lines to determine if concentrations of inorganic analytes in the vicinity of the Lambton Facility are increasing, decreasing or remaining constant.
7. Follow up on recommendations identified in the 2015 Annual Landfill Report (Clean Harbors, 2015).
8. Provide recommendations regarding further investigation or issues to consider during future Biomonitoring Program events.

[8] O.Reg.153/04 Soil, Ground Water and Sediment Standards for use Under Part XV.1 of the *Environmental Protection Act*

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2.0 MATERIALS AND METHODS FOR THE 2015 FIELD YEAR

The location and management of test sites, and methods used to characterize, collect, analyze, and statistically analyze the data are summarized below. Further information regarding the methods is provided in **Appendix A**.

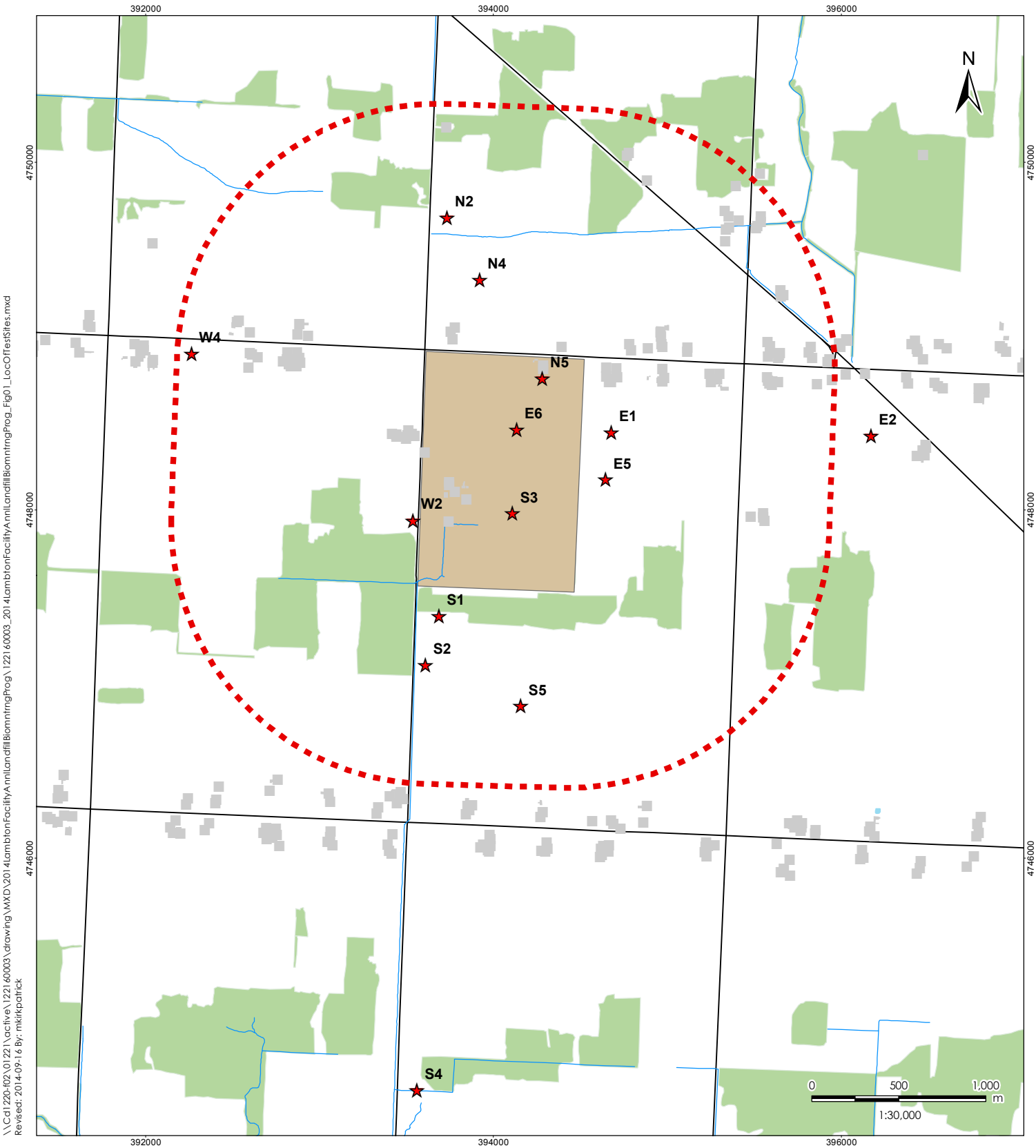
2.1 LOCATION AND MANAGEMENT OF TEST SITES

The lands surrounding the Facility are predominantly agricultural for the production of crops. Descriptions of the 14 test sites are provided in **Appendix A**. A diagram of the facility and the relative locations of the test sites are provided in **Figure 1**. All sites, except three within the Clean Harbor facility (i.e., S3, E6, N5), were managed under a crop rotation that included soybean, winter wheat, and field corn. In 2015, eight of the sites were cultivated with soybean (W2, E1, E2, E5, S1, S2, S4, and S5), two with field corn (N2 and W4) and one site with winter wheat (N4).

Typical tillage systems for agricultural practice in this area disturb approximately 15 cm of soil depth, although no-till management systems which disturb approximately 5 cm of soil depth in 30% of the soil surface, have gained in popularity. Based on the cultural practices surveys[9] completed by the land managers (farmers) responsible for crop cultivation at the various test sites, Sites W2, N4, S1, S2, and S5 were managed using a no-till system in 2015. Site N2 was managed using a plow in the fall of 2014 at a depth of 17.8 cm and using a cultivator in the spring of 2015 at a depth of 7.6 cm. Site W4 was managed using a cultivator in the spring of 2015 at a depth of 10.2 cm. Site E2 was managed using a cultivator in the spring of 2015 at a depth of 3.8 cm. Sites E1 and E5 were managed using a disker in August 2014 at a depth of 12.7 cm, and using a cultivator in September 2014 at a depth of 5.1 cm. Site S4 was managed using a Kenzie 3000 at a depth of 3.8 cm in the spring of 2015.

Sites S3 and E6 were located on clay-capped waste cells and Site N5 was on a previously disturbed, but naturally re-vegetated area. All three sites were maintained with a grass cover within the perimeter of the Lambton Facility. The soil was not tilled at the sites within the facility boundary and was therefore considered undisturbed relative to typical agricultural tillage practices.

[9] Cultural Practice Surveys are sent out to land managers of record for cropped test sites following the conclusion of the sampling program in order to gather information on field management practices. Completed Cultural Practice Surveys are on file in the Raw Data File Notebook (RDFN).



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Revised: 2014-09-16 By: mkirkpatrick

September 2014
122160003

Stantec

Legend

- Sampling Location (Approximate)
- 1.5km from Lambton Facility
- Watercourse
- Road
- Building
- Lambton Facility
- Waterbody
- Wooded Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

Clean Harbours Environmental Services Inc.
Biomonitoring Program
Lambton Facility

Figure No.

1

Title

Location of Test Sites Biomonitoring Program Lambton Facility

2.2 CHARACTERIZATION OF TEST SITES

In the 2015 Field Year, the plant growth and sediment were characterized at each test site. Every year, the plants are characterized based on the type of agricultural crop, growth stage, plant stand, and presence of pests and/or diseases. The field data is on file in the 2015 Raw Data File Notebook (RDFN) (Stantec, 2015b). On an annual basis, sediment sampling for fertility and characterization (concentrations of nutrients, organic matter, pH, cation exchange capacity (CEC), and texture) is completed due to the potential influence of water movement in each drainage ditch on the characteristics of the sediment.

Soil characterization and fertility sampling (concentrations of nutrients, organic matter, pH, CEC, and texture) occurs on a six-year cycle and was most recently conducted in the 2011 Field Year. This will be completed next in the 2017 Field Year.

The characterization of sediment and soil is further discussed in **Appendix B**.

2.3 COLLECTION OF SAMPLES FOR CHEMICAL ANALYSES

Samples of environmental media were collected as per the methods outlined in the Revised Biomonitoring Sampling Program (Stantec, 2016). Soil and natural grasses samples were collected from all 14 sites in 2015. Agricultural crops were sampled at 11 of the 14 sites. Samples of drainage ditch sediment were collected from test sites where drainage ditches were present (i.e., N2, N5, S1, S3, S4 and E2).

A photo log of select sites is provided in **Appendix D**.

2.4 ANALYTICAL PROCEDURES

The samples for chemical analysis from the 2015 Field Year were submitted to ALS Laboratories for the list of Group 1, 2, and 3 analytes identified in **Table 1-1**.

The metals analysis for soil, sediment, and unwashed tissue were conducted by the ALS Edmonton laboratory. In order to meet the detection limits required for the biomonitoring program, the silicon analyses in vegetation and silicon and phosphorus in soil/sediment were conducted by the ALS Lulea, Sweden laboratory.

The organics analysis was conducted by ALS Burlington with the exception of PCB analysis which was conducted by ALS Vancouver.

All quantification used internal standardization. Appropriate quality assurance/quality control (QA/QC) measures were followed including the preparation and analysis of method blanks, analytical duplicates, matrix spikes and proper calibration of instruments according to protocols.

The analytical procedures used for analysis of samples collected during the 2015 Biomonitoring Program are described in **Appendix A**.

2.5 STATISTICAL ANALYSIS AND INTERPRETATION OF THE DATA

The following describes the methods and conventions that were used during the statistical analysis and interpretation of the data obtained during the 2015 Field Year of the Biomonitoring Program.

- The use of actual values of the Reporting Detection Limits (RDLs) (reported by the analytical laboratory) to represent the concentrations of analytes that were not detected.
- Testing for normality was done for inorganic analytes in the 2015 Annual Landfill Report to determine the pattern of distribution of reported data (Clean Harbors Canada, 2015). For data determined to be distributed normally, the actual reported concentrations were used during statistical analyses. For data determined to not be distributed normally, the natural logarithms of the reported concentrations were used during statistical analyses.
- Missing data were accounted for within the statistical analysis and were left blank within each data set.
- In order to compare the toxicity of different samples with different congener profiles, toxic equivalency factors (TEFs) have been developed that standardize "dioxin-like" substances to a toxicologically equivalent (TEQ) amount of 2,3,7,8-TCDD, the most toxic congener.
- The relative percent difference (RPD) was used to assess the accuracy of laboratory and field duplicates.

These conventions are further discussed in **Appendix A**.

2.5.1 Development and Interpretation of Control Charts

Industry has used control charts for many years as a useful tool that graphically monitors the performance of industrial processes. Control charts allow for identification of outlying values and temporal trends that may be developing in the data (King, 1982). Depending on the results, follow-up action may be warranted. The development of the control charts and their schedule within the Biomonitoring Program is further discussed in **Appendix A**.

When evaluating the data collected in the 2015 Field Year, it was considered that concentrations of the analytes that were observed in the environmental media from 1991 to 2014 (represented by the UL15 and LL15 values) were indicative of the local environment and thus represented the 'typical range' of concentrations that may be expected over time and used in the comparison. Concentrations of an analyte collected during the 2015 Field Year that were significantly above its typical range (i.e., greater than the mean concentration of the analyte plus three standard deviations (SD) of the sample population (also called the +3SD or upper control limit)) were treated as 'exceedances' that warranted consideration. Where exceedances of the UL15 were identified, the parameters were compared with relevant

guidelines when available. These guidelines include the rural parkland OTR_{98}, ULN, Table 1 SCS, and the PSQG.

The upper and lower control limits (UL and LL values) for the Biomonitoring program are updated on a three-year cycle.

2.5.2 Development and Interpretation of Trend Lines

Change in the environment over time may be influenced by many local, regional and global factors. In order to understand how concentrations of inorganic analytes have changed in environmental media collected at the biomonitoring sites, concentration trend lines are developed based on linear regression statistics. Trend lines on a site-wide and site-specific basis are updated on a three year cycle for inorganics and a six year cycle for organics.

Site-specific inorganic trend lines have been updated and discussed in **Section 3.2.5** of this report. Site-wide trend lines for the inorganic analytes and site-specific/site-wide trend lines for organic analytes were last updated in the 2014 Annual Landfill Report (2013 Field Year) (Clean Harbors, 2014). Additional details of the established reporting cycles of the Biomonitoring Program are provided in **Appendix A**.

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3.0 RESULTS AND DISCUSSION

3.1 FACTORS AFFECTING THE RESULTS

Many biological and geological processes affect the movement and fate of chemicals in the environment. These processes are driven by chemical, physical and biological interactions that occur at all levels of organization, from molecular to global.

3.1.1 Weather

Plant growth and environmental conditions are influenced significantly by weather including precipitation, temperature and wind. Information on weather conditions in the Sarnia-Lambton region is often interpolated from data obtained at the Sarnia Climate weather station at the Sarnia Chris Hadfield Airport (Environment Canada, 2015a), which is approximately 15 km north of the Lambton Facility.

Table 3-1: Total Precipitation and Mean Temperatures per Month at the Sarnia Airport and the Sarnia Climate Record, Sarnia, ON

Month	Temperature		Precipitation	
	2015 Mean (Sarnia Climate)[b]	30-year Normal[c]	2015 Total (Sarnia Climate)[b]	30-year Normal[c]
Jan	-7.3[a]	-4.8	37.2[a]	51.5
Feb	-12.0	-3.7	19.9[a]	50.9
Mar	-1.3	0.6	17.8	57.5
Apr	7.0[a]	6.9	32.2[a]	71.5
May	14.8	12.7	76.7[a]	79.7
Jun	17.4	18.2	131.8[a]	83.1
Jul	20.4	21.1	46.0[a]	78.5
Aug	20.2	20	29.4[a]	78.5
Sept	19.6	16.4	41.6[a]	104.7
Oct	10.9[a]	10.1	72.5[a]	76.1
Nov	7.6[a]	4.3	59.0[a]	82.4
Dec	3.9[a]	-1.8	50.4[a]	63.9
Mean / Total	8.4	12.3	614.5	878.3

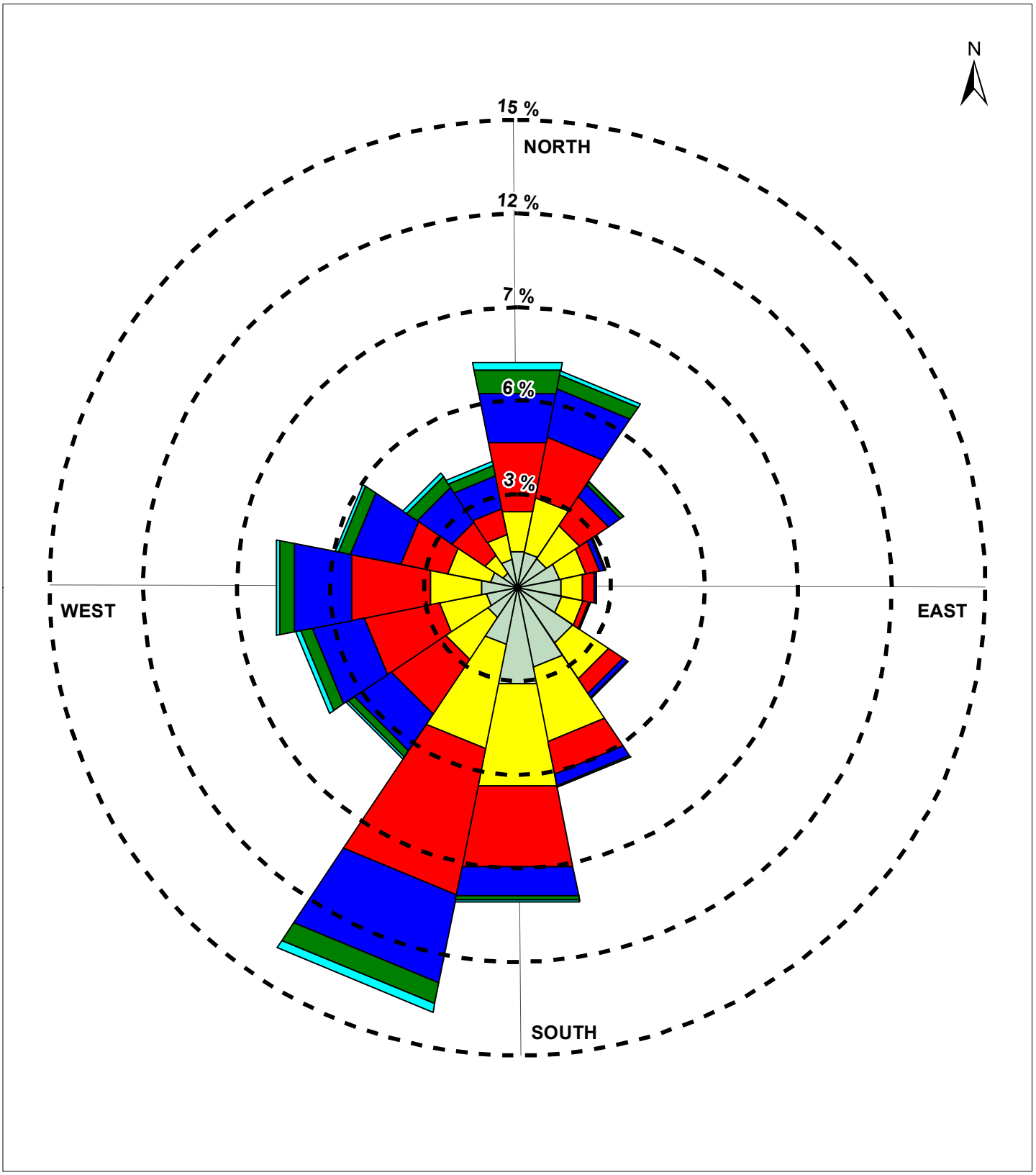
Notes:

a. Number based on incomplete data
b. Sarnia Climate, Daily Data Report for January-December 2015, Environment Canada, 2015a
c. Sarnia Airport, Canadian Climate Normals 1981-2010 Station Data, Environment Canada, 2015b

The Sarnia Climate weather information may provide a general indication of weather conditions during the 2015 growing season relative to the Canadian Climate Normals and Averages (1981-2010) for the region (Environment Canada, 2015b).

The distribution of precipitation at the Sarnia Climate weather station varied from the 30-year normal growing season of May to September (**Table 3-1**). June was wetter than usual with approximately 49 mm more precipitation. Approximately 33 mm, 49 mm, and 63 mm less precipitation was measured in July, August, and September respectively compared to the 30-year normal. The decreased precipitation can potentially result in higher concentrations measured for the vegetation samples as there is a potential for analytes to accumulate via deposition on the outer tissue. The Sarnia Climate weather station reported temperatures that were very similar to the 30-year mean within the growing season, confirming that temperatures did not fluctuate enough to influence the crops' health.

As shown in **Figure 2** in 2015 the wind near the Lambton Facility generally blew from the southwest and north. While the wind blew most often from the south and the southwest it is noted that when the wind was blowing from the north, it generally had a higher wind speed.



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Revised: 2015-12-03 By: svandamme

December 2015
122160003

Stantec

Notes
1. Note to scale.

Legend

Wind Speed (Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 -7
- 1 - 4

Calms: 3.06%

Client/Project

Clean Harbours Environmental Services Inc.
Biomonitoring Program
Lambton Facility

Figure No.

2

Title

Wind Speed Direction (blowing from)

3.1.2 Soil and Sediment Characteristics

Since the inherent characteristics of soil and sediment have a significant impact on the movement and fate of chemicals in the local environment, they also impact the results of the Biomonitoring Program. A discussion of soil and sediment characteristics is provided in **Appendix B**.

3.1.3 Impact of Changes in MDL

Since 1991, some of the method detection limits (MDLs) associated with individual analytical procedures and analytes have changed. Most affected MDLs have decreased as a result of increases in the sensitivity of the analytical method. For a few ubiquitous analytes the MDLs have increased, generally as a trade-off for greater sensitivity with other analytes.

3.1.4 Impact of Updated Control Charts and Upper Limits (UL15)

The 2015 Field Year data was evaluated through comparison with control chart upper limits established using data from 1991 to 2014 (UL15). When control charts are updated, the upper limit or threshold against which exceedances are identified typically changes. The magnitude and direction of the change depends on the variability in the data and, in some cases, the variability in the RDLs that were used to calculate the ULs and LLs. The value of the RDL is used in all calculations for non-detected concentrations. Monitoring the changing ULs should continue and impacts on the findings should be reported where applicable.

Due to changes in the analytical method for silicon in soil and sediment in the 2010 Field Year, which resulted in higher analytical results compared to historical data, the UL15 were not calculated. Further details of the change in analytical method and its impact on the Biomonitoring Program were previously provided in the 2012 Annual Landfill Report (Clean Harbors, 2012). New ULs will be derived when a minimum of six years of silicon data are collected using the new analytical method. In this regard, silicon data will not have new ULs until 2018, when the UL18 and LL18 are calculated. Until then, the range of silicon concentrations in sediment and soil will be compared to the range of historical concentrations starting in 2010 in order to monitor for potential increases above what is expected due to natural variability.

3.1.5 Concerns Regarding Continued Use of Ontario Upper Limit of Normal and Ontario Typical Range Values for Comparison Purposes

The Biomonitoring Program results are compared annually with the ULN (soil and grass (unwashed)) and rural parkland OTR_{98} (soil) values to provide some basis for comparison between the environment surrounding the Lambton Facility and the wider environment typically observed in Ontario. The rural parkland OTR_{98} represent samples collected across the entire province and they use different sample media sources such as “rural parkland” but not “rural

agricultural", which is more characteristic of the land surrounding the Lambton Facility. Thus they are not necessarily specific to the conditions at the Lambton Facility.

The Ontario ULN data represents findings from the 1980s, which makes them approximately 30 years old. It is probable that the values do not adequately represent current environmental conditions. In contrast, the Biomonitoring Program includes up to 25 years of consistent observation, which represents a robust and current database that can be used to detect changes in the environment surrounding the Lambton Facility.

Therefore, more weight may be granted to results related to the exceedances of calculated upper limits and trend lines for the Biomonitoring Program than to comparisons with the ULN or rural parkland OTR_{98} values.

3.2 INORGANIC ANALYTES

The analytical results for the 2015 inorganic parameters have been summarized according to their respective environmental media and compared to applicable guidelines, and are provided in **Tables C-1a, C-1b, C-1c, and C-1d** of **Appendix C**.

3.2.1 Quality Assurance/Quality Control

The data quality objective established for this sampling program was to produce data that were representative, reproducible, complete and suitable for comparison with the results of previous analyses within the Biomonitoring Program and the applicable standards.

To assess whether quality standards associated with the field program were achieved, a QA/QC program was included as a component of the sampling program. Seven blind field duplicates were collected and submitted for laboratory analysis to evaluate both laboratory precision, and field sampling and handling procedures. Three field blanks were collected to evaluate if sample handling practices would result in an artificial increase of the analytical results. In addition, in the 2015 Field Year, a rinsate sample from every bottle of distilled water used for decontamination of field equipment was collected upon opening.

Field duplicates were considered acceptable if the relative percent difference (RPD) was ± 40%. The RPD between the original samples and field duplicates for inorganic data are provided in **Tables C-1a** through **C-1d** and **Table C-1f**. The RPD of all duplicate samples was within the acceptable range.

The data quality objective for field blanks is concentrations which are below or near the RDL. Analytical data for the field blanks is summarized in **Table C-1e**. The field blank collected from Sites E6, N4 and S1 met the data quality objective. The three field blanks contained low concentrations of several analytes (e.g. silicon, strontium, aluminum and copper) near the RDL.

Rinsate blanks were collected at Sites E6, N4, S1, E2, E5, N2, N4 and W2. The purpose of the rinsate sample is to verify that store bought distilled water used for decontaminating field equipment did not introduce detectable concentrations of confounding inorganics. As such, the data quality objective for rinsate blanks is concentrations which are below or near the RDL. The rinsate samples met the data quality objective. The same analytes measured in the field blanks (e.g. silicon, strontium, aluminum and copper) were also measured in the rinsate blanks at similar concentrations.

The percent recovery for the laboratory duplicates, laboratory control samples, laboratory control sample duplicates, matrix spikes, matrix spike duplicates, method blanks, certified reference material, internal reference material, and standard reference material were within the recovery range acceptable to the analytical laboratory for internal quality control requirements or the overall quality control met acceptability criteria. In addition, relative percent differences reported by the laboratory for laboratory replicate samples were within the acceptable laboratory limits.

3.2.2 Annual Findings

In 2015, the concentrations of 21 analytes (15 Group 1 analytes and six Group 2 analytes) exceeded their respective site-specific UL15 within various environmental media (**Table 3-2** and **Table 3-3**).

Five site-wide exceedances (where a chemical exceeds its site-wide (analyte by media) UL15) occurred for five analytes (**Table 3-4**; seven site-wide exceedances were measured in 2014 Field Year).

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
Aluminum	NG	S5	541	290	186	13	-	N/A	-	-	>UL15
	SD	N2	28900	28163	103	9680	-	-	N/A	N/A	>UL15
Arsenic	SD	S4	6.26	6.2	101	3.4	-	-	6	6	>UL15, >O.Reg.153/04, >PSQG
	SS	E2	5.72	5.6	102	2.7	11	10	-	-	>UL15
Barium	SD	S1	126	122	104	60	-	-	N/A	N/A	>UL15
		N2	141	121	116	60	-	-	N/A	N/A	>UL15
	SS	E2	86	83	104	50	170	N/A	-	-	>UL15
		E5	123	89	138	54	170	N/A	-	-	>UL15
		S4	162	129	125	78	170	N/A	-	-	>UL15

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
Beryllium	SS	E2	0.6	0.51	117	0.51	1.1	N/A	-	-	>UL15
		E5	0.87	0.64	135	0.64	1.1	N/A	-	-	>UL15
		E6	0.64	0.62	104	0.62	1.1	N/A	-	-	>UL15
		N2	1.05	1.0	100	1.0	1.1	N/A	-	-	>UL15
		N4	0.78	0.77	101	0.77	1.1	N/A	-	-	>UL15
		N4	0.78	0.77	101	0.77	1.1	N/A	-	-	>UL15
		N5	0.67	0.65	104	0.65	1.1	N/A	-	-	>UL15
		S3	0.71	0.67	106	0.67	1.1	N/A	-	-	>UL15
		S4	1.28	0.92	138	0.92	1.1	N/A	-	-	>UL15, >OTR
		W2	0.63	0.60	104	0.60	1.1	N/A	-	-	>UL15
Boron	NG	N4	45.1	45	100	1.5	-	20	-	-	>UL15, >ULN
		N5	58.1	49	118	1.7	-	20	-	-	>UL15, >ULN
		N5	51.9	49	105	1.7	-	20	-	-	>UL15, >ULN
Calcium	NG	S5	27700	20253	137	2734	-	N/A	-	-	>UL15
	SS	E2	13400	8821	152	4803	54000	N/A	-	-	>UL15
		N4	50300	12021	418	6545	54000	N/A	-	-	>UL15
			55100	12021	458	6545	54000	N/A	-	-	>UL15, >OTR
		N5	64100	43522	147	23698	54000	N/A	-	-	>UL15, >OTR
		S4	7450	4957	150	2699	54000	N/A	-	-	>UL15

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
Chloride	NG	W4	25300	16971	149	3665	-	10000	-	-	>UL15, >ULN
Cobalt	SD	S4	14.9	14	106	9.1	-	-	50	N/A	>UL15
Copper	SD	S1	38	35	108	19	-	-	16	16	>UL15, >O.Reg.153/04, >PSQG
			38.7	35	110	19	-	-	16	16	>UL15, >O.Reg.153/04, >PSQG
	SS	N4	23	22	106	12	46	60	-	-	>UL15
			23.9	22	110	12	46	60	-	-	>UL15
		S4	27.8	21	130	12	46	60	-	-	>UL15
Iron	NG	S5	422	316	134	50	N/A	500	-	-	>UL15
Lead	SS	E2	85.8	37	234	14	34	150	-	-	>UL15, >OTR
Magnesium	NG	S5	6020	3942	153	1289	-	N/A	-	-	>UL15
	SS	E2	7680	5385	143	3022	19000	10000	-	-	>UL15
		N4	19400	9208	211	5167	19000	10000	-	-	>UL15, >OTR, >ULN
			20100	9208	218	5167	19000	10000	-	-	>UL15, >OTR, >ULN
		N5	22700	18006	126	10104	19000	10000	-	-	>UL15, >OTR, >ULN
		S4	8710	8646	101	4852	19000	10000	-	-	>UL15
Manganese	SD	E2	459	392	117	226	-	-	N/A	460	>UL15

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
		S4	656	507	129	293	-	-	N/A	460	>UL15, >PSQG
	SS	E5	608	454	134	211	1900	700	-	-	>UL15
		N2	566	469	121	218	1900	700	-	-	>UL15
		N4	477	428	112	199	1900	700	-	-	>UL15
Mercury	SS	E1	<0.05	0.048	104	0.048	0.13	0.15	-	-	>UL15
		E2	0.111	0.058	192	0.058	0.13	0.15	-	-	>UL15
		E5	<0.05	0.049	102	0.049	0.13	0.15	-	-	>UL15
		N5	0.089	0.073	122	0.073	0.13	0.15	-	-	>UL15
		S2	<0.05	0.046	109	0.046	0.13	0.15	-	-	>UL15
		S3	0.055	0.051	108	0.051	0.13	0.15	-	-	>UL15
		S4	0.055	0.053	104	0.053	0.13	0.15	-	-	>UL15
		S5	<0.05	0.046	109	0.046	0.13	0.15	-	-	>UL15
		W2	<0.05	0.049	102	0.049	0.13	0.15	-	-	>UL15
Molybdenum	SB	E1	8.4	7.4	113	1.3	-	-	-	-	>UL15
	SS	N5	2.35	2.3	102	0.63	0.984	2	-	-	>UL15, >OTR, >ULN
		S3	4.27	1.6	263	0.44	0.984	2	-	-	>UL15, >OTR, >ULN
Nickel	SS	E2	19.9	16	128	15	34	60	-	-	>UL15
		E5	24.8	20	125	20	34	60	-	-	>UL15

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
		E6	21.4	21	101	21	34	60	-	-	>UL15
		E6	21.9	21	103	21	34	60	-	-	>UL15
		N4	27.3	23	116	23	34	60	-	-	>UL15
			27.7	23	118	23	34	60	-	-	>UL15
		N5	25.7	22	115	22	34	60	-	-	>UL15
		S1	28.4	28	103	27	34	60	-	-	>UL15
		S3	25.1	23	108	23	34	60	-	-	>UL15
		S4	36.1	29	125	29	34	60	-	-	>UL15, >OTR
		S5	26.2	26	103	25	34	60	-	-	>UL15
		W4	30.2	29	103	29	34	60	-	-	>UL15
Phosphorus	NG	E2	5310	4799	111	1960	-	N/A	-	-	>UL15
		S1	3920	3391	116	1385	-	N/A	-	-	>UL15
		S2	4070	3491	117	1426	-	N/A	-	-	>UL15
		S3	2880	2480	116	1013	-	N/A	-		>UL15
	SD	N2	1030	1003	103	410	-	-	N/A	600	>UL15, >PSQG
	SS	N4	773	770	100	400	830	N/A	-	-	>UL15
		S4	942	689	137	358	830	N/A	-	-	>UL15, >OTR
Potassium	WW*	N4	6290	6221	101	0	-	-	-	-	>UL15
Strontium	NG	S5	50.1	33	150	7.4	-	N/A	-	-	>UL15

Table 3-2: Concentrations of Analytes in Environmental Media That Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	Site	Conc. (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	LL15 (mg/kg)	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 – LEL (2) (mg/kg)	Exceedances
	SS	E6	64.9	50	131	24	63	N/A	-	-	>UL15, >OTR
			56.8	50	115	24	63	N/A	-	-	>UL15
		N4	42.4	29	148	14	63	N/A	-	-	>UL15
			43.2	29	151	14	63	N/A	-	-	>UL15
		S4	27.7	27	103	13	63	N/A	-	-	>UL15
Sulfur	NG	S5	6700	4741	141	1189	-	5000	-	-	>UL15, >ULN
	SS	N5	1220	1066	114	342	790	1000	-	-	>UL15, >OTR, >ULN
		S4	390	344	113	110	790	1000	-	-	>UL15
Zinc	NG	S2	45.5	44	103	14	-	40	-	-	>UL15, >ULN

Where: SD = sediment, NG = natural grass, SS = soil, SB = soybean, and WW = winter wheat

* The other split of the duplicate sample is below its UL15
Not Bold = Group 1
Bold = Group 2 Analyte
N/A = Not Available
LEL = Lowest Effect Level
- = Not Applicable for this particular environmental media

(1) MOECC O.Reg. 153/04 Table 1 Full Depth Background Site Condition Standards, Sediment, All Property Uses, Soil Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011 (MOEECC, 2011).

(2) No O.Reg. 153/04 value. Lowest Effect Level values from the Provincial Sediment Quality Guidelines (PSQG) used instead. Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario: An Integrated Approach (MOECC, 2008)

Table 3-3: List of Sites and Matrices Where the Concentrations of Analytes in Environmental Media Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Site	Matrix						Total Exceedances of UL15
	Field Corn	Soybeans	Winter Wheat	Natural Grasses	Soil	Sediment	
E1	N/A	Molybdenum	N/A	0	**Mercury**	N/A	2
E2	N/A	0	N/A	Phosphorus	**Arsenic**, Barium, Beryllium, Calcium, **Lead**, Magnesium, **Mercury**, Nickel	Manganese	10
E5	N/A	0	N/A	0	Barium, Beryllium, Manganese, Nickel, **Mercury**	N/A	5
E6	N/A	N/A	N/A	0	Beryllium, Nickel, Strontium	N/A	3
N2	0	N/A	N/A	0	Beryllium, Manganese	**Aluminum**, Barium, Phosphorus	5
A N4	N/	N/A	Potassium	Boron	Beryllium, Calcium, **Copper**, Magnesium, Manganese, Nickel, Phosphorus, Strontium	N/A	10
N5	N/A	N/A	N/A	Boron	Beryllium, Calcium, Magnesium, Molybdenum, Nickel, Sulfur, **Mercury**	0	8
S1	N/A	0	N/A	Phosphorous	Nickel	Barium, **Copper**	4
S2	N/A	0	N/A	Phosphorus, **Zinc**	**Mercury**	N/A	3
S3	N/A	N/A	N/A	Phosphorus	Beryllium, Molybdenum, Nickel, **Mercury**	0	5
S4	N/A	0	N/A	0	Barium, Beryllium, Calcium, **Copper**, Magnesium, **Mercury**, Nickel, Phosphorus, Strontium, Sulfur	**Arsenic**, Cobalt, Manganese	13

Table 3-3: List of Sites and Matrices Where the Concentrations of Analytes in Environmental Media Exceeded Upper Control Limits on a Site-Specific Basis, 2015 Biomonitoring Program, Lambton Facility

Site	Matrix						Total Exceedances of UL15
	Field Corn	Soybeans	Winter Wheat	Natural Grasses	Soil	Sediment	
S5	N/A	0	N/A	**Aluminum**, Calcium, Iron, Magnesium, Strontium, Sulfur	Nickel, **Mercury**	N/A	8
W2	N/A	0	N/A	0	Beryllium, **Mercury**	N/A	2
W4	0	N/A	N/A	Chloride	Nickel	N/A	2
Total	0	1	1	14	55	9	80

N/A = Not Available
Not Bold = Group 1
Bold = Group 2 Analyte

Table 3-4: Inorganic Analytes Where Concentrations of Analytes in Environmental Media Exceeded Upper Control Limits on a Site-Wide Basis, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix	No. Samples (n)	RDL (mg/kg)	Mean Conc (mg/kg)	UL15 (mg/kg)	Conc. as % of UL15	Rural OTR_{98} MOECC 2011 (mg/kg)	Rural ULN (mg/kg)	MOECC O.Reg. 153/04 Table 1 Sediment (1) (mg/kg)	PSQG - Table 1 - LEL (2) (mg/kg)	Exceedances
Beryllium	SS	14	0.20	0.79	0.75	105	1.1	N/A	-	-	>UL15
Calcium	SS	14	100	15247	10031	152	54000	N/A	-	-	>UL15
Magnesium	SS	14	20	8909	8060	111	19000	10000	-	-	>UL15
Nickel	SS	14	0.50	25.1	23.7	106	34	60	-	-	>UL15
Mercury	SS	14	0.050	0.059	0.053	111	0.13	0.15	-	-	>UL15

Where: SS = soil

N/A = Not Available

- = Not Applicable for this particular environmental media.

(1) MOECC O.Reg. 153/04 Table 1 Full Depth Background Site Condition Standards, Sediment, All Property Uses, Soil Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15, 2011 (MOECC, 2011).

(2) No O.Reg. 153/04 value. Lowest Effect Level values from the Provincial Sediment Quality Guidelines (PSQG) used instead. Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario: An Integrated Approach (MOECC, 2008)

3.2.3 Group 1 Analytes

Fifteen of the Group 1 analytes (**Table 1-1**) including barium, beryllium, boron, calcium, chloride, cobalt, iron, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, strontium and sulfur were identified in media at concentrations that exceeded the UL15 on a site-specific basis (**Table 3-2** and **Table 3-3**). Four Group 1 analytes (beryllium, calcium, magnesium, and nickel) were identified in media at concentrations that exceeded the UL15 on a site-wide basis (**Table 3-4**). Silicon in soil and sediment do not have UL15 to which to compare so are discussed below.

3.2.3.1 Barium

Barium exceeded the site-specific UL15 in soil at Sites E2, E5 and S4, and in sediment at Sites N2 and S1.

Barium concentrations in soil were below the OTR_{98}. This is the second exceedance for barium in sediment at Site N2 compared to the UL15 (2015 Field Year) and the UL12 (in the 2014 Field Year). Table 1 SCS or PSQG values for sediment were not available for comparison.

In the 2015 Annual Landfill Report, a literature review of the phytotoxic effects of barium in natural grasses was recommended based on recurring exceedances of the UL at Site S5 for which no guidelines were available. However, considering the absence of natural grasses exceedances in the 2015 Field Year and that the concentration at Site S5 in the 2015 Field Year is within the historical range measured at this site, the literature review is recommended to be delayed. Refer to further discussion in **Section 3.2.6**.

On a site-wide basis barium concentrations did not exceed the UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.2 Beryllium

Beryllium exceeded the site-specific UL15 in soil at Sites E2, E5, E6, N2, N4, N5, S3, S4, and W2.

Beryllium concentrations in soil were less than OTR_{98} with the exception of Site S4 which exceeded the OTR_{98}. There is no ULN in soil for comparison.

On a site-wide basis the mean concentration of beryllium in soil exceeded the UL15 but did not exceed the OTR_{98}.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.3 Boron

Boron exceeded the site-specific UL15 in natural grasses at Sites N4 and N5.

The boron UL15 exceedances in natural grasses at Sites N4 (marginal exceedance <5%)and N5 and also exceeded the ULN. These are the first exceedance of boron in natural grasses since 2010.

On a site-wide basis boron concentrations did not exceed the UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.4 Calcium

Calcium exceeded the site-specific UL15 in natural grasses at Site S5 and in soil at Sites E2, N4, N5 and S4.

This is the first exceedance for calcium in natural grasses at Site S5. A ULN value for natural grasses was not available for comparison.

Calcium concentrations in soil at Sites E2 and S4 were below the OTR_{98}, while concentrations at Sites N4 and N5 exceeded both the UL15 and OTR_{98} (54,000 mg/kg). These are the second exceedances at Site N4 (50,300 mg/kg and 55,100 mg/kg) and Site N5 (64,100 mg/kg) where the 2014 exceedances were compared to the UL12. Site N5 has a history of high concentrations of calcium in soil where it accounted for eight of the top ten measured concentrations of calcium in soil in the Biomonitoring Program (measured, in order of increasing concentrations in the following Field Years: 2008, 2013, 2010, 2009, 2005, 2006, 2015 and 2014). The concentration in the 2014 Field Year (78,000 mg/kg) was the highest measured. However, as discussed in **Section 3.2.5**, there is no statistically significant upward trend for calcium in soil at Site N5; although an increasing trend was identified for Site N4. Monitoring should continue and additional investigation is warranted into the elevated concentrations of calcium in soil.

On a site-wide basis, calcium exceeded the UL15 for soil, but was less than the OTR_{98}.

Monitoring should continue, and additional investigation into the elevated concentrations of calcium in soil is warranted.

3.2.3.5 Chloride

Chloride exceeded the site-specific UL15 in natural grasses at Site W4.

Chloride concentrations in natural grass exceeded the UL15 and more than doubled the ULN guideline at Site W4. This is the first exceedance of chloride in natural grasses at Site W4.

Chloride concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.6 Cobalt

Cobalt exceeded the site-specific UL15 in sediment at Site S4.

Cobalt concentrations in sediment at Site S4 exceeded the UL15 but were less than the MOECC O.Reg.153/04 Table 1 SCS. A PSQG LEL value for natural grasses was not available for comparison.

Cobalt concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.7 Iron

Iron exceeded the site-specific UL15 in natural grasses at Site S5.

Although the concentration in natural grasses at Site S5 is above the UL15, it is below the ULN and the concentration that would cause phytotoxic effects determined in the additional examination conducted in the 2012 Annual Landfill Report (Clean Harbors, 2012).

On a site-wide basis, iron concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.8 Magnesium

Magnesium exceeded the site-specific UL15 in natural grasses at Site S5 and in soil at Sites E2, N4, N5 and S4.

A ULN or OTR_{98} value for natural grasses was not available for comparison. Magnesium concentrations in soil at Sites E2 and S4 were less than the ULN, while soil concentrations at Sites N4 and N5 exceeded the ULN and OTR_{98}.

Magnesium in natural grasses and soil was investigated in the 2011 Annual Landfill Report where it was concluded that its presence in plants and soil is not expected to result in detrimental effects on plant health (Clean Harbors, 2011).

On a site-wide basis, magnesium concentrations in soil exceeded the site-wide UL15, but were less than the ULN and OTR_{98} values.

Monitoring should continue but no additional investigation is warranted at this time.

3.2.3.9 Manganese

Manganese exceeded the site-specific UL15 in soil at Sites E5, N2 and N4 and in sediment at Sites E2 and S4.

Concentrations in soil at Sites E5, N2 and N4 did not exceed the ULN or the OTR_{98}.

Manganese concentrations in sediment at Site E2 and S4 exceeded the PSQG LEL, but were below the PSQG Severe Effect Level (SEL[10]). MOECC O.Reg. 153/04 Table 1 SCS for sediment are not available for comparison.

On a site-wide basis, manganese concentrations did not exceed the UL15 in the media sampled.

Monitoring should continue but no additional investigation is warranted at this time.

3.2.3.10 Molybdenum

Molybdenum exceeded the site-specific UL15 in soil at Sites N5 and S3 and in soybean at Site E1.

Concentrations of molybdenum in soil at Sites N5 and S3 exceeded the ULN and OTR_{98}. A literature search of the toxic effects of molybdenum in soil was presented in the 2015 Annual Landfill report. Results of the literature search indicated molybdenum will occur naturally in concentrations between 0.2 and 6 mg/kg while metal rich soils could contain concentrations between 10 to 100 mg/kg. The concentrations in soil at Sites N5 and S3 are within the natural occurring range. In addition, the literature study indicated phytotoxicity symptoms could occur at a plant tissue concentration of approximately 500 mg/kg to greater than 6,500 mg/kg depending on the plant species and soil conditions. While phytotoxic concentrations were reported as low as 10 mg/kg, for the purpose of the assessment, a level of 100 mg/kg as per Gupta *et al*., 2008 was used as it is more in line with the studies cited for effects on agricultural crops. Since the plant tissue concentrations from the 2015 Field Year were all <100 mg/kg and no phytotoxicity symptoms were observed, the concentrations of molybdenum in soil are not considered sufficient to result in phytotoxic concentrations in plants.

A ULN or OTR_{98} value for soybean was not available for comparison. However, as presented in the literature search in the 2015 Annual Landfill report, toxicity levels of molybdenum in crops or reduced crop yield occur from tissue concentrations of 100 to 1,000 mg/kg but are uncommon (Gupta *et al*. 2008). The soybean concentrations were below 100 mg/kg.

Molybdenum concentrations did not exceed the site-wide UL15 in the media sampled.

[10] Level of contamination expected to be detrimental to the majority of sediment dwelling organisms.

Monitoring should continue but no additional investigation is warranted at this time.

3.2.3.11 Nickel

Nickel exceeded the site-specific UL15 in soil at Sites E2, E5, E6, N4, N5, S1, S3, S4, S5 and W4.

Nickel concentrations in soil at Site S4 exceeded the OTR_{98} but were below the ULN. This is a recurring exceedance of the OTR_{98}; the concentrations in soil at S4 had also exceeded in the 2014 Field Year.

Nickel concentrations exceeded the site-wide UL15 for soil but were below the ULN and OTR_{98}.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.12 Phosphorus

Phosphorus exceeded its site-specific UL15 in natural grasses at Sites E2, S1, S2 and S3, in soil at Sites N4 and S4 and in sediment at Site N2.

This is the first exceedance of the site-specific UL reported for phosphorous in natural grasses at Sites E2, S1, S2 and S3. A ULN value for natural grasses was not available for comparison.

The concentration in soil at Site S4 exceeded the OTR_{98}. A ULN value was not available for comparison. Phosphorous is commonly applied to agricultural fields as a fertilizer, and a blended fertilizer was applied to the field at S4 prior to crop planting. It is likely that the identified exceedances of phosphorous are attributed to fertilizer application.

On a site-wide basis, phosphorus concentrations did not exceed the UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.13 Potassium

Potassium exceeded its site-specific UL15 in winter wheat at Site N4.

This is the first exceedance of the site-specific UL reported for potassium in winter wheat at Site N4; however, the duplicate sample is below the UL. A ULN or OTR_{98} value for winter wheat was not available for comparison.

On a site-wide basis, potassium concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.14 Silicon

Due to changes in the analytical method for silicon in soil and sediment in the 2010 Field Year, which resulted in higher analytical results compared to historical data, UL15 were not calculated. Therefore, the range of silicon concentrations in sediment and soil were compared to the range of historical concentrations starting in 2010 in order to monitor for potential increases above what is expected due to natural variability.

Silicon concentrations in soil in the 2015 Field Year (224,000 – 362,000 mg/kg across all sites) were within the range of historical concentrations (228,000 – 387,000 mg/kg) between 2010 and 2014.

Silicon concentrations in sediment in the 2015 Field Year (189,000 – 254,000 mg/kg across all sites) were within the range of historical concentrations (201,000 – 302,000 mg/kg) between 2010 and 2014.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.15 Strontium

Strontium exceeded the site-specific UL15 in natural grasses at Site S5, and in soil at Sites E6, N4 and S4.

A ULN or OTR_{98} value for natural grasses was not available for comparison. The concentrations in natural grasses were approximately 1.5 times greater than the UL15.

With the exception of the concentration in soil at Site E6, the concentrations of strontium in soil were below the OTR_{98} value including the field duplicate of Site E6. The average of the E6 sample and field duplicate does not exceed the OTR_{98} value.

On a site-wide basis, strontium concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.3.16 Sulfur

Sulfur exceeded the site-specific UL15 in natural grasses at Site S5 and in soil at Sites N5 and S4.

The concentration in natural grasses at Site S5 exceeded the ULN. An OTR_{98} value for natural grasses was not available for comparison. The concentrations of sulfur in natural grasses at Site S5 have been variable where the two highest historical concentrations were measured in the 2013 and 2015 Field Years while the concentration in 2014 was 4.5 times lower than that measured in 2015.

Concentrations in soil at Site N5 exceeded both the ULN and the OTR_{98} value. The exceedance of sulfur in soil was within 15% of the UL15.

Sulfur concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue but no additional investigation is warranted at this time.

3.2.4 Group 2 Analytes

Five Group 2 analytes (aluminum, arsenic, copper, lead, mercury and zinc, **Table 1-1**) were measured at concentrations exceeding their site-specific UL15 (**Table 3-2** and **Table 3-3**). Only mercury in soil was identified as having concentrations that exceeded the site-wide UL15 (**Table 3-4**).

3.2.4.1 Aluminum

Aluminum exceeded the site-specific UL15 values for natural grasses at Site S5 and in sediment at Site N2.

There are no ULN values for comparison to natural grasses concentrations. Recurring findings of aluminum in natural grasses were discussed in the 2009 Annual Landfill Report where it was concluded that although aluminum concentrations measured in natural grasses were elevated, these levels were generally within the range expected to occur in grasses (60-3,410 mg/kg DW, Kabata-Pendias, 2001 and references within) (Clean Harbors, 2009). The concentrations were also below any injury threshold (no visible foliar injury could be induced below this level) and do not represent a threat to the local plant community. Similar findings have been reported by the MOE (Gizyn, 2005; Gizyn, 2008a and 2008b; and DeBrou 2010). In addition, the soil type characteristics of the area (see **Appendix B** for details of major soils characteristics) are represented by a clayey soil with a pH value above neutral which affect (decrease) the bioavailability of aluminum uptake in plants.

Aluminum in sediment marginally exceeded the UL15 at Site N2 by approximately three percent. MOECC O.Reg. 153/04 Table 1 SCS and PSQG values are not available for comparison of sediment concentrations.

Aluminum concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.4.2 Arsenic

Arsenic exceeded the site-specific UL15 in soil at Site E2 and sediment at Site S4.

The concentration in soil marginally (<5%) exceeded the UL15 and was less than the rural parkland OTR_{98} and ULN values. The sediment concentration at Site S4 marginally (<5%) exceeded the Table 1 SCS and PSQG LEL standards, but was below the SEL (33 mg/kg).

Arsenic concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.4.3 Copper

Copper exceeded the site-specific UL15 in soil at Sites N4 and S4 and in sediment at Site S1.

The exceedances identified in soil were below both rural parkland OTR_{98} and ULN guidelines. The copper concentrations in sediment at Site N4 exceeded the Table 1 SCS and PSQG LEL standards but were below the PSQG SEL (110 mg/kg).

Site-wide concentrations of copper did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.4.4 Lead

Lead exceeded the site-specific UL15 in soil at Site E2.

The lead concentration in soil at Site E2 (85.8 mg/kg) exceeded the OTR_{98} (34 mg/kg), but remained below the ULN guideline (150 mg/kg). This is the first lead exceedance in soil at Site E2.

On a site-wide basis, concentrations of lead did not exceed the UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.4.5 Mercury

Mercury exceeded the site-specific UL15 in soil at Sites E1, E2, E5, N5, S2, S3, S4, S5 and W2.

Mercury concentrations in soil did not exceed the OTR_{98} or ULN. Concentrations of mercury in soil at Sites E1, E5, S2, S5 and W2 are below the detection limit, but are considered exceedances because the RDL exceeds the UL. The RDL for mercury in soil has remained consistent at 0.05 mg/kg from 2003 to 2015; however prior to 2003, the RDL was slightly lower (typically 0.04 mg/kg). Over the history of the Biomonitoring Program, approximately 60% of mercury concentrations in soil wereless than the RDL resulting in a calculated upper limit which can be lower than the current RDL of 0.05 mg/Kg.

On a site-wide basis, concentrations of mercury exceeded the UL15 in soil.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.4.6 Zinc

Zinc exceeded the site-specific UL15 in natural grasses at Site S2.

An OTR_{98} value for natural grasses was not available for comparison. Zinc concentrations in natural grass marginally exceeded the ULN by three percent. This is the first exceedance of the site-specific UL for natural grasses at Site S2.

Zinc concentrations did not exceed the site-wide UL15 in the media sampled.

Monitoring should continue, but no additional investigation is warranted at this time.

3.2.5 Site-Specific Inorganic Trend Lines

Analysis was performed on 1246 analyte / matrix / site combinations to determine trend lines ($p < 0.003$, $n \geq 6$ and $x >$ MDL for at least one data point). Previously identified outliers were excluded. Based on normality testing, the appropriate statistical data transformations (taking the logarithm of concentrations, or no transformation) were used to calculate trend lines. Due to the change in the analytical test facility in 2002, select analytes were run using data from 2002-2015 in order to reduce the influence of changes in RDLs and/or laboratory on trend lines, as presented in the 2014 Annual Landfill Report. Further screening produced 178 trend lines of which 99 reflect actual changes in the concentration of analytes in the environment (**Table 3-5** and **Table 3-6**) and are further discussed in this report. These 99 trend lines, representing 15 downward trends and 84 upward trends, have been presented in graphical form in **Appendix E**. The remaining trend lines reflect non-environmental factors that influence change such as changes of the MDL or changes in analytical method over the duration of the Biomonitoring Program.

Appendix E includes a table showing the significance of the findings (Prob>F) at $p<0.003$. This information provides insight into what trends could be emerging in the future based on current data. The reader is cautioned that the results in this table are markedly influenced by changes in MDLs during the life of the program.

Table 3-5 groups the trend by analyte and also indicates if the trends are recurring based on the previous reporting cycles. **Table 3-6** groups the increasing trends by site, and also summarizes the analytes for which the 2015 concentrations exceeded the UL15 or applicable guidelines.

Fifteen (15) trend lines had a downward slope, indicating that these analytes have decreased in environmental concentrations at certain analyte / matrix / site combinations. These downward trend lines occurred in natural grasses (4/15), soil (3/15), and sediment (8/15).

An upward slope was found in 84 trend lines, indicating that these analytes have increased in environmental concentrations at certain sites during the span of the Biomonitoring Program.

These upward trend lines were detected in sediment (38/84), soil (32/84), natural grasses (13/84), and soybean (1/84). As shown in **Table 3-6**, the increasing trends at a site were often found in either soil or sediment, but the same parameters were not found to be increasing in the natural grasses or soybeans at the same location. The upward trends were found to occur in 12 of the 14 sites monitored in the Biomonitoring Program. For comparison purposes, 47 upward trends were identified during the previous cycle of trend analysis in 2012.

Three sites accounted for the majority of upward trends (48/84), specifically Site N2 (20/84), Site N5 (14/84) and Site S4 (14/84). Site N2 is located approximately 700 m to the north of the Lambton Facility, while Site N5 is located within the Facility grounds to the north near Petrolia Line. Site S4 is located approximately 2.4 km km south of the Facility. As discussed in **Section 3.1.1** and shown in **Figure 2** in 2015 the wind near the Lambton Facility generally blew from the southwest and north. While the wind blew most often from the south and the southwest, when the wind was blowing from the north, it generally had a higher wind speed. Within these three sites with the highest number of upward trends, the trends were found to occur most frequently in sediment (Sites N2 and N5) and soil (Site S4). The breakdown of upward trends by media for these three sites is below where the Group 2 analytes are specified:

- Site N2 sediment (14/ 20; Group 2: aluminum, cadmium, copper, lead,vanadium, zinc) and soil (6/20: Group 2: aluminum, arsenic)
- Site N5 sediment (13/14; Group 2: aluminum, arsenic, copper, lead, vanadium) and soil (1/14; Group 2: arsenic)
- Site S4 soil (11/14; Group 2: aluminum), sediment (2/14; Group 2: arsenic) and soybean (1/14)

The parameters with increasing trends were also evaluated with respect to the applicable guidelines. As shown in **Table 3-6**, approximately 30% of the increasing trends (25/84) had measured 2015 Field Year concentrations greater than their applicable guidelines. The three sites with the highest number of upward trends (N2, N5 and S4), also had a high number of exceedances of guidelines. At Site N2, eight inorganic analytes (including four Group 2 analytes: aluminum, cadmium, copper and zinc) exceeded their applicable guidelines; while at Site N5, six inorganic analytes (including two Group 2 analytes: arsenic and copper) exceeded their guidelines. At Site S4, five inorganic analytes (including one Group 2 analyte: arsenic) exceeded its guideline.

Repeated site specific upward trends could have further implications in the Biomonitoring Program. Of the 84 increasing trends, 39 were also listed as increasing during the previous reporting cycle in the 2012 Field Year, and three were also listed as upwards in the 2009 Field Year (**Table 3-5**). At Site N2, nine of the 20 upward trends had also been observed in 2012. Similarly, seven of the 14 upward trends observed at Site N5 were consistent with those found 2012, and four of the 14 upward trends at Site S4 were repeated from 2012. The upward trends at

Sites N2, N5, or S4 were not observed in the 2009 Field Year. Beryllium, chloride and phosphorous in sediment at Site E2 are the only cases where upward trends have been identified in the 2009, 2012, and 2015 Field Years. Site E2 is located approximately 2.0 km east of the Lambton Facility; the predominant wind direction near the Lambton Facility is blowing from the south west to the north east.

Sediment at Site N5 was the subject of a benthic investigation in the 2014 Field Year to characterize the benthic community as part of an investigation into elevated zinc and iron concentrations above the PSQG LEL and SEL (respectively). At that time, Site N5 was found to support numerous benthic communities and was not indicative of toxic conditions (Clean Harbors, 2015).

Given the number of inorganic parameters in sediment at Sites N2 and E2 with repeating upward trends and with concentrations measured above guidelines, additional investigation into the health of the benthic communities at these sites is recommended.

Table 3-5 Site-Specific Trend Lines for Inorganic Analytes (p<0.003), 2015 Biomonitoring Program, Lambton Facility

Trend from 2015 Field Year	Analyte	Matrix	Site	Trend from 2012 Field Year	Trend from 2009 Field Year
Downward	Barium	NG	E1	Downward	No trend
	Calcium	SD	N2	Downward	No trend
			N5	Downward	No trend
	Chloride	SS	E6	No trend	No trend
			N5	No trend	No trend
	Copper	SD	S3	No trend	No trend
			S4	No trend	No trend
	Copper	SS	W2	Downward	No trend
	Lead	NG	S3	Downward	No trend
		SD	S3	No trend	No trend
	Mercury	NG	N4	No trend	No trend
		SD	S3	No trend	No trend
	Nickel	SD	S3	No trend	No trend
	Potassium	NG	N2	Downward	No trend
	Strontium	SD	N5	Downward	No trend
Upward	Aluminum	NG	S1	Upward	No trend
			S5	Upward	No trend
			W2	Upward	No trend
			W4	Upward	No trend

Trend from 2015 Field Year	Analyte	Matrix	Site	Trend from 2012 Field Year	Trend from 2009 Field Year
Upward		SD	E2	No trend	No trend
			N2	Upward	No trend
			N5	Upward	No trend
		SS	N2	No trend	No trend
			S2	No trend	No trend
			S4	No trend	No trend
	Arsenic	SD	N5	No trend	No trend
			S4	No trend	No trend
		SS	N2	No trend	No trend
			N5	No trend	No trend
			S5	No trend	No trend
			W2	No trend	No trend
	Barium	NG	S5	No trend	No trend
		SD	E2	Upward	No trend
			N2	Upward	No trend
			N5	Upward	No trend
		SS	N2	No trend	No trend
			S4	Upward	No trend
	Beryllium	SD	E2	Upward	Upward
			N2	Upward	No trend
			N5	No trend	No trend
		SS	S4	No trend	No trend
	Cadmium	SD	N2	No trend	No trend
	Calcium	NG	S3	Upward	No trend
		SS	N4	No trend	No trend
			S4	Upward	No trend
	Chloride	SD	E2	Upward	Upward
	Chromium	SD	E2	No trend	No trend
			N2	Upward	No trend
			N5	Upward	No trend
		SS	S1	No trend	No trend
			S3	No trend	No trend
			S4	No trend	No trend
	Cobalt	SD	N2	No trend	No trend
	Copper	SD	N2	No trend	No trend

Trend from 2015 Field Year	Analyte	Matrix	Site	Trend from 2012 Field Year	Trend from 2009 Field Year
Upward			N5	No trend	No trend
		SS	N4	No trend	No trend
	Iron	NG	S1	Upward	No trend
			W2	Upward	No trend
		SD	N2	Upward	No trend
			N5	Upward	No trend
		SS	N2	No trend	No trend
	Lead	SD	N2	Upward	No trend
			N5	No trend	No trend
	Magnesium	SS	N4	No trend	No trend
			S4	No trend	No trend
	Manganese	NG	S1	Upward	No trend
		SD	S4	No trend	No trend
		SS	S4	Upward	No trend
	Molybdenum	NG	E6	No trend	No trend
			S3	Upward	No trend
		SB	S4	No trend	No trend
		SD	N5	No trend	No trend
	Nickel	SD	N2	No trend	No trend
			N5	No trend	No trend
		SS	N4	No trend	No trend
			S4	No trend	No trend
	Phosphorus	SD	E2	Upward	Upward
			N2	Upward	No trend
			N5	Upward	No trend
		SS	N2	No trend	No trend
			N4	No trend	No trend
			S1	No trend	Upward
			S3	Upward	No trend
			S4	Upward	No trend
	Potassium	SD	E2	No trend	No trend
			N2	Upward	No trend
		SS	N2	No trend	No trend
			S4	No trend	No trend
	Strontium	NG	S3	Upward	No trend

Trend from 2015 Field Year	Analyte	Matrix	Site	Trend from 2012 Field Year	Trend from 2009 Field Year
		SS	E6	No trend	No trend
			N4	No trend	No trend
			S4	No trend	No trend
	Sulfur	SD	N5	Upward	No trend
	Vanadium	SD	E2	Upward	No trend
			N2	No trend	No trend
			N5	Upward	No trend
	Zinc	NG	S3	Upward	No trend
		SD	E2	Upward	No trend
			N2	Upward	No trend

Table 3-6: Summary of Sites and Matrices With Site-Specific Upward Trend Lines (p<0.003) for Inorganic Analytes, 2015 Biomonitoring Program, Lambton Facility

Site	Matrix				Total Upward Trends	Parameters with Upward Trends where 2015 Concentration also Exceeds UL15 and/or Applicable Standards
	Soybeans	Natural Grasses	Soil	Sediment		
E1	0	0	0	N/A	0	
E2	0	0	0	**Aluminum**, Barium, Beryllium, Chloride, Chromium, Phosporus, Potassium, **Vanadium**, **Zinc**	9	Sediment Chromium >O.Reg.153/04, >ULN
E5	0	0	0	N/A	0	
E6	N/A	Molybdenum	Strontium	N/A	2	Natural Grasses Molybdenum >ULN Soil Strontium >UL15, >OTR
N2	0	0	**Aluminum**, **Arsenic**, Barium, Iron, Phosphorus, Potassium	**Aluminum**, Barium, Beryllium, **Cadmium**, Chromium, Cobalt, **Copper**, Iron, **Lead**, Nickel, Phosphorus, Potassium, **Vanadium**, **Zinc**	20	Soil Phosphorus >OTR Sediment **Aluminum** >UL15 Barium >UL15 **Cadmium** >O.Reg.153/04, >PSQG Chromium >O.Reg.153/04, >PSQG **Copper** >O.Reg.153/04, >PSQG Iron >PSQG Phosphorus >UL15, >PSQG Nickel >O.Reg.153/04, >PSQG **Zinc** >O.Reg.153/04, >PSQG

Site	Matrix				Total Upward Trends	Parameters with Upward Trends where 2015 Concentration also Exceeds UL15 and/or Applicable Standards
	Soybeans	Natural Grasses	Soil	Sediment		
N4	0	0	Calcium, **Copper**, Magnesium, Nickel, Phosphorus, Strontium	N/A	6	<u>Soil</u> Calcium >UL15, >OTR **Copper** >UL15 Magnesium >UL15, >OTR, >ULN Nickel >UL15 Phosphorus >UL15 Strontium >UL15
N5	N/A	0	**Arsenic**	**Aluminum**, **Arsenic**, Barium, Beryllium, Chromium, **Copper**, Iron, **Lead**, Molybdenum, Nickel, Phosphorus, Sulfur, **Vanadium**	14	<u>Sediment</u> **Arsenic** >O.Reg.153/04, >PSQG Chromium >O.Reg.153/04, >PSQG **Copper** >O.Reg.153/04, >PSQG Iron >PSQG Phosphorus >PSQG Nickel >O.Reg.153/04, >PSQG
S1	0	**Aluminum**, Iron, Manganese	Chromium, Phosphorus	0	5	
S2	0	0	**Aluminum**	N/A	1	
S3	N/A	Calcium, Molybdenum, Strontium, **Zinc**	Chromium, Phosphorus	0	6	<u>Natural Grasses</u> **Zinc** >ULN

Site	Matrix				Total Upward Trends	Parameters with Upward Trends where 2015 Concentration also Exceeds UL15 and/or Applicable Standards
	Soybeans	Natural Grasses	Soil	Sediment		
S4	Molybdenum	0	**Aluminum**, Barium, Beryllium, Calcium, Chromium, Magnesium, Manganese, Nickel, Phosphorus, Potassium, Strontium	**Arsenic**, Manganese	14	Soil Barium >UL15 Beryllium >UL15, >OTR Calcium > UL15 Magnesium >UL15 Nickel >UL15, >OTR Phosphorus >UL15, >OTR Strontium >UL15 Sediment **Arsenic** >UL15, >O.Reg. 153/04, >PSQG Manganese >UL15, >PSQG
S5	0	**Aluminum**, Barium	**Arsenic**	N/A	3	Natural Grasses **Aluminum** >UL15
W2	0	**Aluminum**, Iron	**Arsenic**	N/A	3	
W4	0	**Aluminum**	0	N/A	1	
Total	1	13	32	38	84	

Not Bold = Group 1

Bold = Group 2 Analyte

N/A = Not available

ULN - Upper Limit of Normal (MOECC, 1989)

OTR - Ontario Typical Range (MOECC, 2011)

O.Reg. 153/04 - MOECC O.Reg. 153/04 Table 1 Full Depth Background Site Condition Standards (MOECC, 2011).

PSQG - Provincial Sediment Quality Guidelines (MOECC, 2008)

3.2.6 Supplemental Investigations Based on Historical Report Findings

The inorganic findings from previous annual landfill reports which required additional investigation or discussion is provided below. The purpose of this section is to present the results of additional investigations recommended in historical Biomonitoring Reports, or to continue the discussion of previous findings in light of current data.

3.2.6.1 Barium in Natural Grass

In the 2015 Annual Landfill Report, a literature review of the phytotoxic effects of barium in natural grasses was recommended in response to the UL12 exceedances at Site S5 in the 2013 and 2014 Field Years. As a ULN value for natural grasses was not available for comparison, a literature review could provide information on the potential effects, or lack thereof, of barium at Site S5. Considering the absence of barium exceedances in natural grasses in the 2015 Field Year compared to the UL15, the literature review has been postponed. The lack of exceedances to the UL15 is not attributed to an increase in the calculated upper limit. As presented in the 2015 Annual Landfill Report, a comparison of the UL12 and UL15 for barium in natural grasses at Site S5 resulted in only a marginal increase (RPD 2%), while the site-wide UL12 to UL15 decreased marginally (RPD -2%). Monitoring should continue but no additional investigation is warranted at this time.

3.2.6.2 Increases in UL15 for Aluminum and Molybdenum

In the 2015 Annual Landfill Report, a comparison of UL15 and UL12 values was conducted (Clean Harbors, 2016). Since the upper limits are revised on a 3-year cycle, it is possible that gradual trends may be incorporated into the control charts. In that report, it was identified that the UL15 for aluminum and molybdenum increased by an RPD of 5% or greater for several sites in certain media. These parameters should be evaluated in light of the current site-specific trends lines to identify those analyte / site / matrix combinations for which an increase in the UL15 corresponds to an upward trend.

A summary of the aluminum and molybdenum site / matrix combinations for which the upper limits increased is provided below. The sites for which an upward trend was identified in **Section 3.2.5** are bolded.

- Aluminum (>5% increase from UL12 to UL15)
  - Natural grasses: E2, E5, N4, N5, **S1**, S2, S4, **S5**, **W2**, site wide
  - Soybean: W4
  - Sediment: **N5**
- Molybdenum (>5% increase from UL12 to UL15)

- Natural grasses: E6, S4
- Soil: E1, E2, N2, N4, S1, S2, S4, S5

There are no standards to which to compare aluminum in natural grasses, sediment or soybeans. The molybdenum concentration in natural grasses at Site E6 (9.93 mg/kg) for the 2015 Field Year exceeds the ULN (6 mg/kg). The molybdenum concentrations at Sites E1, E2, N2, N4, S1, S2 and S5 exceed the OTR but they do not exceed the ULN.

3.3 ORGANIC ANALYTES

The analytical results for the 2015 organic parameters have been summarized based on environmental media, and are found in **Tables C-2a, C-2b, C-2c, and C-2d** of **Appendix C**.

3.3.1 Quality Assurance/Quality Control

Seven blind field duplicates were analyzed for organic analytes. Field duplicates were considered acceptable if the RPD was ± 40%. The natural grasses, soil and sediment duplicate samples had RPDs exceeding the acceptable range for at least one organic analyte. RPDs were not calculated for the crop field duplicates as concentrations were one fifth of the RDL. The RPD between the original samples and field duplicates for organic data are provided in **Tables C-2a, C-2b, C-2c, C-2d, and C-2e**.

The percent recovery for the laboratory duplicates, laboratory control samples, laboratory control sample duplicates, matrix spikes, matrix spike duplicates, method blanks, certified reference material, internal reference material, and standard reference material were within the recovery range acceptable to the analytical laboratory for internal quality control requirements or the overall quality control met acceptability criteria. Where applicable qualifiers were added to the data and are presented in the tables in **Appendix C**.

3.3.2 Annual Findings

3.3.2.1 OCP

In 2015, 22 OCP analytes[11] were detected in environmental media at concentrations measured above their respective RDLs. These analytes were detected in natural grasses soil, sediment, field corn, soybeans, and winter wheat. The high resolution mass spectrometry/gas chromatography (GC/HRMS) analytical method used in the 2015 Field Year resulted in sample specific reporting detection limits which were typically lower than previous RDLs.

[11] aldrin, alpha-BHC, beta-BHC, delta-BHC, alpha-chlordane, gamma-chlordane, DDD (p,p'-DDD), DDE (p,p'-DDE), DDT (p,p'-DDT), dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin Aldehyde, heptachlor, heptachlor epoxide, lindane (gamma-hexachlorocyclohexane), methoxychlor, mirex, Parlar 26, and Parlar 50

Of the analytes that were detected, none exceeded the applicable guidelines for soil (rural parkland OTR_{98} or Table 1 SCS) or sediment (PSQG or Table 1 SCS) (**Tables C-2a, C-2b, C-2c, and C-2d** of **Appendix C**). There are no standards available for comparison of vegetation.

Monitoring should continue, but no additional examination is warranted at this time.

3.3.2.2 PCBs

None of the samples analyzed for PCBs had concentrations greater than the RDL in the 2015 Field Year. The RDL for PCB was <0.020 mg/kg for soil and sediment, and <0.05 mg/kg in vegetation. There were no soil samples that had detected PCB concentrations greater than the rural parkland OTR_{98} (0.015 mg/kg). A rural parkland OTR_{98} value is not available for comparison to sediment; therefore the sediment results were compared to the Table 1 SCS. No samples of PCBs had concentrations exceeding the Table 1 SCS. Guidelines for comparison of PCB concentrations in vegetation are not available, but all samples were below the RDL.

Monitoring should continue, but no additional examination is warranted at this time.

3.3.2.3 PCPs

The RDL for pentachlorophenol (PCP) varied from <0.0001 mg/kg to <0.0012 mg/kg in agricultural crops. Three samples had low detected concentrations of PCP: in soybean at Site E1, field corn at Site W4, in winter wheat at Site N4. The concentration of PCP in soybean at Site E1 (0.00015 mg/kg) exceeded the RDL (0.00011 mg/kg). Duplicate samples were collected at Site W4 (field corn) and N4 (winter wheat), where at both sites either the sample or its duplicate was below the RDL.

Monitoring should continue, but no additional examination is warranted at this time.

3.3.2.4 PCDD/DF

PCDD/DF parameters for soil samples collected in 2015 were compared to their respective rural parkland OTR_{98} for dioxins/furans, where available. There were no exceedances of the rural parkland OTR_{98} in the 2015 Field Year.

Concentrations of PCCD/DF levels measured in soil were also below or within the range of levels in Canada reported in the scientific literature (1.0 - 330 pg TEQ/g, from Birmingham *et al.*, 1989). The highest TEQ value (1.44 pg/g) was reported at Site W4 (**Table 3-7**).

Criteria for comparison of levels in natural grasses were not identified.

The concentrations of octachlorodibenzodioxin (OCDD) measured in field corn and soybeans were within the range of the typical levels for vegetables (Ontario tomatoes, potatoes) reported in scientific literature (ND to 3 pg/g (fresh weight)) (Birmingham *et al.*, 1989) (**Table 3-7**). The

levels of OCDD measured in winter wheat (fresh weight) were within the range of the typical levels for OCDD in Ontario wheat-based products (ND to 0.7 pg/g fresh weight, from Birmingham *et al.*, 1989).

Monitoring should continue, but no additional examination is warranted at this time.

Table 3-7: Concentration of Dioxins and Furans (TEQ), 2015 Biomonitoring Program, Lambton Facility

Site	Soil			Natural Grass		Crop		
	Lower Bound TEQ	Upper Bound TEQ	Comment	Lower Bound TEQ	Upper Bound TEQ	Type	Lower Bound TEQ	Upper Bound TEQ
E1	0.236	0.738	TEQ<OTR_{98}	0.00108	0.327	Soybean	0.0000780	0.209
E2	0.271	0.903	TEQ<OTR_{98}	0.130	2.42	Soybean	0.00863	0.120
E5	0.142	0.459	TEQ<OTR_{98}	0.00921	0.283	Soybean	0.00746	0.112
E6	0.605	1.02	TEQ<OTR_{98}	0.0576	0.344	N/A	N/A	N/A
E6	0.449	1.05	TEQ<OTR_{98}	N/A	N/A	N/A	N/A	N/A
N2	0.438	0.836	TEQ<OTR_{98}	0.00718	0.383	Field Corn	0.00	0.131
N4	0.215	0.980	TEQ<OTR_{98}	0.00951	0.455	Winter Wheat	0.00	0.171
N4	0.691	1.14	TEQ<OTR_{98}	N/A	N/A	Winter Wheat	0.00	0.308
N5	0.390	1.12	TEQ<OTR_{98}	0.0198	0.495	N/A	N/A	N/A
N5	N/A	N/A	N/A	0.00177	0.264	N/A	N/A	N/A
S1	0.289	0.944	TEQ<OTR_{98}	0.0156	0.390	Soybean	0.000452	0.0545
S2	0.257	0.820	TEQ<OTR_{98}	0.00441	0.205	Soybean	0.000245	0.0479
S2	N/A	N/A	N/A	N/A	N/A	Soybean	0.00	0.0442
S3	0.353	1.02	TEQ<OTR_{98}	0.0106	0.184	N/A	N/A	N/A
S4	0.387	0.862	TEQ<OTR_{98}	0.0175	0.310	Soybean	0.000606	0.0528
S5	0.126	0.522	TEQ<OTR_{98}	0.00759	0.246	Soybean	0.000175	0.0611
W2	0.716	1.02	TEQ<OTR_{98}	0.000527	0.536	Soybean	0.00555	0.358
W4	0.583	1.44	TEQ<OTR_{98}	0.0147	0.572	Field Corn	0.0000280	0.156
W4	N/A	N/A	N/A	N/A	N/A	Field Corn	0.0000281	0.0788

Notes:
Data presented in pg/g
N/A = Not Available
(WHO 2005) TEFs were used to calculate TEQ values (Van den Berg et al., 2006)
OTR_{98} of 0.0048 ng/g = 4.8 pg/g
Lower Bound TEQ - where ND substituted as 0 pg/g in the calculation of TEQ
Upper Bound TEQ - where ND substituted as RDL in the calculation of TEQ

4.0 FOLLOW-UP OF RECOMMENDATIONS FROM PREVIOUS BIOMONITORING REPORTS AND PROPOSED CHANGES

Table 4-1 presents the status of conclusions and recommendations presented previously in Biomonitoring Program reports.

Stantec is proposing a number of modifications to the Biomonitoring Program to streamline the program and accommodate the Landfill Expansion currently underway at the Lambton Facility. The proposed changes were presented in a letter prepared by Stantec (July 3, 2015). Comments were received from the MOECC (MOECC, 2015), and Neegan Burnside on behalf of First Nations (Neegan Burside Ltd., 2015). Taking these comments into consideration, a Revised Biomonitoring Sampling Program was prepared (Stantec, 2015a) and provided to the MOECC. Since that time, conditions at the Lambton Facility have changed, leading to additional proposed revisions to the Biomonitoring Program. A summary of recommended revisions is provided in **Table 4-2**. Further details on the proposed changes, including a figure showing the proposed new sites, are provided in **Appendix G**. Upon approval by the MOECC, these changes could be implemented during the next cycle of the Biomonitoring Program beginning in the 2017 Field Year.

Table 4-1: Status of Historical Conclusions and Recommendations

Item No.	Report	Conclusions and Recommendations Requiring Follow-up	Discussion	Status
1.	2015 Annual Landfill Report 2014 Field Year	Barium in natural grasses investigation	Barium in natural grasses (Discussed in Section 3.2.6) In the 2015 Annual Landfill Report, a literature review of the phytotoxic effects of barium in natural grass was recommended; considering the absence of exceedances in the 2015 Field Year this literature review is recommended to be postponed.	A literature review based on the phytotoxic effects of barium was postponed.
2.	2015 Annual Landfill Report 2014 Field Year	Calcium in soil investigation	Calcium in soil (Discussed in Section 3.2.3.4) In the 2015 Annual Landfill Report, additional investigation was recommended if calcium concentrations in soil exceeded the UL15 at N5. Concentrations of calcium in soil at N5 exceeded the UL15 and OTR_{98}.	Further investigation on the phytotoxic effects of calcium is recommended.
3.	2014 Annual Landfill Report, 2013 Field Year	Entering the remaining analytes into a database	Historic PCP and PCB data should be imported into the EQuIS database.	Not yet completed.

Table 4-2: Summary of Proposed Changes to the Biomonitoring Program

Type of Change	Proposed Changes
Test Sites	**Sites within Lambton Facility affected by Landfill Expansion** • Site E6 – No change at this time. • Site S3 – Remove from Biomonitoring Program. Site has been replaced by an access road. • New Site S7 – Proposed new site to replace Site S3 (refer to **Figure 1** in **Appendix G**). **Sites in Surrounding Area of Lambton Facility** • New Site E7 – Proposed new site to increase coverage to northeast of Facility based on predominant wind direction (refer to **Figure 1** in **Appendix G**). • Site S5 – Remove from Biomonitoring Program. Sufficient coverage to the south of Facility is provided by remaining sites.
Environmental Media	Discontinue maple leaf sampling
Chemical Analytes	Add fluoride as an analyte to all environmental media sampled in the Biomonitoring Program
Sampling Frequency	Change sediment fertility and characterization sampling to every three years.
Analytical Frequency	PCB, PCP and OCP: Analysis will change to a three-year cycle. Year 1, all samples will be submitted for analysis. Years 2 and 3, two samples per environmental media will be submitted for analytical testing: the site with highest historical concentration and the control. Should concentrations of PCB, PCP or OCP be detected at concentrations greater than 50% of the applicable guidelines, the remaining samples will be submitted for analysis.
Data Analysis	Create isopleth maps only when investigating recurring exceedances (more than three years consecutively) for Group 2 Chemicals.

5.0 CONCLUSIONS

Overall, the majority of exceedances of the UL15 in the 2015 Field Year were identified for Group 1 inorganic analytes (barium, beryllium, boron, calcium, chloride, cobalt, iron, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, strontium and sulfur). Many of these Group 1 analytes are ubiquitous or are required nutrients in the environment and are not expected to have deleterious effects on plant, human, and animal health due to chemical toxicity. Although these analytes may be present in the material processed at the Facility, they are given a lower weighting in the Biomonitoring Report. With the potential exception of calcium and barium, monitoring of these analytes in the Biomonitoring Program should continue to satisfy the requirements of ECA No. A031806, and do not warrant additional investigation at this time. Based on the repeated exceedance of the UL15 by calcium in soil at Site N5, additional investigation is warranted, and it is recommended that a literature review of calcium and the potential for phytotoxic effects should be conducted. In the 2015 Annual Landfill Report, a literature review of the phytotoxic effects of barium in natural grasses was recommended; considering the absence of natural grasses exceedances in the 2015 Field Year this literature review is recommended to be delayed.

Group 2 analytes are known to have toxicological effects in the environment or are conservatively considered to have toxicological effects to humans or ecological receptors. Consequently, identified exceedances or increasing trends for Group 2 analytes are weighted more heavily in the Biomonitoring Program in comparison to Group 1 analytes. The Group 2 analytes that exceeded site-specific UL15 values were aluminum, arsenic, copper, lead, mercury and zinc. Mercury was the only Group 2 analyte identified to have exceeded site-wide values, based on concentrations reported in soil. While continued monitoring of these analytes is important, additional investigation is not warranted at this time.

Concentration trend lines using linear regression statistics were updated on a site-specific basis for inorganic analytes. The purpose was to identify trends in the concentration of analytes (i.e. downward, upward, no change) over time. In summary, 99 regressions (upward and downward trends) were significant at $p<0.003$ based on detected concentrations; 15 showed a downward trend, and 84 showed an upward trend. Three sites (N2, N5 and S4) accounted for more than half of the upward trends. In addition, 25 of the 84 increasing trends had 2015 Field Year concentrations measure above their applicable guidelines, and 39 of the 84 increasing trends are repeated trends from the previous reporting cycle in the 2012 Field Year. The majority of the upward trends were Group 1 analytes. Group 2 analytes with upward trends included aluminum (natural grasses, sediment, and soil), arsenic (sediment and soil), cadmium (sediment), lead (sediment), vanadium (sediment) and zinc (natural grasses and sediment). Given the number of inorganic parameters in sediment at Sites N2 and E2 with repeating upward trends, and with concentrations measured above guidelines, additional investigation into the health of the benthic communities at these sites is recommended.

Organic Group 3 analytes are known toxins and/or carcinogens, and are produced when certain waste streams are incinerated and are known to accumulate in the environment. In the 2015 Field Year, Group 3 organic analytes were not detected at concentrations representative of concern for ecological health.

Based on the findings of the report, there are a number of methods of data analysis and reporting that should continue or require change. These methods are outlined below:

- Monitoring of changes in the RDLs during the program should continue and impacts on the results should be reported where applicable.
- When assessing the results for the Biomonitoring Program the greatest weight should be given to comparisons within and between sites monitored in the program versus comparisons with the Ontario ULN and rural parkland OTR_{98} which are representative of aging databases.
- Discussion of recurring findings should continue annually so that previous discussions are compiled and either confirmed or revised based on new results.
- PCP and PCB should be entered into the EQuIS database to improve data management efficiency.

Stantec is proposing a number of modifications to the Biomonitoring Program to streamline the program and accommodate the Landfill Expansion currently underway at the Lambton Facility. A summary of recommended changes to the Biomonitoring Program is provided in **Table 4-2**. Further details on the proposed changes are presented in **Appendix G**. Upon approval by the MOECC, these changes could be implemented during the next cycle of the Biomonitoring Program beginning in the 2017 Field Year.

The concentrations of the identified chemicals were generally within the expected range in comparison with baseline levels, with exceptions/qualifications discussed here in. The range of results indicates that the Biomonitoring Program continues to effectively meet its specific objectives of monitoring environmental concentrations and identifying the trends in concentrations over time.

6.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present.

Closure
March 10, 2017

Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Katherine Ketis, P. Eng. and reviewed by Doug Foye, M.Sc..

All of which is respectfully submitted,

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APPENDIX A
BIOMONITORING PROGRAM MATERIALS AND METHODS

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Appendix A BIOMONITORING PROGRAM MATERIALS AND METHODS

A.1 RATIONALE FOR PROGRAM APPROACH

A.1.1 Selection of Chemicals for Analysis

The Biomonitoring Program monitors the concentrations of selected analytes at select locations within approximately 1.5 km of the Lambton Facility. Initially, the program was designed to address concerns identified in human health/environmental risk assessments conducted during previous environmental assessments (Laidlaw Environmental Services Inc., 1991; Laidlaw Environmental Services Inc., 1996). The selection of analytes in 1991 was based on the results of the above-mentioned risk assessments.

Risk assessment is a tool used to evaluate the potential for human and/or ecological receptor health effects resulting from exposure to chemicals. The risk associated with a given chemical or analyte is dependent on the presence of a chemical, duration of exposure to that chemical, and the concentration of the chemical in the environment. Risk assessment also accounts for possible exposure pathways (e.g., inhalation (breathing), ingestion (food and water), dermal (skin), and plant uptake (from soil/deposition on plants)), the toxicity of the specific chemical, and the potential for a chemical to bio-accumulate.

During the risk assessments completed in 1991 and 1996 for the Lambton Facility, a screening process was used to select analytes for evaluation of potential human health and ecological risk. The types of information considered when selecting the analytes included the nature of the Lambton Facility operations as a hazardous waste management facility, sources of potential release of chemicals, results of environmental monitoring in the Lambton county area, the types and composition of wastes to be incinerated or buried in the landfill site, and the toxicity of the chemicals in the wastes.

The Biomonitoring Program continues to monitor the concentrations of a range of chemicals in the agricultural environment within approximately 1.5 km of the Lambton Facility.

The biomonitoring program includes metals, selected organochlorinated pesticides (OCP), pentachlorophenol (PCP) and dioxins/furans (PCDD/DF) in samples from environmental media. The testing procedure for OCP also provides information on the concentrations of polychlorinated biphenyls (PCB).

For reporting purposes, the analytes were grouped into three categories based on toxicity, and public perception of chemicals.

Group 1: Inorganic analytes representing the lowest potential threat to livestock or to the consuming public that eats crops from the area. At the time of establishing the Biomonitoring Program in 1991, reports of toxic effects in either humans or livestock were not identified in the literature for exposures to the analyte at concentrations considered 'typical' in the environment.

Group 2: Inorganic analytes reported or theorized in the literature to have toxic effects on environmental receptors. However, at the time of establishing the Biomonitoring Program these analytes were not considered to be toxic contaminants that occur on a widespread or common basis.

Group 3: Organic analytes with reported toxicity that are produced when certain waste streams are incinerated. These organic analytes are documented to accumulate in the environment.

From the above rationale, analytes were selected for inclusion in the annual biomonitoring program (**Table A1-1**). The list of analytes required by the Ministry of the Environment and Climate Change (MOECC) to monitor is provided in the design and operation manual which is an attachment to operating Environmental Compliance Approval No. A031806.

Table A1-1: List of Analytes, by Group, Monitored during the 2015 Biomonitoring Program, Lambton Facility

GROUP 1 ANALYTES		
Barium	Iron	Silicon
Beryllium	Magnesium	Silver
Boron	Manganese	Sodium
Calcium	Molybdenum	Strontium
Chloride	Nickel	Sulphur
Chromium	Phosphorus	Titanium
Cobalt	Potassium	Zirconium
GROUP 2 ANALYTES		
Aluminum	Copper	Thallium
Arsenic	Lead	Vanadium
Cadmium	Mercury	Zinc
GROUP 3 ANALYTES		
Organochlorine Pesticides (OCPs)		
Aldrin	p,p' DDD	Endrin
a-BHC	p,p' DDE	Endrin Aldehyde
b-BHC	p,p' DDT	Heptachlor
g-BHC (Lindane)	Dieldrin	Heptachlor Epoxide
d-BHC	a Endosulfan	Methoxychlor
a-Chlordane	b Endosulfan	Mirex
g Chlordane	Endosulfan Sulphate	Toxaphene
Total Polychlorinated Biphenyls (PCB)		
Pentachlorophenol (PCP)		
Furans and Dioxins (PCDD/DF)		
Total Tetrachlorodibenzofurans (T4CDF)	Total Tetrachlorodibenzo-p-dioxins (T4CDD)	
Total Pentachlorodibenzofurans (T5CDF)	Total Pentachlorodibenzo-p-dioxins (T5CDD)	
Total Hexachlorodibenzofurans (T6CDF)	Total Hexachlorodibenzo-p-dioxins (T6CDD)	
Total Heptachlorodibenzofurans (T7CDF)	Total Heptachlorodibenzo-p-dioxins (T7CDD)	
Octachlorodibenzofuran (8CDF)	Octochlorodibenzo-p-dioxin (8CDD)	

A.1.2 Selection of Environmental Media for Analysis

Several natural and agricultural media were considered for inclusion in the Biomonitoring Program. These included soil, grass from hay or pastured fields, grain and oilseed crops, corn silage, maple trees and sediment from drainage ditches. Consideration was also given to the typical practices used during crop production and the species of plants that grow as part of the natural vegetation surrounding the facility. For example, soybean/winter wheat rotations and natural grasses are more prevalent in the vicinity of the Lambton Facility than other agricultural crops and natural vegetation. In addition, the Ontario Ministry of the Environment maintained a phytotoxicology assessment program, which included silver maple leaf foliage, in St. Clair Township (Kinch, 1995). Knowledge of the cropping systems in the area, as well as those media and analytes that were being tested by others, contributed to the selection of the environmental media listed in **Table A1-2**.

Table A1-2 List of Analytes, by Group and Environmental Matrix, Monitored during the Biomonitoring Program, Lambton Facility

Group	Environmental Media			
	Soil	Drainage Ditch Sediment	Natural Grasses	Agricultural Crop
1	All	All	All	All
2	All	All	All	All
3	All (except PCP)	All (except PCDD/DF and PCP)	All (except PCP)	All

A.1.3 Selection of Test Sites

When the Biomonitoring Program was established in 1991, test site selection was based mainly on projections of the location of contaminants that could be dispersed by the facility's on-site liquid waste incinerator and that could have potential impacts on the surrounding environment. In order to include all potential emissions from the facility (i.e., to include fugitive and dust emissions from the landfill and other on-site activities), the site selection criteria were modified. Specifically, these modifications resulted in the selection of test sites that were spaced at approximately equal distances, and located to the north, south, east and west of the Lambton Facility (**Figure 1**). The selection of sites was based on criteria that would allow long-term, representative sampling of the media of interest.

A.1.4 Frequency of Sampling

The frequency of sampling was based on the outcomes from the first six years (1991-1996) of the Biomonitoring Program. The nature of the results was hypothesized to fall within one of two categories.

1. If the content of the waste stream through the Lambton Facility is consistent, then emissions, barring malfunctions, should be relatively consistent over time. In this case, changes in the concentration of stable, persistent analytes in the environment could be expected to occur gradually over time and at a predictable rate. If the rates of change are established over a substantial time period (e.g., six years), then the frequency of subsequent monitoring could be reduced. The concentrations of analytes in environmental media between sampling events could be interpolated from available data.
2. If the content of the waste stream to the Lambton Facility is variable, then emissions should also be expected to vary. This would decrease the potential for establishing patterns of predictable occurrence or accumulation of analytes in the environment. The frequency of subsequent monitoring could then be increased.

The data from 1991 through 1996 appeared to be representative of the latter pattern of change. The data obtained during the Biomonitoring Program suggests that sampling on less than an annual basis could result in an incomplete understanding of changes in the concentrations of analytes in environmental media over time. Hence, annual sampling events were continued.

A.2 MATERIALS AND METHODS

The field protocol for the 2015 Biomonitoring Program and field phase test records from the 2015 Field Year are included within the Raw Data File Notebook (RDFN) (Stantec, 2015b). The field protocol for the Biomonitoring Program describes the methods used during the field and analytical phases of the program. A quality assurance/quality control (QA/QC) program, based on principles embodied in the United States Environmental Protection Agency (US EPA) Good Laboratory Practices (GLP) standards (United States Environmental Protection Agency 1989) and the Organization for Economic Cooperation and Development (OECD) principles of good laboratory practice (Organization for Economic Co-operation and Development 1981), was used during the field phase of the Biomonitoring Program.

The analytical phase of the program relied on verification by the laboratory that government and industry standards were being met at the time of sample analysis. ALS Laboratories in Edmonton, AB, and Burlington, ON, the analytical testing facilities that were responsible for the analytical phase of the Biomonitoring Program, are accredited by the Standards Council of Canada (SCC) in cooperation with the Canadian Association for Laboratory Accreditation Inc. (CALA). The ALS laboratory in Lulea, Sweden which conducted the analysis of silicon in vegetation and soil and phosphorus in soil, is accredited by the Swedish Board for Accreditation

and Conformity Assessment (SWEDAC), which is based on the same standards on which the Canadian ALS is accredited (ISO 17025). Accreditation by SWEDAC is accepted in Canada (ALS, 2009a). An Analytical Data Summary Package is provided by ALS and provides detailed documentation of the actual procedures used during laboratory phase of the 2015 Biomonitoring Program and is on file with Stantec Ltd (Guelph).

The Raw Data File Notebook (RDFN) and the Analytical Data Summary Package provide detailed documentation of the actual procedures used during the field and laboratory phases of the Biomonitoring Program.

A.2.1 Study Design

The study design may be described as a modified radial layout of a network of indicator test sites that include a series of sampling plots. The fixed-plot design ensures that monitoring can be conducted at the same test site location over a number of years. Permanent, electromagnetic markers were buried at one corner of each test site so that the site and plots can be located each year.

A.2.2 Location and Management of Test Sites

Table A2-1 provides a general description of the test sites. Additional detail about the location of each test site is not provided in order to respect landowner confidentiality. A diagram of the facility and the relative locations of the test sites are provided in **Figure 1** in the Annual Landfill Report. All the test sites, except four (N5, S1, E2 and W2), were located in areas free of known anomalies that could influence the results (e.g., dusty, gravel roads or other potential emission sources). Site W2 and the drainage ditch for Site E2 were located relatively close to gravel roads. Upon review of the results from the drainage ditch at Site S1 next to a gravel road (2004-2008), it was decided that the results were likely impacted by the proximity to the road, thus in 2009 the drainage ditch was moved back near its original location north of the crop under the tree cover. Site N5, was located at the northern boundary of the facility and adjacent to a paved road (Petrolia Line) with constant truck and local traffic. It should be noted that other potential sources of emissions (e.g., chemical plants, refineries) exist approximately nine kilometres west and southwest of the Lambton Facility. Emissions from these sources may have affected the results obtained from Sites S4 and W4 in the Biomonitoring Program due to their greater distance from the Lambton Facility.

Given the distance of Sites W4, S4, and E2 from the Lambton Facility, (W4 ~1.4 km, S4 ~2.4 km, E2 ~ 1.75 km), it is likely that data collected from these sites are influenced by other activities than those related to the Lambton Facility.

Table A2-1: Name and Location of Test Sites, Biomonitoring Program, Lambton Facility

Site	Years in Program	Location Relative to the Facility
N2	1991-present	North: located in an agricultural field approx. 700 m from the property boundary
N4	2001-present	North: located in an agricultural field approx. 400 m from the property boundary
N5	2002-present	North: located on a naturally landscaped, but previously disturbed, area at the northern property boundary
E1	1991-present	East: located in an agricultural field approx. 0.1 km from the property boundary
E2	1991-present	East: located in an agricultural field approx. 2.0 km from the property boundary
E5	1992-present	East: located in an agricultural field approx. 0.25 km from the property boundary
E6	2000-present	East: located on the cap of a previously filled waste cell at the property
S1	1991-present	South: located in an agricultural field approx. 0.2 km from the property boundary 1
S2	1991-present	South: located in an agricultural field approx. 0.4 km from the property boundary
S3	1991-present	South: located on the cap of a previously filled waste cell at the property
S4	1991-present	South: located in an agricultural field approx. 2.4 km from the property boundary
S5	1995-present	South: located in an agricultural field approx. 0.8 km from the property boundary
W2	1991-present	West: located in an agricultural field approx. 0.1 km from the property boundary
W4	1997-present	West: located in an agricultural field approx. 1.4 km from the property boundary

1. The drainage ditch at S1 was moved to a location next to a gravel road (2004-2008) and in 2009 was moved back to its original location north of the agricultural field.
2. Only sediment monitored from 1991-1992; all media in 1993–present.

A.2.3 Collection of Samples for Chemical Analyses

Samples of soil, drainage ditch sediment, natural grasses and agricultural crop were collected following the methods outlined in detail in the Revised Biomonitoring Sampling Program (Stantec, 2016). Since the samples were analyzed to determine the concentration of organic chemicals, all sampling equipment was cleaned according to a strict regimen designed to

prevent sample contamination. Documentation of the chain of custody of the samples was maintained.

Given that the lands surrounding the Facility are predominantly agricultural for the production of crops, a sampling depth of 15 cm was used to collect samples of soil. This is based on the recommendations identified in the US EPA Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (US EPA, 2005) which allows for variation of the soil mixing zone through which the chemicals would be deposited and then distributed.

A.2.4 Analytical Procedures in the 2015 Field Year

The analytical procedures used during the 2015 Biomonitoring Program were consistent with US EPA methods (**Table A2-2**). The Analytical Data Summary Package provided by the analytical testing facility contains detailed information of the analytical procedures for the 2015 results. The Analytical Data Summary Package is on file with Stantec Ltd (Guelph).

Analysis of PCDD/DF and OCP proceeded by high resolution mass spectrometry (HRMS). PCB analysis was conducted by capillary column GC with electron capture detection (ECD) while PCP analysis was performed by gas chromatography / low resolution mass spectrometry (GC-LRMS).

Metals analysis was conducted by collision/reaction cell inductively coupled plasma-mass spectrophotometry (ICP-MS) or inductively coupled plasma–optical emission spectroscopy (ICP-OES). Silicon in tissue and phosphorus analysis in soil was conducted by inductively coupled plasma atomic emission spectrometry (ICP-AES) and inductively coupled plasma sector field mass spectrometry (ICP/SFMS). Chloride analysis was performed using ion chromatography. Mercury analysis was performed using cold vapour atomic absorption spectroscopy (CVAAS).

Table A2-2: Analytical Methods, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix		Methods for 2015		
	Soil/ Sediment	Tissue	Method Reference No.	Sample Preparation	Finishing Instrument
Dioxins/furans (PCDD/DF) Includes TEQ and max TEQ	x	x	EPA 1613 Revision B	EPA 1613 Revision B	HRMS
Total PCB (no aroclors)	x		EPA 8082, 3630	EPA 8082, 3630	GC/ECD
Total PCB (no aroclors)		x	EPA 8082, 3540, 3600	EPA 8082, 3540, 3600	GC/ECD
Organochlorinated pesticides (OCP)	x	x	Modified EPA 1699	EPA 1699	HRMS
Pentachlorophenol		x	EPA 8270	EPA 8270	GC-LRMS

Table A2-2: Analytical Methods, 2015 Biomonitoring Program, Lambton Facility

Analyte	Matrix		Methods for 2015		
	Soil/ Sediment	Tissue	Method Reference No.	Sample Preparation	Finishing Instrument
(PCP)			(modified)	(modified)	
Metals[1]	x		EPA 6020A (modified)	EPA 200.2	CRC ICP-MS
Chloride	x		EPA 300.1	EPA 300.1	Ion Chromatography
Mercury	x		EPA 1631E	EPA 200.2	CVAAS
Sulphur	x		EPA 6010B	EPA 200.2	ICP-OES
Phosphorus	x[4]		EPA 200.8	EPA 200.8	ICP-SFMS
Silicon	x[4]		EPA 200.8	EPA 200.8	ICP-SFMS
Silicon		x[4]	EPA 200.8	EPA 200.7	ICP/SFMS
Metals[2]		x	EPA 200.7	EPA 200.3	ICP-OES
Metals[3]		x	EPA 200.8	EPA 200.3	ICP-MS
Sulphur		x	EPA 200.7	EPA 200.3	ICP-OES
Chloride		x	APHA 4110B	CSS (16:7)	Ion Chromatography
Mercury		x	EPA 245.1	EPA 200.3	CVAA

1	Aluminum, arsenic, barium, beryllium, boron, calcium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, , potassium, silver, sodium, strontium, thallium, titanium, vanadium, zinc, zirconium
2	Aluminum, calcium, chromium, iron, phosphorus, potassium, sodium, sulphur, titanium, zinc
3	Arsenic, barium, beryllium, boron, cadmium, cobalt, copper, lead, magnesium, manganese, molybdenum, nickel, silver, strontium, thallium, vanadium and zirconium
4	Analysis conducted at ALS Lulea, Sweden

A.2.5 Data Analysis

Equipment used by the analytical laboratory produced measurements of analytes in environmental media at high levels of reliability within certain limits. The "low" limit is often referred to as the Method Detection Limit (MDL). This represents the concentration below which reliable measurement of an individual analyte cannot be made by laboratory equipment. MDLs may vary between media, analytes, years and, as with dioxins and furans, between samples. The Reporting Detection Limit (RDL) is the concentration at which individual analyses will consistently detect the analytes when present. The RDL must be equal or greater than the MDL.

The actual concentrations below the MDL or RDL are not known. Therefore the value of the RDL was arbitrarily used for statistical treatment of those samples where the concentration of the analyte was not detected above its RDL. This is viewed as a "worst case" estimate of the concentration of the analyte.

In the 2015 Annual Landfill Report, testing of normality was done on biomonitoring concentrations to determine if logarithms of actual concentrations or normal concentrations should be used during statistical analyses of the data to account for the reported distribution of the data. This methodology was used in the interpretation of the data collected in the current field year in order to ensure consistency. Missing data were accounted for within the statistical analysis and were left blank within each data set.

A.2.6 Development of Control Charts

Industry has used control charts for many years as a useful tool that graphically monitors the performance of industrial processes. Control charts allow for identification of outlying values and temporal trends that may be developing in the data (King, 1982) and which may warrant follow-up action. These concepts were initially applied to the first six years of data for each analyte/matrix/test site (1991-1996) collected during the Biomonitoring Program. The control charts are updated on a three year cycle. The control charts were most recently updated in the 2015 report to include data from 1991-2014. Control charts were not developed for sites and matrices where concentrations of an element were not detected above the RDL. Also, a control chart for an analyte was not developed for those sites with <6 data points per matrix.

The log-transformed or normally distributed data for each analyte in each medium were subjected to a two-way analysis of variance (years and sites). The residual and year variance components were estimated from the analysis of variance tables and used to compute the standard deviation (SD) for site-specific and site-wide concentrations of each analyte for each year. For select analyte/matrix combinations which were log-transformed, the mean and mean ±3SD, or upper and lower control limits (UL15 and LL15), were computed on the log scale and then transformed back (by taking the antilog) before the control charts were prepared. Consequently, the mean is not equidistant between the control limits on the charts. It is important to understand that once any analysis is performed on transformed data, the results should remain in the transformed format. Taking the "antilog" of a log-transformed data has the potential to change the results. However, for the purposes of the Biomonitoring Program it was decided that taking the antilog of the control limits would allow the reader to make a meaningful and direct comparison between the annual findings, the calculated control limits and the concentrations of those analytes that have been typically observed in Ontario i.e., ULN, rural parkland OTR_{98}. Log-transformation was not applied to data that were normally distributed; normal distribution was confirmed via the Shapiro-Wilk test and by analyzing the skewness and kurtosis of the analyte/matrix combinations. The mean and mean ±3SD, or upper and lower control limits (UL15 and LL15) were computed directly for these data.

The mean and standard deviation of the annual concentrations of the analytes per matrix per test site or on a site-wide basis can be used to define the "normal" or "expected" variability of the annual mean concentrations of the analytes. Provided there are no outlying values or temporal trends, the annual mean concentrations of the analytes can be expected to fall within plus or minus three standard deviations of the mean, with an approximate probability of 0.997. The site-specific calculations incorporate data from each site individually to determine the typical ranges expected a specific site, while the site-wide calculations pool data from every site together to calculate the typical range for all data. The change in number of sites per year was accounted for in the computation of the standard deviation of the yearly means. Data that has a high degree of variability will result in a large standard deviation, causing the ±3SD, or control limits, to be wide.

A.2.7 Development and Interpretation of Trend Lines

Change in the environment over time may be influenced by many local, regional and global factors. In order to understand how concentrations of chemicals have changed in environmental media collected at the biomonitoring sites, concentration trend lines were developed based on linear regression statistics. The purpose of the regression analyses is to identify trends in the concentrations of analytes (i.e., downward, upward, no change) over time. Upward trends, as with downward trends, are expected and confirm the dynamic nature of environmental change. However, due to the presence of the Lambton Facility within the local area, upward trends may warrant further examination.

Inorganic trend lines are updated on a site-wide and site-specific basis on a three year cycle. Organic trend lines are updated on a six year cycle.

A.2.8 Biomonitoring Program Sampling and Reporting Cycles

The following table details the sampling and reporting cycles of the Clean Harbors Biomonitoring Program (**Table A2-3**).

Table A2-3 Sampling and Reporting Cycles, Biomonitoring Program, Lambton Facility

Task	Timing	Dataset	2016 Report	2017 Report	2018 Report	2019 Report	2020 Report
			2015 Field Year	2016 Field Year	2017 Field Year	2018 Field Year	2019 Field Year
Sampling Task							
Collect biomonitoring chemistry samples at all sites	annual	N/A	X	X	X	X	X
Collect sediment fertility & characterization samples at applicable sites	annual	N/A	X			X	
Collect soil fertility samples at all sites	6 yr cycle	N/A			X		
Collect soil characterization samples at all sites	6 yr cycle	N/A			X		
Reporting Task							
Compare annual findings with control chart upper limits	annual	Current year	X	X	X*	X	X
Compare annual findings with government guidelines, where they exist	annual	Current year	X	X	X	X	X
Follow up on identified issues, if any	annual	N/A	X	X	X	X	X
Update control chart limits used for annual comparisons (inorganic, and organic if applicable)	3 yr cycle	1991 - current year			X (UL18, LL18)		
Update inorganic site-specific trends	3 yr cycle	1991- current year	X			X	
Update inorganic site-wide trends	3 yr cycle	1991- current year		X			X
Update organic site-specific/site-wide trends	6 yr cycle	1991- current year					X

Notes:

* Although control charts are updated this year, the current year's data is compared to the previous control chart limits (i.e., 2017 field year data is compared to the UL15)

A.2.9 Interpretation of Dioxin and Furan Data

Dioxin and furan congeners are rarely encountered individually, and are generally present as mixtures of several congeners (CCME, 2002). There are 210 possible congeners of dioxins and furans, each with unique physico-chemical properties. However, only 7 of the 75 PCDD congeners and 10 of the 135 PCDF congeners are thought to have "dioxin-like" toxicity (i.e., elicit their toxicity via binding to the aryl hydrocarbon (Ah) receptor) (CCME, 2002). In order to compare the toxicity of different samples with different congener profiles, toxic equivalency factors (TEFs) have been developed that standardize "dioxin-like" substances to a toxicologically equivalent (TEQ) amount of 2,3,7,8-TCDD, the most toxic congener (CCME, 2002). The TEQ is expressed as:

$$\text{Total TEQ} = \sum_{i=1}^{n} (C_i \times TEF_i)$$

Where:

TEQ = concentration of the mixture of congeners, expressed as a toxic equivalent of 2,3,7,8-TCDD

n = number of congeners with available TEF values (i.e., 17)

Ci = concentration of congener i

TEFi = toxic equivalency factor for the congener i (unitless)

Toxic equivalency factors (TEFs) developed by the World Health Organization (WHO) (WHO, 2005) were applied to the reported concentrations of the 17 congeners to determine the TEQ. The TEFs are provided in **Table A2-4**.

Table A2-4: TEFs for Dioxins and Furans (PCDD/PCDF), Biomonitoring Program, Lambton Facility

Analyte	Humans/Mammals $TEF_{H/M}$
Chlorinated dibenzo-p-dioxins	
2,3,7,8-TCDD	1.0
1,2,3,7,8-PeCDD	1.0
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01

Table A2-4: TEFs for Dioxins and Furans (PCDD/PCDF), Biomonitoring Program, Lambton Facility

Analyte	Humans/Mammals $TEF_{H/M}$
OCDD	0.0003
Chlorinated dibenzofurans	
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.03
2,3,4,7,8-PeCDF	0.3
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.0003
Notes: TEF = Toxic equivalency factor for humans/mammals based on WHO (2005)	

A.2.10 Interpretation of Field Duplicates

The assessment of laboratory and field duplicates was compared based on the relative percent difference (RPD) between the two. The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Where:

RPD = relative percent difference;

Coriginal = concentration in the original sample; and

Cdup = concentration in the duplicate.

The RPD could not be calculated if either of the concentrations were less than 5 times the MDL. Field duplicates were considered acceptable if the RPD was +/- 40%.

A.3 REFERENCES

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APPENDIX B
CHARACTERIZATION OF SOILS AT TEST SITES

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Appendix B CHARACTERIZATION OF SOILS AT TEST SITES

B.1 SOIL AND SEDIMENT CHARACTERISTICS

The media used to monitor the inorganic and organic chemicals in the Biomonitoring Program include agricultural soil, crops, natural grasses and sediment from nearby drainage ditches (many of which collect water and eroded soil from adjacent farm fields, woodlots and grassy areas). Since the inherent characteristics of two of these media, soil and sediment, have a very significant impact on the movement and fate of chemicals in the local environment, they also have a very significant impact on the results of the program. In soil, cation exchange capacity (CEC), organic matter, clay content and pH are among the most important factors affecting the fate of inorganic and organic chemicals. In general, soil consists of 25% air, 25% water, 45% mineral matter and 5% organic matter (Brady & Weil, 2002). Clay in mineral matter and humus in organic matter possess an abundance of positive and negative molecular charges on their surfaces. Negatively charged sites, however, tend to predominate. This is particularly true for humus in neutral and alkaline (pH ≥ 7.0) soils. Thus, to varying degrees, chemicals in the soil solution, which are also positively and/or negatively charged, are attracted to and held by soil particles, or are repelled by soil particles and taken up by plants or leached into the groundwater.

CEC measures the ability of a soil to adsorb, or attract and hold, positively charged ions (e.g., Al3+, Ca2+, Mg2+, K+, NH4+, Na+) called cations (anions are negatively charged ions). Cations are attracted to the negatively charged surfaces of clay and humus particles in the soil. Hydrogen ions (H+), which are also positively charged, compete with other cations for negative charge sites on clay and humus particles. The pH of the soil, which indicates the concentration of H+ ions in the soil, has a significant impact on the CEC.

In soil, these processes drive the movement of inorganic chemicals. Although these processes also affect some organic chemicals, most organic chemicals, due to their hydrophobic characteristics, are generally sorbed within the organic fraction of soils (Brady & Weil, 2002). This sorption process leads to a partitioning of the organic chemical: a portion becomes associated with organic matter and a portion remains in the soil solution. The following general statements apply to discussions on the effect of soil CEC, organic matter, clay content and pH on the findings arising from the Biomonitoring Program:

- increase organic matter (OM), increase CEC, may increase sorption
- increase clay, increase CEC, may increase sorption
- increase pH, increase CEC, may increase sorption

Therefore for inorganic chemicals:

- increase pH (less H+), increase CEC (more negative sites available)
- for cations increase soil adsorption, decrease plant and microbial uptake, decrease leaching

Therefore for organic chemicals:

- increase OM (more sorption sites)
- increase soil sorption, decrease plant and microbial uptake, decrease leaching

B.2 SOIL AND SEDIMENT CHARACTERIZATION

The soil at each test site was characterized in two ways. First, when the site was initiated, the soil profile was examined to a depth of 100 cm. The site was classified and compared with the expected classification indicated in the Soil Survey of Lambton County Report No. 22 of the Ontario Soil Survey (Mathews et al., 1957). The soil and general conditions at each test site were assessed in the field and described in accordance with the information presented in the Field Manual for Describing Soils in Ontario (Ontario Centre for Soil Resource Evaluation, 1993). This provided a method for the description and classification of soil properties, soil profiles and landscape features consistent with the Canadian System of Soil Classification (Research Branch, 1987). Second, samples of the soil are analyzed on a six-year cycle to determine the concentrations of nutrients, organic matter, pH, and CEC, and particle size distribution (texture).

Due to the potential influence of water movement in each drainage ditch on the characteristics of the sediment in each drainage ditch, samples of the sediment are analyzed to determine the concentrations of nutrients, organic matter, pH, CEC and particle size distribution (texture). These analyses are conducted annually to ensure that the characterization of the drainage ditch sediment represents the conditions under which the analytical samples were obtained. The detailed methodology for sediment sampling is provided in the Revised Biomonitoring Sampling Program (Stantec, 2016).

B.3 SOIL HORIZON LAYERS

The following information provides descriptions of the general soil horizons as identified on the biomonitoring sites, soil characterization field sheets. Each horizon description is identified with a combination of an upper case A, B or C letter code that describes the mineral layer or horizon, and various lower case suffixes that describe the characteristics of the horizon. The combination of upper and lower case codes represents the soil horizon sequence and specific attributes of each horizon.

Mineral Layers or Horizons:

A Dark coloured, mineral, surface horizons, enriched with organic matter
B Brownish, subsurface horizons, often described as zones of accumulation
C Relatively non-weathered material from which the soil profile has developed
AB A transition horizon from A to B materials
g A horizon characterized by grey colours and/or prominent mottling, indicating periodic intense reduction
j A modifier of suffixes to denote an expression of, but failure to meet the requirements of the suffix it modifies. It must be placed to the right of and adjacent to the suffix it modifies
k A horizon containing calcium and/or magnesium carbonates that will effervesce with dilute hydrochloric acid (HCl)
m A horizon slightly altered by hydrolysis, oxidation, or solution, or all three to give a change in colour or structure or both
p A horizon disturbed by man's activities such as cultivation, logging and habitation
t A horizon enriched with silicate clay

Table B3-1 Explanation of nutrient levels:

Nutrient	Typical Range for Agricultural Soils in Ontario (mg/kg)	Analysis Methodology
Phosphorous (P)	0-30	Phosphorous analysis was calculated as sodium bicarbonate extractable phosphorous and was expressed in parts per million (mg/kg).
Potassium (K)	150 - 250	Potassium analysis was calculated as ammonium acetate extractable potassium and was expressed in parts per million (mg/kg).
Magnesium (Mg)	100 - 400	Magnesium analysis was calculated as ammonium acetate extractable magnesium and was expressed in parts per million (mg/kg).
Calcium (Ca)	1,000 – 5,000	Calcium analysis was calculated as ammonium acetate extractable calcium and was expressed in parts per million (mg/kg).

B.4 SOIL CLASS

When the individual biomonitoring sites were initiated, the soil profile was examined to a depth of 100 cm. The soil types reported for the individual biomonitoring sites were representative of the soils commonly found in the area surrounding the facility. The soil profile descriptions recorded for the 14 biomonitoring sites were used to verify the type of soils identified in the Soil

Survey of Lambton County Report No. 22 of the Ontario Soil Survey (Mathews et al., 1957). **Table B4-1** provides details on the soil profile identified at each site.

The majority of the sites (9 of 14) were classified as a Caistor clay loam. These soils are composed of fine textured limestone till materials containing abundant Huron shale fragments in the clayey parent material. The B horizon is frequently a dense and compact layer and restrictive to root growth. The topography is level to slightly undulating and embodies numerous shallow depression areas. One site (W2) was classified as well to imperfectly drained Caistor-loamy phase soils. These soils are characterized as medium textured material over shallow clay till parent material that occurs within one metre of the surface. The entire profile contains numerous coarse fragments in the form of gravels and Huron shale particles. The three sites (N5, E6, S3) located at the Lambton Facility were composed of calcareous clay materials. All of these sites were consistent with the calcareous parent material associated with the Caistor clay soil series. However, the fact that they consisted of disturbed soil precluded actual naming of the soil series. One site (W4) was classified as a poorly drained Brookston clay soil. These soils developed on level to slightly sloping topography and have slow internal and external drainage.

Table B4-1: Soil Profile Descriptions for Each Site, Biomonitoring Program, Lambton Facility

Site	Horizon[1] [2]	Depth (cm)	Texture[3]	Drainage Class	Slope (%)	Soil Type
N2	Ap Bmgj Btgj Ckgj	0 - 20 20 - 34 34 - 63 63 - 100	C SiCL C C	Imperfect	0.5	Caistor Clay Loam
N4	P MgJ KgJ	0 - 25 25 - 46 46 - 100	L/CL Si/CL Si/CL	Imperfect	1-1.5	Caistor Clay Loam
N5	Abk Bmgjk Ckgj	0 – 30 30 – 55 55 – 70+	SiCl SiCl SiCl	Not Applicable	<1	Disturbed (Landscaped Perimeter)
E1	Ap Bmgj Btgj Ckgj	0 - 23 23 - 49 49 - 92 92 - 100	L SCL SiCL SiCL	Imperfect	1.0	Caistor Clay Loam
E2	Ap Bmgj Btgj Ckgj	0 - 20 20 - 31 31 - 46 46 - 100	SCL CL SiCL SiCL	Imperfect	0.5	Caistor Clay Loam

Table B4-1: Soil Profile Descriptions for Each Site, Biomonitoring Program, Lambton Facility

Site	Horizon[1] [2]	Depth (cm)	Texture[3]	Drainage Class	Slope (%)	Soil Type
E5	Ap AB Bmgj Btgj Ckgj	0 - 20 20 - 32 32 - 47 47 - 81 81 - 100	L CL CL SiC SiCL	Imperfect	1.0	Caistor Clay Loam
E6	Ahk Ckg	0 - 20 20 - 25 > 25	C C Dense clay & shale fragments	Not Applicable	<1	Disturbed Soil (Landfill Cap)
S1	Apk Bktgj Ckg	0 - 21 21 - 46 46 - 100	CL SiC C	Imperfect	0.5	Caistor Clay Loam
S2	Ap Bmgj Ckgj	0 - 22 22 - 35 35 - 100	CL SiC C	Imperfect	0.5	Caistor Clay Loam
S3	Ap Ckgj	Disturbed Site	L[4]	Not Applicable	2.0	Disturbed Soil (Landfill Cap)
S4	Ap Btgj Ckg	0 - 22 22 - 71 71 - 100	SiCL C C	Imperfect	1.0	Caistor Clay Loam
S5	Ap Btgj Ckgj	0 - 25 25 - 58 58 - 100	SCL C C	Imperfect	1.0	Caistor Clay Loam
W2	Ap Bmgj Btgj Ckgj	0 - 23 23 - 45 45 - 61 61 - 100	L CL SiC SiC	Well	0.5	Caistor- Loamy Phase
W4	Ap Bmgj Ckgj	0 - 21 21 - 56 56 - 100	CL C C	Poor	<1.0	Brookston Clay

Data collected July, 1993 for all sites except S5 (1995), W4 (1997), E6 (2000), N4 (2001) and N5 (2002) when these sites entered the program

C = Clay, L = Loam, S = Sand, Si = Silt

A Horizon Only

B.5 SOIL AND SEDIMENT RESULTS

B.5.1 Soil Class

Soil characterization samples were collected during the 2011 Biomonitoring Program (**Table B5-1**). This information is collected on a six year cycle. The soil types reported for the individual biomonitoring sites were representative of the soils commonly found in the area surrounding the facility. The soil profile descriptions recorded for the 14 biomonitoring sites were used to verify the type of soils identified in the Soil Survey of Lambton County Report No. 22 of the Ontario Soil Survey (Mathews *et al*., 1957).

B.5.2 Soil Nutrients, OM, CEC, pH, Clay Content and Surface Texture, 2011 Field Year

Soil fertility samples were collected during the 2011 Biomonitoring Program (**Table B5-2**). This information is collected on a three year cycle, but will be changed to a six-year cycle starting in 2013 as described in the Revised Biomonitoring Sampling Program (Stantec, 2016). The 2011 soil fertility results indicated that the nutrients, organic matter (OM), cation exchange capacity (CEC), pH, and surface texture of the near surface soil varied from site to site. The soil fertility results were comparable to those last reported in 2009, taking into consideration natural variation.

Table B5-1: Particle Size Distribution and Textural Class of Soil, 2011 Biomonitoring Program, Lambton Facility

Site	Soil Texture	Sand (%)	Silt (%)	Clay (%)
N2	Silty Clay	18	41	41
N4	Clay Loam	25	42	33
N5	Clay	26	31	43
E1	Loam	47	29	24
E2	Loam	41	38	21
E5	Loam	39	35	26
E6	Loam	39	37	24
S1	Loam	32	42	26
S2	Clay Loam	20	46	34
S3	Clay Loam	36	37	27
S4	Silty Clay	6	47	47
S5	Clay	20	30	50
W2	Loam	38	38	24
W4	Silty Clay	14	43	43

Table B5-2: Nutrients (P, K, Mg, Ca), Organic Matter (OM), pH, Cation Exchange Capacity (CEC) of Soil, 2011 Biomonitoring Program, Lambton Facility

Site	P	K	Mg	Ca	OM	pH	CEC
	(ppm)	(ppm)	(ppm)	(ppm)	(%)		(MEQ/100g)
N2	25	216	679	4153	3.8	7.2	28.2
N4	32	156	305	5268	3.2	7.7	30.5
N5	6	123	426	4906	4.8	7.6	29.6
E1	61	267	560	5554	6.9	7.5	34.3
E2	26	128	334	2743	4.2	7.3	18
E5	14	123	460	2766	3.2	7.3	19.2
E6	5	164	369	4207	4.8	7.5	25.7
S1	16	141	492	3538	3.6	7.6	23.4
S2	10	324	362	3095	3.8	7.5	20.5
S3	21	157	575	2988	3.4	7.2	21.3
S4	18	194	910	4549	2.8	7.5	32
S5	16	158	574	3596	2.6	7.7	24.4
W2	24	112	431	2948	3.3	7.4	19.8
W4	73	218	553	3344	4	6.5	23.1

B.5.3 Sediment Depth

The depth of the sediment in each drainage ditch varies from year to year and site to site depending on soil erosion processes. Precipitation, cropping practices and the stability of the drainage ditch banks are a few of the factors affecting how much sediment may be present in a drainage ditch at a given time.

B.5.4 Sediment Nutrients, OM, CEC, pH, Clay Content and Surface Texture, 2015 Field Year

The sediment nutrients, OM, CEC, pH, clay content and surface texture are analyzed annually as described in the Biomonitoring Program: Materials and Methods (**Appendix A**). Sediment was sampled under dry conditions for all Sites where drainage ditch sediment was sampled (Sites N2, N5, S1, S3, S4 and E2). At all sites sediment was sampled to approximately 15 cm depth.

As expected, in 2015 the sand, silt and clay content (**Table B5-3**) and the nutrients, OM, CEC, and pH (**Table B5-4**) of the sediment varied from site to site, similar to last year. These sediment characteristics can be affected by the annual and historical management practices used at

each field or location in which each test site is located. The data fell within the expected range for southern Ontario and there were no observable spatial trends among the sites.

Table B5-3: Particle Size Distribution and Textural Class of Sediment, 2015 Biomonitoring Program, Lambton Facility

Site	Soil Texture	Sand (%)	Silt (%)	Clay (%)
N2	Silt Loam	12	64	24
N5	Silty Clay Loam	11	61	28
E2	Silt	9	90	1
S1	Silt Loam	24	67	9
S3	Clay Loam	34	39	27
S4	Silt Loam	35	52	13

Table B5-4: Nutrients (P, K, Mg, Ca), Organic Matter (OM), pH, Cation Exchange Capacity (CEC) of Sediment, 2015 Biomonitoring Program, Lambton Facility

Site	P (ppm)	K (ppm)	Mg (ppm)	Ca (ppm)	OM (%)	pH	CEC (MEQ/100g)
N2	33	178	627	6291	7.2	7.5	38.3
N5	49	174	574	5825	7.6	7.4	35.6
E2	9	106	421	4791	1.5	7.9	28.9
S1	18	213	827	5563	7.8	7.2	36.5
S3	9	111	261	4241	3.7	7.7	24.9
S4	11	116	495	5145	2.4	7.7	31.3

B.6 REFERENCES

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APPENDIX C
INORGANIC AND ORGANIC ANALYTES
2015 DATA AND DESCRIPTIVE STATISTICS

Table C-1a
Summary of Natural Grass 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location			E1		E2		E5	E6	N2	N4		N5			S1		S2		S3	
Sample Date			22-Sep-15	22-Sep-15	23-Sep-15	23-Sep-15	22-Sep-15	22-Sep-15	23-Sep-15	5-Oct-15	5-Oct-15	22-Sep-15	22-Sep-15		22-Sep-15	22-Sep-15	21-Sep-15	21-Sep-15	22-Sep-15	22-Sep-15
Sample ID			15-E1-NG-CH-039	15-E1-NG-CH-039 (LR)	15-E2-NG-CH-049	15-E2-NG-CH-049 (LR)	15-E5-NG-CH-055	15-E6-NG-CH-061	15-N2-NG-CH-019	15-N4-NG-CH-025	15-N4-NG-CH-025 (LR)	15-N5-NG-CH-035	15-D3-NG-CH-105		15-S1-NG-CH-069	15-S1-NG-CH-069 (LR)	15-S2-NG-CH-075	15-S2-NG-CH-075 (LR)	15-S3-NG-CH-085	15-S3-NG-CH-085 (LR)
Sampling Company			STANTEC		STANTEC		STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC		STANTEC		STANTEC		STANTEC	
Laboratory Work Order			L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387		L1707387	L1707387	L1707387	L1707387	L1707387	L1707387
Laboratory Sample ID		Rural ULN	L1707387-19	WG2251847-18	L1707387-23	WG2251847-20	L1707387-26	L1707387-28	L1707387-10	L1707387-13	WG2251847-15	L1707387-16	L1707387-48	RPD	L1707387-32	WG2251847-25	L1707387-35	WG2251847-27	L1707387-38	WG2251949-7
Sample Type	Units	A		Lab Replicate		Lab Replicate					Lab Replicate		Field Duplicate	(%)		Lab Replicate		Lab Replicate		Lab Replicate
General Chemistry																				
Chloride	mg/kg	10000[A]	5250	-	2940	-	5780	**13100[A]**	7030	5750	-	4780	5270	9.75 %	4190	-	3510	-	6360	-
Metals, Group 1																				
Barium	mg/kg	n/v	3.64	3.96	9.12	8.81	4.37	10.4	7.28	13.7	13.2	8.03	7.32	9.25 %	4.75	4.77	3.77	3.81	5.85	6.08
Beryllium	mg/kg	n/v	<0.20	<0.2	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	nc	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2
Boron	mg/kg	20[A]	**32.7[A]**	**34.4[A]**	**36.8[A]**	**35.7[A]**	**44.2[A]**	**27.3[A]**	**33.7[A]**	**45.1[A]**	**46.9[A]**	**58.1[A]**	**51.9[A]**	11.27 %	**39.0[A]**	**38.5[A]**	**39.5[A]**	**40.6[A]**	**89.3[A]**	**85.2[A]**
Calcium	mg/kg	n/v	6420	6690	9000	9980	12200	7790	7620	10800	10700	11700	13600	15.02 %	9770	9580	9010	8990	11500	-
Chromium	mg/kg	5[A]	0.56	0.70	0.76	0.81	0.81	1.35	0.64	0.57	0.39	0.53	0.94	nc	0.35	0.25	0.48	0.54	0.91	-
Cobalt	mg/kg	2[A]	<0.10	<0.1	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	nc	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1
Iron	mg/kg	500[A]	109	107	93.4	87.7	98.0	64.3	61.9	59.8	55.4	96.7	99.9	3.26 %	55.7	52.3	51.3	50.0	57.4	-
Magnesium	mg/kg	n/v	1420	1600	2490	2340	2990	2360	2040	2440	2670	2740	2770	1.09 %	2530	2550	2030	2020	2190	2220
Manganese	mg/kg	50[A]	10.9	12.2	18.2	17.9	25.0	35.3	38.3	20.7	21.0	24.4	22.5	8.10 %	22.1	22.1	15.9	15.8	22.8	23.4
Molybdenum	mg/kg	6[A]	0.523	0.521	2.23	2.25	1.16	**9.93[A]**	0.683	1.66	1.64	0.518	0.515	0.58 %	1.02	1.01	0.915	0.936	1.09	1.09
Nickel	mg/kg	5[A]	0.76	0.94	0.70	0.70	0.57	1.09	0.91	0.96	1.02	0.94	0.77	19.88 %	1.09	1.12	0.80	0.80	1.01	0.98
Phosphorus	mg/kg	n/v	3990	4150	5310	5240	2800	1470	2830	3490	3470	1650	1490	10.19 %	3920	3740	4070	4020	2880	-
Potassium	mg/kg	n/v	20900	20900	22000	22300	26200	20300	20600	25100	24900	22400	24300	8.14 %	25400	25500	23900	24200	22700	-
Silicon	mg/kg	n/v	1620	-	1540	-	2530	3930	7250	1570	-	4350	4820	nc	1060	-	3790	-	916	-
Silver	mg/kg	n/v	<0.10	<0.1	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	nc	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1
Sodium	mg/kg	n/v	24	25	24	24	27	108	26	62	60	57	63	nc	22	23	<20	<20	33	-
Strontium	mg/kg	n/v	11.7	12.0	15.4	15.9	12.9	40.4	16.1	14.5	14.2	56.0	52.0	7.41 %	13.2	13.2	14.5	14.1	42.9	42.6
Sulfur	mg/kg	5000[A]	1940	1980	2780	2720	1900	3220	2580	2070	2020	1420	1400	1.42 %	1930	1830	1600	1570	1950	2000
Titanium	mg/kg	n/v	3.04	2.07	2.98	2.22	2.94	2.02	1.89	2.29	1.83	3.38	3.63	7.13 %	1.85	1.63	1.64	1.54	2.20	-
Zirconium	mg/kg	n/v	<5.0	<5	<5.0	<5	<5.0	<5.0	<5.0	<5.0	<5	<5.0	<5.0	nc	<5.0	<5	<5.0	<5	<5.0	<5
Metals, Group 2																				
Aluminum	mg/kg	n/v	90	81	75	60	66	35	17	34	21	56	59	5.22 %	18	13	12	<10	23	-
Arsenic	mg/kg	n/v	<0.20	<0.2	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	nc	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2
Cadmium	mg/kg	0.5[A]	<0.050	<0.05	0.068	0.070	<0.050	0.382	<0.050	<0.050	0.072	<0.050	0.050	nc	0.078	0.088	0.254	0.260	0.072	0.082
Copper	mg/kg	7[A]	**7.20[A]**	**8.12[A]**	**8.21[A]**	**8.11[A]**	**10.1[A]**	6.51	**9.14[A]**	**8.86[A]**	**9.09[A]**	**8.80[A]**	**8.32[A]**	5.61 %	**10.2[A]**	**10.3[A]**	**9.38[A]**	**9.48[A]**	**9.69[A]**	**9.92[A]**
Lead	mg/kg	20[A]	0.15	0.15	0.12	0.12	0.18	0.23	0.10	<0.10	0.10	0.45	0.37	nc	<0.10	<0.1	<0.10	<0.1	0.15	0.13
Mercury	mg/kg	n/v	<0.020	0.021	<0.020	<0.02	0.039	0.044	<0.020	<0.020	<0.02	0.076	0.072	nc	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02
Thallium	mg/kg	n/v	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	<0.05	<0.050	<0.050	nc	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05
Vanadium	mg/kg	6[A]	<0.50	<0.5	<0.50	<0.5	<0.50	<0.50	<0.50	<0.50	<0.5	<0.50	<0.50	nc	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5
Zinc	mg/kg	40[A]	32.6	33.3	38.6	35.4	36.0	27.2	34.7	32.7	31.9	29.5	28.2	4.51 %	36.5	35.4	**45.5[A]**	**45.1[A]**	**50.7[A]**	-

See last page for notes.

Table C-1a
Summary of Natural Grass 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location			S4	S5	W2	W4
Sample Date			21-Sep-15	21-Sep-15	21-Sep-15	23-Sep-15
Sample ID			15-S4-NG-CH-093	15-S5-NG-CH-099	15-W2-NG-CH-003	15-W4-NG-CH-009
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC
Laboratory Work Order			L1707387	L1707387	L1707387	L1707387
Laboratory Sample ID		Rural ULN	L1707387-42	L1707387-45	L1707387-3	L1707387-6
Sample Type	Units	A				
General Chemistry						
Chloride	mg/kg	10000[A]	8370	9660	8890	**25300[A]**
Metals, Group 1						
Barium	mg/kg	n/v	9.83	25.7	8.80	6.98
Beryllium	mg/kg	n/v	<0.20	<0.20	<0.20	<0.20
Boron	mg/kg	20[A]	8.8	**44.8[A]**	10.4	4.9
Calcium	mg/kg	n/v	6370	27700	7050	4250
Chromium	mg/kg	5[A]	1.98	2.51	2.49	4.71
Cobalt	mg/kg	2[A]	<0.10	0.28	<0.10	0.20
Iron	mg/kg	500[A]	67.9	422	209	435
Magnesium	mg/kg	n/v	3120	6020	2160	2820
Manganese	mg/kg	50[A]	16.9	20.5	34.1	21.0
Molybdenum	mg/kg	6[A]	3.57	3.42	5.52	3.27
Nickel	mg/kg	5[A]	1.36	1.72	1.02	3.00
Phosphorus	mg/kg	n/v	2910	1370	3260	3330
Potassium	mg/kg	n/v	22600	12000	27700	35300
Silicon	mg/kg	n/v	9000	6510	8560	10300
Silver	mg/kg	n/v	<0.10	<0.10	<0.10	<0.10
Sodium	mg/kg	n/v	<20	38	40	99
Strontium	mg/kg	n/v	13.8	50.1	12.4	7.64
Sulfur	mg/kg	5000[A]	3090	**6700[A]**	3100	2720
Titanium	mg/kg	n/v	1.72	13.3	5.09	9.46
Zirconium	mg/kg	n/v	<5.0	<5.0	<5.0	<5.0
Metals, Group 2						
Aluminum	mg/kg	n/v	37	541	194	469
Arsenic	mg/kg	n/v	<0.20	<0.20	<0.20	<0.20
Cadmium	mg/kg	0.5[A]	0.059	0.120	<0.050	0.140
Copper	mg/kg	7[A]	4.98	5.52	**8.58[A]**	6.08
Lead	mg/kg	20[A]	<0.10	0.36	0.18	0.43
Mercury	mg/kg	n/v	<0.020	<0.020	0.022	0.026
Thallium	mg/kg	n/v	<0.050	<0.050	<0.050	<0.050
Vanadium	mg/kg	6[A]	<0.50	1.13	<0.50	1.05
Zinc	mg/kg	40[A]	18.4	23.7	24.0	23.2

Notes:

MOE	Ontario Ministry of the Environment
A	Ontario Ministry of the Environment Rural "upper limit of normal" contaminant guidelines for phytotoxicology samples (1989)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-1b
Summary of Sediment 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location				E2	N2	N5	S1			S3	S4
Sample Date				23-Sep-15	23-Sep-15	22-Sep-15	22-Sep-15	22-Sep-15		22-Sep-15	21-Sep-15
Sample ID				15-E2-SD-CH-045	15-N2-SD-CH-015	15-N5-SD-CH-031	15-S1-SD-CH-065	15-D4-SD-CH-106		15-S3-SD-CH-081	15-S4-SD-CH-089
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory Work Order		Ontario SCS	PSQG	L1707387	L1707387	L1707387	L1707387	L1707387		L1707387	L1707387
Laboratory Sample ID		Table 1	Table 1 - LEL	L1707387-22	L1707387-9	L1707387-15	L1707387-31	L1707387-49	RPD	L1707387-37	L1707387-41
Sample Type	Units	A	B					Field Duplicate	(%)		
General Chemistry											
Chloride	mg/kg	n/v	n/v	73.8	79.1	447	11.1	10.4	6.51 %	94.4	15.7
Metals, Group 1											
Barium	mg/kg	n/v	n/v	81.5	141	164	118	126	6.56 %	63.5	109
Beryllium	mg/kg	n/v	n/v	0.73	1.26	1.10	1.03	1.05	1.92 %	0.62	0.80
Boron	mg/kg	n/v	n/v	18.8	17.4	12.8	18.9	17.1	10.00 %	16.9	14.4
Calcium	mg/kg	n/v	n/v	104000	43100	38800	19000	22200	15.53 %	80100	62800
Chromium	mg/kg	26[A]	26[B]	**27.0[AB]**	**40.2[AB]**	**41.0[AB]**	**46.3[AB]**	**46.7[AB]**	0.86 %	23.3	**26.6[AB]**
Cobalt	mg/kg	50[A]	n/v	10.5	10.8	11.5	11.5	11.5	0.00 %	7.98	14.9
Iron	mg/kg	n/v	20000[B]	**21000[B]**	**28700[B]**	**31000[B]**	**26600[B]**	**26400[B]**	0.75 %	17300	**23200[B]**
Magnesium	mg/kg	n/v	n/v	33400	20000	16500	13100	13600	3.75 %	25600	19300
Manganese	mg/kg	n/v	460[B]	459	335	334	208	210	0.96 %	349	**656[B]**
Molybdenum	mg/kg	n/v	n/v	2.80	1.86	2.91	4.16	4.66	11.34 %	3.77	1.20
Nickel	mg/kg	16[A]	16[B]	**29.0[AB]**	**36.3[AB]**	**38.9[AB]**	**40.3[AB]**	**40.4[AB]**	0.25 %	**24.7[AB]**	**30.4[AB]**
Phosphorus	mg/kg	n/v	600[B]	540	**1030[B]**	**1210[B]**	**968[B]**	**953[B]**	nc	356	568
Potassium	mg/kg	n/v	n/v	3310	4170	4010	4030	3550	12.66 %	2260	2990
Silicon	mg/kg	n/v	n/v	204000	199000	189000	249000	235000	nc	220000	254000
Silver	mg/kg	0.5[A]	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	nc	<0.20	<0.20
Sodium	mg/kg	n/v	n/v	210	160	500	130	130	nc	220	130
Strontium	mg/kg	n/v	n/v	94.7	53.0	58.9	33.4	34.1	2.07 %	72.2	67.8
Sulfur	mg/kg	n/v	n/v	250	1180	2460	1640	1550	5.64 %	2300	490
Titanium	mg/kg	n/v	n/v	247	76.8	48.7	113	94.1	18.25 %	148	146
Zirconium	mg/kg	n/v	n/v	7.0	<5.0	<5.0	<5.0	<5.0	nc	<5.0	<5.0
Metals, Group 2											
Aluminum	mg/kg	n/v	n/v	16900	28900	27100	23400	22400	4.37 %	12000	17700
Arsenic	mg/kg	6[A]	6[B]	5.36	5.56	**8.18[AB]**	4.64	4.56	1.74 %	**6.23[AB]**	**6.26[AB]**
Cadmium	mg/kg	0.6[A]	0.6[B]	0.19	**0.70[AB]**	**1.28[AB]**	**0.80[AB]**	**0.81[AB]**	1.24 %	0.32	0.22
Copper	mg/kg	16[A]	16[B]	**19.1[AB]**	**30.1[AB]**	**33.6[AB]**	**38.0[AB]**	**38.7[AB]**	1.83 %	**19.1[AB]**	**18.2[AB]**
Lead	mg/kg	31[A]	31[B]	9.09	17.7	29.5	22.1	23.0	3.99 %	11.9	13.6
Mercury	mg/kg	0.2[A]	0.2[B]	<0.050	0.061	0.153	0.080	0.084	nc	0.144	<0.050
Thallium	mg/kg	n/v	n/v	0.230	0.345	0.453	0.344	0.341	0.88 %	0.239	0.189
Vanadium	mg/kg	n/v	n/v	33.2	50.0	50.8	44.7	42.6	4.81 %	26.8	35.0
Zinc	mg/kg	120[A]	120[B]	53.1	**128[AB]**	**187[AB]**	108	107	0.93 %	51.4	57.7

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
[A]	Table 1 - All Types of Property Uses
PSQG	Ontario Provincial Sediment Quality Guidelines
[B]	Table 1: PSQG for Metals and Nutrients - Lowest Effect Level
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-1c
Summary of Soil 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location					E1	E2		E5	E6			N2		N4			N5	S1		S2
Sample Date					15-Sep-15	15-Sep-15	15-Sep-15	15-Sep-15	22-Sep-15	22-Sep-15		5-Oct-15	5-Oct-15	8-Jul-15	8-Jul-15		22-Sep-15	16-Sep-15	16-Sep-15	16-Sep-15
Sample ID					15-E1-SS-CH-037	15-E2-SS-CH-043	15-E2-SS-CH-043 (LR)	15-E5-SS-CH-053	15-E6-SS-CH-059	15-D2-SS-CH-104		15-N2-SS-CH-013	15-N2-SS-CH-013 (LR)	15-N4-SS-CH-023	15-D1-SS-CH-103		15-N5-SS-CH-029	15-S1-SS-CH-063	15-S1-SS-CH-063 (LR)	15-S2-SS-CH-073
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC		STANTEC	STANTEC		STANTEC	STANTEC		STANTEC
Laboratory Work Order		Ontario SCS			L1707387	L1707387	L1707387	L1707387	L1707387	L1707387		L1707387	L1707387	L1707387	L1707387		L1707387	L1707387	L1707387	L1707387
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1707387-17	L1707387-20	L1707387-20B	L1707387-24	L1707387-27	L1707387-47		L1707387-7	WG2250095-7	L1707387-11	L1707387-46		L1707387-14	L1707387-29	WG2250095-8	L1707387-33
Sample Type	Units	A	B	C			Lab Replicate			Field Duplicate	RPD (%)		Lab Replicate		Field Duplicate	RPD (%)			Lab Replicate	
General Chemistry																				
Chloride	mg/kg	n/a	35	n/v	1.78	1.70	-	1.17	9.87	11.2	12.62 %	4.81	-	10.4	9.82	5.74 %	8.97	5.72	-	3.91
Metals, Group 1																				
Barium	mg/kg	210	170	n/v	40.1	86.0	-	123	82.2	68.8	17.75 %	121	120	86.6	80.0	7.92 %	80.0	102	102	93.9
Beryllium	mg/kg	2.5	2.5	n/v	0.39	0.60	-	0.87	0.64	0.57	nc	1.05	1.05	0.78	0.78	nc	0.67	0.86	0.89	0.82
Boron	mg/kg	36	30	10_p	3.8	8.7	-	9.4	**10.2**^{C}	7.6	nc	**12.4**^{C}	**11.4**^{C}	**10.4**^{C}	**11.6**^{C}	10.91 %	**15.3**^{C}	**11.4**^{C}	9.8	8.4
Calcium	mg/kg	n/v	54000	n/v	2390	13400	-	4780	25900	20700	22.32 %	4740	4870	50300	**55100**^{B}	9.11 %	**64100**^{B}	8010	8170	7210
Chromium	mg/kg	67	58	50	14.2	21.8	-	28.6	23.3	23.0	1.30 %	35.4	35.7	25.0	24.5	2.02 %	25.1	28.9	28.8	26.1
Cobalt	mg/kg	19	16	25	4.05	7.42	-	9.87	7.49	7.42	0.94 %	11.7	11.6	10.3	8.94	14.14 %	9.06	10.2	11.0	12.3
Iron	mg/kg	n/v	36000	35000	11700	18900	-	21800	17500	17500	0.00 %	23700	24800	19400	19600	1.03 %	19000	23000	22900	21900
Magnesium	mg/kg	n/v	19000	10000	2520	7680	-	5490	**10900**^{C}	**10200**^{C}	6.64 %	6820	6960	**19400**^{BC}	**20100**^{BC}	3.54 %	**22700**^{BC}	7630	7470	7300
Manganese	mg/kg	n/v	1900	700	161	338	-	608	420	415	1.20 %	566	482	477	359	28.23 %	433	484	596	489
Molybdenum	mg/kg	2	0.984	2_p	**1.30**^{B}	**1.45**^{B}	-	**2.11**^{ABC}	**2.03**^{ABC}	**1.91**^{B}	6.09 %	**1.13**^{B}	**1.16**^{B}	**2.11**^{ABC}	**2.14**^{ABC}	1.41 %	**2.35**^{ABC}	**1.11**^{B}	**1.10**^{B}	**1.35**^{B}
Nickel	mg/kg	37	34	60	11.5	19.9	-	24.8	21.4	21.9	2.31 %	31.6	32.4	27.3	27.7	1.45 %	25.7	28.4	28.5	26.0
Phosphorus	mg/kg	n/v	830	n/v	409	611	655	568	505	369	nc	**910**^{B}	-	693	773	nc	555	799	-	625
Potassium	mg/kg	n/v	6500	n/v	994	2280	-	2670	1720	1550	10.40 %	3500	3330	2440	2490	2.03 %	2560	2990	2770	2300
Silicon	mg/kg	n/v	n/v	n/v	362000	301000	313000	316000	296000	330000	nc	302000	-	246000	270000	nc	224000	262000	-	301000
Silver	mg/kg	0.5	0.27	n/v	<0.20	<0.20	-	<0.20	<0.20	<0.20	nc	<0.20	<0.2	<0.20	<0.20	nc	<0.20	<0.20	<0.2	<0.20
Sodium	mg/kg	n/a	690	n/v	<100	<100	-	<100	<100	<100	nc	<100	<100	<100	<100	nc	150	<100	<100	<100
Strontium	mg/kg	n/v	n/v	n/v	7.2	22.8	-	17.2	64.9	56.8	13.31 %	18.0	19.5	42.4	43.2	1.87 %	69.4	17.5	17.3	18.2
Sulfur	mg/kg	n/v	n/v	1000	260	480	-	380	510	450	nc	350	380	330	320	nc	**1220**^{C}	360	390	280
Titanium	mg/kg	n/v	n/v	n/v	66.9	88.0	-	96.7	96.6	73.2	27.56 %	105	99.0	88.2	101	13.53 %	125	105	75.7	72.8
Zirconium	mg/kg	n/v	n/v	n/v	<5.0	<5.0	-	<5.0	<5.0	<5.0	nc	<5.0	<5	<5.0	<5.0	nc	<5.0	<5.0	<5	<5.0
Metals, Group 2																				
Aluminum	mg/kg	n/v	30000	n/v	10300	15000	-	20200	14600	13500	7.83 %	24500	24100	16100	16100	0.00 %	14100	19900	19500	18600
Arsenic	mg/kg	11	11	10	4.23	5.72	-	5.27	5.10	5.35	4.78 %	5.18	5.30	5.66	5.71	0.88 %	6.49	6.51	6.60	6.06
Cadmium	mg/kg	1	0.7	3	0.31	0.33	-	0.45	0.47	0.50	nc	0.52	0.51	0.38	0.34	nc	**0.71**^{B}	0.47	0.53	0.37
Copper	mg/kg	62	46	60	8.35	18.6	-	15.8	15.6	15.9	1.90 %	25.1	25.9	23.0	23.9	3.84 %	19.2	17.5	17.4	14.0
Lead	mg/kg	45	34	150	10.7	**85.8**^{AB}	-	14.4	13.7	14.6	6.36 %	15.2	15.2	11.2	11.6	3.51 %	18.7	15.0	15.4	14.6
Mercury	mg/kg	0.16	0.13	0.15	<0.050	0.111	-	<0.050	0.058	0.058	nc	0.053	0.055	<0.050	<0.050	nc	0.089	<0.050	<0.05	<0.050
Thallium	mg/kg	1	5500	n/v	0.146	0.195	-	0.220	0.201	0.198	nc	0.215	0.205	0.198	0.209	nc	0.326	0.233	0.227	0.207
Vanadium	mg/kg	86	86	70	23.6	31.5	-	38.8	30.7	29.7	3.31 %	40.2	40.1	31.8	32.4	1.87 %	30.2	40.1	38.4	36.0
Zinc	mg/kg	290	160	500	41.0	76.6	-	72.6	65.4	65.9	0.76 %	83.1	85.0	60.8	61.0	0.33 %	86.8	68.2	67.5	57.1

See last page for notes.

Table C-1c
Summary of Soil 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location					S3	S4	S5	W2	W4	
Sample Date					22-Sep-15	21-Sep-15	16-Sep-15	21-Sep-15	5-Oct-15	5-Oct-15
Sample ID					15-S3-SS-CH-079	15-S4-SS-CH-087	15-S5-SS-CH-097	15-W2-SS-CH-001	15-W4-SS-CH-007	15-W4-SS-CH-007 (LR)
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory Work Order		Ontario SCS			L1707387	L1707387	L1707387	L1707387	L1707387	L1707387
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1707387-36	L1707387-39	L1707387-43	L1707387-1	L1707387-4	L1707387-4B
Sample Type	Units	A	B	C						Lab Replicate
General Chemistry										
Chloride	mg/kg	n/a	35	n/v	**218[B]**	3.54	10.0	6.50	1.63	-
Metals, Group 1										
Barium	mg/kg	210	170	n/v	68.0	162	101	68.1	106	-
Beryllium	mg/kg	2.5	2.5	n/v	0.71	1.28	0.79	0.63	0.97	-
Boron	mg/kg	36	30	10_p	**17.8[C]**	8.8	9.2	5.6	**11.4[C]**	-
Calcium	mg/kg	n/v	54000	n/v	7580	7450	8860	4170	4770	-
Chromium	mg/kg	67	58	50	24.9	39.7	26.3	20.1	32.5	-
Cobalt	mg/kg	19	16	25	8.69	11.5	9.50	6.80	8.99	-
Iron	mg/kg	n/v	36000	35000	18800	26700	22200	17000	23200	-
Magnesium	mg/kg	n/v	19000	10000	6180	8710	8730	4020	6650	-
Manganese	mg/kg	n/v	1900	700	406	292	346	372	264	-
Molybdenum	mg/kg	2	0.984	2_p	**4.27[ABC]**	0.76	**1.18[B]**	**1.71[B]**	**1.22[B]**	-
Nickel	mg/kg	37	34	60	25.1	**36.1[B]**	26.2	17.2	30.2	-
Phosphorus	mg/kg	n/v	830	n/v	709	**942[B]**	583	536	**1020[B]**	**1040[B]**
Potassium	mg/kg	n/v	6500	n/v	2620	3580	2670	1350	3620	-
Silicon	mg/kg	n/v	n/v	n/v	298000	259000	305000	323000	283000	299000
Silver	mg/kg	0.5	0.27	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	-
Sodium	mg/kg	n/a	690	n/v	660	<100	<100	<100	<100	-
Strontium	mg/kg	n/v	n/v	n/v	37.0	27.7	17.5	10.8	17.3	-
Sulfur	mg/kg	n/v	n/v	1000	600	390	260	310	400	-
Titanium	mg/kg	n/v	n/v	n/v	72.5	57.3	105	88.7	83.5	-
Zirconium	mg/kg	n/v	n/v	n/v	<5.0	<5.0	<5.0	<5.0	<5.0	-
Metals, Group 2										
Aluminum	mg/kg	n/v	30000	n/v	15300	29900	19000	14800	22800	-
Arsenic	mg/kg	11	11	10	5.92	4.52	6.20	6.34	5.11	-
Cadmium	mg/kg	1	0.7	3	0.49	0.44	0.29	0.40	0.45	-
Copper	mg/kg	62	46	60	16.9	27.8	13.8	12.0	25.4	-
Lead	mg/kg	45	34	150	14.9	17.1	13.5	14.3	16.4	-
Mercury	mg/kg	0.16	0.13	0.15	0.055	0.055	<0.050	<0.050	0.052	-
Thallium	mg/kg	1	5500	n/v	0.201	0.205	0.201	0.180	0.274	-
Vanadium	mg/kg	86	86	70	31.0	44.6	37.3	32.7	39.6	-
Zinc	mg/kg	290	160	500	68.9	85.3	59.6	52.6	95.0	-

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
A	Table 1 - Agricultural or Other Property Use
MOE	Ontario Ministry of the Environment
B	Ontario Typical Range (OTR) values for Rural Parks, Ontario Ministry of Environment and Energy (OMEE, 1993)
C	Ontario Ministry of the Environment Rural "upper limit of normal" contaminant guidelines for phytotoxicology samples (1989)
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
n/a	Not applicable.
p	Provisional
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-1d
Summary of Agricultural Crops 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		E1		E2		E5		N2		N4					S1		S2				
Sample Date		15-Sep-15	15-Sep-15	15-Sep-15	15-Sep-15	15-Sep-15	15-Sep-15	5-Oct-15	5-Oct-15	8-Jul-15	8-Jul-15	8-Jul-15		8-Jul-15	16-Sep-15	16-Sep-15	16-Sep-15	16-Sep-15	16-Sep-15		16-Sep-15
Sample ID		15-E1-SB-CH-041	15-E1-SB-CH-041 (LR)	15-E2-SB-CH-051	15-E2-SB-CH-051 (LR)	15-E5-SB-CH-057	15-E5-SB-CH-057 (LR)	15-N2-FC-CH-021	15-N2-FC-CH-021 (LR)	15-N4-WW-CH-027	15-N4-WW-CH-027 (LR)	15-D7-WW-CH-109		15-D7-WW-CH-109 (LR)	15-S1-SB-CH-071	15-S1-SB-CH-071 (LR)	15-S2-SB-CH-077	15-S2-SB-CH-077 (LR)	15-D5-SB-CH-107		15-D5-SB-CH-107 (LR)
Sampling Company		STANTEC		STANTEC		STANTEC		STANTEC		STANTEC		STANTEC			STANTEC		STANTEC		STANTEC		
Laboratory Work Order		L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387		L1707387		L1707387		L1707387	L1707387		L1707387		L1707387		L1707387
Laboratory Sample ID		L1707387-18	WG2251847-17	L1707387-21	WG2251847-19	L1707387-25	WG2251847-21	L1707387-8	WG2251847-12	L1707387-12	WG2251847-14	L1707387-52	RPD	WG2251949-17	L1707387-30	WG2251847-24	L1707387-34	WG2251847-26	L1707387-50	RPD	WG2251949-13
Sample Type	Units		Lab Replicate		Lab Replicate		Lab Replicate		Lab Replicate		Lab Replicate	Field Duplicate	(%)	Lab Replicate		Lab Replicate		Lab Replicate	Field Duplicate	(%)	Lab Replicate
General Chemistry																					
Chloride	mg/kg	59	-	54	-	67	-	421	424	704	-	750	6.33 %	-	85	-	67	-	76	12.59 %	-
Metals, Group 1																					
Barium	mg/kg	1.38	1.32	0.74	0.69	1.09	1.12	<0.10	<0.1	5.25	-	4.63	12.55 %	4.62	0.94	1.00	1.07	1.10	1.15	7.21 %	0.99
Beryllium	mg/kg	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	-	<0.20	nc	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	nc	<0.2
Boron	mg/kg	27.0	26.1	24.3	24.2	24.2	24.4	<2.0	<2	<2.0	<2	<2.0	nc	<2	29.7	27.9	28.5	27.7	29.7	4.12 %	28.4
Calcium	mg/kg	2030	2040	1520	1490	2390	2280	39	37	642	662	527	19.67 %	533	2240	2240	2210	-	2710	20.33 %	2620
Chromium	mg/kg	0.20	0.22	0.32	0.23	<0.20	<0.2	<0.20	<0.2	1.12	1.06	0.68	nc	1.06	<0.20	<0.2	0.56	-	0.38	nc	0.20
Cobalt	mg/kg	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	-	<0.10	nc	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	nc	<0.1
Iron	mg/kg	71.3	70.3	67.1	63.8	63.7	62.8	18.0	15.8	41.9	43.1	30.1	32.78 %	32.4	62.2	62.4	62.9	-	80.4	24.42 %	74.4
Magnesium	mg/kg	2040	2060	2220	2230	2180	2060	934	849	1070	-	998	6.96 %	996	2180	2110	1950	1960	2060	5.49 %	1970
Manganese	mg/kg	23.1	22.4	16.7	17.3	21.3	21.0	3.36	3.23	17.4	-	15.1	14.15 %	14.9	24.1	23.3	22.6	23.1	22.8	0.88 %	22.8
Molybdenum	mg/kg	8.40	8.22	10.6	10.5	7.87	7.91	0.339	0.323	1.71	-	1.64	4.18 %	1.55	4.84	4.55	5.56	5.60	5.15	7.66 %	5.13
Nickel	mg/kg	1.11	1.10	0.78	0.80	1.50	1.44	0.22	0.25	0.48	-	0.46	nc	0.64	1.88	1.80	1.19	1.27	1.35	12.60 %	1.40
Phosphorus	mg/kg	5680	5510	6090	5940	5210	5010	2310	2190	2990	3050	2990	0.00 %	2960	5430	5290	5010	-	5480	8.96 %	5340
Potassium	mg/kg	20200	19800	19100	18700	18100	18100	3090	2970	5350	5730	6290	16.15 %	6300	18200	18300	16900	-	18300	7.95 %	17900
Silicon	mg/kg	12.6	-	6.74	11.6	10.5	-	19.1	-	5100	-	8190	nc	-	12.7	-	8.85	11.1	11.3	nc	-
Silver	mg/kg	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	nc	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	nc	<0.1
Sodium	mg/kg	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	nc	<20	<20	<20	<20	-	<20	nc	<20
Strontium	mg/kg	2.35	2.32	2.00	2.00	2.57	2.61	<0.10	<0.1	1.73	-	1.44	18.30 %	1.45	2.02	1.88	3.37	3.27	3.37	0.00 %	3.19
Sulfur	mg/kg	3200	3080	3470	3360	3200	3080	840	830	1120	1100	1160	3.51 %	1050	3210	3130	3060	3090	3280	6.94 %	3160
Titanium	mg/kg	<0.50	<0.5	<0.50	<0.5	0.59	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	nc	<0.5	<0.50	<0.5	<0.50	-	0.57	nc	0.53
Zirconium	mg/kg	<5.0	<5	<5.0	<5	<5.0	<5	<5.0	<5	<5.0	<5	<5.0	nc	<5	<5.0	<5	<5.0	<5	<5.0	nc	<5
Metals, Group 2																					
Aluminum	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	nc	<10	<10	<10	<10	-	<10	nc	<10
Arsenic	mg/kg	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	-	<0.20	nc	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	nc	<0.2
Cadmium	mg/kg	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	0.088	-	0.091	nc	0.094	<0.050	<0.05	<0.050	<0.05	<0.050	nc	<0.05
Copper	mg/kg	11.4	11.2	12.7	13.1	11.5	11.5	1.53	1.59	5.02	-	5.01	0.20 %	4.88	11.5	11.1	9.90	10.2	10.4	4.93 %	10.1
Lead	mg/kg	0.15	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	-	<0.10	nc	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	nc	<0.1
Mercury	mg/kg	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02	<0.020	nc	<0.02	<0.020	<0.02	<0.020	<0.02	<0.020	nc	<0.02
Thallium	mg/kg	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	-	<0.050	nc	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	nc	<0.05
Vanadium	mg/kg	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	-	<0.50	nc	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	nc	<0.5
Zinc	mg/kg	40.3	39.2	40.9	39.8	33.3	31.7	16.0	15.6	25.7	26.7	26.8	4.19 %	26.7	31.3	30.5	28.2	-	32.9	15.38 %	31.8

See last page for notes.

Table C-1d
Summary of Agricultural Crops 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		S4		S5		W2		W4						
Sample Date		21-Sep-15	21-Sep-15	16-Sep-15	16-Sep-15	21-Sep-15	21-Sep-15	5-Oct-15	5-Oct-15	5-Oct-15	5-Oct-15		5-Oct-15	5-Oct-15
Sample ID		15-S4-SB-CH-095	15-S4-SB-CH-095 (LR)	15-S5-SB-CH-101	15-S5-SB-CH-101 (LR)	15-W2-SB-CH-005	15-W2-SB-CH-005 (LR)	15-W4-FC-CH-011	15-W4-FC-CH-011 (LR)	15-W4-FC-CH-011 (LR)	15-D6-FC-CH-108		15-D6-FC-CH-108 (LR)	15-D6-FC-CH-108 (LR)
Sampling Company		STANTEC		STANTEC		STANTEC		STANTEC			STANTEC			
Laboratory Work Order		L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387		L1707387	L1707387
Laboratory Sample ID		L1707387-40	WG2251949-8	L1707387-44	WG2251949-10	L1707387-2	WG2251847-8	L1707387-5	WG2251847-10	WG2251847-5	L1707387-51	RPD	WG2251949-14	WG2251949-16
Sample Type	Units		Lab Replicate		Lab Replicate		Lab Replicate		Lab Replicate	Lab Replicate	Field Duplicate	(%)	Lab Replicate	Lab Replicate
General Chemistry														
Chloride	mg/kg	58	-	76	-	88	-	334	-	-	321	3.97 %	319	-
Metals, Group 1														
Barium	mg/kg	1.42	1.42	1.14	1.10	0.77	0.79	<0.10	<0.1	<0.1	<0.10	nc	<0.1	<0.1
Beryllium	mg/kg	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.2	<0.20	nc	<0.2	<0.2
Boron	mg/kg	31.9	30.6	27.6	26.8	28.4	28.0	<2.0	<2	<2	<2.0	nc	<2	<2
Calcium	mg/kg	2670	2670	2420	2530	2050	1970	40	41	41	36	nc	36	35
Chromium	mg/kg	<0.20	<0.2	0.39	<0.2	<0.20	<0.2	<0.20	<0.2	0.22	<0.20	nc	0.24	<0.2
Cobalt	mg/kg	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.1	<0.10	nc	<0.1	<0.1
Iron	mg/kg	58.8	58.3	68.1	69.5	73.3	70.9	16.2	17.0	17.0	17.9	nc	17.5	15.6
Magnesium	mg/kg	2200	2190	2090	2130	2450	2380	926	972	962	1010	8.68 %	1060	935
Manganese	mg/kg	9.42	9.63	22.1	21.3	22.6	21.2	3.53	3.82	3.73	3.61	2.24 %	3.71	3.39
Molybdenum	mg/kg	8.58	8.30	5.90	5.87	5.14	5.09	0.373	0.380	0.386	0.368	1.35 %	0.408	0.352
Nickel	mg/kg	2.47	2.54	1.39	1.34	0.88	0.86	0.22	0.23	0.24	0.18	nc	0.22	0.20
Phosphorus	mg/kg	5550	5460	5300	5540	6160	5950	2480	2500	2460	2540	2.39 %	2400	2360
Potassium	mg/kg	18700	18300	18200	19100	18400	17700	3400	3520	3470	3880	13.19 %	3350	3630
Silicon	mg/kg	13	-	7.5	9.6	21.8	-	23.4	-	-	13.9	nc	-	-
Silver	mg/kg	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.1	<0.10	nc	<0.1	<0.1
Sodium	mg/kg	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	nc	<20	<20
Strontium	mg/kg	3.09	3.02	3.48	3.33	2.15	2.13	<0.10	<0.1	<0.1	<0.10	nc	<0.1	<0.1
Sulfur	mg/kg	3200	3130	2980	3100	2870	2810	940	940	930	970	3.14 %	950	1120
Titanium	mg/kg	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.5	<0.50	nc	<0.5	<0.5
Zirconium	mg/kg	<5.0	<5	<5.0	<5	<5.0	<5	<5.0	<5	<5	<5.0	nc	<5	<5
Metals, Group 2														
Aluminum	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	nc	<10	<10
Arsenic	mg/kg	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.20	<0.2	<0.2	<0.20	nc	<0.2	<0.2
Cadmium	mg/kg	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.05	<0.050	nc	<0.05	<0.05
Copper	mg/kg	9.31	9.27	10.2	10.2	10.0	9.57	1.51	1.66	1.62	1.69	11.25 %	1.78	1.56
Lead	mg/kg	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.10	<0.1	<0.1	<0.10	nc	<0.1	<0.1
Mercury	mg/kg	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02	<0.020	<0.02	<0.02	<0.020	nc	<0.02	<0.02
Thallium	mg/kg	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.050	<0.05	<0.05	<0.050	nc	<0.05	<0.05
Vanadium	mg/kg	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.50	<0.5	<0.5	<0.50	nc	<0.5	<0.5
Zinc	mg/kg	33.3	32.3	31.8	33.5	31.4	30.9	17.2	17.7	17.7	20.2	16.04 %	17.9	19.0

Notes:

15.2	Concentration was detected.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
-	Parameter not analyzed / not available.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-1e
Relative Percent Difference of Inorganic Field Duplicates and Lab Replicates
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Matrix		Field Corn													
Sample Location		N2			W4										
Sample Date		5-Oct-15	5-Oct-15		5-Oct-15	5-Oct-15		5-Oct-15		5-Oct-15		5-Oct-15		5-Oct-15	
Sample ID		15-N2-FC-CH-021	15-N2-FC-CH-021 (LR)		15-W4-FC-CH-011	15-W4-FC-CH-011 (LR)		15-W4-FC-CH-011 (LR)		15-D6-FC-CH-108		15-D6-FC-CH-108 (LR)		15-D6-FC-CH-108 (LR)	
Sampling Company		STANTEC			STANTEC					STANTEC					
Laboratory Work Order		L1707387	L1707387		L1707387	L1707387		L1707387		L1707387		L1707387		L1707387	
Laboratory Sample ID		L1707387-8	WG2251847-12	RPD	L1707387-5	WG2251847-10	RPD	WG2251847-5	RPD	L1707387-51	RPD	WG2251949-14	RPD	WG2251949-16	RPD
Sample Type	Units		Lab Replicate	(%)		Lab Replicate	(%)	Lab Replicate	(%)	Field Duplicate	(%)	Lab Replicate	(%)	Lab Replicate	(%)
General Chemistry															
Chloride	mg/kg	421	424	0.71 %	334	-	-	-	-	321	3.97 %	319	0.63 %	-	-
Metals, Group 1															
Barium	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.1	nc	<0.10	nc	<0.1	nc	<0.1	nc
Beryllium	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.2	nc	<0.20	nc	<0.2	nc	<0.2	nc
Boron	mg/kg	<2.0	<2	nc	<2.0	<2	nc	<2	nc	<2.0	nc	<2	nc	<2	nc
Calcium	mg/kg	39	37	nc	40	41	nc	41	nc	36	nc	36	nc	35	nc
Chromium	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	0.22	nc	<0.20	nc	0.24	nc	<0.2	nc
Cobalt	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.1	nc	<0.10	nc	<0.1	nc	<0.1	nc
Iron	mg/kg	18.0	15.8	nc	16.2	17.0	nc	17.0	nc	17.9	nc	17.5	nc	15.6	nc
Magnesium	mg/kg	934	849	9.53 %	926	972	4.85 %	962	3.81 %	1010	8.68 %	1060	4.83 %	935	7.71 %
Manganese	mg/kg	3.36	3.23	3.95 %	3.53	3.82	7.89 %	3.73	5.51 %	3.61	2.24 %	3.71	2.73 %	3.39	6.29 %
Molybdenum	mg/kg	0.339	0.323	4.83 %	0.373	0.380	1.86 %	0.386	3.43 %	0.368	1.35 %	0.408	10.31 %	0.352	4.44 %
Nickel	mg/kg	0.22	0.25	nc	0.22	0.23	nc	0.24	nc	0.18	nc	0.22	nc	0.20	nc
Phosphorus	mg/kg	2310	2190	5.33 %	2480	2500	0.80 %	2460	0.81 %	2540	2.39 %	2400	5.67 %	2360	7.35 %
Potassium	mg/kg	3090	2970	3.96 %	3400	3520	3.47 %	3470	2.04 %	3880	13.19 %	3350	14.66 %	3630	6.66 %
Silicon	mg/kg	19.1	-	-	23.4	-	-	-	-	13.9	nc	-	-	-	-
Silver	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.1	nc	<0.10	nc	<0.1	nc	<0.1	nc
Sodium	mg/kg	<20	<20	nc	<20	<20	nc	<20	nc	<20	nc	<20	nc	<20	nc
Strontium	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.1	nc	<0.10	nc	<0.1	nc	<0.1	nc
Sulfur	mg/kg	840	830	1.20 %	940	940	0.00 %	930	1.07 %	970	3.14 %	950	2.08 %	1120	14.35 %
Titanium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.5	nc	<0.50	nc	<0.5	nc	<0.5	nc
Zirconium	mg/kg	<5.0	<5	nc	<5.0	<5	nc	<5	nc	<5.0	nc	<5	nc	<5	nc
Metals, Group 2															
Aluminum	mg/kg	<10	<10	nc	<10	<10	nc	<10	nc	<10	nc	<10	nc	<10	nc
Arsenic	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.2	nc	<0.20	nc	<0.2	nc	<0.2	nc
Cadmium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.05	nc	<0.050	nc	<0.05	nc	<0.05	nc
Copper	mg/kg	1.53	1.59	3.85 %	1.51	1.66	9.46 %	1.62	7.03 %	1.69	11.25 %	1.78	5.19 %	1.56	8.00 %
Lead	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.1	nc	<0.10	nc	<0.1	nc	<0.1	nc
Mercury	mg/kg	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.02	nc	<0.020	nc	<0.02	nc	<0.02	nc
Thallium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.05	nc	<0.050	nc	<0.05	nc	<0.05	nc
Vanadium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.5	nc	<0.50	nc	<0.5	nc	<0.5	nc
Zinc	mg/kg	16.0	15.6	2.53 %	17.2	17.7	2.87 %	17.7	2.87 %	20.2	16.04 %	17.9	12.07 %	19.0	6.12 %

See last page for notes.

Table C-1e
Relative Percent Difference of Inorganic Field Duplicates and Lab Replicates
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Matrix		Natural Grass																				
Sample Location		E1			E2			N4			N5			S1			S2			S3		
Sample Date		22-Sep-15	22-Sep-15		23-Sep-15	23-Sep-15		5-Oct-15	5-Oct-15		22-Sep-15	22-Sep-15		22-Sep-15	22-Sep-15		21-Sep-15	21-Sep-15		22-Sep-15	22-Sep-15	
Sample ID		15-E1-NG-CH-039	15-E1-NG-CH-039 (LR)		15-E2-NG-CH-049	15-E2-NG-CH-049 (LR)		15-N4-NG-CH-025	15-N4-NG-CH-025 (LR)		15-N5-NG-CH-035	15-D3-NG-CH-105		15-S1-NG-CH-069	15-S1-NG-CH-069 (LR)		15-S2-NG-CH-075	15-S2-NG-CH-075 (LR)		15-S3-NG-CH-085	15-S3-NG-CH-085 (LR)	
Sampling Company		STANTEC			STANTEC			STANTEC			STANTEC	STANTEC		STANTEC			STANTEC			STANTEC		
Laboratory Work Order		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387	
Laboratory Sample ID		L1707387-19	WG2251847-18		L1707387-23	WG2251847-20		L1707387-13	WG2251847-15		L1707387-16	L1707387-48		L1707387-32	WG2251847-25		L1707387-35	WG2251847-27		L1707387-38	WG2251949-7	
Sample Type	Units		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Field Duplicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)
General Chemistry																						
Chloride	mg/kg	5250	-	-	2940	-	-	5750	-	-	4780	5270	9.75 %	4190	-	-	3510	-	-	6360	-	-
Metals, Group 1																						
Barium	mg/kg	3.64	3.96	8.42 %	9.12	8.81	3.46 %	13.7	13.2	3.72 %	8.03	7.32	9.25 %	4.75	4.77	0.42 %	3.77	3.81	1.06 %	5.85	6.08	3.86 %
Beryllium	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.20	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc
Boron	mg/kg	32.7	34.4	5.07 %	36.8	35.7	3.03 %	45.1	46.9	3.91 %	58.1	51.9	11.27 %	39.0	38.5	1.29 %	39.5	40.6	2.75 %	89.3	85.2	4.70 %
Calcium	mg/kg	6420	6690	4.12 %	9000	9980	10.33 %	10800	10700	0.93 %	11700	13600	15.02 %	9770	9580	1.96 %	9010	8990	0.22 %	11500	-	-
Chromium	mg/kg	0.56	0.70	nc	0.76	0.81	nc	0.57	0.39	nc	0.53	0.94	nc	0.35	0.25	nc	0.48	0.54	nc	0.91	-	-
Cobalt	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.10	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc
Iron	mg/kg	109	107	1.85 %	93.4	87.7	6.29 %	59.8	55.4	7.64 %	96.7	99.9	3.26 %	55.7	52.3	6.30 %	51.3	50.0	2.57 %	57.4	-	-
Magnesium	mg/kg	1420	1600	11.92 %	2490	2340	6.21 %	2440	2670	9.00 %	2740	2770	1.09 %	2530	2550	0.79 %	2030	2020	0.49 %	2190	2220	1.36 %
Manganese	mg/kg	10.9	12.2	11.26 %	18.2	17.9	1.66 %	20.7	21.0	1.44 %	24.4	22.5	8.10 %	22.1	22.1	0.00 %	15.9	15.8	0.63 %	22.8	23.4	2.60 %
Molybdenum	mg/kg	0.523	0.521	0.38 %	2.23	2.25	0.89 %	1.66	1.64	1.21 %	0.518	0.515	0.58 %	1.02	1.01	0.99 %	0.915	0.936	2.27 %	1.09	1.09	0.00 %
Nickel	mg/kg	0.76	0.94	21.18 %	0.70	0.70	0.00 %	0.96	1.02	6.06 %	0.94	0.77	19.88 %	1.09	1.12	2.71 %	0.80	0.80	0.00 %	1.01	0.98	3.02 %
Phosphorus	mg/kg	3990	4150	3.93 %	5310	5240	1.33 %	3490	3470	0.57 %	1650	1490	10.19 %	3920	3740	4.70 %	4070	4020	1.24 %	2880	-	-
Potassium	mg/kg	20900	20900	0.00 %	22000	22300	1.35 %	25100	24900	0.80 %	22400	24300	8.14 %	25400	25500	0.39 %	23900	24200	1.25 %	22700	-	-
Silicon	mg/kg	1620	-	-	1540	-	-	1570	-	-	4350	4820	nc	1060	-	-	3790	-	-	916	-	-
Silver	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.10	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc
Sodium	mg/kg	24	25	nc	24	24	nc	62	60	nc	57	63	nc	22	23	nc	<20	<20	nc	33	-	-
Strontium	mg/kg	11.7	12.0	2.53 %	15.4	15.9	3.19 %	14.5	14.2	2.09 %	56.0	52.0	7.41 %	13.2	13.2	0.00 %	14.5	14.1	2.80 %	42.9	42.6	0.70 %
Sulfur	mg/kg	1940	1980	2.04 %	2780	2720	2.18 %	2070	2020	2.44 %	1420	1400	1.42 %	1930	1830	5.32 %	1600	1570	1.89 %	1950	2000	2.53 %
Titanium	mg/kg	3.04	2.07	nc	2.98	2.22	nc	2.29	1.83	nc	3.38	3.63	7.13 %	1.85	1.63	nc	1.64	1.54	nc	2.20	-	-
Zirconium	mg/kg	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5.0	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc
Metals, Group 2																						
Aluminum	mg/kg	90	81	10.53 %	75	60	22.22 %	34	21	nc	56	59	5.22 %	18	13	nc	12	<10	nc	23	-	-
Arsenic	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.20	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc
Cadmium	mg/kg	<0.050	<0.05	nc	0.068	0.070	nc	<0.050	0.072	nc	<0.050	0.050	nc	0.078	0.088	nc	0.254	0.260	2.33 %	0.072	0.082	nc
Copper	mg/kg	7.20	8.12	12.01 %	8.21	8.11	1.23 %	8.86	9.09	2.56 %	8.80	8.32	5.61 %	10.2	10.3	0.98 %	9.38	9.48	1.06 %	9.69	9.92	2.35 %
Lead	mg/kg	0.15	0.15	nc	0.12	0.12	nc	<0.10	0.10	nc	0.45	0.37	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	0.15	0.13	nc
Mercury	mg/kg	<0.020	0.021	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	0.076	0.072	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc
Thallium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.050	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc
Vanadium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.50	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc
Zinc	mg/kg	32.6	33.3	2.12 %	38.6	35.4	8.65 %	32.7	31.9	2.48 %	29.5	28.2	4.51 %	36.5	35.4	3.06 %	45.5	45.1	0.88 %	50.7	-	-

See last page for notes.

Table C-1e
Relative Percent Difference of Inorganic Field Duplicates and Lab Replicates
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Matrix		Sediment			Soil																	
Sample Location		S1			E2			E6			N2			N4			S1			W4		
Sample Date		22-Sep-15	22-Sep-15		15-Sep-15	15-Sep-15		22-Sep-15	22-Sep-15		5-Oct-15	5-Oct-15		8-Jul-15	8-Jul-15		16-Sep-15	16-Sep-15		5-Oct-15	5-Oct-15	
Sample ID		15-S1-SD-CH-065	15-D4-SD-CH-106		15-E2-SS-CH-043	15-E2-SS-CH-043 (LR)		15-E6-SS-CH-059	15-D2-SS-CH-104		15-N2-SS-CH-013	15-N2-SS-CH-013 (LR)		15-N4-SS-CH-023	15-D1-SS-CH-103		15-S1-SS-CH-063	15-S1-SS-CH-063 (LR)		15-W4-SS-CH-007	15-W4-SS-CH-007 (LR)	
Sampling Company		STANTEC	STANTEC		STANTEC	STANTEC		STANTEC	STANTEC		STANTEC			STANTEC	STANTEC		STANTEC			STANTEC	STANTEC	
Laboratory Work Order		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387	
Laboratory Sample ID		L1707387-31	L1707387-49		L1707387-20	L1707387-20B		L1707387-27	L1707387-47		L1707387-7	WG2250095-7		L1707387-11	L1707387-46		L1707387-29	WG2250095-8		L1707387-4	L1707387-4B	
Sample Type	Units		Field Duplicate	RPD (%)		Lab Replicate	RPD (%)		Field Duplicate	RPD (%)		Lab Replicate	RPD (%)		Field Duplicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)
General Chemistry																						
Chloride	mg/kg	11.1	10.4	6.51 %	1.70	-	-	9.87	11.2	12.62 %	4.81	-	-	10.4	9.82	5.74 %	5.72	-	-	1.63	-	-
Metals, Group 1																						
Barium	mg/kg	118	126	6.56 %	86.0	-	-	82.2	68.8	17.75 %	121	120	0.83 %	86.6	80.0	7.92 %	102	102	0.00 %	106	-	-
Beryllium	mg/kg	1.03	1.05	1.92 %	0.60	-	-	0.64	0.57	nc	1.05	1.05	0.00 %	0.78	0.78	nc	0.86	0.89	nc	0.97	-	-
Boron	mg/kg	18.9	17.1	10.00 %	8.7	-	-	10.2	7.6	nc	12.4	11.4	8.40 %	10.4	11.6	10.91 %	11.4	9.8	nc	11.4	-	-
Calcium	mg/kg	19000	22200	15.53 %	13400	-	-	25900	20700	22.32 %	4740	4870	2.71 %	50300	55100	9.11 %	8010	8170	1.98 %	4770	-	-
Chromium	mg/kg	46.3	46.7	0.86 %	21.8	-	-	23.3	23.0	1.30 %	35.4	35.7	0.84 %	25.0	24.5	2.02 %	28.9	28.8	0.35 %	32.5	-	-
Cobalt	mg/kg	11.5	11.5	0.00 %	7.42	-	-	7.49	7.42	0.94 %	11.7	11.6	0.86 %	10.3	8.94	14.14 %	10.2	11.0	7.55 %	8.99	-	-
Iron	mg/kg	26600	26400	0.75 %	18900	-	-	17500	17500	0.00 %	23700	24800	4.54 %	19400	19600	1.03 %	23000	22900	0.44 %	23200	-	-
Magnesium	mg/kg	13100	13600	3.75 %	7680	-	-	10900	10200	6.64 %	6820	6960	2.03 %	19400	20100	3.54 %	7630	7470	2.12 %	6650	-	-
Manganese	mg/kg	208	210	0.96 %	338	-	-	420	415	1.20 %	566	482	16.03 %	477	359	28.23 %	484	596	20.74 %	264	-	-
Molybdenum	mg/kg	4.16	4.66	11.34 %	1.45	-	-	2.03	1.91	6.09 %	1.13	1.16	2.62 %	2.11	2.14	1.41 %	1.11	1.10	0.90 %	1.22	-	-
Nickel	mg/kg	40.3	40.4	0.25 %	19.9	-	-	21.4	21.9	2.31 %	31.6	32.4	2.50 %	27.3	27.7	1.45 %	28.4	28.5	0.35 %	30.2	-	-
Phosphorus	mg/kg	968	953	nc	611	655	nc	505	369	nc	910	-	-	693	773	nc	799	-	-	1020	1040	nc
Potassium	mg/kg	4030	3550	12.66 %	2280	-	-	1720	1550	10.40 %	3500	3330	4.98 %	2440	2490	2.03 %	2990	2770	7.64 %	3620	-	-
Silicon	mg/kg	249000	235000	nc	301000	313000	nc	296000	330000	nc	302000	-	-	246000	270000	nc	262000	-	-	283000	299000	nc
Silver	mg/kg	<0.20	<0.20	nc	<0.20	-	-	<0.20	<0.20	nc	<0.20	<0.2	nc	<0.20	<0.20	nc	<0.20	<0.2	nc	<0.20	-	-
Sodium	mg/kg	130	130	nc	<100	-	-	<100	<100	nc	<100	<100	nc	<100	<100	nc	<100	<100	nc	<100	-	-
Strontium	mg/kg	33.4	34.1	2.07 %	22.8	-	-	64.9	56.8	13.31 %	18.0	19.5	8.00 %	42.4	43.2	1.87 %	17.5	17.3	1.15 %	17.3	-	-
Sulfur	mg/kg	1640	1550	5.64 %	480	-	-	510	450	nc	350	380	nc	330	320	nc	360	390	nc	400	-	-
Titanium	mg/kg	113	94.1	18.25 %	88.0	-	-	96.6	73.2	27.56 %	105	99.0	5.88 %	88.2	101	13.53 %	105	75.7	32.43 %	83.5	-	-
Zirconium	mg/kg	<5.0	<5.0	nc	<5.0	-	-	<5.0	<5.0	nc	<5.0	<5	nc	<5.0	<5.0	nc	<5.0	<5	nc	<5.0	-	-
Metals, Group 2																						
Aluminum	mg/kg	23400	22400	4.37 %	15000	-	-	14600	13500	7.83 %	24500	24100	1.65 %	16100	16100	0.00 %	19900	19500	2.03 %	22800	-	-
Arsenic	mg/kg	4.64	4.56	1.74 %	5.72	-	-	5.10	5.35	4.78 %	5.18	5.30	2.29 %	5.66	5.71	0.88 %	6.51	6.60	1.37 %	5.11	-	-
Cadmium	mg/kg	0.80	0.81	1.24 %	0.33	-	-	0.47	0.50	nc	0.52	0.51	1.94 %	0.38	0.34	nc	0.47	0.53	nc	0.45	-	-
Copper	mg/kg	38.0	38.7	1.83 %	18.6	-	-	15.6	15.9	1.90 %	25.1	25.9	3.14 %	23.0	23.9	3.84 %	17.5	17.4	0.57 %	25.4	-	-
Lead	mg/kg	22.1	23.0	3.99 %	85.8	-	-	13.7	14.6	6.36 %	15.2	15.2	0.00 %	11.2	11.6	3.51 %	15.0	15.4	2.63 %	16.4	-	-
Mercury	mg/kg	0.080	0.084	nc	0.111	-	-	0.058	0.058	nc	0.053	0.055	nc	<0.050	<0.050	nc	<0.050	<0.05	nc	0.052	-	-
Thallium	mg/kg	0.344	0.341	0.88 %	0.195	-	-	0.201	0.198	nc	0.215	0.205	nc	0.198	0.209	nc	0.233	0.227	nc	0.274	-	-
Vanadium	mg/kg	44.7	42.6	4.81 %	31.5	-	-	30.7	29.7	3.31 %	40.2	40.1	0.25 %	31.8	32.4	1.87 %	40.1	38.4	4.33 %	39.6	-	-
Zinc	mg/kg	108	107	0.93 %	76.6	-	-	65.4	65.9	0.76 %	83.1	85.0	2.26 %	60.8	61.0	0.33 %	68.2	67.5	1.03 %	95.0	-	-

See last page for notes.

Table C-1e
Relative Percent Difference of Inorganic Field Duplicates and Lab Replicates
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Matrix		Soybean																		
Sample Location		E1			E2			E5			S1			S2						
Sample Date		15-Sep-15	15-Sep-15		15-Sep-15	15-Sep-15		15-Sep-15	15-Sep-15		16-Sep-15	16-Sep-15		16-Sep-15	16-Sep-15		16-Sep-15		16-Sep-15	
Sample ID		15-E1-SB-CH-041	15-E1-SB-CH-041 (LR)		15-E2-SB-CH-051	15-E2-SB-CH-051 (LR)		15-E5-SB-CH-057	15-E5-SB-CH-057 (LR)		15-S1-SB-CH-071	15-S1-SB-CH-071 (LR)		15-S2-SB-CH-077	15-S2-SB-CH-077 (LR)		15-D5-SB-CH-107		15-D5-SB-CH-107 (LR)	
Sampling Company		STANTEC			STANTEC			STANTEC			STANTEC			STANTEC			STANTEC			
Laboratory Work Order		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387		L1707387	
Laboratory Sample ID		L1707387-18	WG2251847-17		L1707387-21	WG2251847-19		L1707387-25	WG2251847-21		L1707387-30	WG2251847-24		L1707387-34	WG2251847-26		L1707387-50		WG2251949-13	
Sample Type	Units		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)		Lab Replicate	RPD (%)	Field Duplicate	RPD (%)	Lab Replicate	RPD (%)
General Chemistry																				
Chloride	mg/kg	59	-	-	54	-	-	67	-	-	85	-	-	67	-	-	76	12.59 %	-	-
Metals, Group 1																				
Barium	mg/kg	1.38	1.32	4.44 %	0.74	0.69	6.99 %	1.09	1.12	2.71 %	0.94	1.00	6.19 %	1.07	1.10	2.76 %	1.15	7.21 %	0.99	14.95 %
Beryllium	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	nc	<0.2	nc
Boron	mg/kg	27.0	26.1	3.39 %	24.3	24.2	0.41 %	24.2	24.4	0.82 %	29.7	27.9	6.25 %	28.5	27.7	2.85 %	29.7	4.12 %	28.4	4.48 %
Calcium	mg/kg	2030	2040	0.49 %	1520	1490	1.99 %	2390	2280	4.71 %	2240	2240	0.00 %	2210	-	-	2710	20.33 %	2620	3.38 %
Chromium	mg/kg	0.20	0.22	nc	0.32	0.23	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	0.56	-	-	0.38	nc	0.20	nc
Cobalt	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	nc	<0.1	nc
Iron	mg/kg	71.3	70.3	1.41 %	67.1	63.8	5.04 %	63.7	62.8	1.42 %	62.2	62.4	0.32 %	62.9	-	-	80.4	24.42 %	74.4	7.75 %
Magnesium	mg/kg	2040	2060	0.98 %	2220	2230	0.45 %	2180	2060	5.66 %	2180	2110	3.26 %	1950	1960	0.51 %	2060	5.49 %	1970	4.47 %
Manganese	mg/kg	23.1	22.4	3.08 %	16.7	17.3	3.53 %	21.3	21.0	1.42 %	24.1	23.3	3.38 %	22.6	23.1	2.19 %	22.8	0.88 %	22.8	0.00 %
Molybdenum	mg/kg	8.40	8.22	2.17 %	10.6	10.5	0.95 %	7.87	7.91	0.51 %	4.84	4.55	6.18 %	5.56	5.60	0.72 %	5.15	7.66 %	5.13	0.39 %
Nickel	mg/kg	1.11	1.10	0.90 %	0.78	0.80	2.53 %	1.50	1.44	4.08 %	1.88	1.80	4.35 %	1.19	1.27	6.50 %	1.35	12.60 %	1.40	3.64 %
Phosphorus	mg/kg	5680	5510	3.04 %	6090	5940	2.49 %	5210	5010	3.91 %	5430	5290	2.61 %	5010	-	-	5480	8.96 %	5340	2.59 %
Potassium	mg/kg	20200	19800	2.00 %	19100	18700	2.12 %	18100	18100	0.00 %	18200	18300	0.55 %	16900	-	-	18300	7.95 %	17900	2.21 %
Silicon	mg/kg	12.6	-	-	6.74	11.6	nc	10.5	-	-	12.7	-	-	8.85	11.1	nc	11.3	nc	-	-
Silver	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	nc	<0.1	nc
Sodium	mg/kg	<20	<20	nc	<20	<20	nc	<20	<20	nc	<20	<20	nc	<20	-	-	<20	nc	<20	nc
Strontium	mg/kg	2.35	2.32	1.28 %	2.00	2.00	0.00 %	2.57	2.61	1.54 %	2.02	1.88	7.18 %	3.37	3.27	3.01 %	3.37	0.00 %	3.19	5.49 %
Sulfur	mg/kg	3200	3080	3.82 %	3470	3360	3.22 %	3200	3080	3.82 %	3210	3130	2.52 %	3060	3090	0.98 %	3280	6.94 %	3160	3.73 %
Titanium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	0.59	<0.5	nc	<0.50	<0.5	nc	<0.50	-	-	0.57	nc	0.53	nc
Zirconium	mg/kg	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	nc	<5	nc
Metals, Group 2																				
Aluminum	mg/kg	<10	<10	nc	<10	<10	nc	<10	<10	nc	<10	<10	nc	<10	-	-	<10	nc	<10	nc
Arsenic	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	nc	<0.2	nc
Cadmium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	nc	<0.05	nc
Copper	mg/kg	11.4	11.2	1.77 %	12.7	13.1	3.10 %	11.5	11.5	0.00 %	11.5	11.1	3.54 %	9.90	10.2	2.99 %	10.4	4.93 %	10.1	2.93 %
Lead	mg/kg	0.15	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	nc	<0.1	nc
Mercury	mg/kg	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	nc	<0.02	nc
Thallium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	nc	<0.05	nc
Vanadium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	nc	<0.5	nc
Zinc	mg/kg	40.3	39.2	2.77 %	40.9	39.8	2.73 %	33.3	31.7	4.92 %	31.3	30.5	2.59 %	28.2	-	-	32.9	15.38 %	31.8	3.40 %

See last page for notes.

Table C-1e
Relative Percent Difference of Inorganic Field Duplicates and Lab Replicates
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Matrix		Soybean									Winter Wheat						
Sample Location		S4			S5			W2			N4						
Sample Date		21-Sep-15	21-Sep-15		16-Sep-15	16-Sep-15		21-Sep-15	21-Sep-15		8-Jul-15	8-Jul-15		8-Jul-15		8-Jul-15	
Sample ID		15-S4-SB-CH-095	15-S4-SB-CH-095 (LR)		15-S5-SB-CH-101	15-S5-SB-CH-101 (LR)		15-W2-SB-CH-005	15-W2-SB-CH-005 (LR)		15-N4-WW-CH-027	15-N4-WW-CH-027 (LR)		15-D7-WW-CH-109		15-D7-WW-CH-109 (LR)	
Sampling Company		STANTEC			STANTEC			STANTEC			STANTEC			STANTEC			
Laboratory Work Order		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387	L1707387		L1707387		L1707387	
Laboratory Sample ID		L1707387-40	WG2251949-8	RPD	L1707387-44	WG2251949-10	RPD	L1707387-2	WG2251847-8	RPD	L1707387-12	WG2251847-14	RPD	L1707387-52	RPD	WG2251949-17	RPD
Sample Type	Units		Lab Replicate	(%)		Lab Replicate	(%)		Lab Replicate	(%)		Lab Replicate	(%)	Field Duplicate	(%)	Lab Replicate	(%)
General Chemistry																	
Chloride	mg/kg	58	-	-	76	-	-	88	-	-	704	-	-	750	6.33 %	-	-
Metals, Group 1																	
Barium	mg/kg	1.42	1.42	0.00 %	1.14	1.10	3.57 %	0.77	0.79	2.56 %	5.25	-	-	4.63	12.55 %	4.62	0.22 %
Beryllium	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	-	-	<0.20	nc	<0.2	nc
Boron	mg/kg	31.9	30.6	4.16 %	27.6	26.8	2.94 %	28.4	28.0	1.42 %	<2.0	<2	nc	<2.0	nc	<2	nc
Calcium	mg/kg	2670	2670	0.00 %	2420	2530	4.44 %	2050	1970	3.98 %	642	662	3.07 %	527	19.67 %	533	1.13 %
Chromium	mg/kg	<0.20	<0.2	nc	0.39	<0.2	nc	<0.20	<0.2	nc	1.12	1.06	5.50 %	0.68	nc	1.06	nc
Cobalt	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	-	-	<0.10	nc	<0.1	nc
Iron	mg/kg	58.8	58.3	0.85 %	68.1	69.5	2.03 %	73.3	70.9	3.33 %	41.9	43.1	2.82 %	30.1	32.78 %	32.4	7.36 %
Magnesium	mg/kg	2200	2190	0.46 %	2090	2130	1.90 %	2450	2380	2.90 %	1070	-	-	998	6.96 %	996	0.20 %
Manganese	mg/kg	9.42	9.63	2.20 %	22.1	21.3	3.69 %	22.6	21.2	6.39 %	17.4	-	-	15.1	14.15 %	14.9	1.33 %
Molybdenum	mg/kg	8.58	8.30	3.32 %	5.90	5.87	0.51 %	5.14	5.09	0.98 %	1.71	-	-	1.64	4.18 %	1.55	5.64 %
Nickel	mg/kg	2.47	2.54	2.79 %	1.39	1.34	3.66 %	0.88	0.86	2.30 %	0.48	-	-	0.46	nc	0.64	nc
Phosphorus	mg/kg	5550	5460	1.63 %	5300	5540	4.43 %	6160	5950	3.47 %	2990	3050	1.99 %	2990	0.00 %	2960	1.01 %
Potassium	mg/kg	18700	18300	2.16 %	18200	19100	4.83 %	18400	17700	3.88 %	5350	5730	6.86 %	6290	16.15 %	6300	0.16 %
Silicon	mg/kg	13	-	-	7.5	9.6	nc	21.8	-	-	5100	-	-	8190	nc	-	-
Silver	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	nc	<0.1	nc
Sodium	mg/kg	<20	<20	nc	<20	<20	nc	<20	<20	nc	<20	<20	nc	<20	nc	<20	nc
Strontium	mg/kg	3.09	3.02	2.29 %	3.48	3.33	4.41 %	2.15	2.13	0.93 %	1.73	-	-	1.44	18.30 %	1.45	0.69 %
Sulfur	mg/kg	3200	3130	2.21 %	2980	3100	3.95 %	2870	2810	2.11 %	1120	1100	1.80 %	1160	3.51 %	1050	9.95 %
Titanium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	nc	<0.5	nc
Zirconium	mg/kg	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	<5	nc	<5.0	nc	<5	nc
Metals, Group 2																	
Aluminum	mg/kg	<10	<10	nc	<10	<10	nc	<10	<10	nc	<10	<10	nc	<10	nc	<10	nc
Arsenic	mg/kg	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	<0.2	nc	<0.20	-	-	<0.20	nc	<0.2	nc
Cadmium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	0.088	-	-	0.091	nc	0.094	nc
Copper	mg/kg	9.31	9.27	0.43 %	10.2	10.2	0.00 %	10.0	9.57	4.39 %	5.02	-	-	5.01	0.20 %	4.88	2.63 %
Lead	mg/kg	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	<0.1	nc	<0.10	-	-	<0.10	nc	<0.1	nc
Mercury	mg/kg	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	<0.02	nc	<0.020	nc	<0.02	nc
Thallium	mg/kg	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	<0.05	nc	<0.050	-	-	<0.050	nc	<0.05	nc
Vanadium	mg/kg	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	<0.5	nc	<0.50	-	-	<0.50	nc	<0.5	nc
Zinc	mg/kg	33.3	32.3	3.05 %	31.8	33.5	5.21 %	31.4	30.9	1.61 %	25.7	26.7	3.82 %	26.8	4.19 %	26.7	0.37 %

Notes:

15.2	Concentration was detected.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
-	Parameter not analyzed / not available.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-1f
Summary of Quality Control 2015 Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		Field Blank (E6)	Field Blank (N4)		Field Blank (S1)		Rinsate_ Blank_E2	Rinsate_ Blank_E5	Rinsate_ Blank_N2	Rinsate_ Blank_N4	Rinsate_ Blank_W2
Sample Date		22-Sep-15	8-Jul-15	8-Jul-15	16-Sep-15	16-Sep-15	15-Sep-15	22-Sep-15	5-Oct-15	8-Jul-15	21-Sep-15
Sample ID		15-E6-FB-CH-114	15-N4-FB-CH-111	15-N4-FB-CH-111 (LR)	15-S1-FB-CH-112	15-S1-FB-CH-112 (LR)	15-E2-RB-CH-116	15-E5-RB-CH-118	15-N2-RB-CH-119	15-N4-RB-CH-113	15-W2-RB-CH-117
Sampling Company		STANTEC	STANTEC		STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory Work Order		L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387	L1707387
Laboratory Sample ID		L1707387-58	L1707387-53	WG2244553-3	L1707387-54	WG2244884-2	L1707387-56	L1707387-59	L1707387-60	L1707387-55	L1707387-57
Sample Type	Units	Field Blank	Field Blank	Lab Replicate	Field Blank	Lab Replicate	Material Rinse Blank	Material Rinse Blank	Material Rinse Blank	Material Rinse Blank	Material Rinse Blank
Metals, Group 1											
Barium	mg/L	<0.0030	<0.0030	-	<0.0030	-	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Beryllium	mg/L	<0.0010	<0.0010	-	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	<0.0020	<0.0020	-	<0.0020	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	mg/L	<0.50	<0.50	-	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	mg/L	<0.0050	<0.0050	-	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt	mg/L	<0.0020	<0.0020	-	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Iron	mg/L	<0.010	<0.010	-	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010
Magnesium	mg/L	<0.10	<0.10	-	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
Manganese	mg/L	<0.0020	<0.0020	-	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Molybdenum	mg/L	<0.0050	<0.0050	-	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	mg/L	<0.0020	<0.0020	-	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus	mg/L	<0.30	<0.30	-	<0.30	-	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium	mg/L	<0.10	<0.10	-	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
Silicon	mg/L	0.149	0.164	-	0.135	-	0.109	0.060	0.058	0.082	<0.050
Silver	mg/L	<0.00010	<0.00010	-	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	<1.0	<1.0	-	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0
Strontium	mg/L	0.00045	0.00047	-	0.00044	-	0.00034	0.00027	0.00028	0.00028	0.00026
Sulfur	mg/L	<0.50	<0.50	-	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50
Titanium	mg/L	<0.0010	<0.0010	-	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Metals, Group 2											
Aluminum	mg/L	<0.010	0.011	-	0.011	-	0.015	0.019	0.016	<0.010	0.010
Arsenic	mg/L	<0.00040	<0.00040	-	<0.00040	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Cadmium	mg/L	<0.000050	<0.000050	-	<0.000050	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Copper	mg/L	0.0038	0.0021	-	0.0038	-	0.0017	0.0013	0.0011	0.0012	0.0011
Lead	mg/L	<0.00010	<0.00010	-	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Mercury	mg/L	<0.0000050	<0.0000050	<0.000005	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Thallium	mg/L	<0.00010	<0.00010	-	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Vanadium	mg/L	<0.0010	<0.0010	-	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	<0.0040	<0.0040	-	<0.0040	-	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Notes:

15.2	Concentration was detected.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
-	Parameter not analyzed / not available.

Table C-2a
Summary of Natural Grass 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		E1	E2	E5	E6	N2	N4	N5			S1	S2	S3	S4	S5	W2	W4
Sample Date		22-Sep-15	23-Sep-15	22-Sep-15	22-Sep-15	23-Sep-15	5-Oct-15	22-Sep-15	22-Sep-15		22-Sep-15	21-Sep-15	22-Sep-15	21-Sep-15	21-Sep-15	21-Sep-15	23-Sep-15
Sample ID		15-E1-NG-CH-039	15-E2-NG-CH-049	15-E5-NG-CH-055	15-E6-NG-CH-061	15-N2-NG-CH-019	15-N4-NG-CH-025	15-N5-NG-CH-035	15-D3-NG-CH-105		15-S1-NG-CH-069	15-S2-NG-CH-075	15-S3-NG-CH-085	15-S4-NG-CH-093	15-S5-NG-CH-099	15-W2-NG-CH-003	15-W4-NG-CH-009
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM
Laboratory Work Order		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539
Laboratory Sample ID		L1713539-19	L1713539-23	L1713539-26	L1713539-28	L1713539-10	L1713539-13	L1713539-16	L1713539-48	RPD	L1713539-32	L1713539-35	L1713539-38	L1713539-42	L1713539-45	L1713539-3	L1713539-6
Sample Type	Units								Field Duplicate	(%)							
General Chemistry																	
Moisture Content	%	62.6	63.8	67.1	62.2	76.4	59.3	65.6	66.8	2 %	60.8	61.7	56.4	67.4	65.5	68.0	76.8
Dioxins/Furans (PCDD/DF)																	
Tetrachlorodibenzofuran, 2,3,7,8-	pg/g wwt	0.230 XM JA EN	<0.51	0.120 XM JA EN	0.223 JA XM	<0.11	<0.10	<0.096	0.095 JA EN	nc	0.104 JA	<0.052	0.054 JA XM	0.145 JA XM	0.081 XM JA EN	<0.17 XM	0.32 JA EN
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	pg/g wwt	<0.094	<0.92	<0.065	<0.092	<0.19	<0.20	<0.20	<0.073	nc	<0.10	<0.059	<0.034	<0.097	<0.11	<0.24	<0.26
Pentachlorodibenzofuran, 1,2,3,7,8-	pg/g wwt	0.150 JA EN	0.76 JA XM	<0.12	<0.11 XM	0.23 JA B	<0.17	0.19 JA B	<0.075 XM	nc	<0.18	<0.096	<0.071	0.098 JA XM	<0.044	0.096 XM JA EN	<0.12 XM
Pentachlorodibenzofuran, 2,3,4,7,8-	pg/g wwt	0.089 XM JA EN	<0.37 XM	<0.093	<0.089	<0.084	<0.17	<0.16	<0.076	nc	<0.18	<0.077	<0.076	0.100 XM JA EN	<0.038	<0.072	<0.10
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	pg/g wwt	<0.055	0.87 XM JA EN	<0.070 XM	<0.11	<0.068	<0.091	<0.087	<0.059	nc	<0.098	<0.048 XM	<0.036	<0.091	<0.065	<0.17	<0.15
Octachlorodibenzofuran	pg/g wwt	0.365 JA XM	0.98 XM JA EN	0.43 JA	0.57 XM JA EN	<0.11	<0.15	0.80 JA XM	0.68 JA	nc	<0.16 XM	0.14 XM JA EN	0.19 JA EN	0.32 JA XM	0.430 JA EN	0.22 JA XM	0.42 JA XM
Octachlorodibenzo-p-dioxin	pg/g wwt	3.22 JA	3.80 XM JA EN	3.22 JA XM	5.49 JA	0.93 JA XM	2.37 JA XM	7.49	5.24 JA	35 %	2.01 JA	1.05 JA	2.25 JA	1.40 JA EN	2.78 JA	1.54 JA XM	5.19 JA
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	pg/g wwt	0.36 XM JA EN	1.08 JA XM B	<0.24	0.44 JA	<0.30	<0.49 XM	<2.1	0.32 JA EN	nc	<0.32	<0.16	<0.23	0.18 JA EN	0.212 JA XM	<0.14	0.390 XM JA EN
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	pg/g wwt	<0.34	<0.68 XM	<0.38	<0.26	<0.45	<0.70 XM	<1.2	<0.23	nc	<0.40	<0.24	<0.35	<0.15	<0.12	<0.21	<0.11
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	pg/g wwt	0.79 JA EN	1.81 JA XM	0.81 JA	1.27 JA	0.17 XM JA EN	0.88 JA XM	1.17 JA XM	0.69 JA EN	**52 %**	0.46 JA	0.409 JA	0.455 JA	0.60 JA EN	0.464 JA	0.38 XM JA EN	1.30 JA XM
Hexachlorodibenzofuran, 1,2,3,4,7,8-	pg/g wwt	<0.061	<0.46 XM	<0.060 XM	0.081 JA XM	<0.046	<0.079	<0.076	<0.052	nc	<0.062	<0.055	<0.049	<0.066 XM	<0.045	<0.096	<0.088
Hexachlorodibenzofuran, 1,2,3,6,7,8-	pg/g wwt	<0.056 XM	0.51 XM JA EN	<0.056 XM	0.084 JA XM	<0.045	<0.079	<0.073	<0.051 XM	nc	<0.054	<0.055	<0.042	<0.064	<0.043 XM	<0.092	<0.079
Hexachlorodibenzofuran, 1,2,3,7,8,9-	pg/g wwt	<0.093	0.78 JA XM B	<0.091	<0.089 XM	<0.079	<0.12	<0.12	<0.083	nc	<0.099	<0.092	<0.069	<0.083 XM	<0.051	<0.14	<0.13
Hexachlorodibenzofuran, 2,3,4,6,7,8-	pg/g wwt	0.094 JA EN	<0.46 XM	<0.10	0.066 XM JA EN	<0.053	<0.11	<0.091	<0.051	nc	<0.059	<0.052	<0.055	0.071 XM JA EN	<0.041 XM	<0.088	0.140 XM JA EN
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	pg/g wwt	<0.28	<0.63	<0.20 XM	<0.13	<0.18	<0.12	<0.20	<0.20	nc	<0.28	<0.11	<0.16	<0.12	<0.079	<0.12	<0.12
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	pg/g wwt	<0.24	<0.61	<0.19 XM	<0.11 XM	<0.15	<0.13	<0.21	<0.20	nc	<0.27	<0.11	<0.18 XM	<0.12 XM	<0.075 XM	<0.11	<0.10
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	pg/g wwt	<0.25	<0.65	<0.19 XM	<0.12 XM	<0.17	<0.13	<0.21	<0.20	nc	<0.27	<0.11	<0.17	<0.12 XM	<0.076	<0.12	<0.11
Total Tetrachlorodibenzofuran	pg/g wwt	0.745	<0.51	0.539	0.546	<0.11	0.29	0.653	0.246	nc	0.187	0.219	0.174	0.145	<0.059	<0.17	0.60
Total Tetrachlorodibenzo-p-dioxin	pg/g wwt	1.06	<0.92	0.588	<0.092	<0.19	0.31	<0.20	<0.073	nc	0.15	0.189	<0.034	0.204	0.24	<0.24	0.64
Total Pentachlorodibenzofuran	pg/g wwt	0.162	0.76	<0.12	0.46	0.23	0.32	0.19	0.917	nc	0.19	0.266	<0.076	0.173	0.045	<0.085	0.30
Total Pentachlorodibenzo-p-dioxin	pg/g wwt	0.470	<0.39	0.550	0.60	<0.068	0.870	0.205	0.385	nc	0.396	0.360	0.132	<0.091	0.123	<0.17	0.36
Total Hexachlorodibenzofuran	pg/g wwt	<0.093	1.16	0.32	0.165	<0.079	<0.12	0.28	<0.083	nc	<0.099	<0.092	<0.069	<0.083	0.060	0.19	<0.13
Total Hexachlorodibenzo-p-dioxin	pg/g wwt	<0.28	<0.65	0.67	0.37	<0.18	1.79	1.71	<0.20	nc	0.48	0.26	0.35	0.61	0.288	0.42	<0.12
Total Heptachlorodibenzofuran	pg/g wwt	<0.34	1.65	<0.38	0.44	<0.45	<0.70	<2.1	<0.23	nc	<0.40	<0.24	<0.35	<0.15	0.21	<0.21	<0.11
Total Heptachlorodibenzo-p-dioxin	pg/g wwt	<0.10	1.81	0.81	1.27	<0.14	1.19	2.27	1.32	**53 %**	0.46	0.409	0.455	0.97	1.29	<0.17	3.20
Total HpCDD # Homologues	none	0	1	1	1	0	2	2	1	-	1	1	1	1	2	0	2
Total HpCDF # Homologues	none	0	2	0	1	0	0	0	0	-	0	0	0	0	1	0	0
Total HxCDD # Homologues	none	0	0	1	1	0	2	2	0	-	1	1	1	1	1	1	0
Total HxCDF # Homologues	none	0	2	3	2	0	0	2	0	-	0	0	0	0	1	1	0
Total PeCDD # Homologues	none	2	0	1	2	0	1	1	1	-	1	3	2	0	1	0	1
Total PeCDF # Homologues	none	1	1	0	2	1	2	1	4	-	2	2	0	2	1	0	1
Total TCDD # Homologues	none	4	0	3	0	0	1	0	0	-	1	2	0	1	1	0	1
Total TCDF # Homologues	none	4	0	4	3	0	2	3	3	-	2	3	4	1	0	0	2
Lower Bound PCDD/F TEQ (WHO 2005)	pg/g wwt	0.00108	0.130	0.00921	0.0576	0.00718	0.00951	0.0198	0.00177	nc	0.0156	0.00441	0.0106	0.0175	0.00759	0.000527	0.0147
Mid Point PCDD/F TEQ (WHO 2005)	pg/g wwt	0.201	1.74	0.152	0.204	0.196	0.232	0.258	0.143	nc	0.203	0.105	0.0973	0.186	0.131	0.272	0.318
Upper Bound PCDD/F TEQ (WHO 2005)	pg/g wwt	0.327	2.42	0.283	0.344	0.383	0.455	0.495	0.264	nc	0.390	0.205	0.184	0.310	0.246	0.536	0.572

See last page for notes.

Table C-2a
Summary of Natural Grass 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		E1	E2	E5	E6	N2	N4	N5			S1	S2	S3	S4	S5	W2	W4
Sample Date		22-Sep-15	23-Sep-15	22-Sep-15	22-Sep-15	23-Sep-15	5-Oct-15	22-Sep-15	22-Sep-15		22-Sep-15	21-Sep-15	22-Sep-15	21-Sep-15	21-Sep-15	21-Sep-15	23-Sep-15
Sample ID		15-E1-NG-CH-039	15-E2-NG-CH-049	15-E5-NG-CH-055	15-E6-NG-CH-061	15-N2-NG-CH-019	15-N4-NG-CH-025	15-N5-NG-CH-035	15-D3-NG-CH-105		15-S1-NG-CH-069	15-S2-NG-CH-075	15-S3-NG-CH-085	15-S4-NG-CH-093	15-S5-NG-CH-099	15-W2-NG-CH-003	15-W4-NG-CH-009
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM
Laboratory Work Order		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539	L1713539
Laboratory Sample ID		L1713539-19	L1713539-23	L1713539-26	L1713539-28	L1713539-10	L1713539-13	L1713539-16	L1713539-48	RPD	L1713539-32	L1713539-35	L1713539-38	L1713539-42	L1713539-45	L1713539-3	L1713539-6
Sample Type	Units								Field Duplicate	(%)							
Organochlorinated pesticides (OCP)																	
Aldrin	ng/g	<0.025	<0.049	<0.021	<0.0060	<0.025	<0.032 XM	<0.049	<0.060	nc	<0.039	<0.032	<0.22	<0.0065	<0.0056	<0.0022	0.0029 JA EN
BHC, alpha-	ng/g	<0.31	<0.45	<0.55	0.089 JA EN	<0.34	<0.81	<0.61	<0.19	nc	<0.67	0.083 JA	<2.1	0.025 JA EN	0.036 JA EN	<0.072	<0.12
BHC, beta-	ng/g	<0.42	<0.61	<0.74	<0.032	<0.46	<1.1	<0.81	<0.25	nc	<0.84	<0.072	<2.6	<0.015	<0.025	<0.096	<0.16
BHC, delta-	ng/g	<0.43	<0.68	<0.69	<0.026	<0.44	<1.0	<0.80	<0.20	nc	<0.91	<0.040	<2.9	<0.015	<0.025	<0.096	<0.14
Chlordane, alpha-	ng/g	<0.25	<0.44	<0.36	0.142 JA	<0.44	<0.89	<0.61	<0.20 XM	nc	<0.10	<0.36	<0.34	0.083 JA XM	<0.039	<0.019	<0.013
Chlordane, trans- (gamma-Chlordane)	ng/g	<0.079	<0.45	<0.37	0.115 JA XM	<0.45	<0.92	<0.62	<0.22	nc	<0.10	<0.39	<1.6	0.058 JA	<0.042	<0.020	<0.013
DDD (p,p'-DDD)	ng/g	0.019 JA EN	0.033 JA XM	0.028 XM JA EN	<0.037	0.019 JA XM	0.071 XM JA EN	0.067 JA XM	<0.30	nc	<0.18	<0.25	0.116 JA XM	<0.085	<0.15	0.033 JA EN	0.0280 JA EN
DDE (p,p'-DDE)	ng/g	0.246 JA XM B	0.202 B XM	0.230 B XM	0.293 JA	0.188 JA XM B	0.400 XM	0.321 XM	0.44	nc	0.470 JA XM B	0.30	1.05 JA XM B	0.173 JA B	0.148 JA B	0.0806 JA B	0.137 JA B
DDT (p,p'-DDT)	ng/g	<0.012	0.091 JA XM	0.105 JA XM	<0.21	0.066 JA XM	0.200 XM	0.158 JA XM	<1.0	nc	2.99	<0.96	<0.16	<0.31	<0.55	0.104 JA	0.116 JA
Dieldrin	ng/g	0.35 XM	<0.22	<0.20 XM	0.326 JA	<0.24	<0.45	<0.28	0.40	nc	<0.051	0.26 XM	<0.14	0.178 JA	0.208 JA	0.157 JA	0.173 JA
Endosulfan I	ng/g	<0.088	<0.046	0.066 XM JA EN	0.130 JA EN	<0.012	<0.066	0.214 XM	<0.80	nc	<0.27 XM	<0.26 XM	<0.23	0.094 JA XM	0.42 JA	<0.0077	<0.0066
Endosulfan II	ng/g	<0.11	<0.059	<0.076	<0.046 JA EN	0.016 JA EN	0.110 XM JA EN	<0.049	<1.3	nc	<0.38	<0.53	<0.32	<0.086	<0.19	<0.010	<0.0085
Endosulfan Sulfate	ng/g	0.166 JA XM	0.162 JA XM	0.037 XM JA EN	0.131 JA	0.155 JA	0.150 XM JA EN	0.160 XM JA EN	<0.96	nc	<0.13	<0.35	<0.11	0.093 JA	<0.081 XM	0.150 JA EN	0.162 JA
Endrin	ng/g	<0.31	<0.60	<0.48	0.032 JA EN	<0.69	<1.1	<0.73	<0.41	nc	<0.058	<0.24	<0.27	0.031 JA EN	0.112 JA	<0.040	<0.021
Endrin Aldehyde	ng/g	<0.013	0.031 XM JA EN	0.030 JA XM B	0.020 JA XM	<0.046	<0.22	0.030 XM JA EN	0.26 JA	nc	0.744 JA XM	0.46 XM	0.78 JA XM	<0.032	0.056 JA XM	<0.0053	0.058 JA B
Heptachlor	ng/g	<0.0033	<0.0054	0.0059 XM JA EN	<0.019 XM	0.0042 XM JA EN	<0.0039	<0.0084	<0.011 XM	nc	<0.0034	<0.0086	<0.037	<0.0072 XM	<0.0058 XM	<0.0069	<0.0011
Heptachlor Epoxide	ng/g	0.0842 JA XM	0.031 XM JA EN	0.123 JA XM	0.0804 JA	0.0450 XM JA EN	0.0210 XM JA EN	0.061 JA XM	0.140 JA	nc	<0.0083	0.074 JA	<0.11	0.0486 JA	0.0450 JA EN	<0.0024	0.0022 JA EN
Lindane (Hexachlorocyclohexane, gamma)	ng/g	<0.37	<0.59	<0.60	0.061 JA EN	<0.38	<0.91	<0.70	<0.18	nc	<0.82	<0.036	<2.6	<0.014	<0.023	<0.083	<0.13
Methoxychlor (4,4'-Methoxychlor)	ng/g	<0.25	<0.18	<0.13	<0.089	<0.25	<0.30	<0.28	<1.2	nc	<0.80	<0.39	<2.7	<0.17	<0.96	<0.11	<0.15
Mirex	ng/g	<0.0025 XM	0.0036 XM JA EN	<0.0016	0.0080 JA EN	<0.0015	<0.0025	0.0021 JA XM	0.073 JA EN	nc	<0.015	0.047 XM JA EN	<0.052	0.031 XM JA EN	0.095 XM JA EN	0.00090 JA EN	0.00075 JA EN
PARLAR 26	ng/g	<0.013	<0.069	<0.039	<0.14	<0.020	<0.077	<0.050	<0.79	nc	<5.2	<0.43	<0.57	<0.22	<0.57	<0.65	<0.012
PARLAR 50	ng/g	<0.23	<0.38	<0.23	<0.13	<0.24	<0.77	<0.66	<1.3	nc	<6.9	<0.59	<3.3	<0.39	<0.93	<0.089	<0.042
PARLAR 62	ng/g	<0.27	<0.44	<0.26	<0.16	<0.28	<0.90	<0.77	<2.8	nc	<7.3	<1.3	<3.5	<0.83	<2.0	<0.10	<0.049
Polychlorinated biphenyls (PCB)																	
Polychlorinated Biphenyls (PCBs)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.080	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Notes:

15.2	Concentration was detected.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
-	Parameter not analyzed / not available.
B	Indicates analyte was found in associated blank, as well as in the sample.
EN	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum
JA	Analyte was detected below the calibrated range but above the detection limit.
XM	A peak has been manually integrated.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-2b
Summary of Sediment 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location					E2	N2	N5	S1			S3	S4
Sample Date					23-Sep-15	23-Sep-15	22-Sep-15	22-Sep-15	22-Sep-15		22-Sep-15	21-Sep-15
Sample ID					15-E2-SD-CH-045	15-N2-SD-CH-015	15-N5-SD-CH-031	15-S1-SD-CH-065	15-D4-SD-CH-106		15-S3-SD-CH-081	15-S4-SD-CH-089
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory					ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM
Laboratory Work Order		Ontario SCS	PSQG		L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539
Laboratory Sample ID			Table 1 - LEL	Table 2 - LEL	L1713539-22	L1713539-9	L1713539-15	L1713539-31	L1713539-49	RPD	L1713539-37	L1713539-41
Sample Type	Units	Table 1 A	B	C					Field Duplicate	(%)		
General Chemistry												
Moisture Content	%	n/v	n/v	n/v	14.1	45.8	51.9	19.7	20.2	3 %	46.4	18.9
Organochlorinated pesticides (OCP)												
Aldrin	ng/g	2	n/v	2	<0.00069	0.0017 XM JA EN	0.0114 JA	0.0051 JA XM	0.0025 JA EN	nc	<0.016	0.0092 XM JA EN
BHC, alpha-	ng/g	n/v	n/v	6	<0.0034	<0.0052 XM JA EN	0.0190 JA EN	<0.018 XM JA EN	<0.035	nc	<0.23	<0.14
BHC, beta-	ng/g	n/v	n/v	5	<0.0053	<0.0080	0.0345 JA	<0.023	<0.044	nc	<0.30	<0.19
BHC, delta-	ng/g	n/v	n/v	n/v	<0.0051	<0.0076	<0.0072	<0.025	<0.051	nc	<0.30	<0.19
Chlordane, alpha-	ng/g	n/v	n/v	n/v	0.0101 JA XM	0.057 JA	0.179 JA	<0.0088	0.130 JA EN	nc	<0.16	<0.17
Chlordane, trans- (gamma-Chlordane)	ng/g	n/v	n/v	n/v	0.0096 XM JA EN	0.039 JA	0.160 JA	0.0590 XM JA EN	0.170 JA XM	**97 %**	<0.16	<0.17
DDD (p,p'-DDD)	ng/g	8	n/v	8	0.0173 JA XM	0.109 JA	1.21	0.314 JA XM	0.368 JA XM	16 %	0.102 JA XM	0.0735 JA XM
DDE (p,p'-DDE)	ng/g	5	n/v	5	0.0779 JA B	0.412	1.38	0.946	1.05 XM	10 %	0.166 JA XM B	0.204 JA XM B
DDT (p,p'-DDT)	ng/g	7	n/v	7	<0.031	0.586	0.43	0.196 JA XM	0.311 JA XM	**45 %**	0.183 JA XM	0.0791 JA XM
Dieldrin	ng/g	2	n/v	2	0.0150 JA EN	0.0643 JA	0.0954 JA	0.141 JA XM	0.219 JA	**43 %**	0.110 XM JA EN	<0.095
Endosulfan I	ng/g	n/v	n/v	n/v	<0.0081	<0.013	<0.019	<0.0080	<0.0099	nc	<0.017	<0.0071
Endosulfan II	ng/g	n/v	n/v	n/v	<0.015	<0.021 XM	<0.024	<0.011	<0.014	nc	<0.022	0.0200 JA EN
Endosulfan Sulfate	ng/g	n/v	n/v	n/v	<0.0071	<0.0073 XM	<0.022	0.0079 XM JA EN	<0.0057	nc	0.0293 JA XM B	0.0202 JA B
Endrin	ng/g	3	n/v	3	0.0048 JA EN	<0.0081	<0.013	<0.012	<0.017	nc	<0.19	<0.20
Endrin Aldehyde	ng/g	n/v	n/v	n/v	<0.0035	<0.013	0.0086 JA XM	<0.011	<0.022	nc	0.0097 XM JA EN	0.0125 JA XM
Heptachlor	ng/g	n/v	n/v	n/v	<0.0014 XM	0.0033 JA EN	0.0059 JA EN	<0.00023	<0.00095	nc	<0.0022	<0.0012
Heptachlor Epoxide	ng/g	5	n/v	5_b	0.0043 JA	0.0091 JA	0.0063 JA XM	0.00280 XM JA EN	<0.00069	nc	0.0105 JA XM	<0.0013 XM
Lindane (Hexachlorocyclohexane, gamma)	ng/g	n/v	n/v	3_{ab}	<0.0045	0.0136 JA XM	0.310	0.105 JA XM	0.155 JA XM	nc	1.61 XM	<0.17
Methoxychlor (4,4'-Methoxychlor)	ng/g	n/v	n/v	n/v	<0.041	<0.028	<0.032	<0.10 XM	<0.20 XM	nc	0.280 JA EN	<0.040
Mirex	ng/g	n/v	n/v	7	0.0032 JA EN	0.0097 JA EN	0.0220 JA EN	0.0318 JA XM B	<0.0040	nc	0.0087 XM JA EN	<0.00030
PARLAR 26	ng/g	n/v	n/v	n/v	<0.029	<0.090	<0.066 XM	<0.075	0.34 JA XM	nc	<0.014 XM	<0.0055
PARLAR 50	ng/g	n/v	n/v	n/v	<0.055	<0.16	<0.079	<0.12	<0.75	nc	<0.067	<0.070
PARLAR 62	ng/g	n/v	n/v	n/v	<0.075	<0.22	<0.11	<0.13 XM	<0.93	nc	<0.074	<0.077
Polychlorinated biphenyls (PCB)												
Polychlorinated Biphenyls (PCBs)	mg/kg	0.07_{s14}	n/v	0.07	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
A	Table 1 - All Types of Property Uses
PSQG	Ontario Provincial Sediment Quality Guidelines
B	Table 1: PSQG for Metals and Nutrients - Lowest Effect Level
C	Table 2: PSQG for PCBs and Organochlorine Pesticides - Lowest Effect Level
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
ab	10% SLC (Screening Level Concentration) (see Section 4.2.4). Denotes tentative guideline.
b	10% SLC (Screening Level Concentration) (see Section 4.2.4).
s14	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
B	Indicates analyte was found in associated blank, as well as in the sample.
EN	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum
JA	Analyte was detected below the calibrated range but above the detection limit.
XM	A peak has been manually integrated.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-2c
Summary of Soil 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location					E1	E2	E5		E6			N2	N4			N5	S1	S2
Sample Date					15-Sep-15	15-Sep-15	15-Sep-15	22-Sep-15	22-Sep-15		22-Sep-15	5-Oct-15	8-Jul-15	8-Jul-15		22-Sep-15	16-Sep-15	16-Sep-15
Sample ID					15-E1-SS-CH-037	15-E2-SS-CH-043	15-E5-SS-CH-053	15-E6-SS-CH-059	Duplicate		15-D2-SS-CH-104	15-N2-SS-CH-013	15-N4-SS-CH-023	15-D1-SS-CH-103		15-N5-SS-CH-029	15-S1-SS-CH-063	15-S2-SS-CH-073
Sample Depth					15 cm	15 cm	15 cm	15 cm	15 cm		15 cm	15 cm	15 cm	15 cm		15 cm	15 cm	15 cm
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC			STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC
Laboratory					ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM
Laboratory Work Order		Ontario SCS			L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1713539-17	L1713539-20	L1713539-24	L1713539-27	WG2243497-4	RPD	L1713539-47	L1713539-7	L1713539-11	L1713539-46	RPD	L1713539-14	L1713539-29	L1713539-33
Sample Type	Units	A	B	C					Lab Replicate	(%)	Field Duplicate			Field Duplicate	(%)			
General Chemistry																		
Moisture Content	%	n/v	n/v	n/v	8.97	14.1	16.4	9.99	-	-	10.6	6 %	16.0	13.8	13.3	4 %	14.8	13.4	11.4
Dioxins/Furans (PCDD/DF)																		
Tetrachlorodibenzofuran, 2,3,7,8-	pg/g	n/v	n/v	n/v	0.43 JA	<0.21	<0.13	0.19 XM JA EN	-	-	0.19 XM JA EN	nc	0.27 JA EN	0.246 JA XM	0.40 JA XM	nc	0.22 XM JA EN	0.40 XM JA EN	0.26 XM JA EN
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	pg/g	n/v	0.9	n/v	<0.12	0.25 XM JA EN	<0.13 JA EN	0.23 JA XM	-	-	0.31 JA EN	nc	0.19 XM JA EN	0.53 XM JA EN	0.61	nc	0.360 XM JA EN	0.22 JA EN	0.24 JA EN
Pentachlorodibenzofuran, 1,2,3,7,8-	pg/g	n/v	n/v	n/v	0.28 JA	<0.22 XM	<0.10 XM	0.32 JA	-	-	0.220 JA EN	nc	<0.13	<0.13	<0.21	nc	0.165 JA	0.21 XM JA EN	<0.12
Pentachlorodibenzofuran, 2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.350 JA EN	0.46 JA XM	0.216 JA	0.472 JA	-	-	0.350 JA EN	30 %	0.55 JA XM	0.51 JA	0.36 XM JA EN	nc	0.320 JA EN	0.47 JA	0.46 JA EN
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	pg/g	n/v	n/v	n/v	0.15 XM JA EN	0.17 XM JA EN	<0.099 XM	0.230 JA EN	-	-	0.22 JA XM	nc	0.21 JA	0.120 JA EN	<0.21 XM	nc	0.140 XM JA EN	<0.21 XM	0.191 JA
Octachlorodibenzofuran	pg/g	n/v	n/v	n/v	4.27 JA	2.02 JA	0.951 JA XM	4.92 JA	-	-	4.22 JA	15 %	1.50 XM JA EN	1.53 JA XM	1.10 XM JA EN	33 %	13.5	2.21 JA XM	1.05 JA
Octachlorodibenzo-p-dioxin	pg/g	n/v	n/v	n/v	33.6	29.9	17.5	73.9	-	-	61.4	18 %	23.5	19.1	13.6	34 %	103	45.2	17.4
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	3.32	1.20 JA EN	1.01 JA	2.60 JA EN	-	-	3.08	17 %	1.34 JA	0.920 JA EN	0.844 JA XM	9 %	6.02	1.59 JA XM	1.10 XM JA EN
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	pg/g	n/v	n/v	n/v	0.16 JA EN	<0.28	<0.085 XM	0.17 XM JA EN	-	-	<0.11 XM	nc	0.100 XM JA EN	<0.090 XM	<0.14	nc	0.21 XM JA EN	<0.22 XM	<0.17
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	4.90 EN	6.08	3.13	8.93	-	-	9.31	4 %	4.23	3.16	2.90	9 %	10.8	6.53	3.66 XM
Hexachlorodibenzofuran, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.47 JA XM	0.25 XM JA EN	<0.12 XM	0.51 XM JA EN	-	-	0.50 JA EN	nc	<0.18 XM	0.160 JA EN	<0.17 XM	nc	0.97 JA	0.28 XM JA EN	0.20 XM JA EN
Hexachlorodibenzofuran, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	0.39 JA XM	0.21 JA	0.16 JA	0.41 JA XM	-	-	0.36 JA XM	nc	0.18 XM JA EN	0.130 JA EN	<0.15	nc	0.37 XM JA EN	<0.21 XM	0.19 XM JA EN
Hexachlorodibenzofuran, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	<0.21	<0.29	<0.16	<0.21	-	-	<0.20	nc	<0.26	<0.12	<0.24	nc	<0.18	<0.33	<0.17
Hexachlorodibenzofuran, 2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	0.55 JA XM	0.43 JA	0.14 JA XM	0.40 JA	-	-	0.25 XM JA EN	nc	0.26 XM JA EN	0.130 XM JA EN	<0.16 XM	nc	0.36 JA EN	0.52 JA XM	0.31 JA EN
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	<0.17	<0.41	<0.15	0.27 JA	-	-	<0.27 XM	nc	<0.31	<0.12	<0.17	nc	0.15 JA EN	0.28 XM JA EN	<0.20
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	<0.16 XM	<0.36 XM	<0.14 XM	0.35 XM JA EN	-	-	0.51 JA XM	nc	<0.28 XM	0.12 JA EN	<0.16 XM	nc	0.42 JA	<0.23 XM	0.24 JA XM
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	0.23 XM JA EN	<0.38	<0.14 XM	0.32 XM JA EN	-	-	0.39 XM JA EN	nc	<0.29 XM	0.23 XM JA EN	<0.16 XM	nc	0.44 JA XM	0.44 XM JA EN	0.36 JA EN
Total Tetrachlorodibenzofuran	pg/g	n/v	12	n/v	4.02	1.86	0.83	1.92	-	-	3.37	**55 %**	3.82	4.28	1.71	**86 %**	2.71	4.69	2.26
Total Tetrachlorodibenzo-p-dioxin	pg/g	n/v	6.6	n/v	<0.12	0.27	0.34	0.75	-	-	1.80	**82 %**	1.77	3.65	2.62	33 %	1.89	<0.21	<0.14
Total Pentachlorodibenzofuran	pg/g	n/v	19	n/v	2.04	3.46	2.26	4.02	-	-	2.81	35 %	2.66	3.70	1.02	nc	2.68	3.79	4.89
Total Pentachlorodibenzo-p-dioxin	pg/g	n/v	16	n/v	2.41	3.41	0.882	3.37	-	-	3.22	5 %	2.94	4.24	4.05	5 %	5.71	0.72	2.94
Total Hexachlorodibenzofuran	pg/g	n/v	28	n/v	3.64	2.93	1.17	3.01	-	-	2.08	37 %	2.22	0.53	<0.24	nc	4.89	2.12	1.95
Total Hexachlorodibenzo-p-dioxin	pg/g	n/v	13	n/v	3.06	<0.41	3.38	6.88	-	-	7.15	4 %	2.28	3.59	3.92	9 %	5.12	3.86	3.10
Total Heptachlorodibenzofuran	pg/g	n/v	32	n/v	3.32	<0.28	1.07	1.57	-	-	3.08	**65 %**	1.34	<0.090	1.26	nc	10.5	2.94	<0.17
Total Heptachlorodibenzo-p-dioxin	pg/g	n/v	55	n/v	5.89	12.4	6.87	18.4	-	-	18.9	3 %	9.15	6.56	6.31	4 %	24.4	6.53	8.33
Total HpCDD # Homologues	none	n/v	n/v	n/v	1	2	2	2	-	-	2	-	2	2	2	-	2	1	2
Total HpCDF # Homologues	none	n/v	n/v	n/v	1	0	2	1	-	-	1	-	1	0	2	-	2	3	0
Total HxCDD # Homologues	none	n/v	n/v	n/v	2	0	5	4	-	-	5	-	2	3	3	-	4	2	3
Total HxCDF # Homologues	none	n/v	n/v	n/v	6	4	4	5	-	-	2	-	3	2	0	-	5	2	3
Total PeCDD # Homologues	none	n/v	n/v	n/v	4	4	2	4	-	-	5	-	6	4	4	-	6	2	5
Total PeCDF # Homologues	none	n/v	n/v	n/v	3	4	5	8	-	-	6	-	3	7	2	-	5	4	6
Total TCDD # Homologues	none	n/v	n/v	n/v	0	1	1	2	-	-	5	-	4	6	5	-	3	0	0
Total TCDF # Homologues	none	n/v	n/v	n/v	10	1	2	4	-	-	6	-	4	8	3	-	6	6	4
Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	0.236	0.271	0.142	0.605	-	-	0.449	nc	0.438	0.215	0.691	nc	0.390	0.289	0.257
Mid Point PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	0.651	0.815	0.365	1.01	-	-	1.03	nc	0.768	0.966	0.969	nc	1.11	0.800	0.799
Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	0.738	0.903	0.459	1.02	-	-	1.05	nc	0.836	0.980	1.14	nc	1.12	0.944	0.820

See last page for notes.

Table C-2c
Summary of Soil 2015 Organic Analytical Results
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Sample Location					E1	E2	E5		E6			N2	N4			N5	S1	S2
Sample Date					15-Sep-15	15-Sep-15	15-Sep-15	22-Sep-15	22-Sep-15		22-Sep-15	5-Oct-15	8-Jul-15	8-Jul-15		22-Sep-15	16-Sep-15	16-Sep-15
Sample ID					15-E1-SS-CH-037	15-E2-SS-CH-043	15-E5-SS-CH-053	15-E6-SS-CH-059	Duplicate		15-D2-SS-CH-104	15-N2-SS-CH-013	15-N4-SS-CH-023	15-D1-SS-CH-103		15-N5-SS-CH-029	15-S1-SS-CH-063	15-S2-SS-CH-073
Sample Depth					15 cm	15 cm	15 cm	15 cm	15 cm		15 cm	15 cm	15 cm	15 cm		15 cm	15 cm	15 cm
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC			STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC
Laboratory					ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM
Laboratory Work Order		Ontario SCS			L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1713539-17	L1713539-20	L1713539-24	L1713539-27	WG2243497-4	RPD	L1713539-47	RPD	L1713539-7	L1713539-11	L1713539-46	RPD	L1713539-14	L1713539-29	L1713539-33
Sample Type	Units	A	B	C					Lab Replicate	(%)	Field Duplicate	(%)			Field Duplicate	(%)			
Organochlorinated pesticides (OCP)																		
Aldrin	ng/g	50	1_p	n/v	0.00263 JA XM	0.00118 JA	0.00155 JA	<0.00096	<0.0009	nc	0.00394 JA XM	nc	<0.0010	0.00082 JA XM	<0.0030	nc	0.0221 JA	<0.00049	<0.0013
BHC, alpha-	ng/g	n/v	n/v	n/v	<0.0036	0.0041 JA EN	0.0037 JA EN	<0.019	<0.029	nc	<0.024	nc	0.0043 XM JA EN	0.0110 XM JA EN	<0.020	nc	0.135	<0.039	<0.033
BHC, beta-	ng/g	n/v	n/v	n/v	<0.0056	<0.0036	<0.0056	<0.024	<0.038	nc	<0.030	nc	<0.0060	<0.0043	<0.026	nc	0.0576 JA	<0.051	<0.043
BHC, delta-	ng/g	n/v	n/v	n/v	<0.0052	<0.0037	<0.0048	<0.025	<0.037	nc	<0.035	nc	<0.0057	<0.0039	<0.029	nc	0.0122 JA XM	<0.049	<0.040
Chlordane, alpha-	ng/g	n/v	2_p	n/v	0.0175 JA	0.0261 JA	0.0190 XM JA EN	<0.0080	<0.0081	nc	<0.0076	nc	0.0325 JA	0.0556 JA XM	0.0190 XM JA EN	nc	0.083 JA XM	<0.0096	0.0071 XM JA EN
Chlordane, trans- (gamma-Chlordane)	ng/g	n/v	n/v	n/v	0.0148 JA	0.0206 JA	0.0110 JA EN	<0.0082	0.0130 XM JA EN	nc	<0.0079	nc	0.0137 JA	0.0392 JA	0.0210 XM JA EN	nc	0.076 JA	<0.0099	0.0270 XM JA EN
DDD (p,p'-DDD)	ng/g	50	n/v	n/v	0.0315 JA XM	0.013 JA XM	0.0155 JA	0.0669 JA XM	0.0803 JA XM	18 %	0.0663 JA XM	1 %	0.0209 JA	0.0629 JA	0.0614 JA XM	2 %	0.315	0.0516 JA XM	0.0294 JA B
DDE (p,p'-DDE)	ng/g	50	n/v	n/v	0.209	0.432	0.197	0.379 JA	0.435 JA	14 %	0.389 JA	3 %	0.328	0.479	0.456 JA	5 %	1.32	0.607	0.445 JA
DDT (p,p'-DDT)	ng/g	78	75	n/v	0.295	0.246	0.201	0.422 JA XM	0.442 JA XM	5 %	0.457 JA XM	8 %	0.378	0.427	0.474 JA XM	10 %	2.69	0.373 JA XM	0.489 JA XM
Dieldrin	ng/g	50	4_p	n/v	0.0348 JA	0.0636 JA	0.0419 JA	<0.0037	0.0293 JA XM	nc	0.0460 JA EN	nc	0.0721 JA	0.127	0.161 JA	24 %	0.115 JA	0.0660 XM JA EN	0.0620 XM JA EN
Endosulfan I	ng/g	n/v	n/v	n/v	<0.0059	0.0074 JA	<0.0077	<0.0030	<0.0044	nc	<0.0030	nc	<0.0051	<0.0079	<0.019	nc	0.013 JA EN	<0.0021	0.0110 JA EN
Endosulfan II	ng/g	n/v	n/v	n/v	0.0126 JA	0.011 XM JA EN	<0.0098	<0.0040	<0.0059	nc	<0.0042	nc	<0.0071	<0.016	<0.027	nc	<0.020	<0.0028	<0.0049
Endosulfan Sulfate	ng/g	n/v	n/v	n/v	<0.0079	<0.0059	<0.0066 XM	<0.0016	<0.0024	nc	<0.0017	nc	<0.010	0.0067 JA	<0.011 XM	nc	0.0098 XM JA EN	<0.0011	0.0098 XM JA EN
Endrin	ng/g	40	4_p	n/v	<0.0053	0.0077 JA EN	0.0042 XM JA EN	<0.0078	<0.01	nc	<0.0096	nc	0.0090 JA EN	0.0085 JA EN	<0.011	nc	0.0363 JA	<0.011	<0.0040
Endrin Aldehyde	ng/g	n/v	n/v	n/v	<0.0038	<0.0050	<0.0027	0.0095 XM JA EN	0.0068 XM JA EN	nc	<0.015 XM	nc	0.0078 JA	<0.0069	0.0086 XM JA EN	nc	<0.0054	0.0200 XM JA EN	0.024 JA XM
Heptachlor	ng/g	50	1_p	n/v	0.00180 JA EN	0.00170 JA EN	0.00180 JA EN	<0.00032	0.00300 JA EN	nc	<0.00056	nc	0.0016 JA EN	0.0026 JA EN	<0.00042	nc	0.0081 JA EN	<0.00059	0.00330 XM JA EN
Heptachlor Epoxide	ng/g	50	1_p	n/v	0.0164 JA	0.0314 JA	0.0212 JA	0.0130 XM JA EN	0.00490 XM JA EN	**91 %**	<0.0024 XM	nc	0.0343 JA	0.0501 JA	0.0525 JA	5 %	0.0334 JA	0.0230 XM JA EN	0.0441 JA XM
Lindane (Hexachlorocyclohexane, gamma)	ng/g	10	1_p	n/v	0.0217 JA	0.0164 JA	0.0161 JA	0.108 JA XM	0.156 JA XM	nc	0.149 JA XM	nc	0.0083 JA	0.0099 JA XM	<0.025	nc	0.341	<0.043	<0.035
Methoxychlor (4,4'-Methoxychlor)	ng/g	50	5_p	n/v	<0.0060	<0.011	<0.010	<0.036 XM	<0.053 XM	nc	<0.12	nc	<0.0094	<0.022	<0.095 XM	nc	0.140 XM JA EN	<0.086	<0.082 XM
Mirex	ng/g	n/v	n/v	n/v	0.00590 JA EN	0.00650 JA EN	0.00600 JA EN	0.0198 JA XM B	0.0142 JA XM B	33 %	0.00890 XM JA EN	**76 %**	0.00630 JA EN	0.0074 JA EN	0.00600 XM JA EN	21 %	0.0110 JA EN	0.00915 JA XM B	0.00799 JA XM B
PARLAR 26	ng/g	n/v	n/v	n/v	0.035 JA	0.051 JA	<0.023	<0.017	<0.0077	nc	<0.021	nc	0.021 JA EN	0.110 JA EN	<0.015	nc	<0.051	<0.0084	<0.017
PARLAR 50	ng/g	n/v	n/v	n/v	<0.036	<0.041	<0.041	<0.11	<0.048	nc	<0.028	nc	<0.038	<0.055	<0.047	nc	<0.096	<0.028	<0.028
PARLAR 62	ng/g	n/v	n/v	n/v	<0.050	<0.057	<0.056	<0.12	<0.054	nc	<0.035	nc	<0.053	<0.076	<0.058	nc	<0.13	<0.031	<0.031
Polychlorinated biphenyls (PCB)																			
Polychlorinated Biphenyls (PCBs)	mg/kg	0.3_{s14}	0.015_p	n/v	***<0.020***	***<0.020***	***<0.020***	***<0.020***	-	-	***<0.020***	nc	***<0.020***	***<0.020***	***<0.020***	nc	***<0.020***	***<0.020***	***<0.020***

Table C-2c
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Sample Location					S3	S4	S5	W2			W4
Sample Date					22-Sep-15	21-Sep-15	16-Sep-15	21-Sep-15	21-Sep-15		5-Oct-15
Sample ID					15-S3-SS-CH-079	15-S4-SS-CH-087	15-S5-SS-CH-097	15-W2-SS-CH-001	Duplicate		15-W4-SS-CH-007
Sample Depth					15 cm	15 cm	15 cm	15 cm	15 cm		15 cm
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC			STANTEC
Laboratory					ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM
Laboratory Work Order		Ontario SCS			L1713539	L1713539	L1713539	L1713539	L1713539		L1713539
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1713539-36	L1713539-39	L1713539-43	L1713539-1	WG2243493-4	RPD	L1713539-4
Sample Type	Units	A	B	C					Lab Replicate	(%)	
General Chemistry											
Moisture Content	%	n/v	n/v	n/v	13.7	17.7	12.4	10.9	11.2	3 %	17.0
Dioxins/Furans (PCDD/DF)											
Tetrachlorodibenzofuran, 2,3,7,8-	pg/g	n/v	n/v	n/v	0.32 XM JA EN	<0.23	0.15 JA XM	<0.15 XM	0.28 XM JA EN	nc	0.43 XM JA EN
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	pg/g	n/v	0.9	n/v	0.16 XM JA EN	0.22 JA XM	0.14 XM JA EN	0.25 JA	0.48 JA	nc	0.26 XM JA EN
Pentachlorodibenzofuran, 1,2,3,7,8-	pg/g	n/v	n/v	n/v	0.21 XM JA EN	0.26 JA XM	<0.13 XM	0.28 JA	0.18 JA XM	nc	0.24 JA XM
Pentachlorodibenzofuran, 2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.54 JA XM	0.45 XM JA EN	0.28 XM JA EN	0.67 JA	0.59 JA XM	nc	0.722 JA XM
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	pg/g	n/v	n/v	n/v	0.310 JA EN	0.15 XM JA EN	<0.086 XM	0.200 XM JA EN	0.21 XM JA EN	nc	0.25 JA EN
Octachlorodibenzofuran	pg/g	n/v	n/v	n/v	3.43 JA	2.94 JA	0.960 JA EN	2.03 JA	2.16 JA	6 %	12.2
Octachlorodibenzo-p-dioxin	pg/g	n/v	n/v	n/v	55.1	37.8	14.7	41.8	30.7	31 %	110
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	2.55 JA	2.13 JA	1.25 JA	2.04 JA	1.79 JA	13 %	6.51
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	pg/g	n/v	n/v	n/v	0.140 XM JA EN	<0.15 XM	<0.084	0.20 XM JA EN	0.18 XM JA EN	nc	0.34 XM JA EN
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	8.68	8.10	3.07	6.38	5.73	11 %	22.0
Hexachlorodibenzofuran, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	0.55 XM JA EN	0.25 XM JA EN	0.24 XM JA EN	0.39 JA EN	0.36 XM JA EN	nc	0.50 JA EN
Hexachlorodibenzofuran, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	0.30 JA XM	0.35 XM JA EN	0.18 JA XM	<0.098 XM	0.27 JA	nc	0.38 JA
Hexachlorodibenzofuran, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	<0.17	<0.30	<0.21	<0.13	<0.4	nc	<0.32
Hexachlorodibenzofuran, 2,3,4,6,7,8-	pg/g	n/v	n/v	n/v	0.40 XM JA EN	0.45 JA XM	0.28 JA	0.694 JA	<0.27 XM	nc	0.53 JA EN
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	pg/g	n/v	n/v	n/v	<0.14	<0.25	<0.15	0.21 JA EN	<0.22 XM	nc	<0.17
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	pg/g	n/v	n/v	n/v	0.27 JA EN	<0.23 XM	0.21 XM JA EN	0.49 JA	0.36 JA XM	nc	0.92 JA EN
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	pg/g	n/v	n/v	n/v	0.32 JA XM	0.28 XM JA EN	0.17 JA XM	0.43 JA XM	0.49 JA XM	nc	0.57 JA EN
Total Tetrachlorodibenzofuran	pg/g	n/v	12	n/v	3.29	4.24	3.53	2.34	2.66	13 %	5.01
Total Tetrachlorodibenzo-p-dioxin	pg/g	n/v	6.6	n/v	1.54	0.40	1.00	1.23	1.37	11 %	0.87
Total Pentachlorodibenzofuran	pg/g	n/v	19	n/v	3.02	5.49	2.66	7.77	4.98	**44 %**	6.85
Total Pentachlorodibenzo-p-dioxin	pg/g	n/v	16	n/v	2.25	1.13	1.25	3.56	1.59	**77 %**	3.02
Total Hexachlorodibenzofuran	pg/g	n/v	28	n/v	2.61	2.16	0.71	4.19	2.33	**57 %**	6.98
Total Hexachlorodibenzo-p-dioxin	pg/g	n/v	13	n/v	6.63	4.98	3.28	6.36	5.84	9 %	6.07
Total Heptachlorodibenzofuran	pg/g	n/v	32	n/v	2.55	2.13	1.89	2.21	2.94	28 %	14.5
Total Heptachlorodibenzo-p-dioxin	pg/g	n/v	55	n/v	18.0	14.5	6.54	12.7	11.6	9 %	35.6
Total HpCDD # Homologues	none	n/v	n/v	n/v	2	2	2	2	-	-	2
Total HpCDF # Homologues	none	n/v	n/v	n/v	1	1	2	2	-	-	2
Total HxCDD # Homologues	none	n/v	n/v	n/v	5	4	3	6	-	-	2
Total HxCDF # Homologues	none	n/v	n/v	n/v	5	2	3	4	-	-	4
Total PeCDD # Homologues	none	n/v	n/v	n/v	3	2	1	4	-	-	5
Total PeCDF # Homologues	none	n/v	n/v	n/v	5	7	5	6	-	-	9
Total TCDD # Homologues	none	n/v	n/v	n/v	4	2	2	2	-	-	2
Total TCDF # Homologues	none	n/v	n/v	n/v	6	5	7	4	-	-	7
Lower Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	0.353	0.387	0.126	0.716	-	-	0.583
Mid Point PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	1.00	0.811	0.458	0.997	-	-	1.42
Upper Bound PCDD/F TEQ (WHO 2005)	pg/g	7	4.8	n/v	1.02	0.862	0.522	1.02	-	-	1.44

See last page for notes.

Table C-2c
Summary of Soil 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location					S3	S4	S5	W2			W4
Sample Date					22-Sep-15	21-Sep-15	16-Sep-15	21-Sep-15	21-Sep-15		5-Oct-15
Sample ID					15-S3-SS-CH-079	15-S4-SS-CH-087	15-S5-SS-CH-097	15-W2-SS-CH-001	Duplicate		15-W4-SS-CH-007
Sample Depth					15 cm	15 cm	15 cm	15 cm	15 cm		15 cm
Sampling Company					STANTEC	STANTEC	STANTEC	STANTEC			STANTEC
Laboratory					ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM
Laboratory Work Order		Ontario SCS			L1713539	L1713539	L1713539	L1713539	L1713539		L1713539
Laboratory Sample ID		Table 1Agr	Rural OTR	Rural ULN	L1713539-36	L1713539-39	L1713539-43	L1713539-1	WG2243493-4	RPD	L1713539-4
Sample Type	Units	A	B	C					Lab Replicate	(%)	
Organochlorinated pesticides (OCP)											
Aldrin	ng/g	50	1_p	n/v	<0.00065	<0.027	<0.0089	0.00105 JA	-	-	0.00135 JA
BHC, alpha-	ng/g	n/v	n/v	n/v	<0.015 XM	<0.18	<0.094	0.0044 XM JA EN	-	-	0.0070 XM JA EN
BHC, beta-	ng/g	n/v	n/v	n/v	<0.020	<0.23	<0.12	<0.0057	-	-	<0.0055
BHC, delta-	ng/g	n/v	n/v	n/v	<0.019	<0.23	<0.12	<0.0053	-	-	<0.0053
Chlordane, alpha-	ng/g	n/v	2_p	n/v	0.0483 JA	<0.098	<0.10	0.0130 JA EN	-	-	0.0668 JA
Chlordane, trans- (gamma-Chlordane)	ng/g	n/v	n/v	n/v	0.0290 JA EN	<0.10	<0.11	0.0115 JA	-	-	0.0269 JA
DDD (p,p'-DDD)	ng/g	50	n/v	n/v	0.0714 JA XM	0.0634 JA XM	0.0216 JA XM B	0.013 XM JA EN	-	-	0.038 JA
DDE (p,p'-DDE)	ng/g	50	n/v	n/v	0.387 JA	0.846 XM	0.385 JA XM	0.337	-	-	0.572
DDT (p,p'-DDT)	ng/g	78	75	n/v	0.264 JA XM	0.771 XM	0.430 JA XM	0.307	-	-	0.871
Dieldrin	ng/g	50	4_p	n/v	0.0661 JA	<0.054	<0.058	0.0386 JA	-	-	0.245
Endosulfan I	ng/g	n/v	n/v	n/v	<0.0034	<0.0089	<0.0087	<0.0051	-	-	<0.0066
Endosulfan II	ng/g	n/v	n/v	n/v	0.0092 XM JA EN	<0.012	<0.012	<0.010 XM	-	-	<0.011
Endosulfan Sulfate	ng/g	n/v	n/v	n/v	0.0239 JA XM B	0.0216 JA XM B	<0.0047	<0.0061	-	-	0.0089 JA
Endrin	ng/g	40	4_p	n/v	<0.0050	<0.12	<0.12	0.0097 JA EN	-	-	0.0074 JA EN
Endrin Aldehyde	ng/g	n/v	n/v	n/v	0.0110 XM JA EN	<0.0077	<0.011	<0.0067	-	-	<0.0068
Heptachlor	ng/g	50	1_p	n/v	0.00110 JA EN	<0.0027	<0.0015	0.0021 JA EN	-	-	0.00240 JA EN
Heptachlor Epoxide	ng/g	50	1_p	n/v	0.0200 XM JA EN	0.0370 XM JA EN	0.0240 XM JA EN	0.0259 JA	-	-	0.0699 JA
Lindane (Hexachlorocyclohexane, gamma)	ng/g	10	1_p	n/v	0.342 JA XM	<0.20	<0.10	0.0190 JA XM	-	-	0.0326 JA
Methoxychlor (4,4'-Methoxychlor)	ng/g	50	5_p	n/v	<0.056 XM	<0.040 XM	<0.033 XM	<0.0065	-	-	<0.0087
Mirex	ng/g	n/v	n/v	n/v	0.0150 JA XM B	0.0026 JA XM B	0.00355 JA XM B	0.0110 JA EN	-	-	0.00920 JA EN
PARLAR 26	ng/g	n/v	n/v	n/v	<0.010	<0.049	<0.015	0.064 JA	-	-	0.087 JA
PARLAR 50	ng/g	n/v	n/v	n/v	<0.044	<0.081 XM	<0.016	<0.074	-	-	0.095 JA
PARLAR 62	ng/g	n/v	n/v	n/v	<0.049	<0.089	<0.017	<0.10	-	-	<0.097
Polychlorinated biphenyls (PCB)											
Polychlorinated Biphenyls (PCBs)	mg/kg	0.3_{s14}	0.015_p	n/v	***<0.020***	***<0.020***	***<0.020***	***<0.020***	-	-	***<0.020***

Notes:

Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011)
A	Table 1 - Agricultural or Other Property Use
MOE	Ontario Ministry of the Environment
B	Ontario Typical Range (OTR) values for Rural Parks, Ontario Ministry of Environment and Energy (OMEE, 1993)
C	Ontario Ministry of the Environment Rural "upper limit of normal" contaminant guidelines for phytotoxicology samples (1989)
6.5^A	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
p	Provisional
s14	Standard is applicable to total PCBs, and the individual Aroclors should be added for comparison.
B	Indicates analyte was found in associated blank, as well as in the sample.
EN	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum
JA	Analyte was detected below the calibrated range but above the detection limit.
XM	A peak has been manually integrated.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

Table C-2d
Summary of Agricultural Crop 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		E1	E2	E5	N2	N4			S1	S2			S4	S5	W2	W4		
Sample Date		15-Sep-15	15-Sep-15	15-Sep-15	5-Oct-15	8-Jul-15	8-Jul-15		16-Sep-15	16-Sep-15	16-Sep-15		21-Sep-15	16-Sep-15	21-Sep-15	5-Oct-15	5-Oct-15	
Sample ID		15-E1-SB-CH-041	15-E2-SB-CH-051	15-E5-SB-CH-057	15-N2-FC-CH-021	15-N4-WW-CH-027	15-D7-WW-CH-109		15-S1-SB-CH-071	15-S2-SB-CH-077	15-D5-SB-CH-107		15-S4-SB-CH-095	15-S5-SB-CH-101	15-W2-SB-CH-005	15-W4-FC-CH-011	15-D6-FC-CH-108	
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	
Laboratory Work Order		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539	L1713539	
Laboratory Sample ID		L1713539-18	L1713539-21	L1713539-25	L1713539-8	L1713539-12	L1713539-52	RPD	L1713539-30	L1713539-34	L1713539-50	RPD	L1713539-40	L1713539-44	L1713539-2	L1713539-5	L1713539-51	RPD
Sample Type	Units						Field Duplicate	(%)			Field Duplicate	(%)					Field Duplicate	(%)
General Chemistry																		
Moisture Content	%	8.68	10.4	8.71	22.7	53.9	53.1	1 %	12.4	11.3	9.97	13 %	12.8	10.1	10.5	23.8	18.3	26 %
Dioxins/Furans (PCDD/DF)																		
Tetrachlorodibenzofuran, 2,3,7,8-	pg/g wwt	<0.090	<0.060	<0.049	<0.064	0.085 XM JA EN	<0.087	nc	<0.014	<0.014	<0.013	nc	<0.012	<0.017	<0.19	<0.062	<0.020	nc
Tetrachlorodibenzo-p-Dioxin, 2,3,7,8-	pg/g wwt	<0.11	<0.052	<0.059	<0.070	<0.080	<0.15	nc	<0.021	<0.017	<0.014	nc	<0.019	<0.025	<0.18	<0.076	<0.033	nc
Pentachlorodibenzofuran, 1,2,3,7,8-	pg/g wwt	<0.035	0.024 XM JA EN	<0.017	<0.028	<0.031	<0.058	nc	<0.011	0.0110 XM JA EN	<0.0075	nc	0.0120 JA XM	<0.014	<0.050	<0.034	<0.016	nc
Pentachlorodibenzofuran, 2,3,4,7,8-	pg/g wwt	<0.035	0.028 JA XM	0.022 JA XM	<0.023	<0.028	<0.048	nc	<0.0092	<0.0085	<0.0065	nc	<0.0067	<0.011	<0.046	<0.030	<0.015	nc
Pentachlorodibenzo-p-Dioxin, 1,2,3,7,8-	pg/g wwt	<0.049	<0.030	<0.021	<0.026	<0.046	<0.087	nc	<0.014	<0.015	<0.019	nc	<0.018	<0.019	<0.086	<0.038	<0.021	nc
Octachlorodibenzofuran	pg/g wwt	0.071 XM JA EN	0.106 JA	0.072 JA EN	<0.045	<0.044 XM	<0.12	nc	0.044 JA B	<0.017	<0.014	nc	0.021 JA XM B	<0.018 XM	<0.091	<0.058 XM	0.042 XM JA EN	nc
Octachlorodibenzo-p-dioxin	pg/g wwt	0.260 JA	0.260 JA	0.200 XM JA EN	0.056 XM JA EN	0.150 XM JA EN	0.37 XM JA EN	nc	0.088 XM JA EN	0.052 XM JA EN	<0.026 XM	nc	0.062 XM JA EN	<0.040	0.074 XM JA EN	0.093 JA XM	0.094 JA XM	nc
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	pg/g wwt	0.063 JA EN	0.042 XM JA EN	0.063 JA EN	<0.026	<0.029	0.081 XM JA EN	nc	0.052 JA EN	0.025 JA XM	<0.015	nc	0.024 JA XM	0.018 JA XM	<0.089	<0.044	<0.029 XM	nc
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	pg/g wwt	<0.051	<0.049 XM	<0.043 XM	<0.041	<0.043	<0.072	nc	<0.016	<0.021	<0.022	nc	<0.017	<0.018	<0.15	<0.068	<0.041	nc
Heptachlorodibenzo-p-Dioxin, 1,2,3,4,6,7,8-	pg/g wwt	0.140 XM JA EN	0.140 JA EN	0.101 JA	<0.045	0.052 XM JA EN	<0.11 XM	nc	0.044 JA XM	<0.021	<0.021	nc	0.039 JA EN	0.034 JA EN	<0.12	<0.052	0.051 XM JA EN	nc
Hexachlorodibenzofuran, 1,2,3,4,7,8-	pg/g wwt	<0.032	<0.023 XM	<0.019	<0.016	<0.028	<0.053	nc	<0.015	<0.011	<0.0074	nc	<0.012	<0.014	0.056 JA XM	<0.029	<0.019	nc
Hexachlorodibenzofuran, 1,2,3,6,7,8-	pg/g wwt	<0.028 XM	<0.023	<0.019 XM	<0.016	<0.027	<0.046	nc	<0.015	<0.010	<0.0068	nc	<0.012 XM	<0.013	<0.050	<0.029	<0.018 XM	nc
Hexachlorodibenzofuran, 1,2,3,7,8,9-	pg/g wwt	<0.040	<0.033 XM	<0.028	<0.026	<0.039	<0.081 XM	nc	<0.020 XM	<0.014	<0.0092 XM	nc	<0.016	<0.016	<0.099	<0.052	<0.030	nc
Hexachlorodibenzofuran, 2,3,4,6,7,8-	pg/g wwt	<0.026	<0.023 XM	<0.018 XM JA EN	<0.017	<0.028	0.053 JA EN	nc	<0.014	<0.0097	<0.0069	nc	<0.012	<0.012	<0.060	<0.031	<0.019 XM	nc
Hexachlorodibenzo-p-Dioxin, 1,2,3,4,7,8-	pg/g wwt	<0.054	<0.035	<0.032	<0.041	<0.046	<0.068	nc	<0.026	<0.021	<0.014	nc	<0.021	<0.019	<0.099	<0.037	<0.027	nc
Hexachlorodibenzo-p-Dioxin, 1,2,3,6,7,8-	pg/g wwt	<0.045	<0.035	<0.031 XM	<0.039	<0.044	<0.064	nc	<0.024	<0.022	<0.013	nc	<0.020	<0.018	<0.082	<0.032	<0.026	nc
Hexachlorodibenzo-p-Dioxin, 1,2,3,7,8,9-	pg/g wwt	<0.048	<0.035 XM	<0.031	<0.041	<0.046	<0.068	nc	<0.025 XM	<0.022	<0.014	nc	<0.021	<0.018	<0.091	<0.034	<0.027	nc
Total Tetrachlorodibenzofuran	pg/g wwt	<0.090	<0.060	<0.049	<0.064	<0.052	<0.087	nc	<0.014	<0.014	<0.013	nc	<0.012	<0.017	<0.19	<0.062	<0.020	nc
Total Tetrachlorodibenzo-p-dioxin	pg/g wwt	<0.11	<0.052	<0.059	<0.070	<0.080	<0.15	nc	<0.021	<0.017	<0.014	nc	<0.019	<0.025	<0.18	<0.076	<0.033	nc
Total Pentachlorodibenzofuran	pg/g wwt	0.046	0.028	0.022	<0.028	<0.031	<0.058	nc	<0.011	<0.0099	<0.0075	nc	0.0120	<0.014	<0.050	<0.034	<0.016	nc
Total Pentachlorodibenzo-p-dioxin	pg/g wwt	0.065	0.044	<0.021	<0.026	<0.046	<0.087	nc	<0.014	<0.015	<0.019	nc	<0.018	<0.019	<0.086	<0.038	<0.021	nc
Total Hexachlorodibenzofuran	pg/g wwt	<0.040	<0.033	<0.028	<0.026	<0.039	<0.081	nc	<0.020	<0.014	<0.0092	nc	<0.016	<0.016	<0.099	<0.052	<0.030	nc
Total Hexachlorodibenzo-p-dioxin	pg/g wwt	<0.054	<0.035	0.088	<0.041	<0.046	<0.068	nc	<0.026	<0.022	<0.014	nc	<0.021	0.024	<0.099	<0.037	<0.027	nc
Total Heptachlorodibenzofuran	pg/g wwt	<0.051	<0.049	<0.043	<0.041	<0.043	<0.072	nc	<0.016	0.025	<0.022	nc	0.024	<0.018	<0.15	<0.068	<0.041	nc
Total Heptachlorodibenzo-p-dioxin	pg/g wwt	0.209	<0.036	0.267	<0.045	<0.032	<0.11	nc	0.092	<0.021	<0.021	nc	<0.018	<0.017	<0.12	<0.052	<0.029	nc
Total HpCDD # Homologues	none	1	0	2	0	0	0	-	2	0	0	-	0	0	0	0	0	-
Total HpCDF # Homologues	none	0	0	0	0	0	0	-	0	1	0	-	1	0	0	0	0	-
Total HxCDD # Homologues	none	0	0	1	0	0	0	-	0	0	0	-	0	1	0	0	0	-
Total HxCDF # Homologues	none	0	0	0	0	0	0	-	0	0	0	-	0	0	0	0	0	-
Total PeCDD # Homologues	none	1	1	0	0	0	0	-	0	0	0	-	0	0	0	0	0	-
Total PeCDF # Homologues	none	1	1	1	0	0	0	-	0	0	0	-	1	0	0	0	0	-
Total TCDD # Homologues	none	0	0	0	0	0	0	-	0	0	0	-	0	0	0	0	0	-
Total TCDF # Homologues	none	0	0	0	0	0	0	-	0	0	0	-	0	0	0	0	0	-
Lower Bound PCDD/F TEQ (WHO 2005)	pg/g wwt	0.0000780	0.00863	0.00746	0.00	0.00	0.00	nc	0.000452	0.000245	0.00	nc	0.000606	0.000175	0.00555	0.0000280	0.0000281	nc
Mid Point PCDD/F TEQ (WHO 2005)	pg/g wwt	0.106	0.0658	0.0609	0.0655	0.0900	0.157	nc	0.0278	0.0243	0.0221	nc	0.0269	0.0308	0.182	0.0782	0.0397	nc
Upper Bound PCDD/F TEQ (WHO 2005)	pg/g wwt	0.209	0.120	0.112	0.131	0.171	0.308	nc	0.0545	0.0479	0.0442	nc	0.0528	0.0611	0.358	0.156	0.0788	nc

See last page for notes.

Table C-2d
Summary of Agricultural Crop 2015 Organic Analytical Results
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Sample Location		E1	E2	E5	N2	N4			S1	S2			S4	S5	W2	W4		
Sample Date		15-Sep-15	15-Sep-15	15-Sep-15	5-Oct-15	8-Jul-15	8-Jul-15		16-Sep-15	16-Sep-15	16-Sep-15		21-Sep-15	16-Sep-15	21-Sep-15	5-Oct-15	5-Oct-15	
Sample ID		15-E1-SB-CH-041	15-E2-SB-CH-051	15-E5-SB-CH-057	15-N2-FC-CH-021	15-N4-WW-CH-027	15-D7-WW-CH-109		15-S1-SB-CH-071	15-S2-SB-CH-077	15-D5-SB-CH-107		15-S4-SB-CH-095	15-S5-SB-CH-101	15-W2-SB-CH-005	15-W4-FC-CH-011	15-D6-FC-CH-108	
Sampling Company		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	
Laboratory		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM		ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	ALS-EDM	
Laboratory Work Order		L1713539	L1713539	L1713539	L1713539	L1713539	L1713539		L1713539	L1713539	L1713539		L1713539	L1713539	L1713539	L1713539	L1713539	
Laboratory Sample ID		L1713539-18	L1713539-21	L1713539-25	L1713539-8	L1713539-12	L1713539-52	RPD	L1713539-30	L1713539-34	L1713539-50	RPD	L1713539-40	L1713539-44	L1713539-2	L1713539-5	L1713539-51	RPD
Sample Type	Units						Field Duplicate	(%)			Field Duplicate	(%)					Field Duplicate	(%)
Organochlorinated pesticides (OCP)																		
Aldrin	ng/g	<0.011	<0.0084	<0.025	<0.00036	<0.034	<0.0017	nc	<0.0010	<0.0011	<0.0010	nc	<0.0011	<0.0015	0.00200 JA EN	<0.0033	<0.00089	nc
BHC, alpha-	ng/g	<0.20	<0.14	<0.26	<0.026	<0.18	<0.0053	nc	0.0093 JA EN	0.0110 JA EN	0.0093 JA EN	nc	0.0140 JA EN	0.0095 JA EN	<0.031	<0.029	<0.0024	nc
BHC, beta-	ng/g	<0.27	<0.19	<0.35	<0.034	<0.24	<0.0070	nc	<0.0050	<0.0046	<0.0049	nc	<0.0040	<0.0032	<0.041	<0.039	<0.0031	nc
BHC, delta-	ng/g	<0.24	<0.18	<0.30	<0.031	<0.22	<0.0079	nc	<0.0048	<0.0049	<0.0061	nc	<0.0039	<0.0040	<0.039	<0.037	<0.0036	nc
Chlordane, alpha-	ng/g	<0.11	<0.073	<0.11	<0.0013	<0.35	<0.012	nc	0.0224 JA	0.0231 JA	0.016 JA XM	nc	0.0318 JA	0.0170 JA	<0.0011	<0.0020	<0.0072	nc
Chlordane, trans- (gamma-Chlordane)	ng/g	<0.12	<0.075	<0.12	<0.0014	<0.36	<0.025	nc	0.0099 JA	0.0141 JA XM	<0.015	nc	0.0112 JA	0.0109 JA	<0.0012	<0.0020	<0.0076	nc
DDD (p,p'-DDD)	ng/g	0.0086 JA XM	0.0072 JA XM	<0.0075	0.0078 JA EN	<0.0091 XM	<0.049	nc	<0.017	<0.013	<0.058	nc	<0.024	<0.061	0.0111 JA	0.0060 JA EN	<0.039	nc
DDE (p,p'-DDE)	ng/g	<0.012	<0.011 XM	<0.016	0.0144 JA B	<0.021	0.025 JA XM B	nc	0.0146 JA XM B	0.0173 JA B	<0.013	nc	<0.011	<0.016	0.0124 JA B	0.0120 JA EN	<0.011	nc
DDT (p,p'-DDT)	ng/g	<0.0072	<0.0092 XM	<0.013	0.0075 JA EN	0.021 JA XM	<0.30	nc	<0.11	<0.11	<0.17	nc	<0.094	<0.24	0.0100 JA EN	0.0079 JA EN	<0.20	nc
Dieldrin	ng/g	0.067 XM JA EN	0.100 EN XM	0.081 XM JA EN	0.00360 JA EN	<0.17	0.0497 JA XM	nc	0.0600 JA EN	0.0695 JA	0.074 JA	6 %	0.105	0.0594 JA	0.0350 JA EN	<0.0011	0.0048 JA EN	nc
Endosulfan I	ng/g	<0.0069	0.0140 JA EN	<0.017	<0.0042	<0.016	<0.11	nc	0.042 JA EN	0.048 JA	0.062 XM JA EN	nc	0.063 JA XM	0.074 JA	<0.0045	<0.0023	<0.019	nc
Endosulfan II	ng/g	<0.0089	<0.0084	<0.022	<0.0054	<0.021	<0.14	nc	<0.023	<0.028	<0.12	nc	<0.029	<0.056	<0.0058	<0.0030	<0.032	nc
Endosulfan Sulfate	ng/g	0.0529 JA XM	0.0550 XM JA EN	0.062 XM JA EN	0.0060 JA EN	0.0150 XM JA EN	<0.088	nc	0.023 JA XM	0.025 JA	<0.089	nc	0.037 JA	<0.046	0.0220 JA EN	<0.0014	<0.031	nc
Endrin	ng/g	<0.17	<0.11	<0.18	<0.0022	<0.53	<0.020	nc	<0.0067	<0.012	0.023 JA XM	nc	<0.0079	0.024 XM JA EN	<0.0021	<0.0030	0.0081 JA EN	nc
Endrin Aldehyde	ng/g	0.0095 XM JA EN	0.0100 XM JA EN	<0.070 XM	<0.020	<0.011	0.019 JA	nc	<0.0073	<0.0086	0.022 JA XM	nc	0.0073 XM JA EN	<0.012	<0.0032	0.0041 JA EN	<0.0071	nc
Heptachlor	ng/g	<0.00099	<0.0016	<0.0029	<0.00096	<0.0032	<0.0019	nc	0.0018 JA EN	<0.0017 JA EN	<0.0012 XM	nc	0.00180 XM JA EN	0.0017 JA EN	<0.015	<0.0027	0.00100 JA EN	nc
Heptachlor Epoxide	ng/g	<0.0030	0.0140 XM JA EN	0.0264 JA	<0.00078	0.0028 XM JA EN	0.0093 JA	nc	0.0288 JA	0.0267 JA	0.0257 JA	4 %	0.0401 JA	0.0217 JA	0.0110 JA EN	<0.00063	<0.00091	nc
Lindane (Hexachlorocyclohexane, gamma)	ng/g	<0.21	<0.16	<0.26	<0.027	<0.20	<0.0071	nc	<0.0046	<0.0044	<0.0055	nc	0.0044 JA	<0.0036	<0.034	<0.032	<0.0032	nc
Methoxychlor (4,4'-Methoxychlor)	ng/g	<0.070	<0.060	<0.069	<0.049	<0.094	<0.63	nc	<0.024	<0.025	<0.32	nc	<0.068	<0.24	<0.050	<0.058	<0.20	nc
Mirex	ng/g	<0.00039	<0.0010	<0.0012	0.00100 JA EN	<0.0021 XM	0.014 JA EN	nc	<0.0014	0.0062 JA EN	0.0082 JA EN	nc	0.0110 JA EN	0.0140 JA EN	<0.00013	<0.00018	<0.0096 XM	nc
PARLAR 26	ng/g	<0.0070	<0.010	<0.011	<0.010	<0.017	<0.14	nc	<0.048	<0.027	<0.13	nc	<0.047	<0.095	<0.0016	<0.0060	<0.078	nc
PARLAR 50	ng/g	<0.076	<0.050	<0.14	<0.0057	<0.077	<0.35	nc	<0.043	<0.027	<0.21	nc	<0.067	<0.16	<0.013	<0.015	<0.14	nc
PARLAR 62	ng/g	<0.089	<0.058	<0.16	<0.0067	<0.090	<0.75	nc	<0.052	<0.057	<0.44	nc	<0.14	<0.34	<0.015	<0.017	<0.30	nc
Pentachlorophenol (PCP)																		
Pentachlorophenol	ng/g	0.15 JA	<0.15	<0.17	<0.76	0.66 JA XM	<0.49	nc	<0.16	<0.16	<0.25	nc	<0.17	<0.11	<1.2	<0.82	0.35 JA XM	nc
Polychlorinated biphenyls (PCB)																		
Polychlorinated Biphenyls (PCBs)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	nc	<0.050	<0.050	<0.050	<0.050	<0.050	nc

Notes:

15.2	Concentration was detected.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
-	Parameter not analyzed / not available.
B	Indicates analyte was found in associated blank, as well as in the sample.
EN	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum
JA	Analyte was detected below the calibrated range but above the detection limit.
XM	A peak has been manually integrated.
RPD	Relative Percent Difference
nc	RPD is not calculable if either of the concentrations were less than 5 times the MDL.
42.00%	RPD exceeds cut-off criteria of 40%

The formula used to determine the RPD from the mean between two samples, the original and the duplicate, is the absolute value of the following:

$$RPD = 100\% \times \frac{C_{original} - C_{dup}}{\frac{1}{2}(C_{original} + C_{dup})}$$

APPENDIX D
PHOTO LOG

Photo 1: Soybean collection area at Site E1

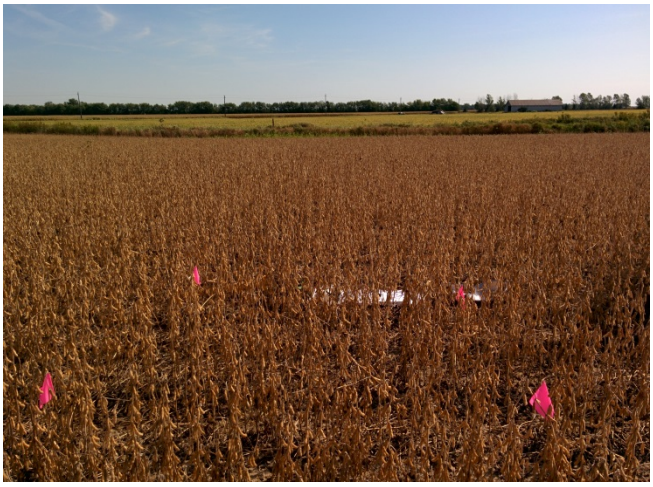


Photo 2: Soybean collection area at Site E2

Photo 3: Natural grass collection area at Site E5

Photo 4: Soybean collection area at Site E5

Photo 5: Natural grass collection area at Site E6

Photo 6: Natural grass collection area at Site N2

Photo 7: Field corn collection area at Site N2

Photo 8: Winter wheat collection area at Site N4

Photo 9: Natural grass collection area at Site N5

Photo 10: Sediment collection area at Site N5

Photo 11: Soybean collection area at Site S1

Photo 12: Sediment collection area at Site S1

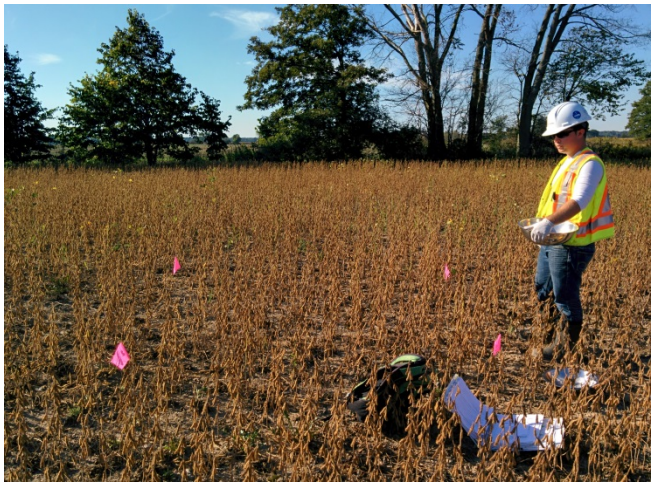


Photo 13: Soybean collection area at Site S2

Photo 14: Natural grass collection area at Site S3

Photo 15: Natural grass and sediment collection area at Site S4

Photo 16: Natural grass collection area at Site S5

Photo 17: Dried natural grass from collection area at Site S5

Photo 18: Soybean collection area at Site W2

Photo 19: Field corn collection area at Site W4

Photo 20: Natural grass collection area at Site W4

APPENDIX E
SITE SPECIFIC INORGANIC TRENDS

APPENDIX E-1
SITE-SPECIFIC INORGANIC TREND LINE GRAPHS P<0.003

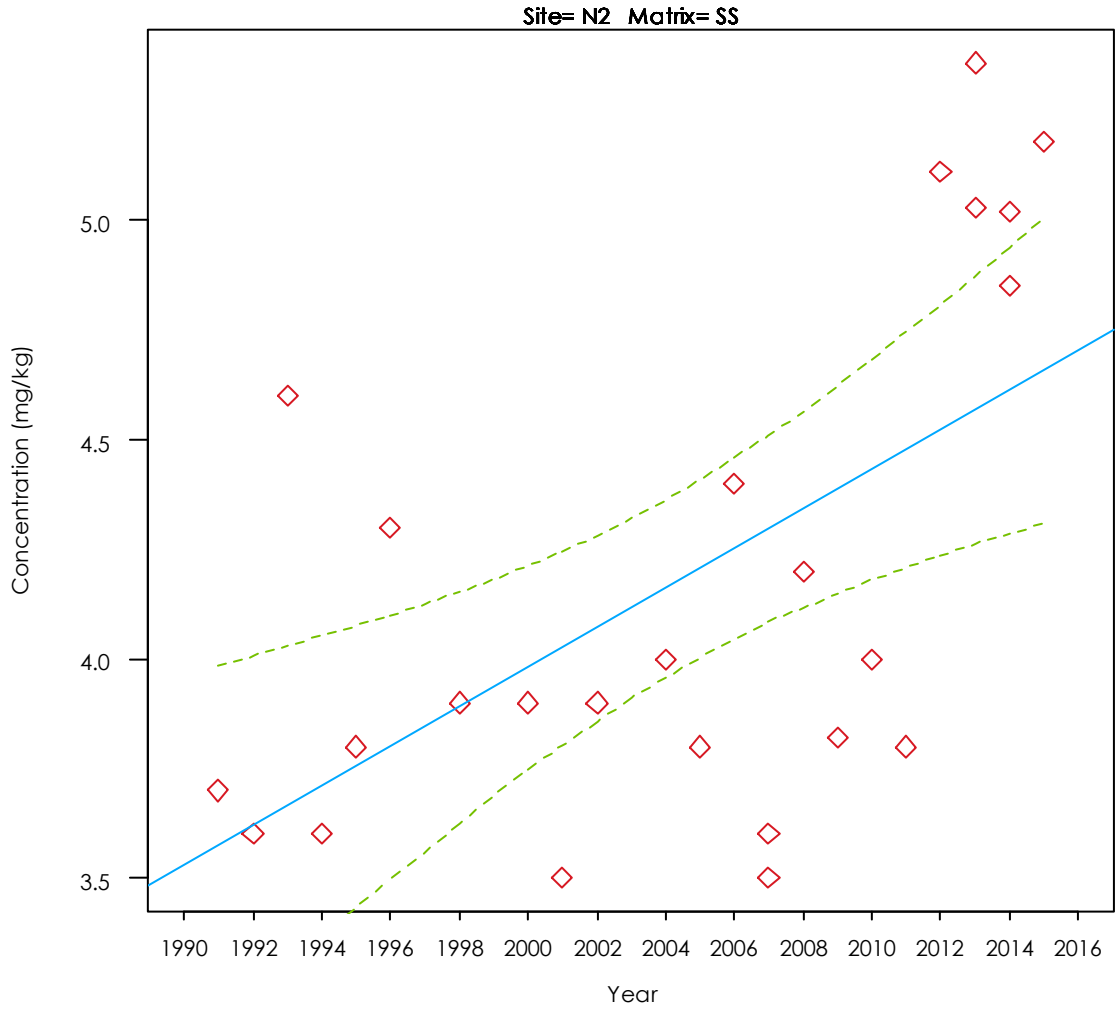
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: Concentration = -86.3849 + 0.0452 * Year

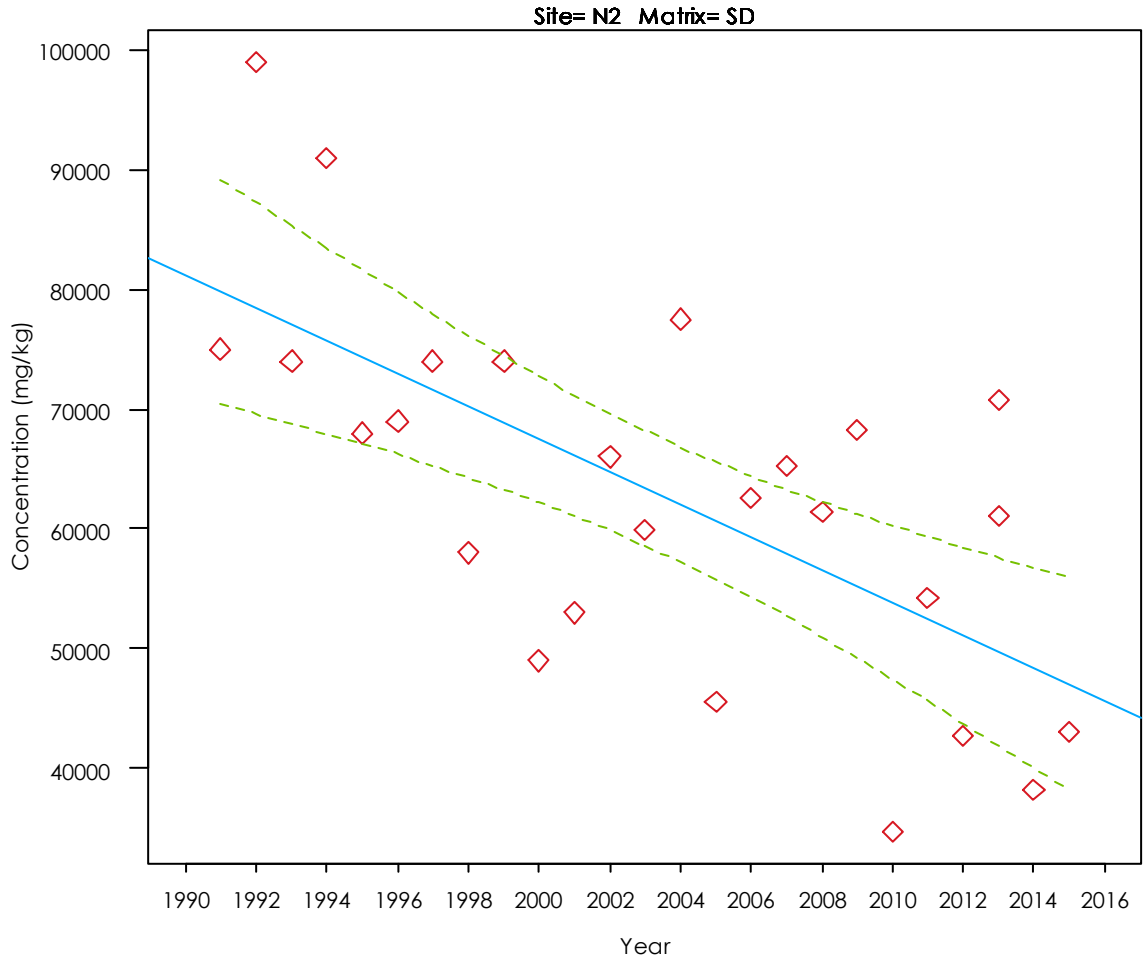
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Calcium



Regression Equation: Concentration = 2792679.3664 + -1362.5895 * Year

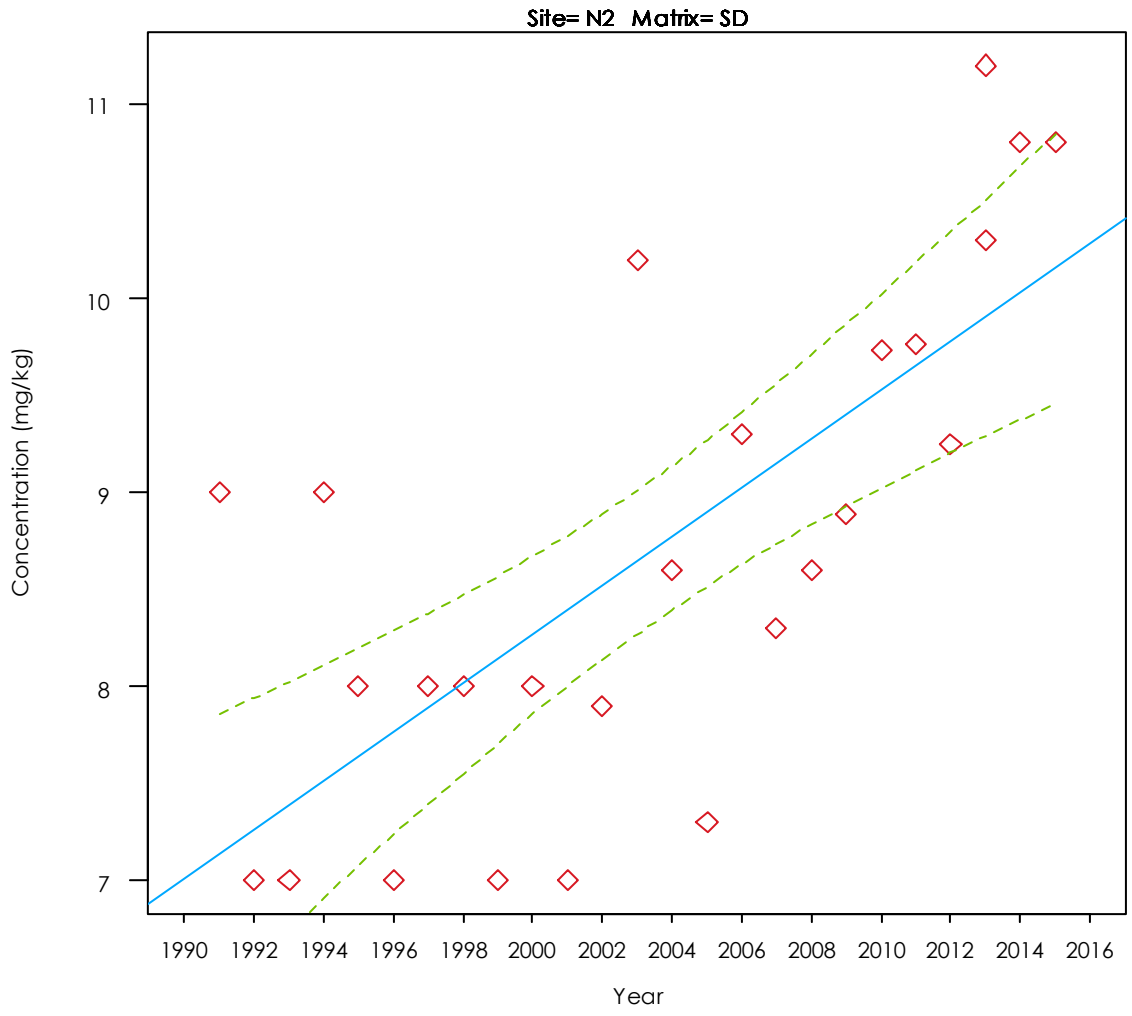
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Cobalt



Regression Equation: Concentration = -243.4046 + 0.1258 * Year

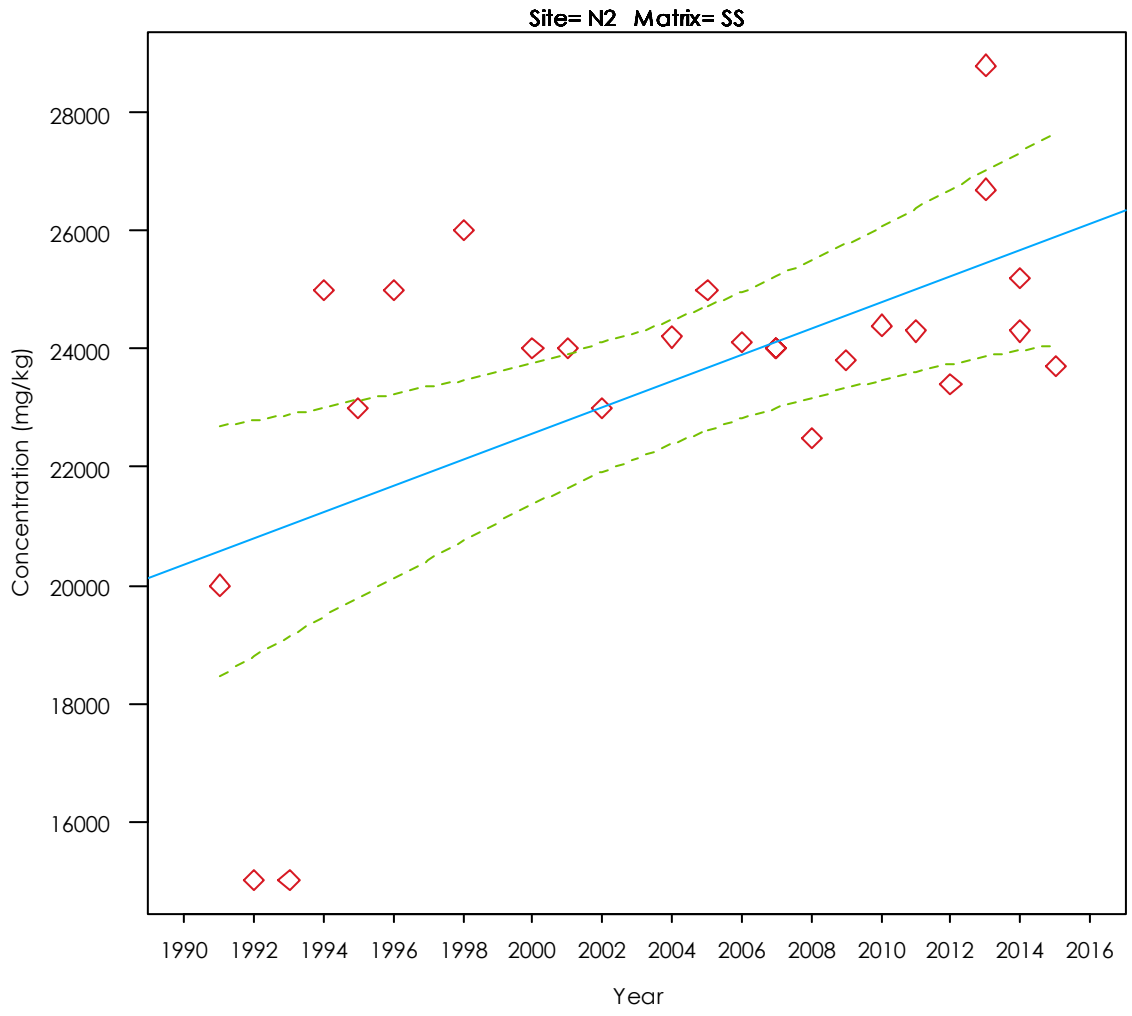
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Iron



Regression Equation: Concentration = -419972.3955 + 221.2674 * Year

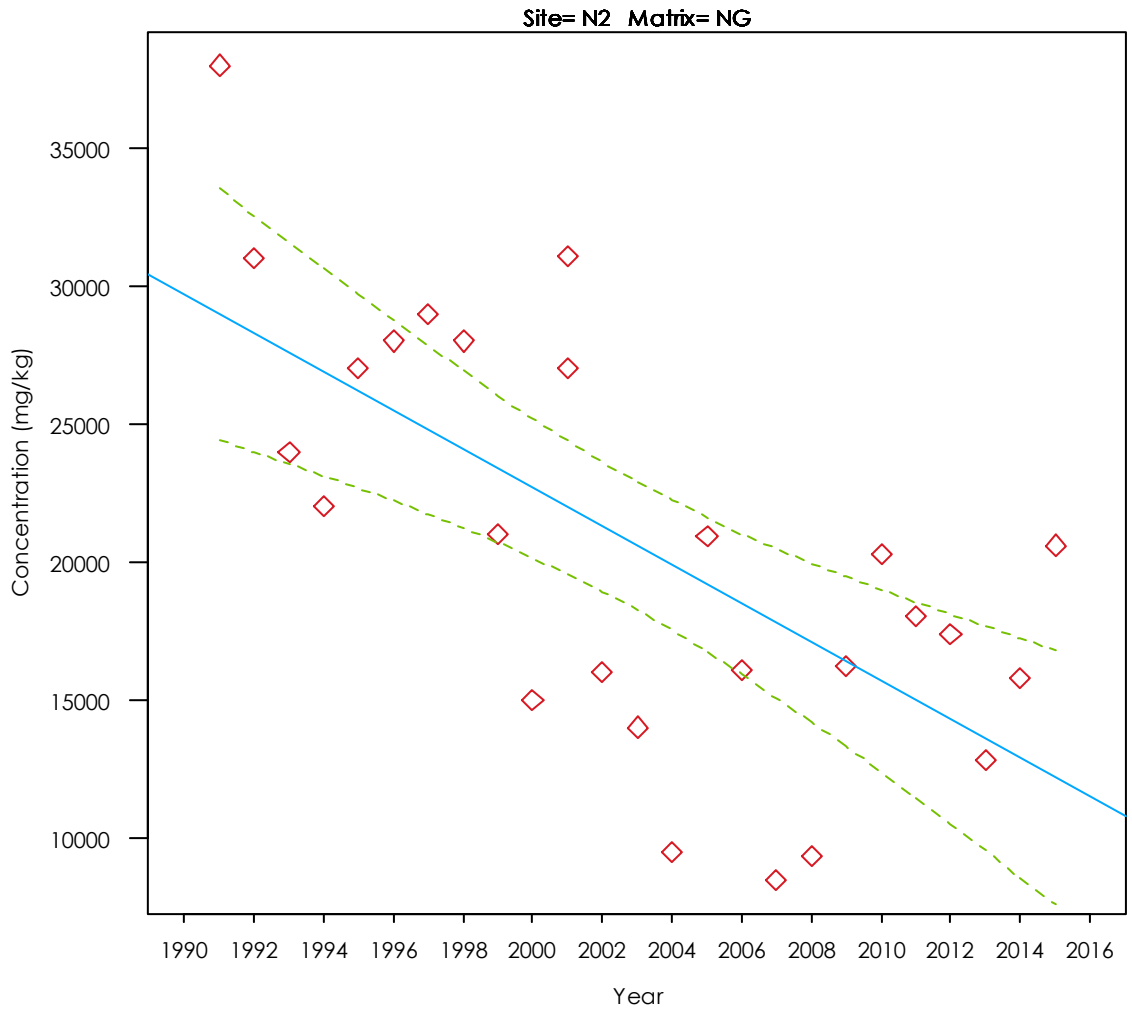
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Potassium



Regression Equation: Concentration = 1421965.1758 + -699.6448 * Year

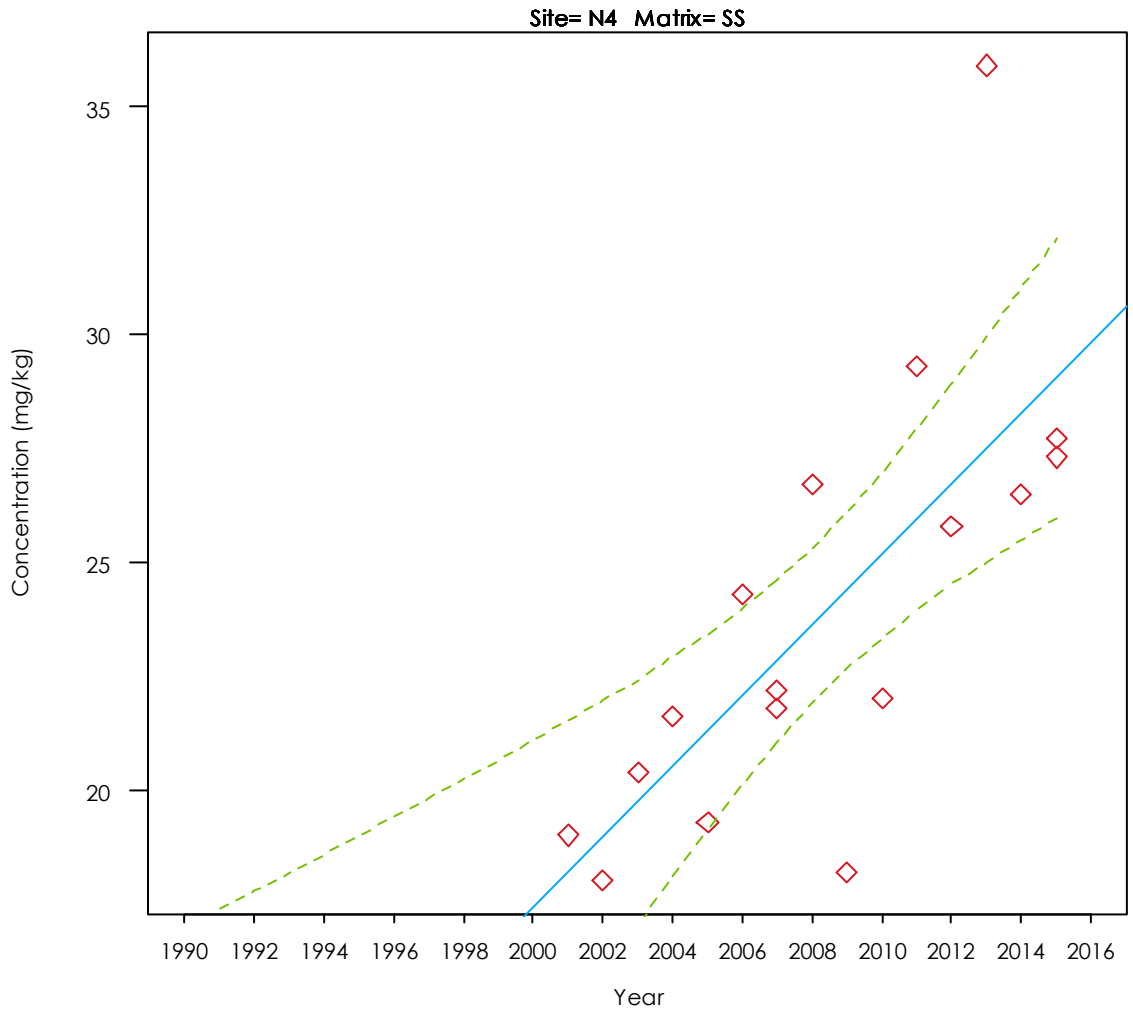
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Nickel



Regression Equation: Concentration = -1529.5105 + 0.7735 * Year

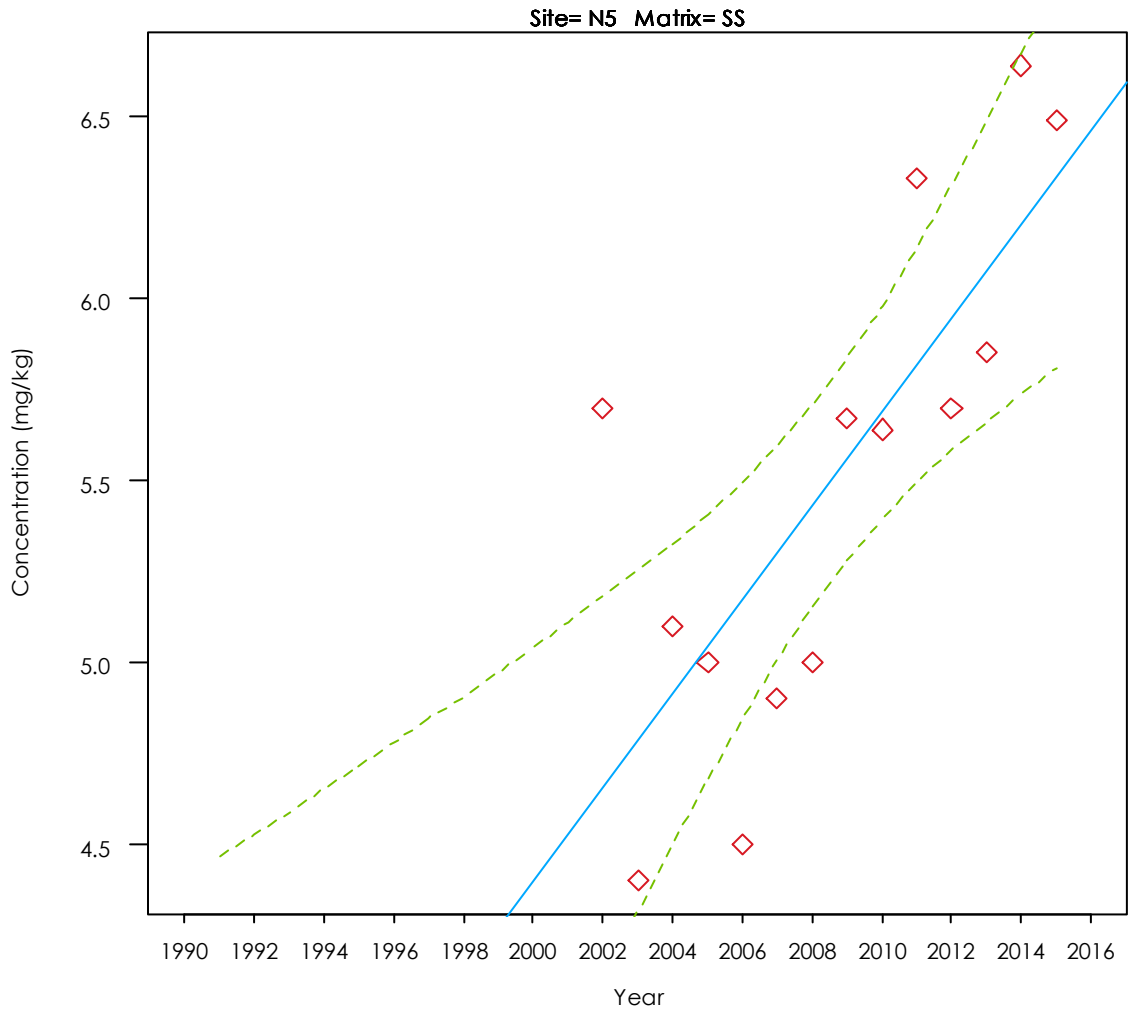
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: Concentration = -253.1829 + 0.1288 * Year

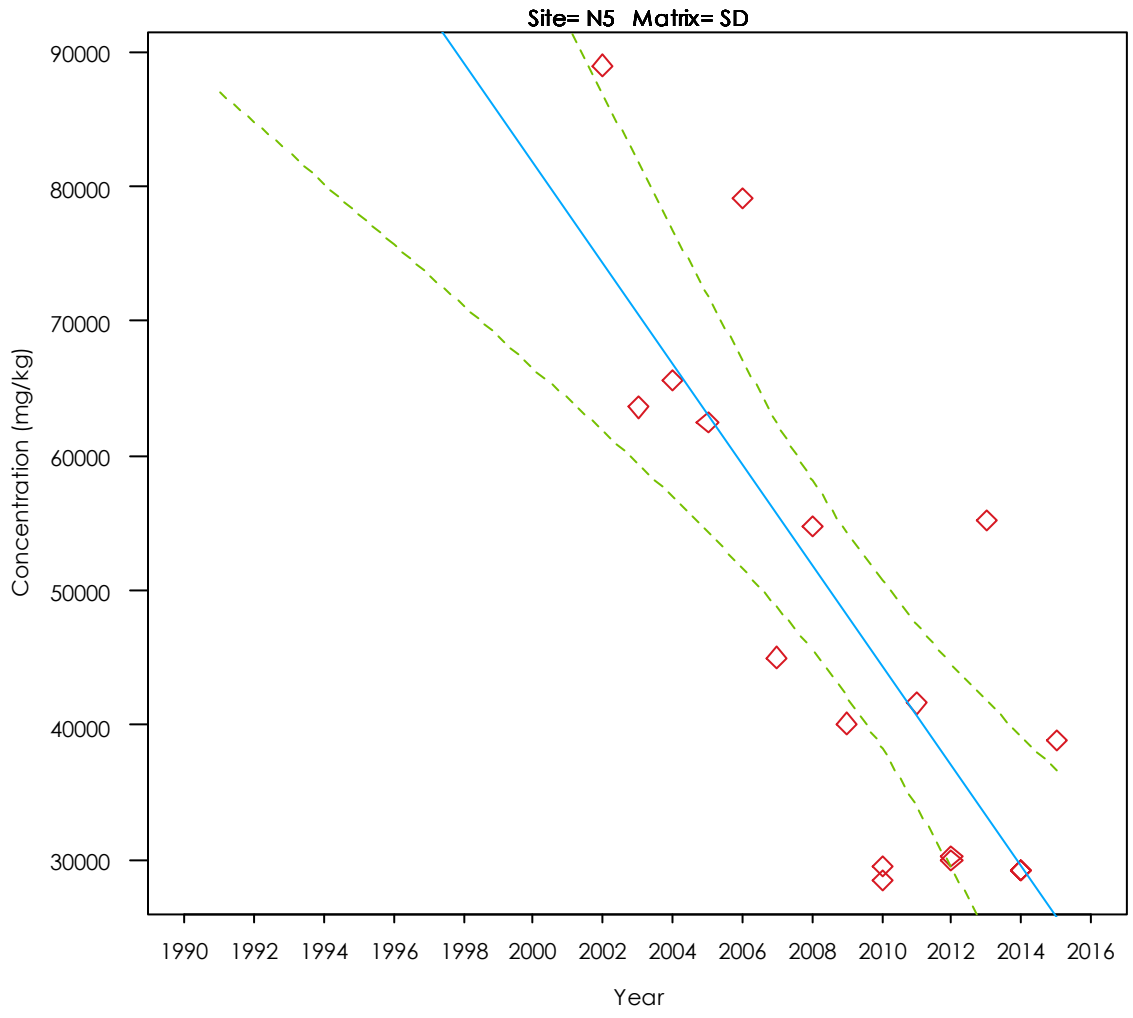
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Calcium



Regression Equation: Concentration = 7555206.3745 + -3736.6977 * Year

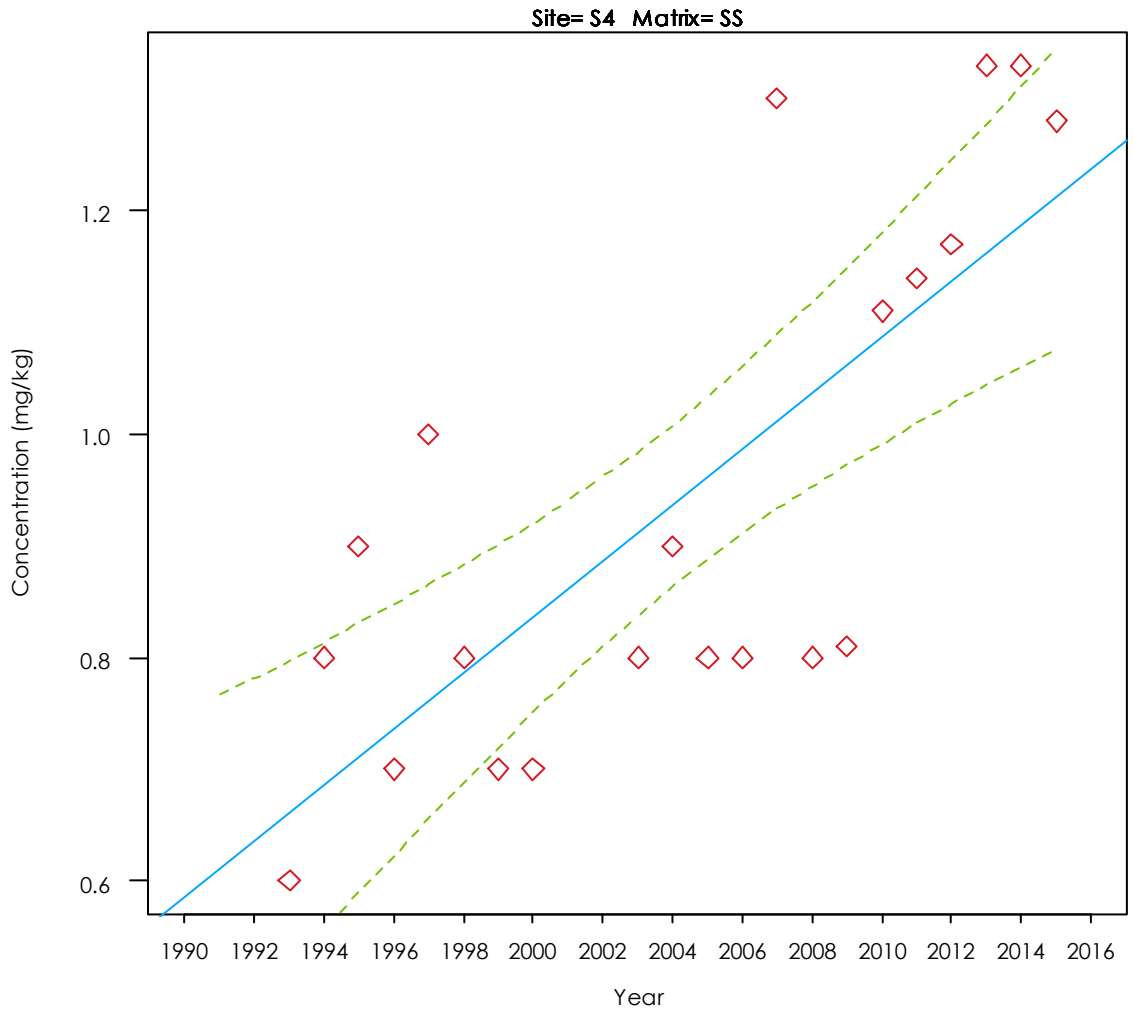
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Beryllium



Regression Equation: Concentration = -49.2602 + 0.025 * Year

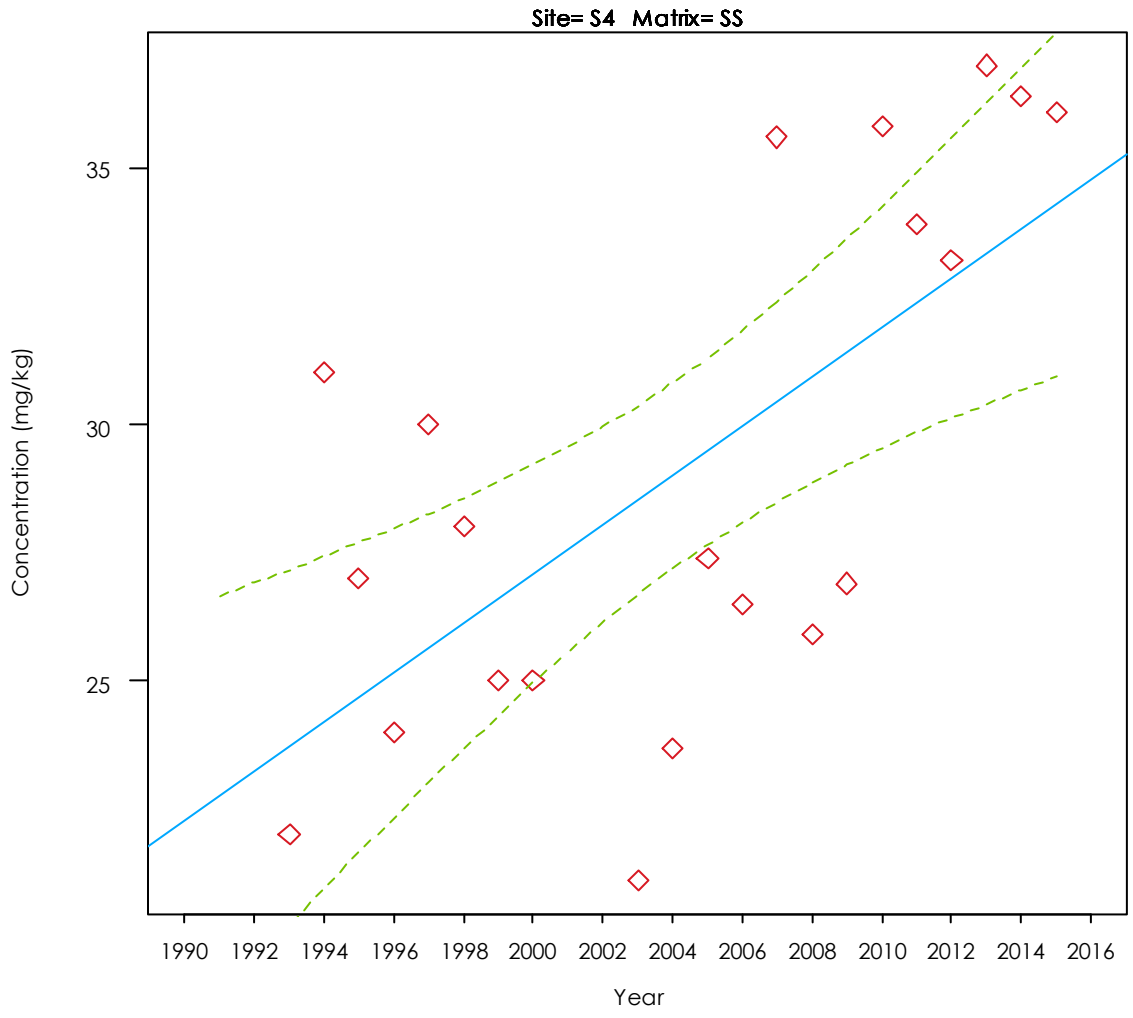
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Nickel



Regression Equation: Concentration = -935.8402 + 0.4815 * Year

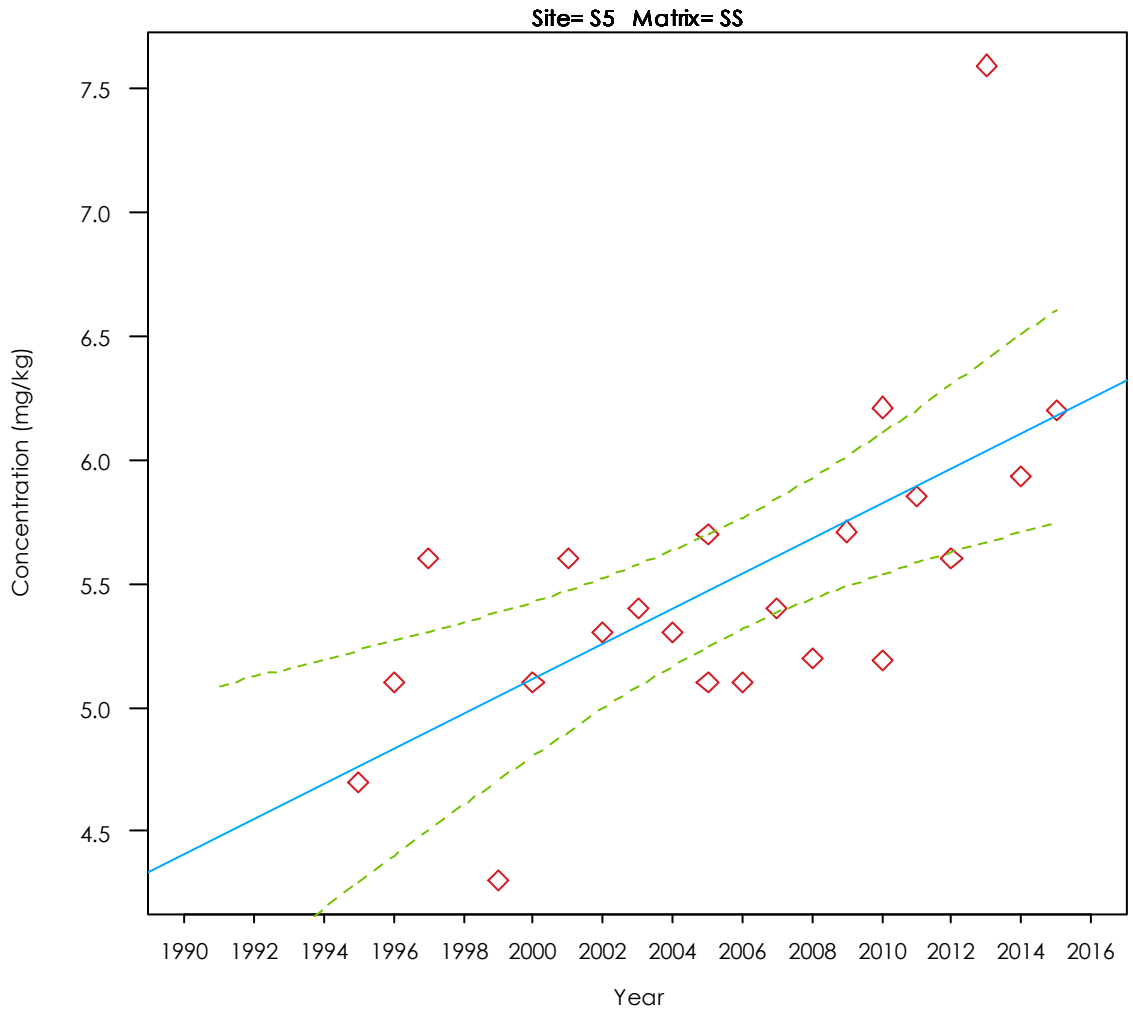
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: Concentration = -136.1547 + 0.0706 * Year

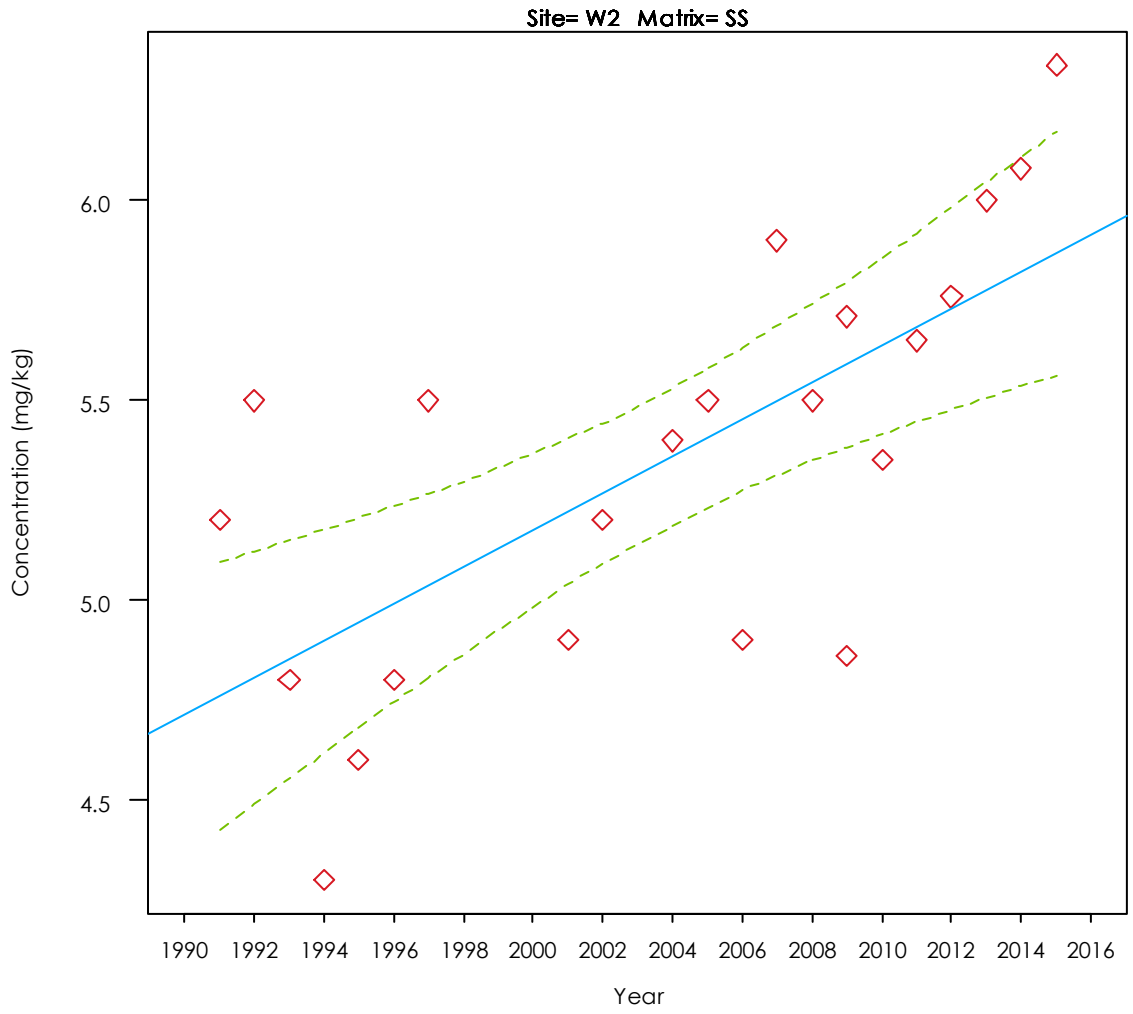
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: Concentration = -87.2183 + 0.0462 * Year

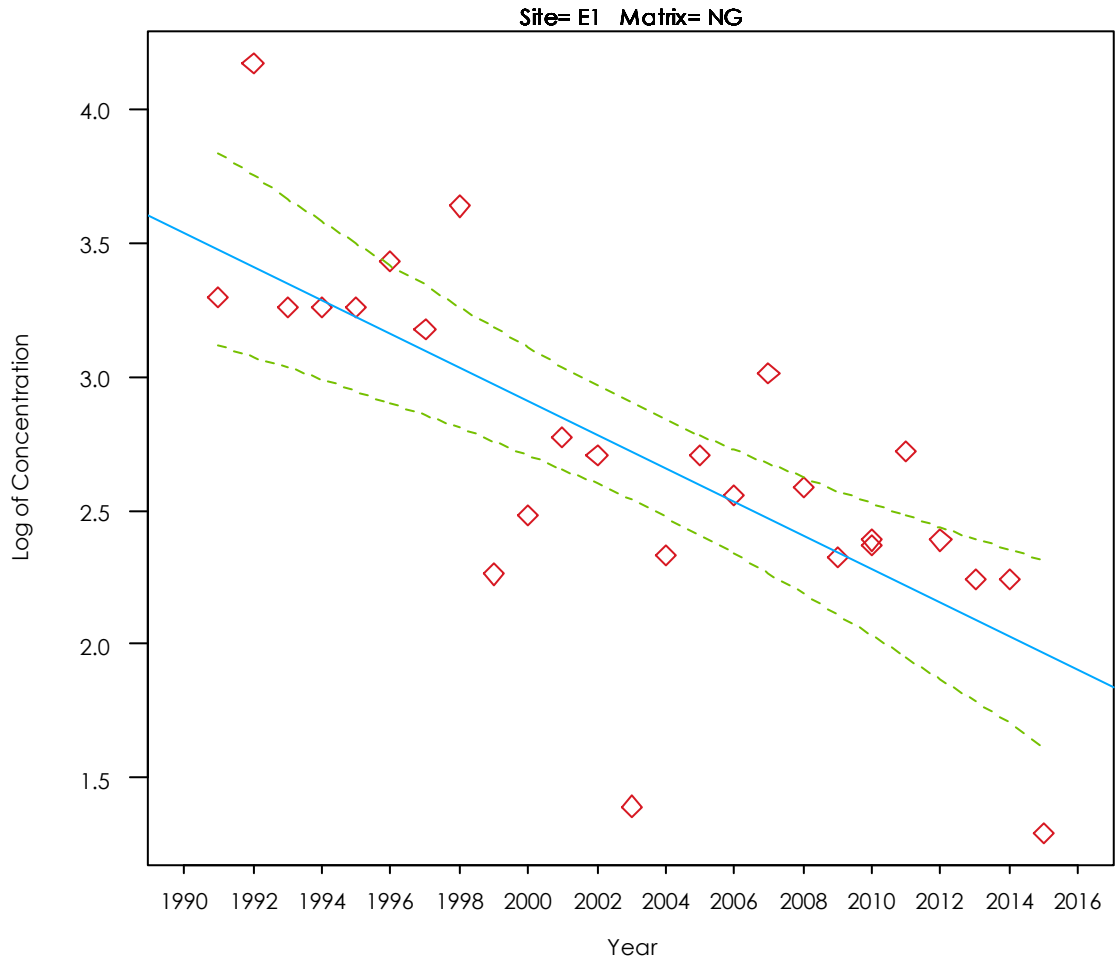
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = 128.8937 + -0.063 * Year

Log base e (natural logarithm)

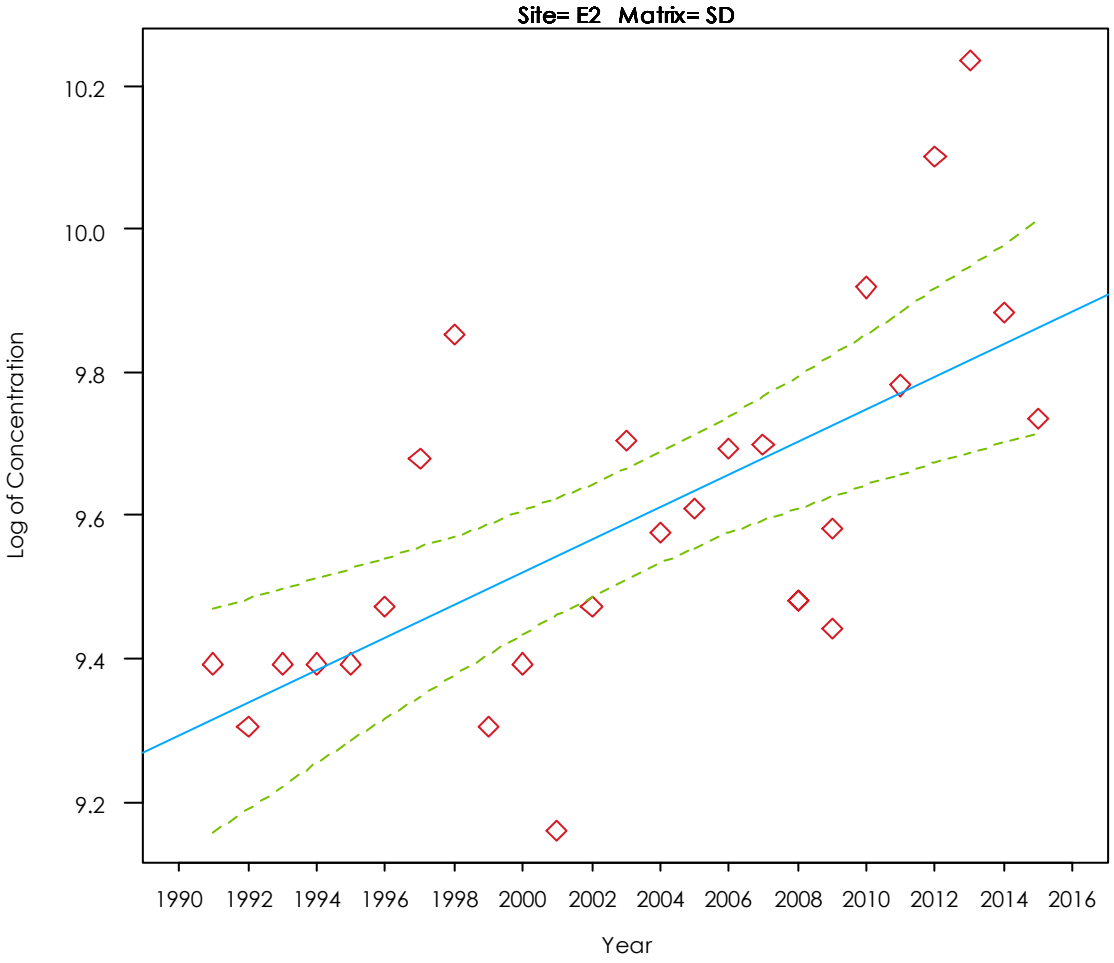
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -36.2149 + 0.0229 * Year

Log base e (natural logarithm)

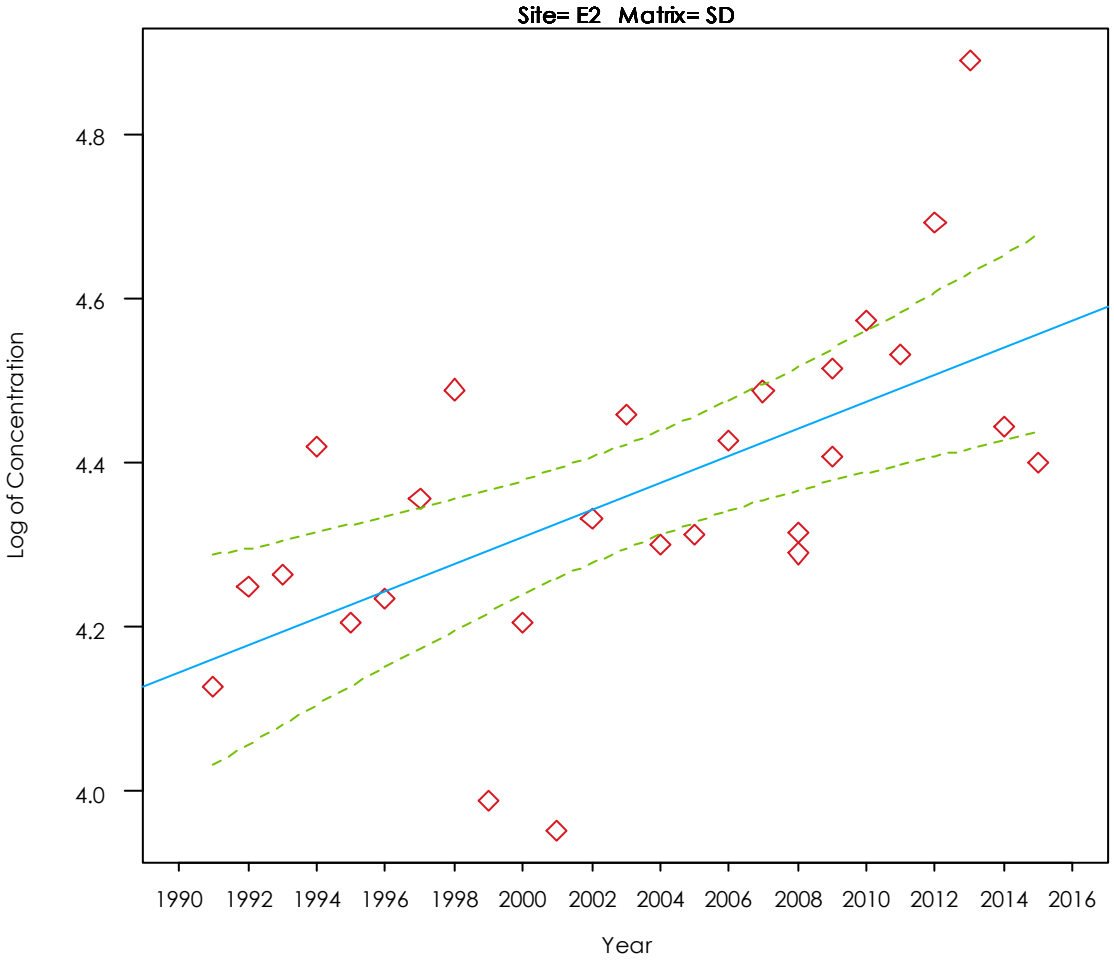
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -28.7691 + 0.0165 * Year

Log base e (natural logarithm)

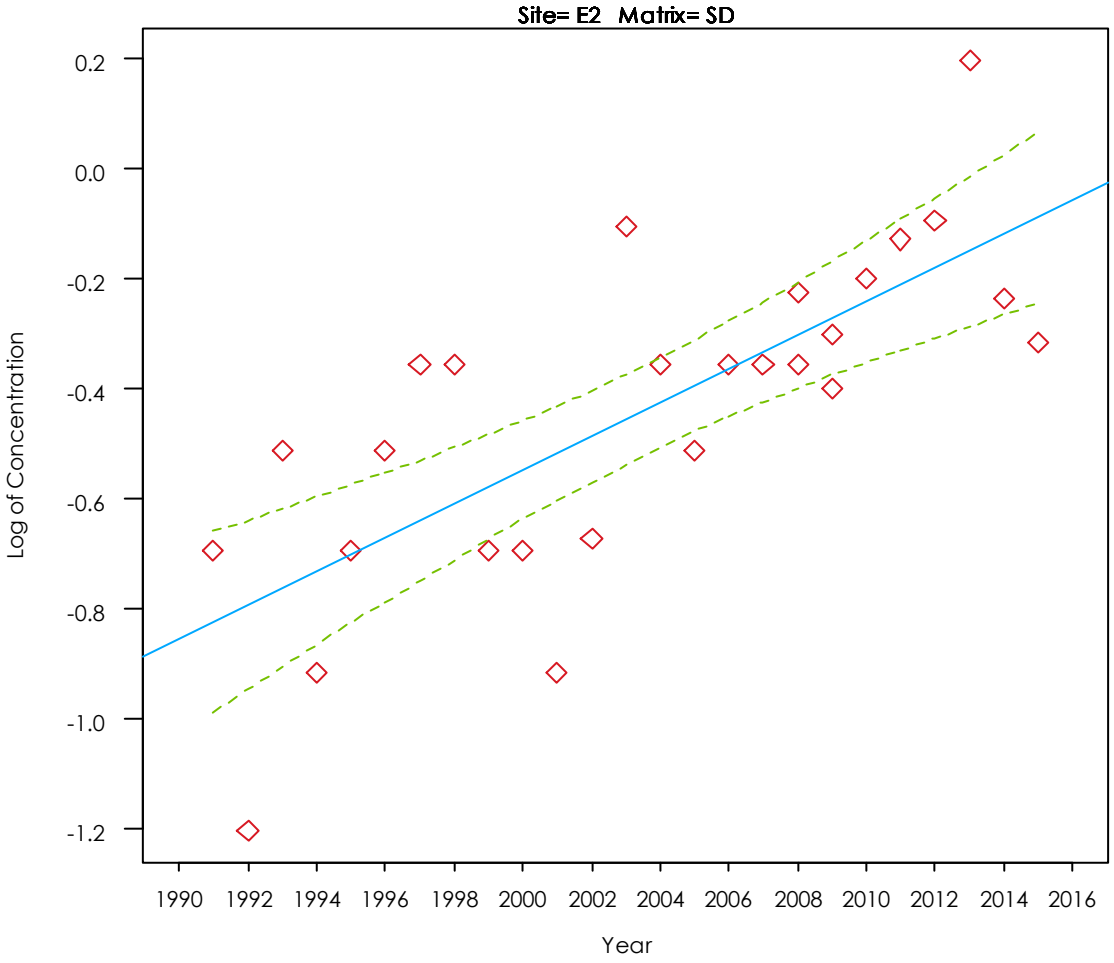
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Beryllium



Regression Equation: LogConcentration = -61.8291 + 0.0306 * Year

Log base e (natural logarithm)

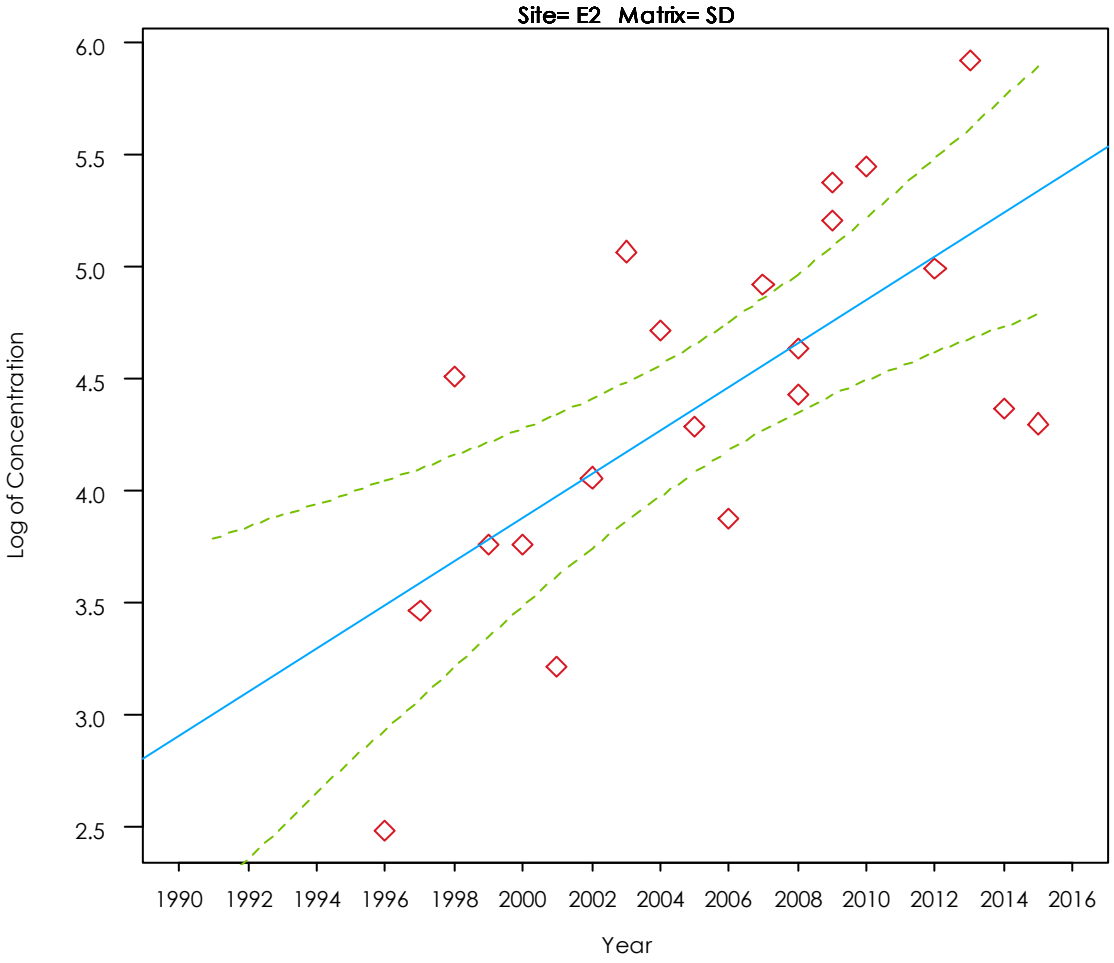
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chloride



Regression Equation: LogConcentration = -190.8704 + 0.0974 * Year

Log base e (natural logarithm)

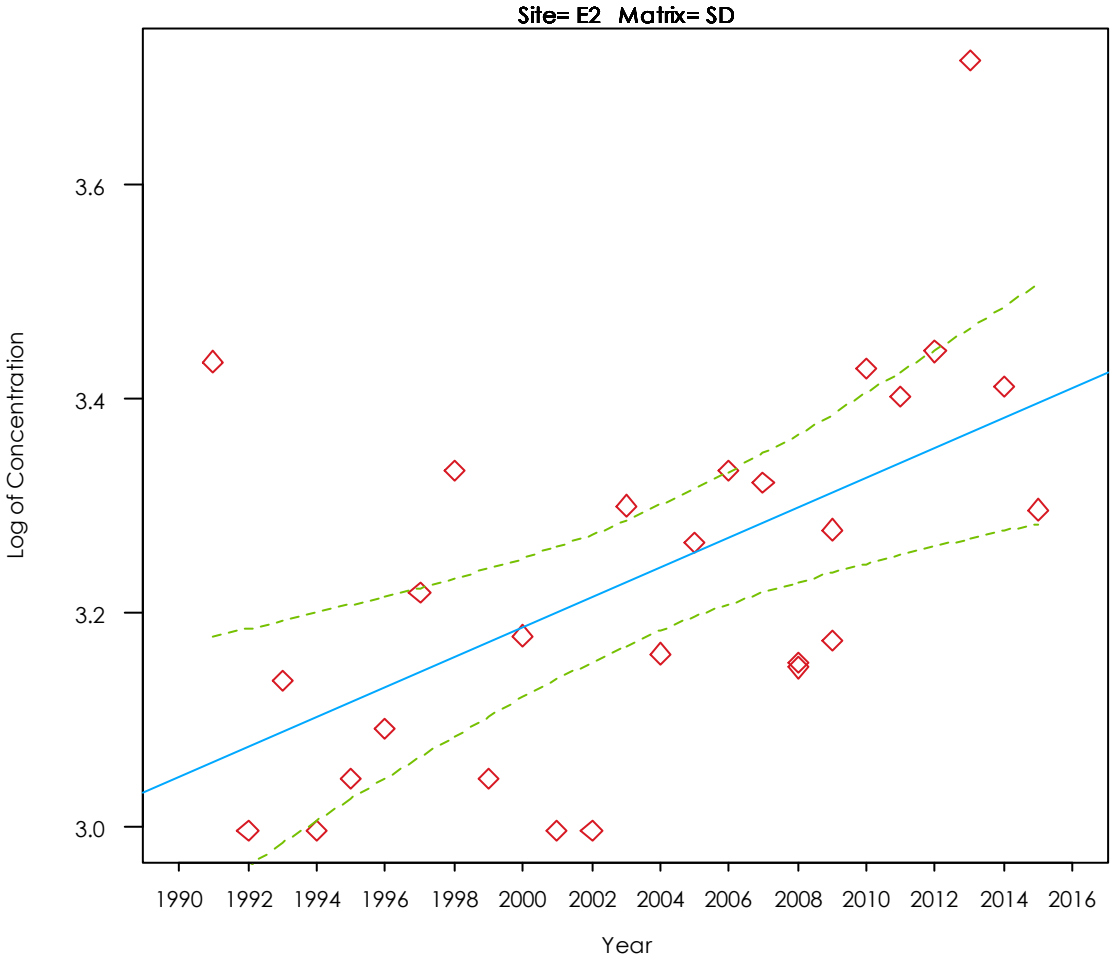
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -24.6914 + 0.0139 * Year

Log base e (natural logarithm)

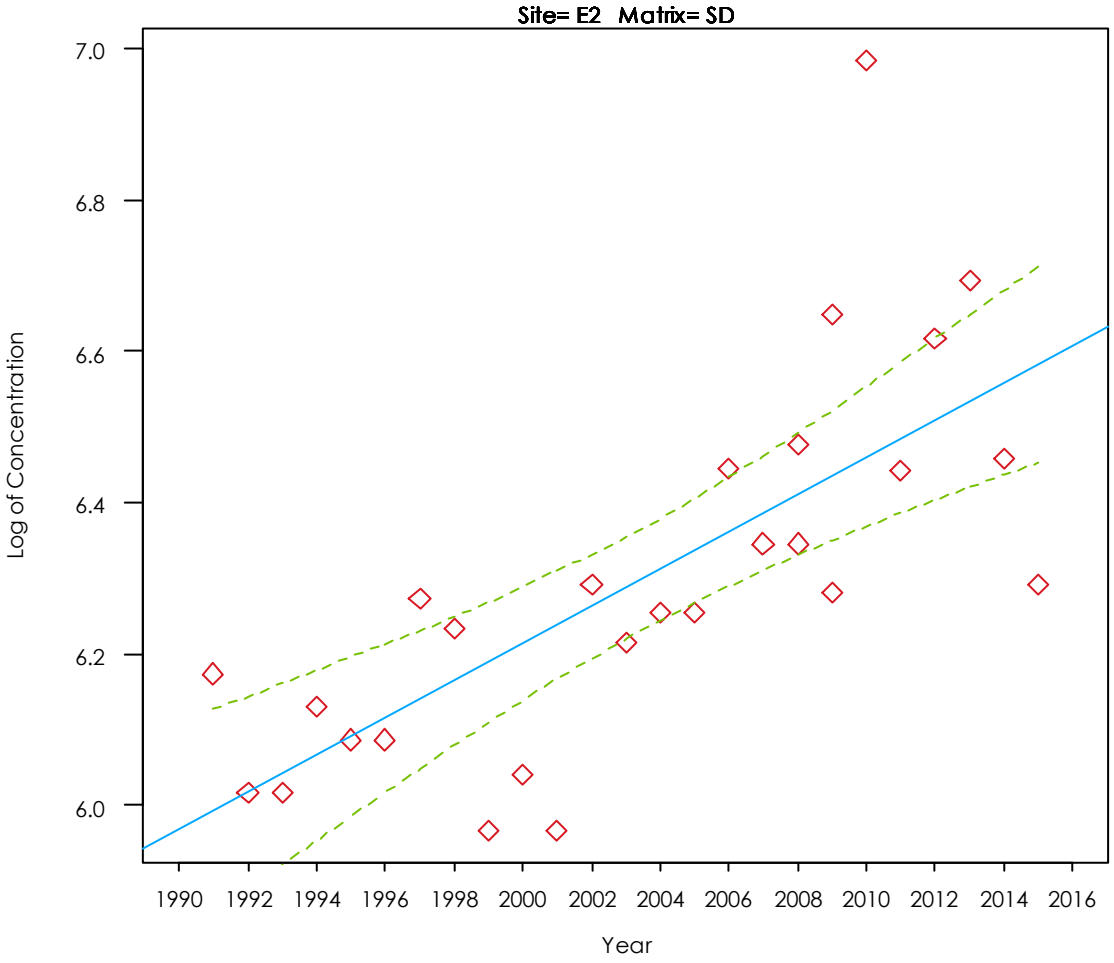
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -43.0528 + 0.0246 * Year

Log base e (natural logarithm)

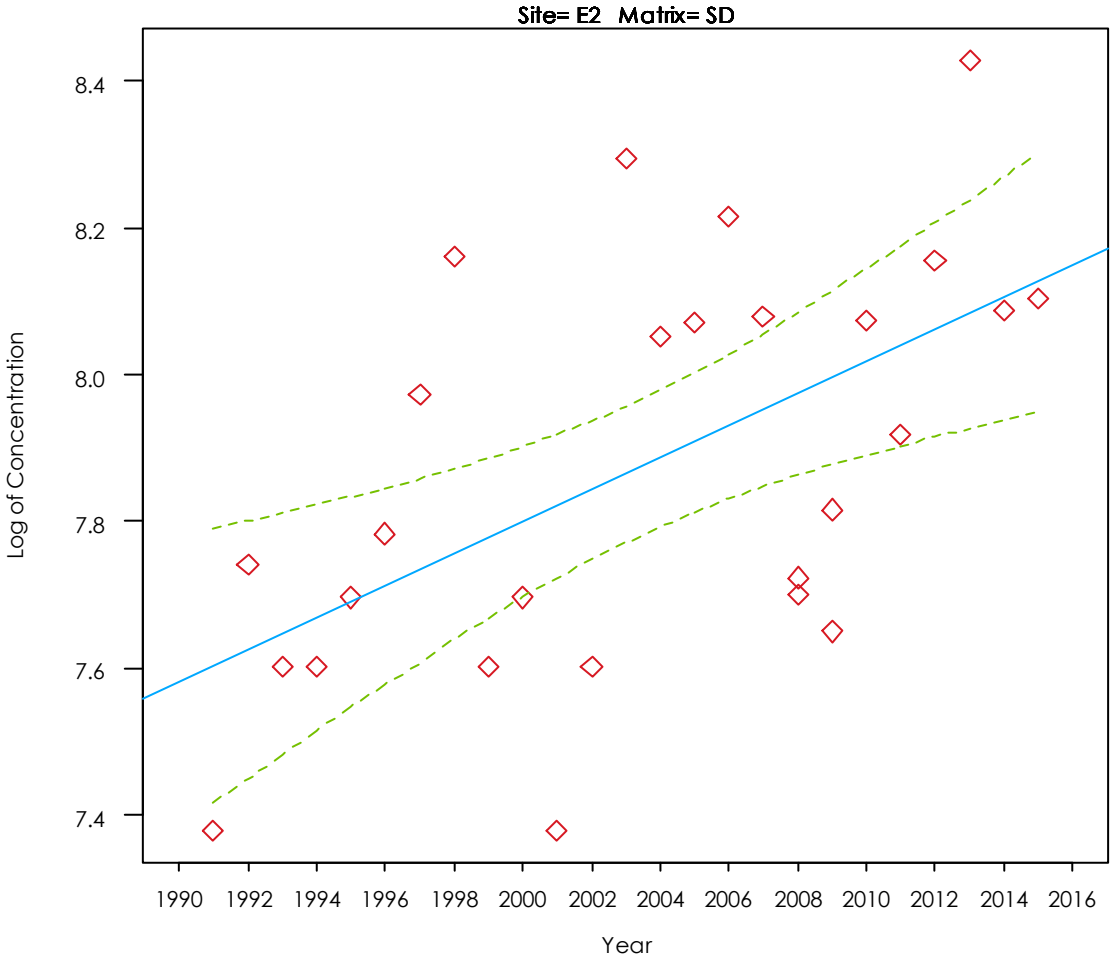
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Potassium



Regression Equation: LogConcentration = -35.8446 + 0.0218 * Year

Log base e (natural logarithm)

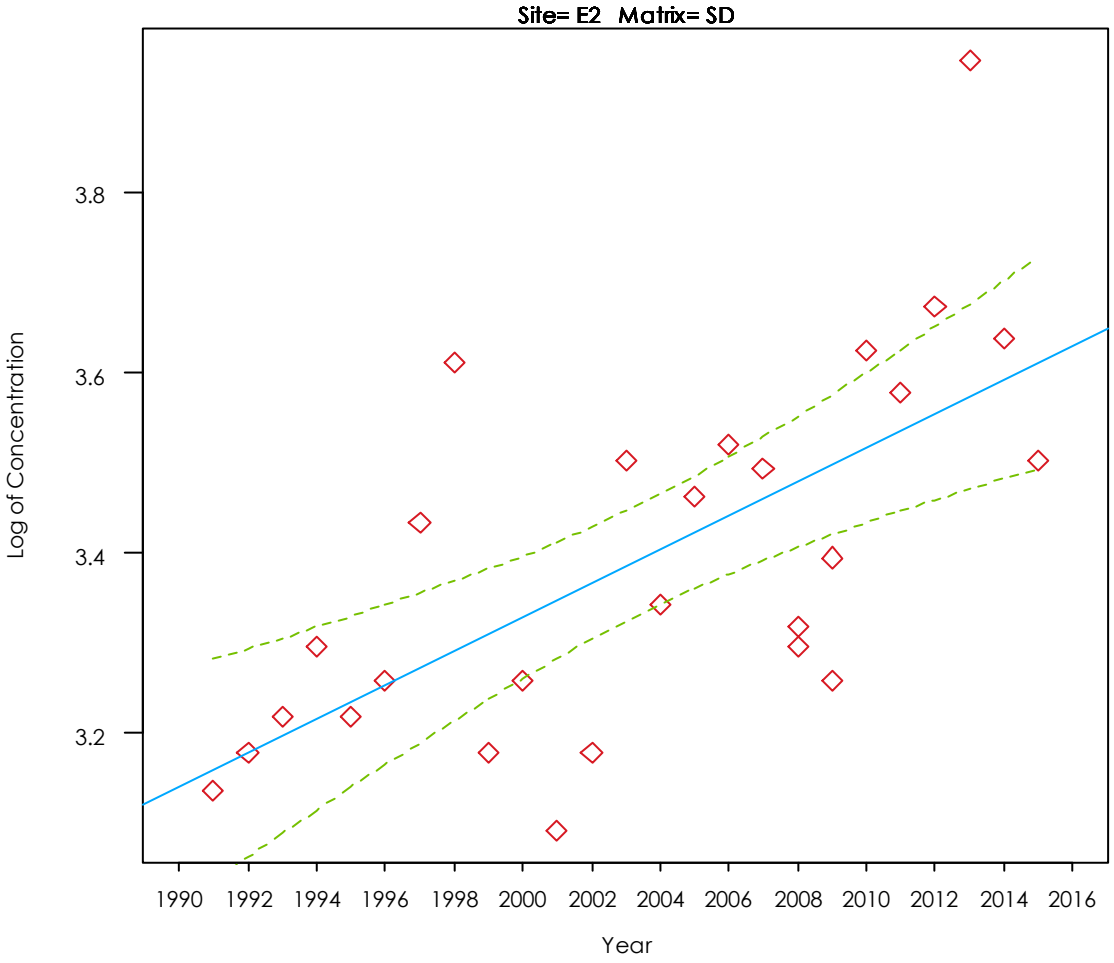
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Vanadium



Regression Equation: LogConcentration = -34.3309 + 0.0188 * Year

Log base e (natural logarithm)

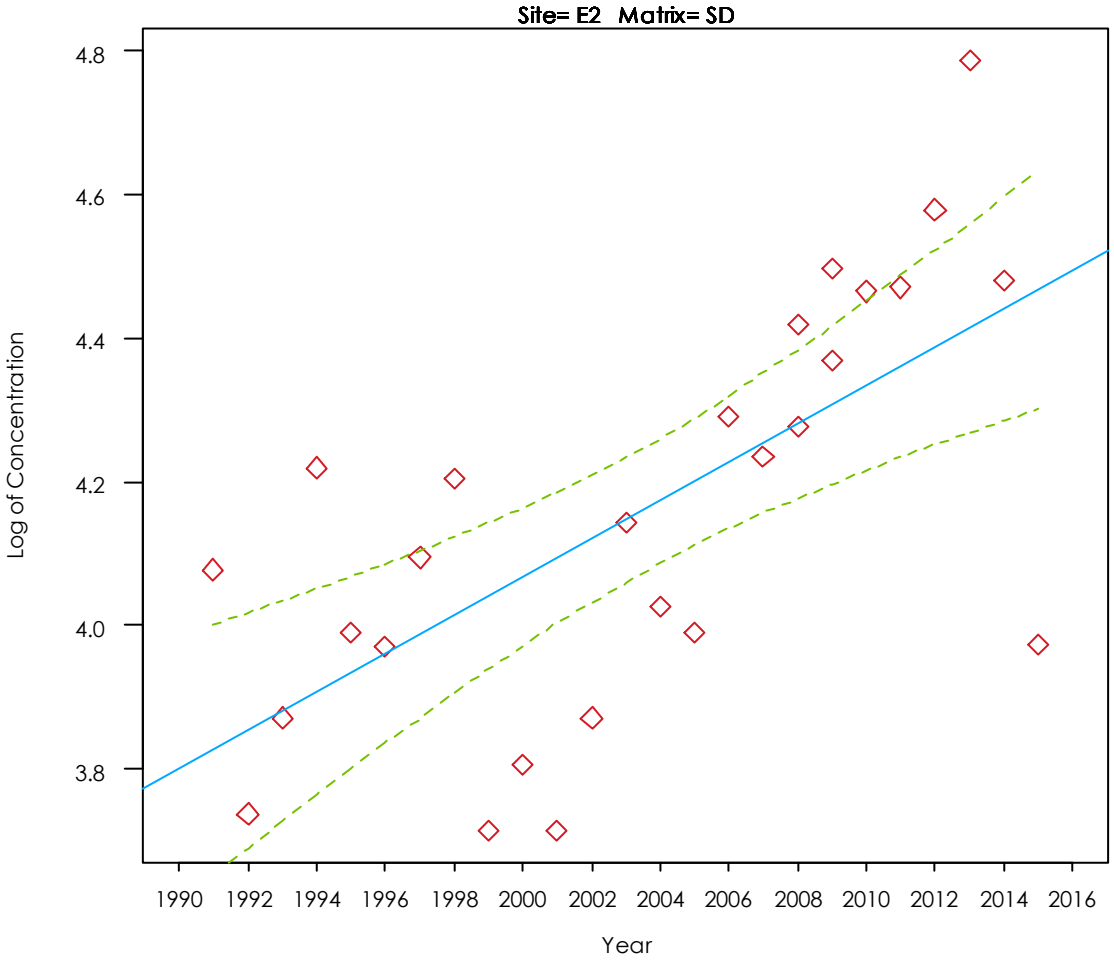
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Zinc



Regression Equation: LogConcentration = -49.2917 + 0.0267 * Year

Log base e (natural logarithm)

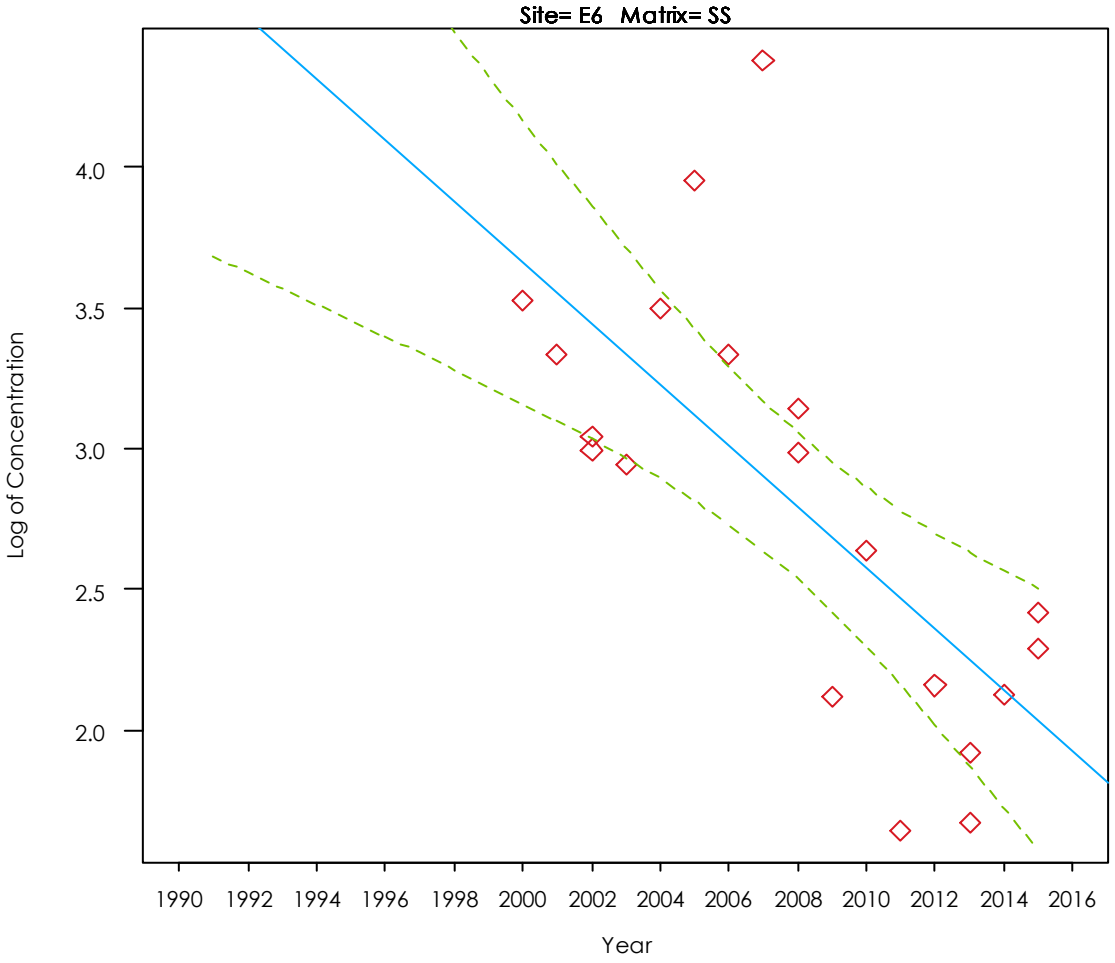
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chloride



Regression Equation: LogConcentration = 220.3065 + -0.1083 * Year

Log base e (natural logarithm)

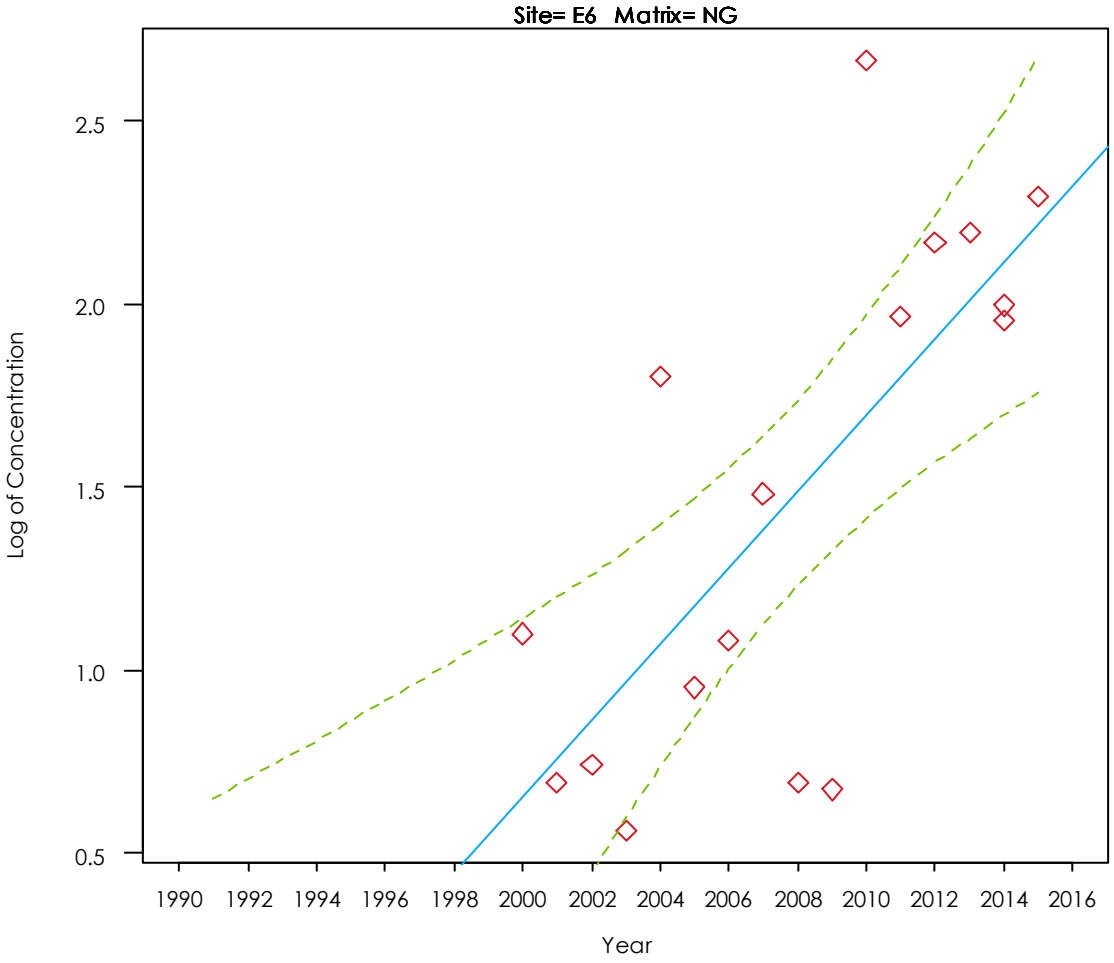
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Molybdenum



Regression Equation: LogConcentration = -208.2706 + 0.1045 * Year

Log base e (natural logarithm)

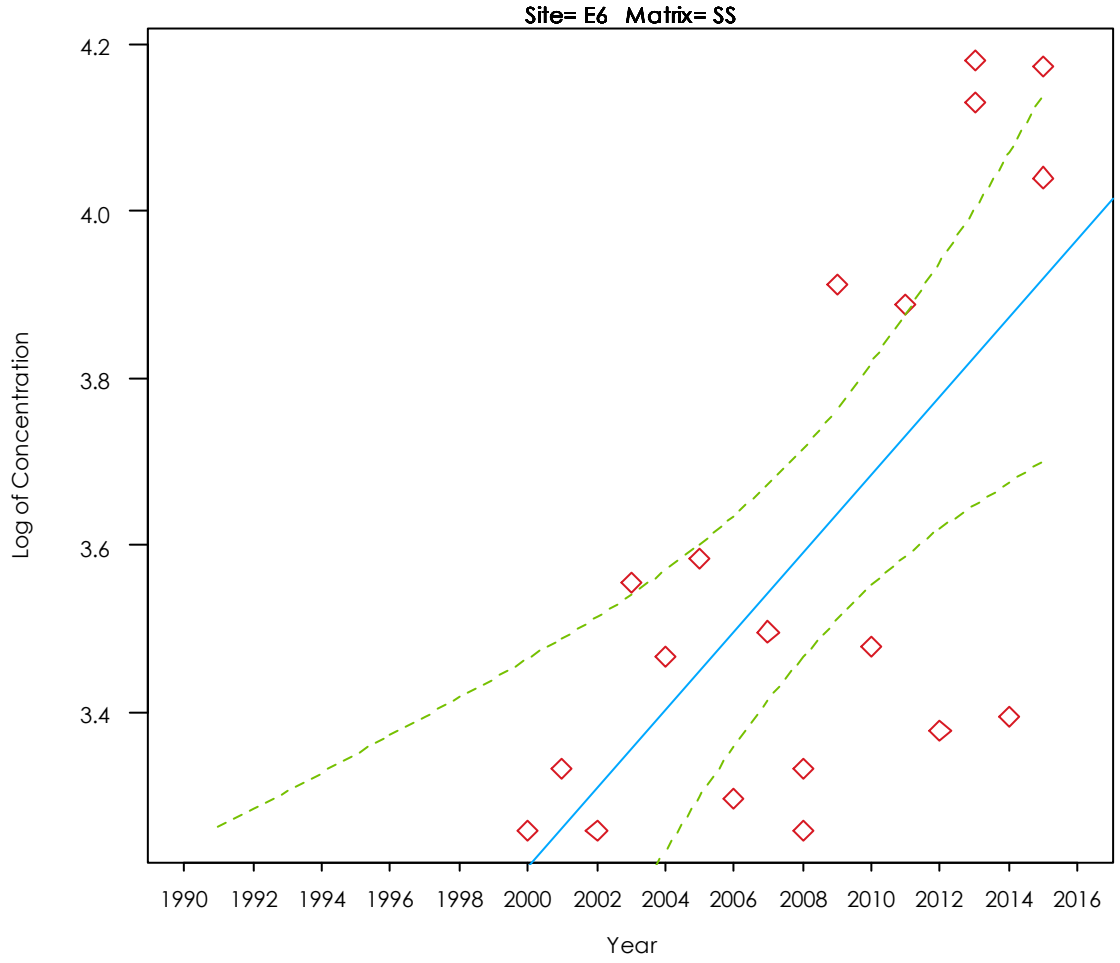
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Strontium



Regression Equation: LogConcentration = -90.8664 + 0.047 * Year

Log base e (natural logarithm)

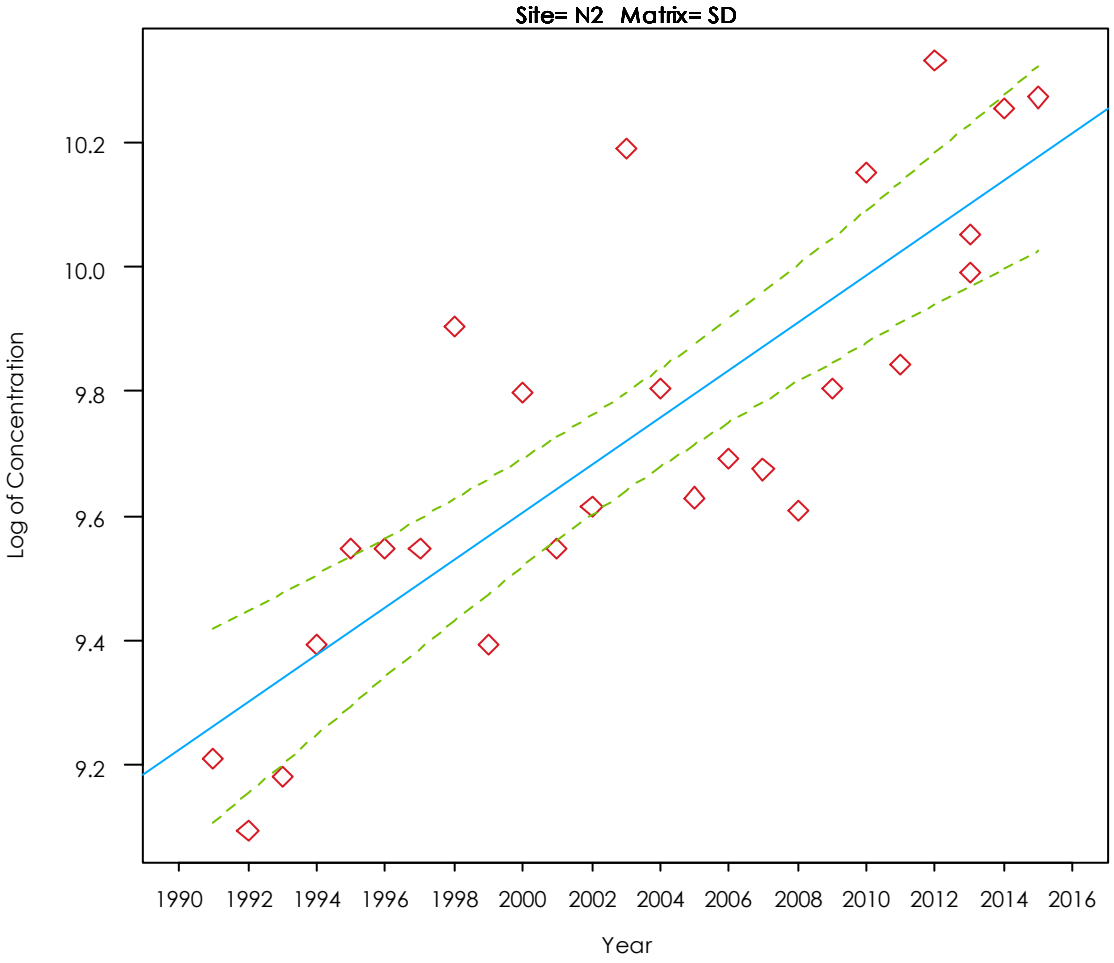
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -66.3913 + 0.038 * Year

Log base e (natural logarithm)

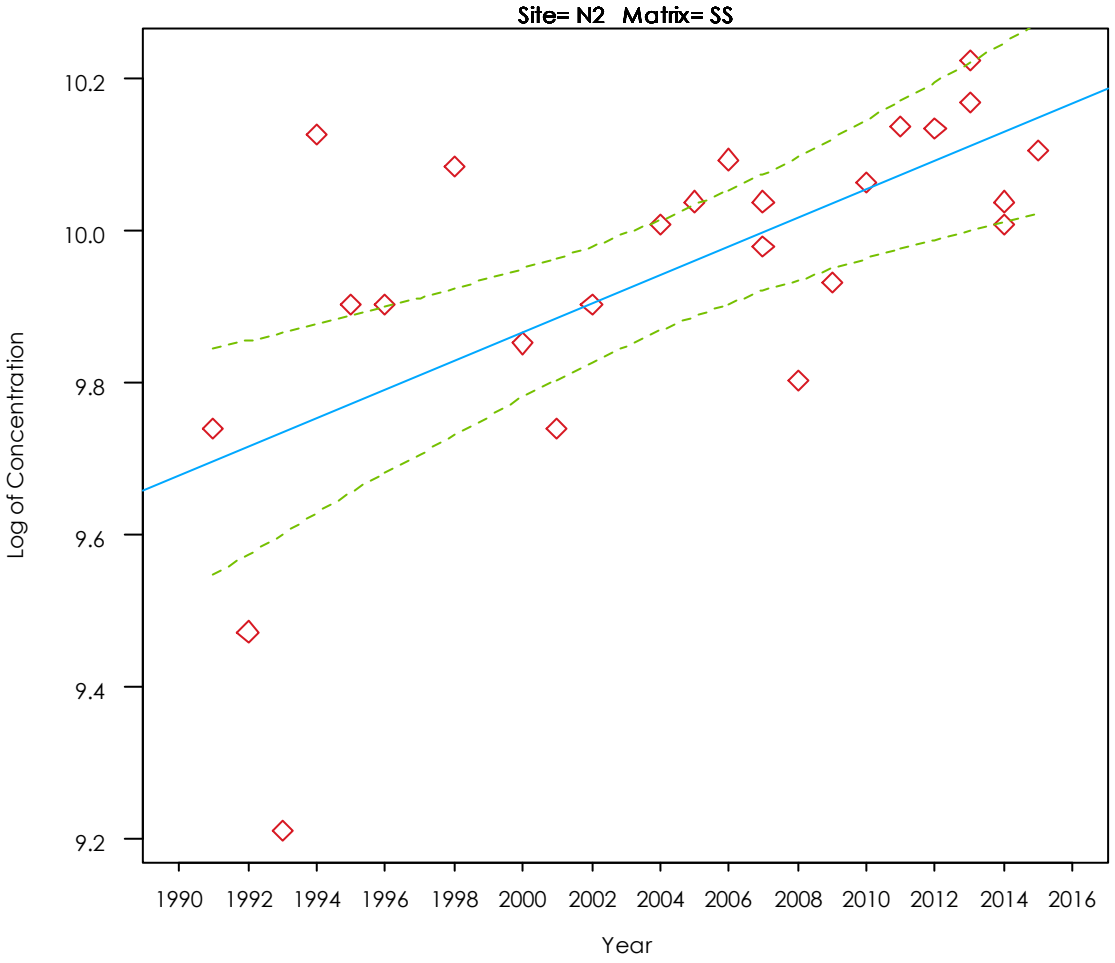
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -27.8897 + 0.0189 * Year

Log base e (natural logarithm)

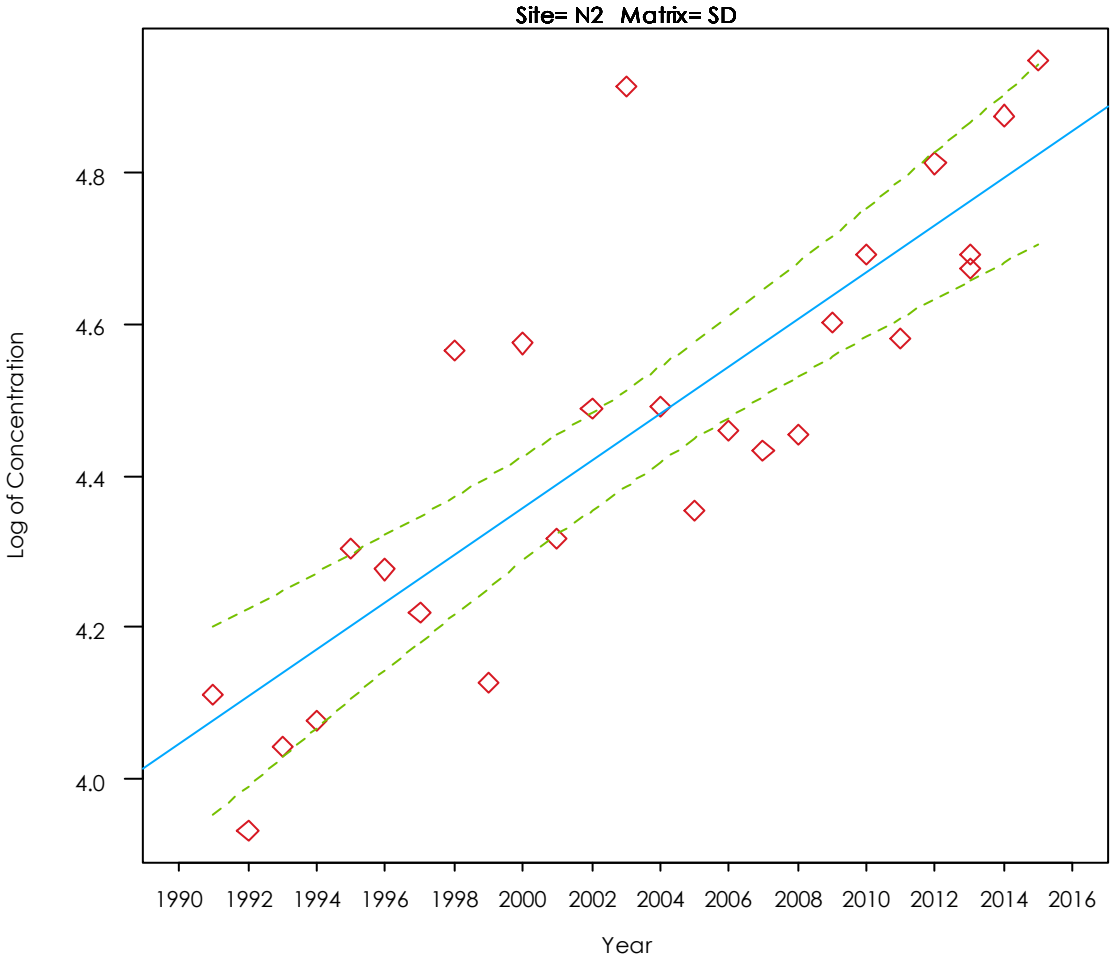
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -57.8927 + 0.0311 * Year

Log base e (natural logarithm)

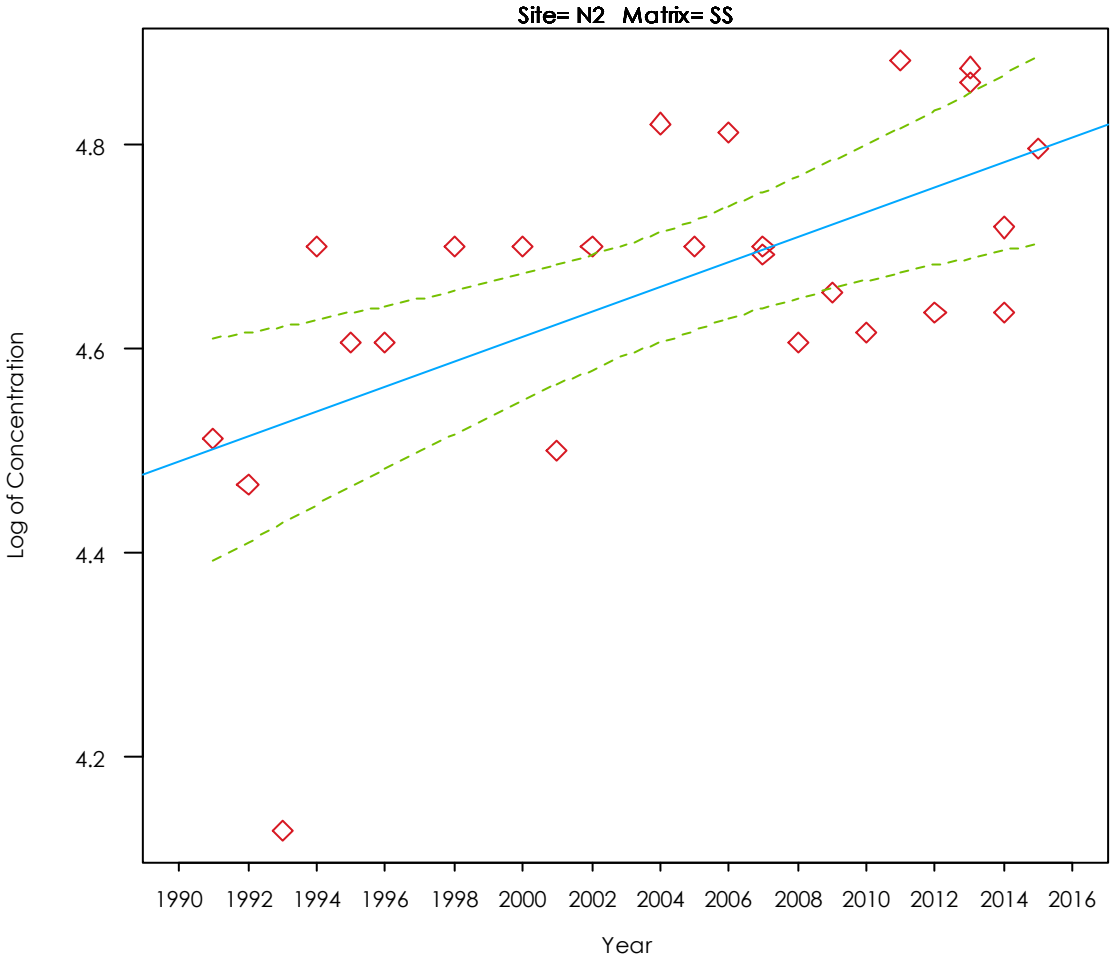
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -19.8529 + 0.0122 * Year

Log base e (natural logarithm)

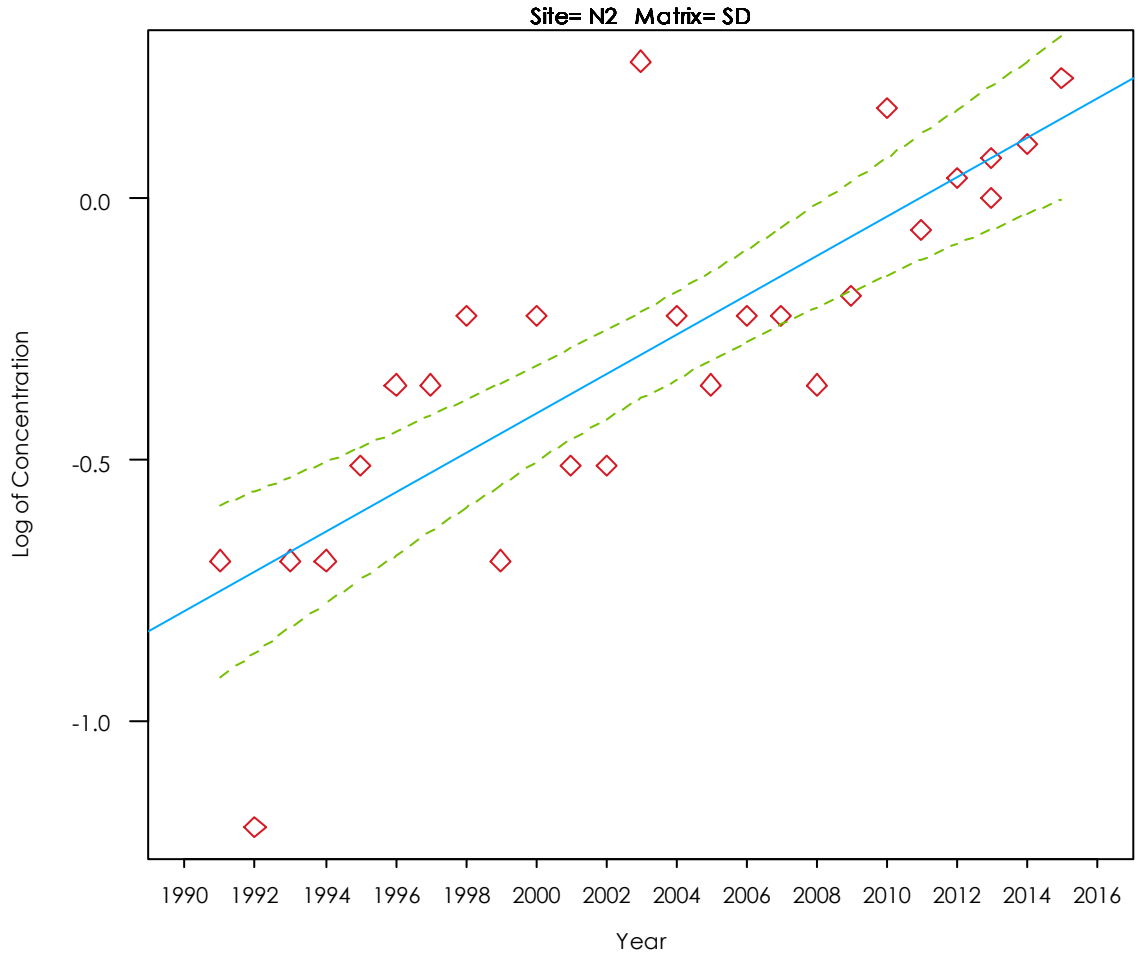
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Beryllium



Regression Equation: LogConcentration = -75.9952 + 0.0378 * Year

Log base e (natural logarithm)

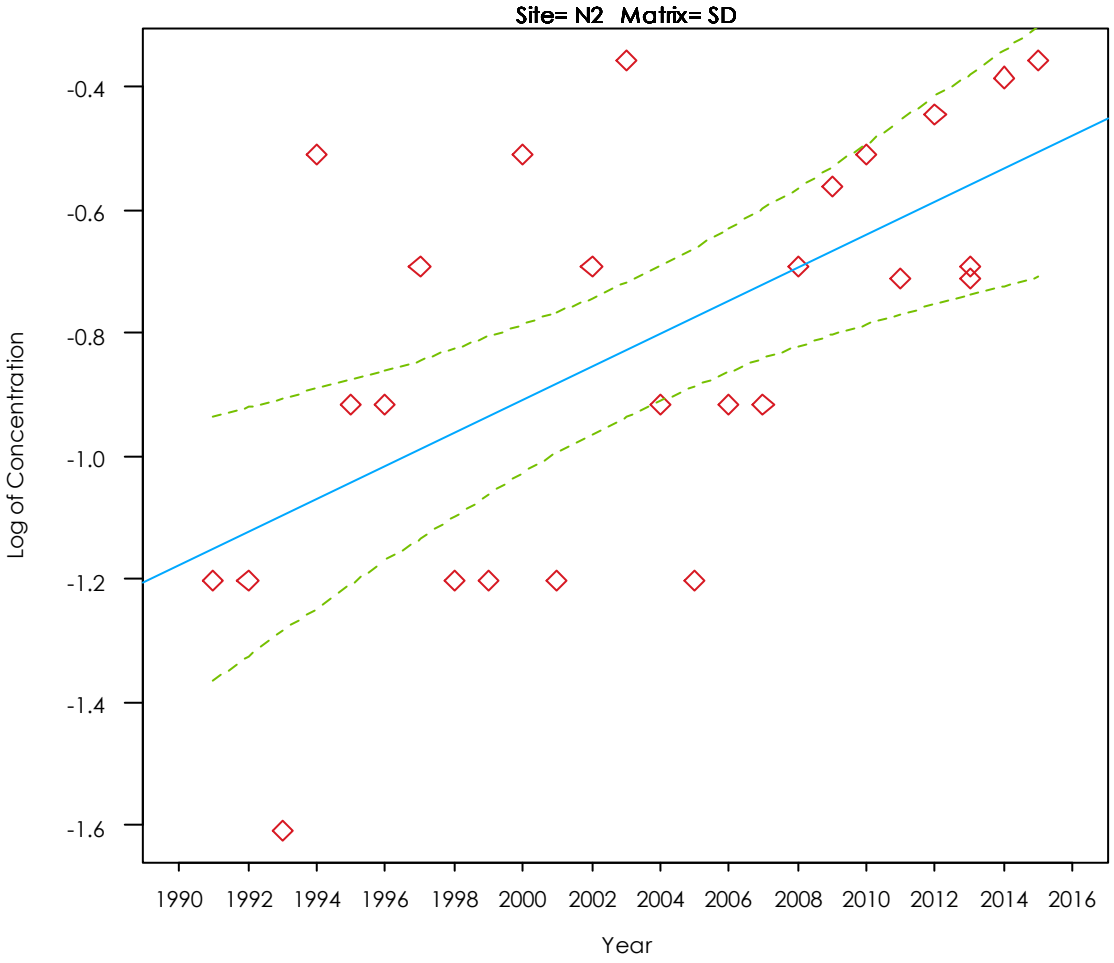
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Cadmium



Regression Equation: LogConcentration = -54.5802 + 0.0268 * Year

Log base e (natural logarithm)

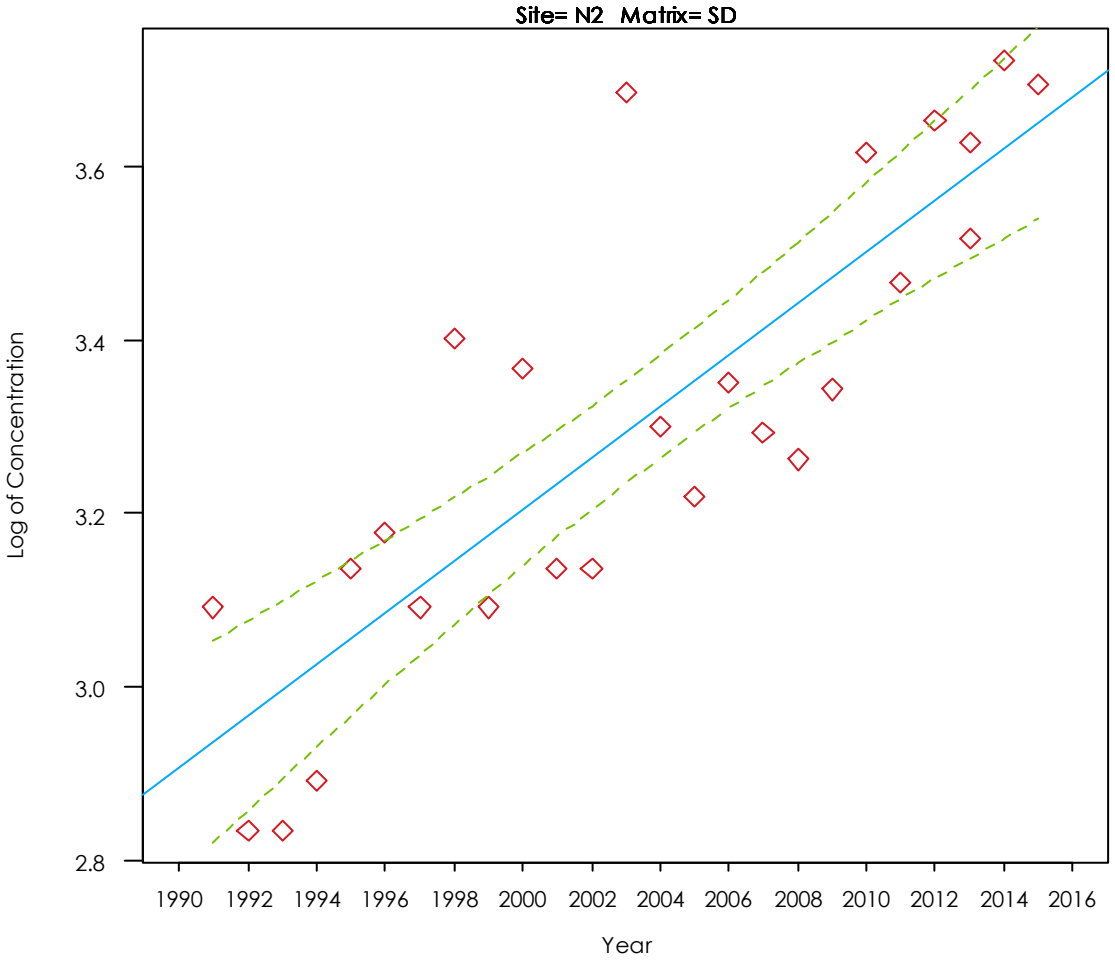
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -56.3309 + 0.0298 * Year

Log base e (natural logarithm)

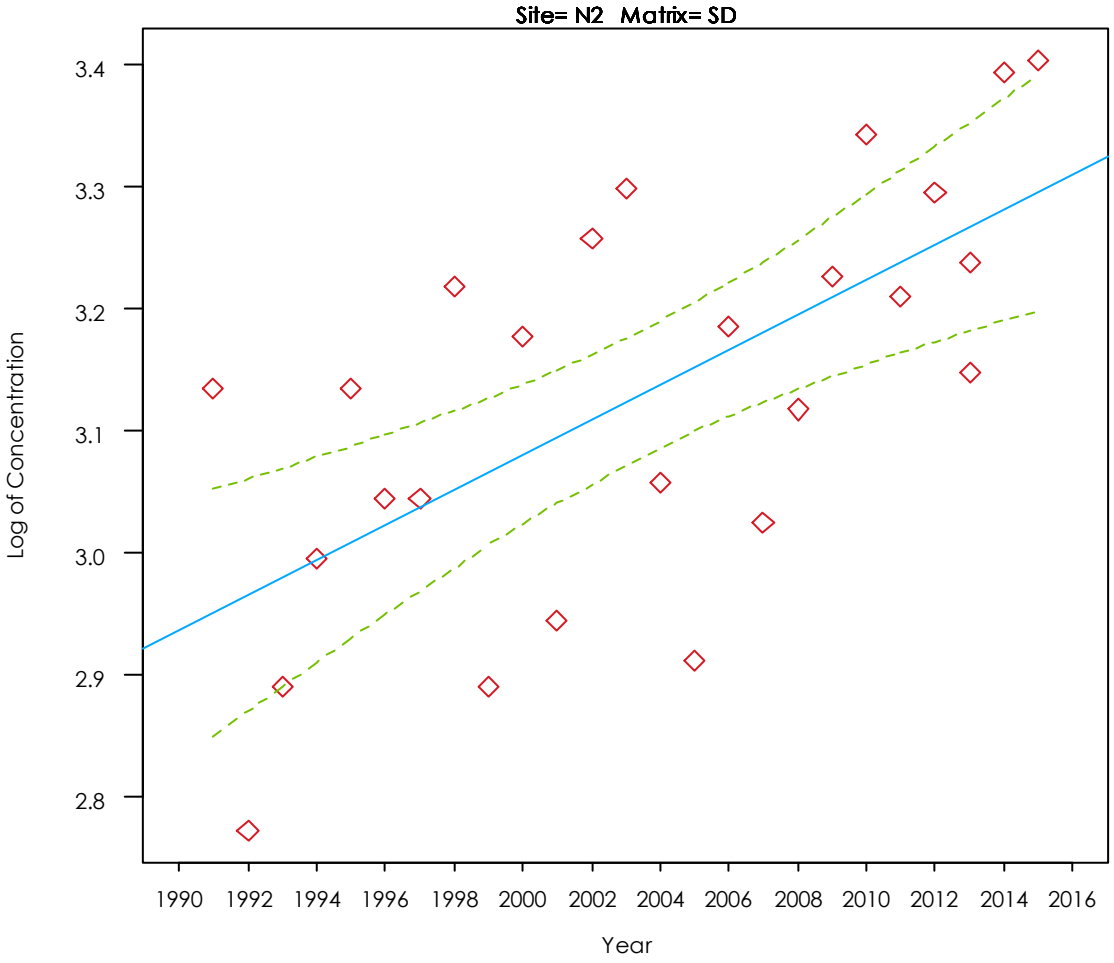
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = -25.6018 + 0.0143 * Year

Log base e (natural logarithm)

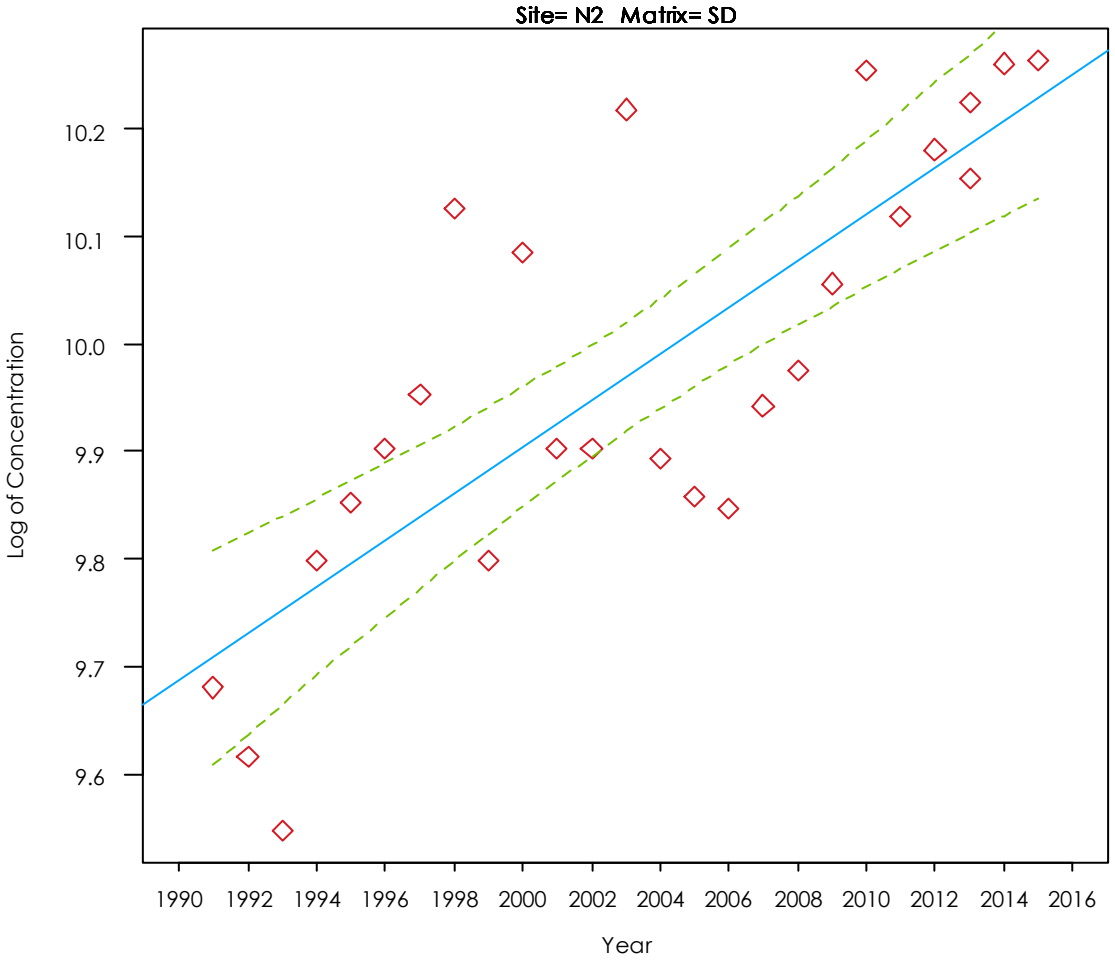
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Iron



Regression Equation: LogConcentration = -33.5391 + 0.0217 * Year

Log base e (natural logarithm)

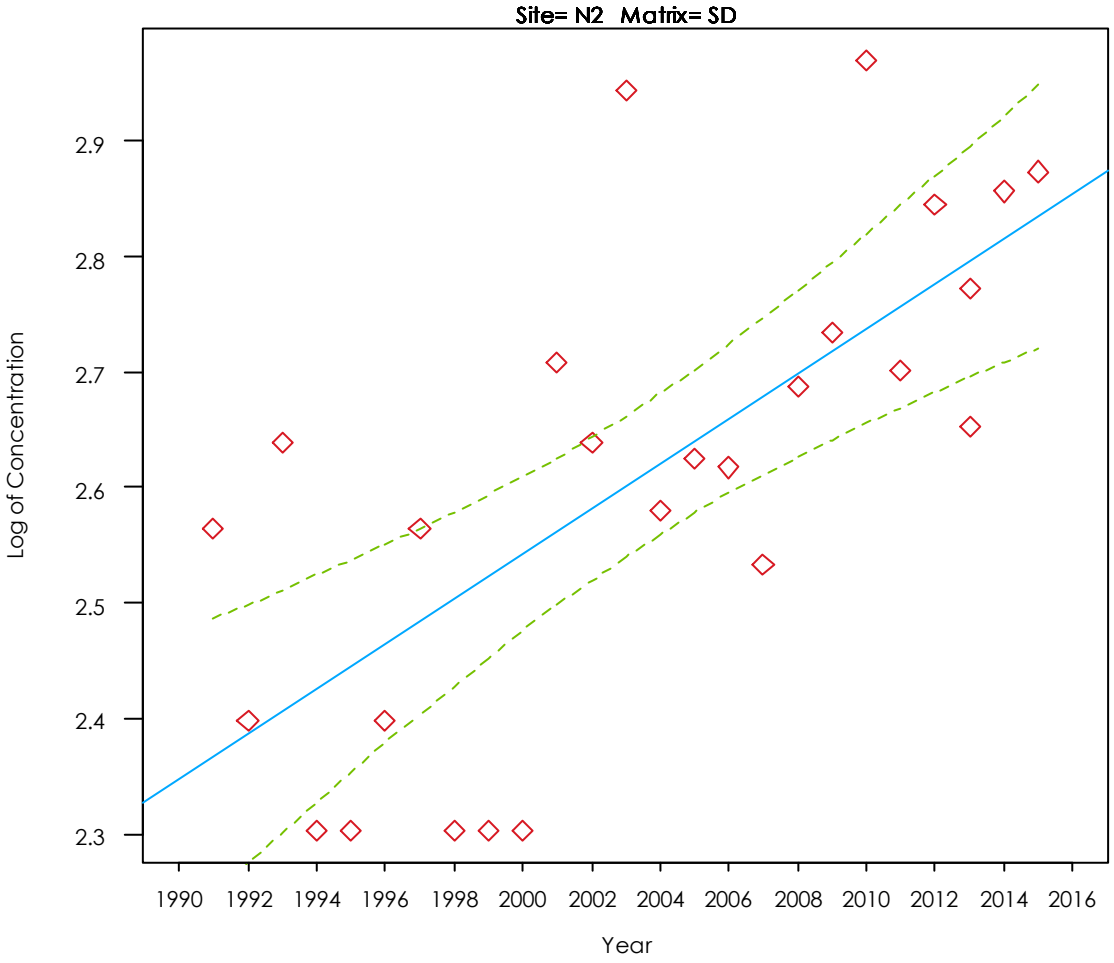
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Lead



Regression Equation: LogConcentration = -36.4155 + 0.0195 * Year

Log base e (natural logarithm)

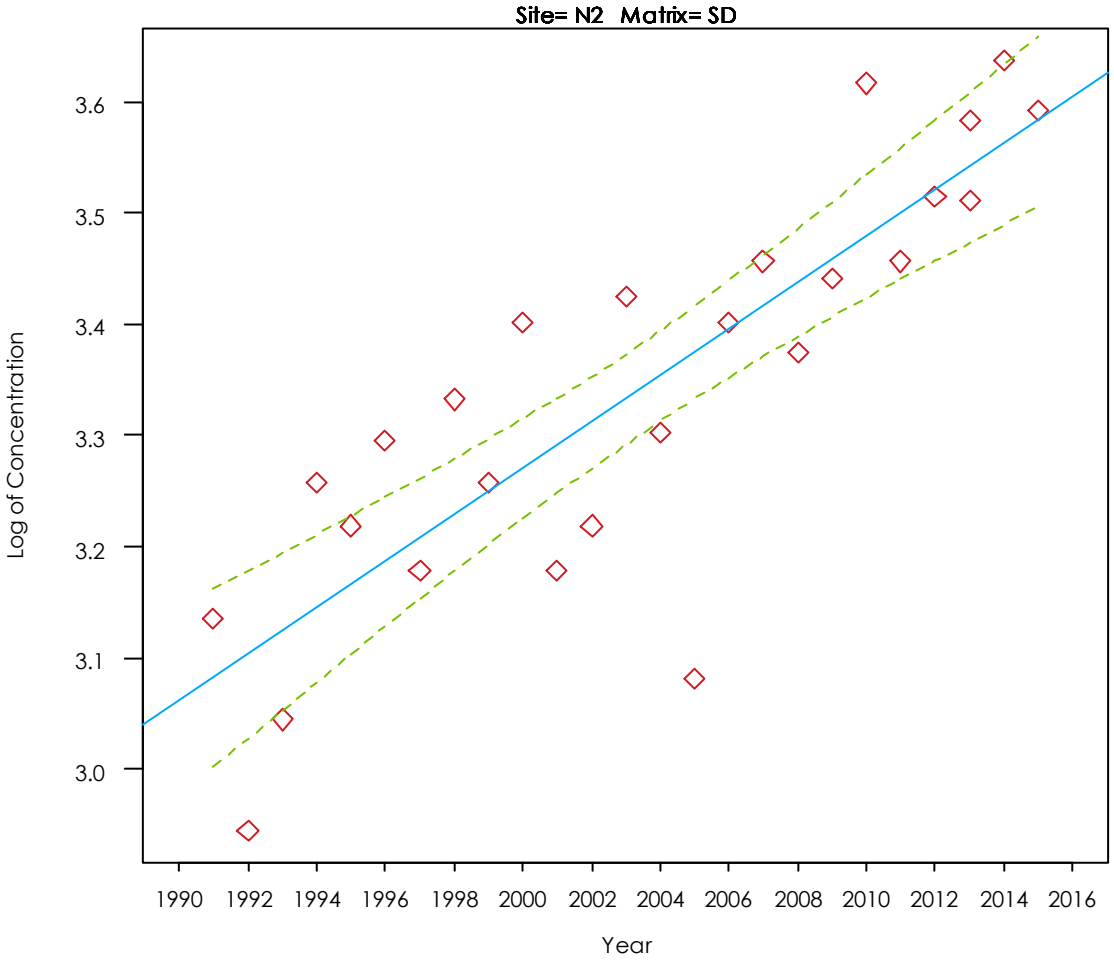
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Nickel



Regression Equation: LogConcentration = -38.4432 + 0.0209 * Year

Log base e (natural logarithm)

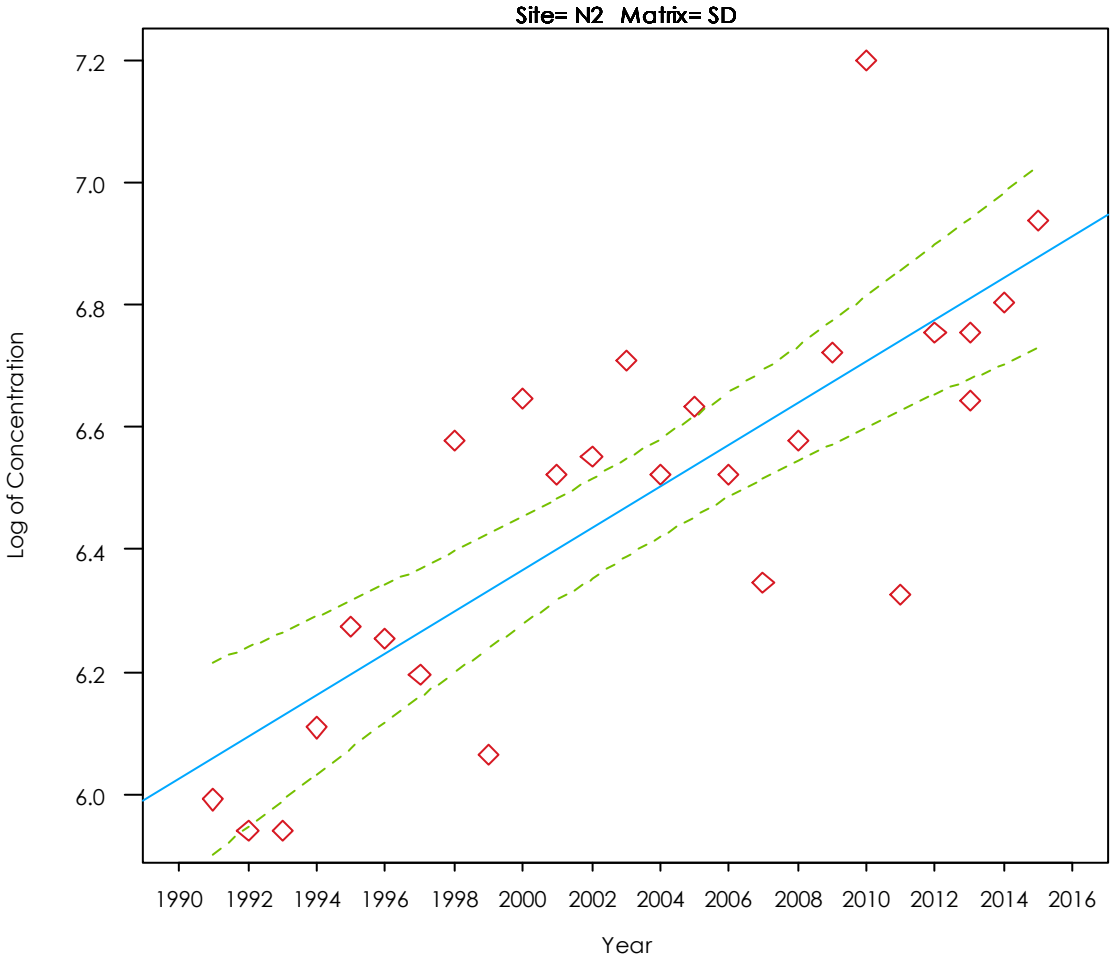
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -61.8229 + 0.0341 * Year

Log base e (natural logarithm)

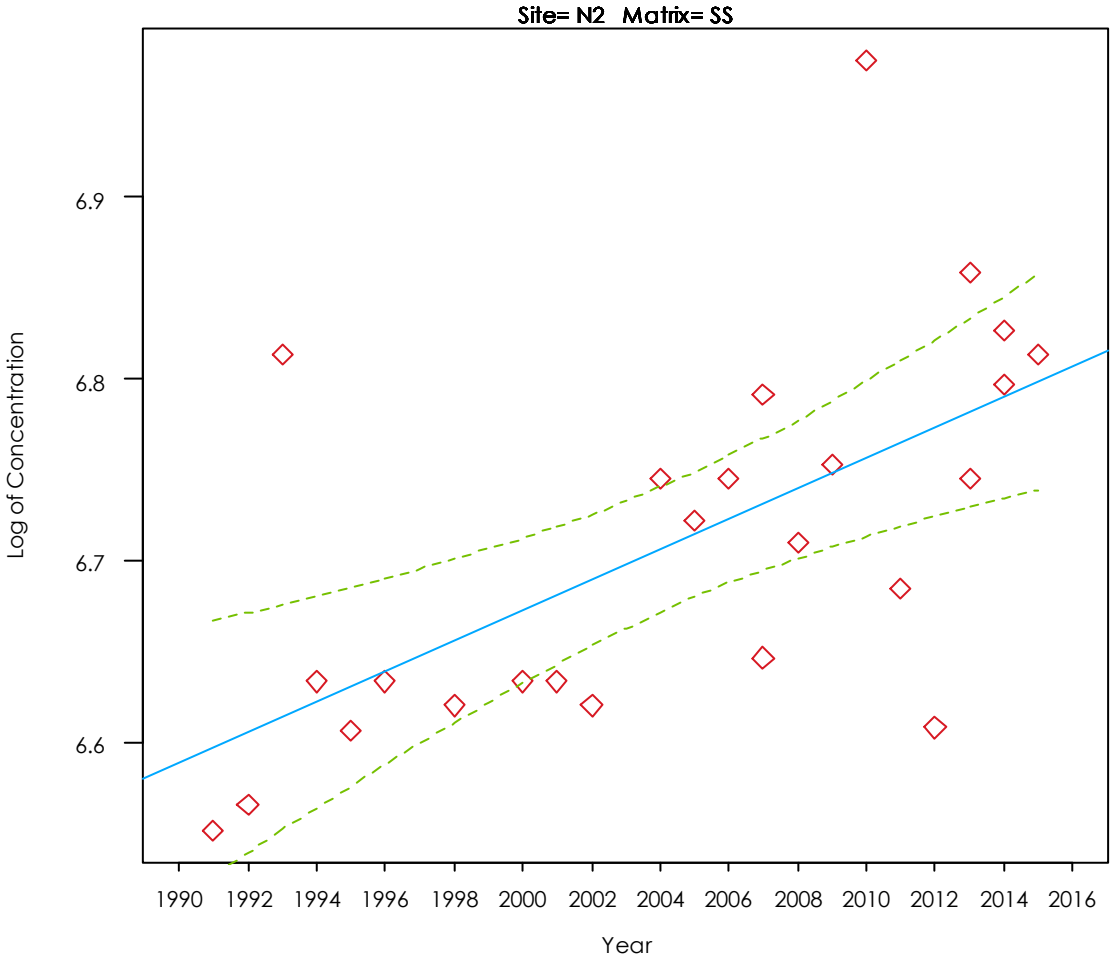
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -10.0512 + 0.0084 * Year

Log base e (natural logarithm)

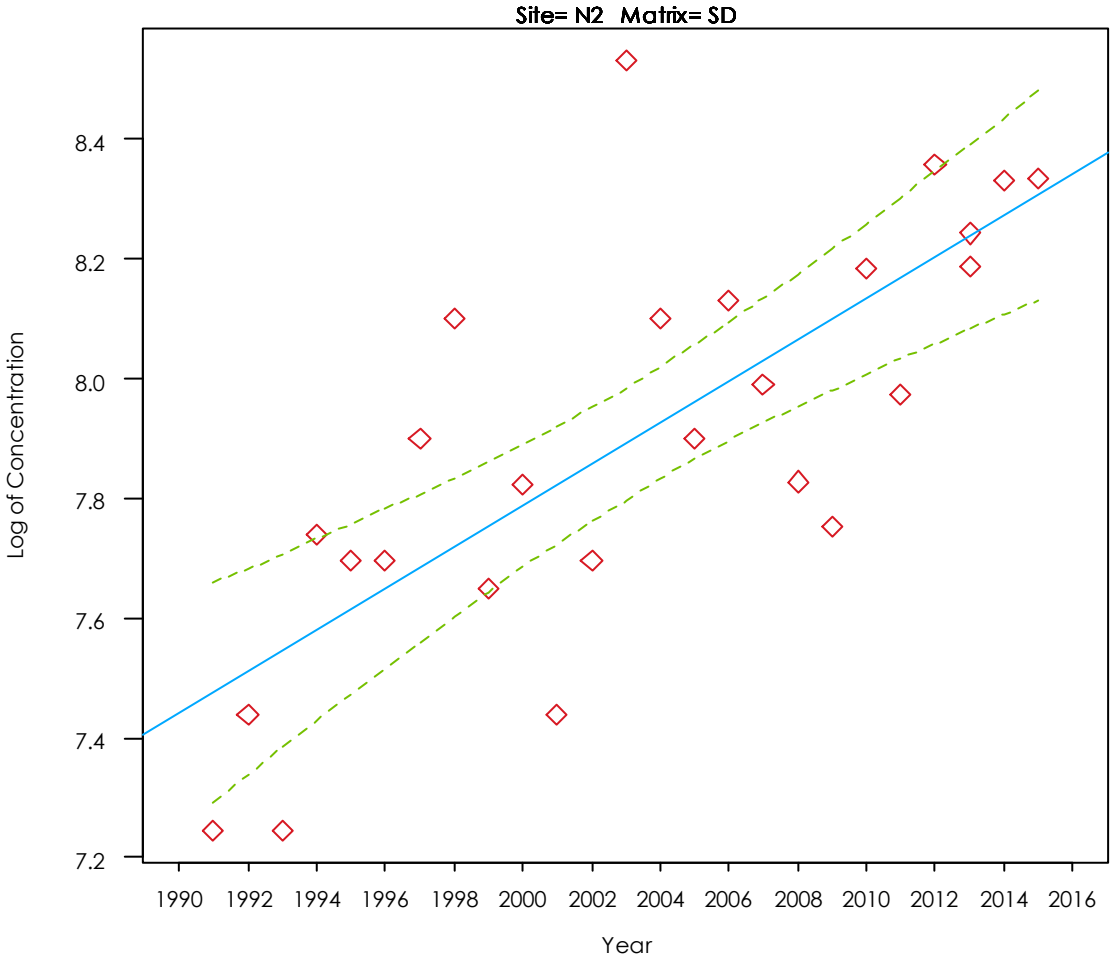
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Potassium



Regression Equation: LogConcentration = -61.3832 + 0.0346 * Year

Log base e (natural logarithm)

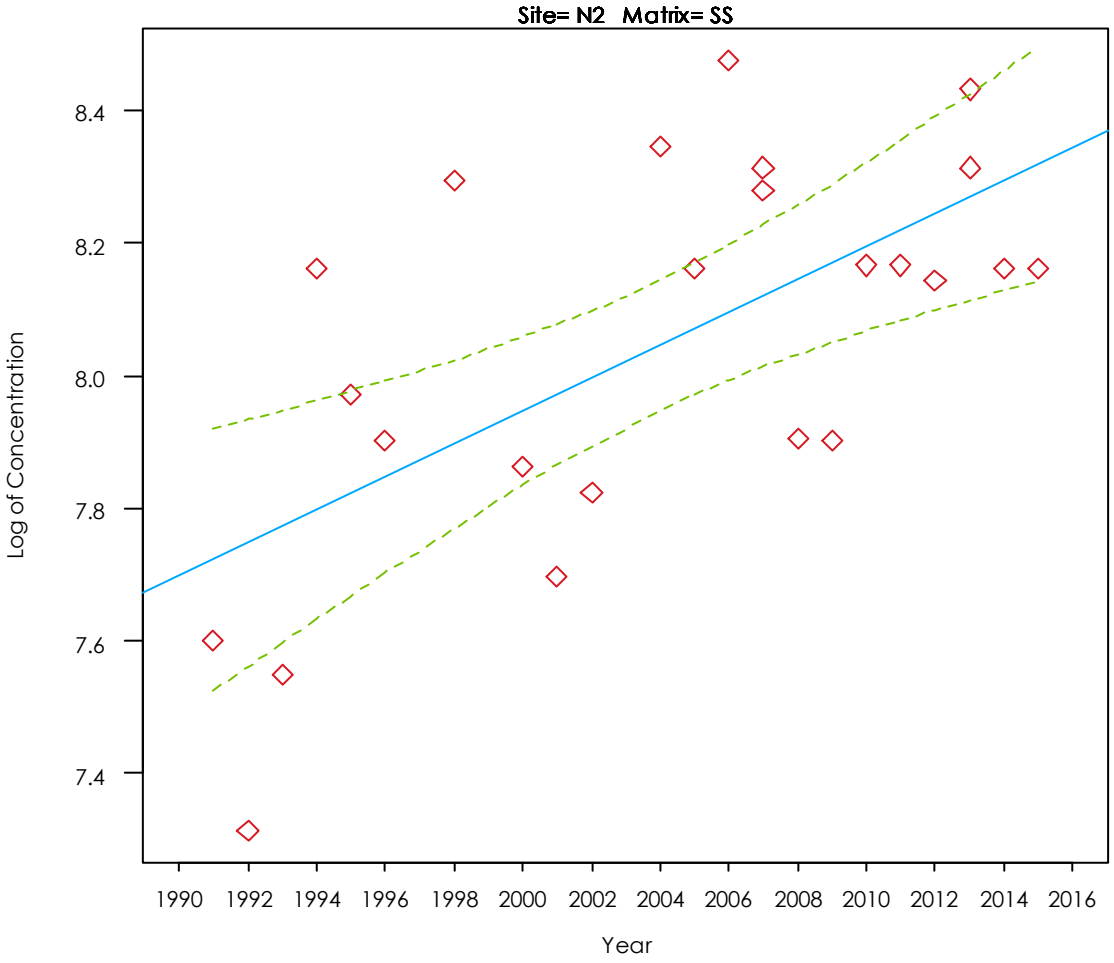
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Potassium



Regression Equation: LogConcentration = -41.7054 + 0.0248 * Year

Log base e (natural logarithm)

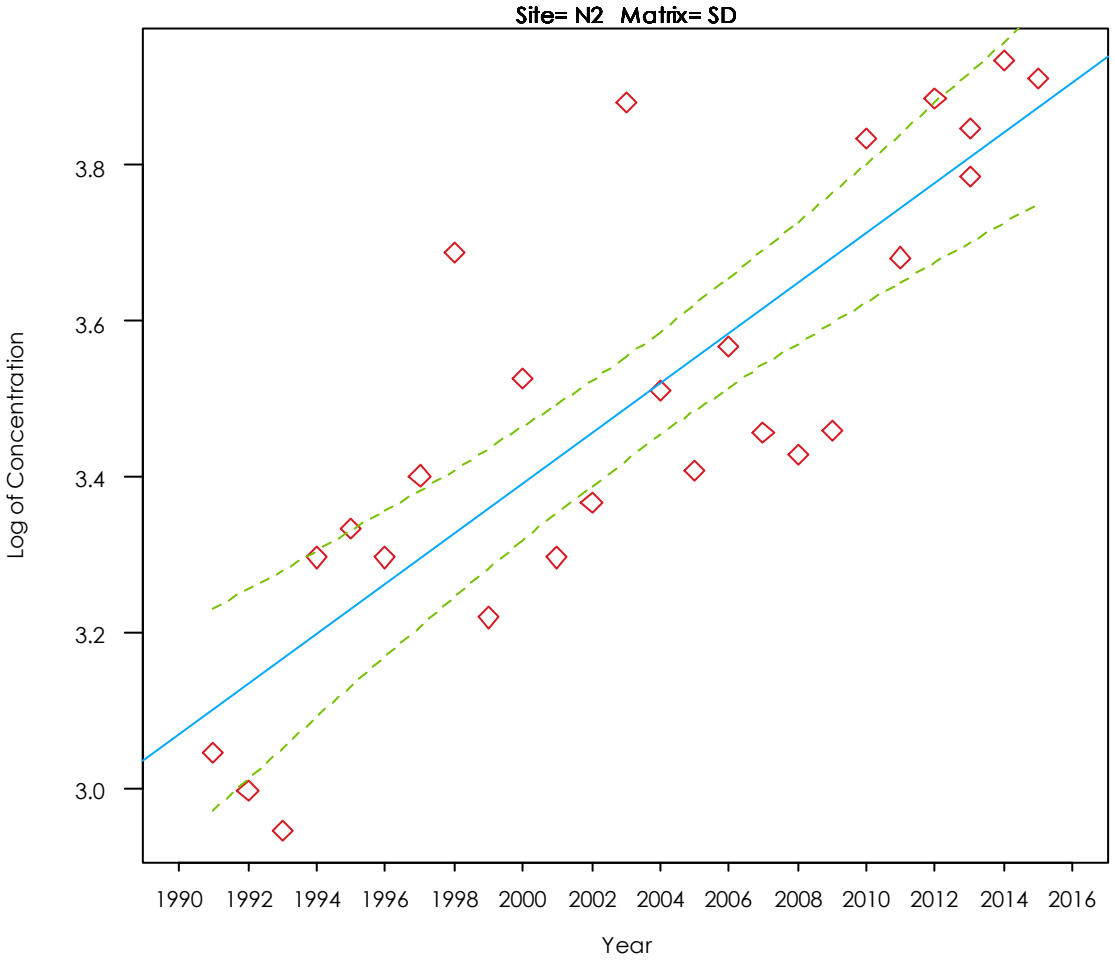
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Vanadium



Regression Equation: LogConcentration = -61.0837 + 0.0322 * Year

Log base e (natural logarithm)

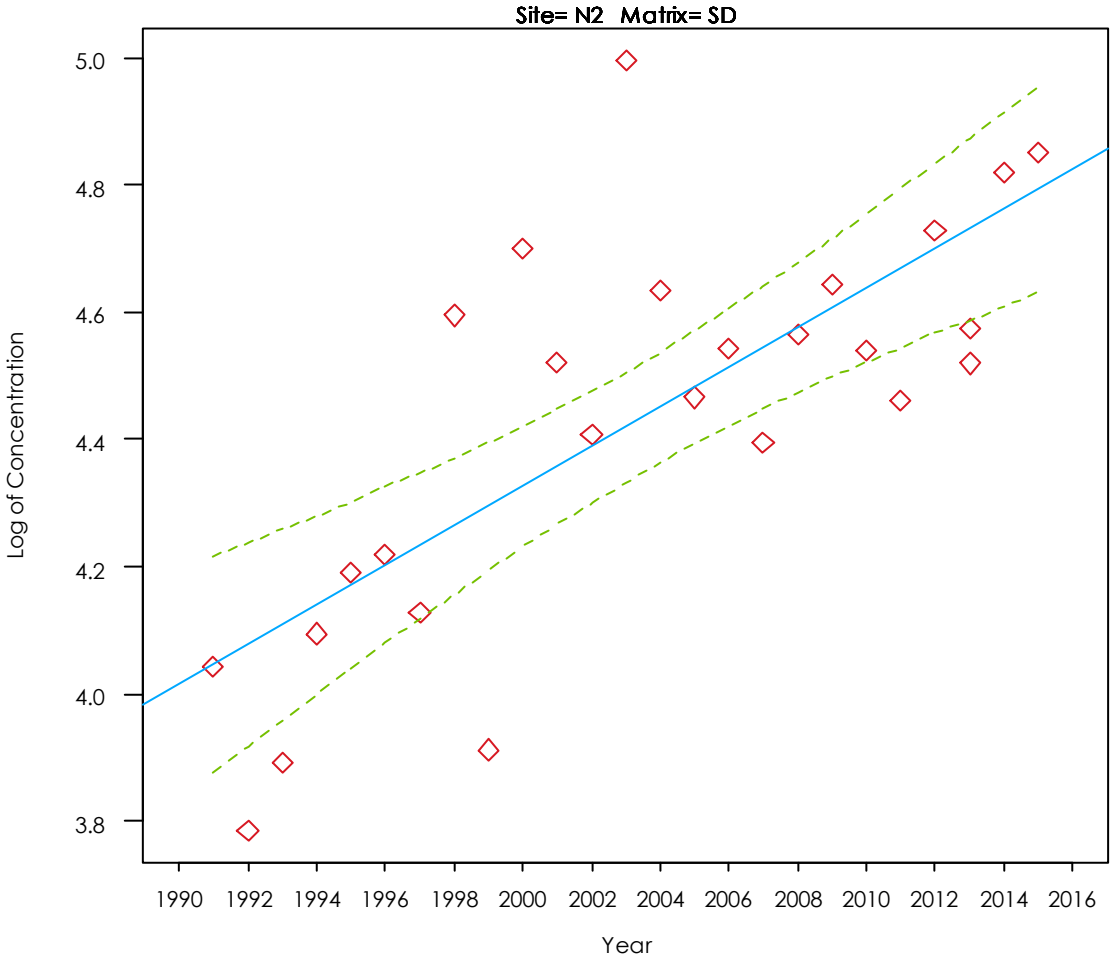
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Zinc



Regression Equation: LogConcentration = -57.9158 + 0.0311 * Year

Log base e (natural logarithm)

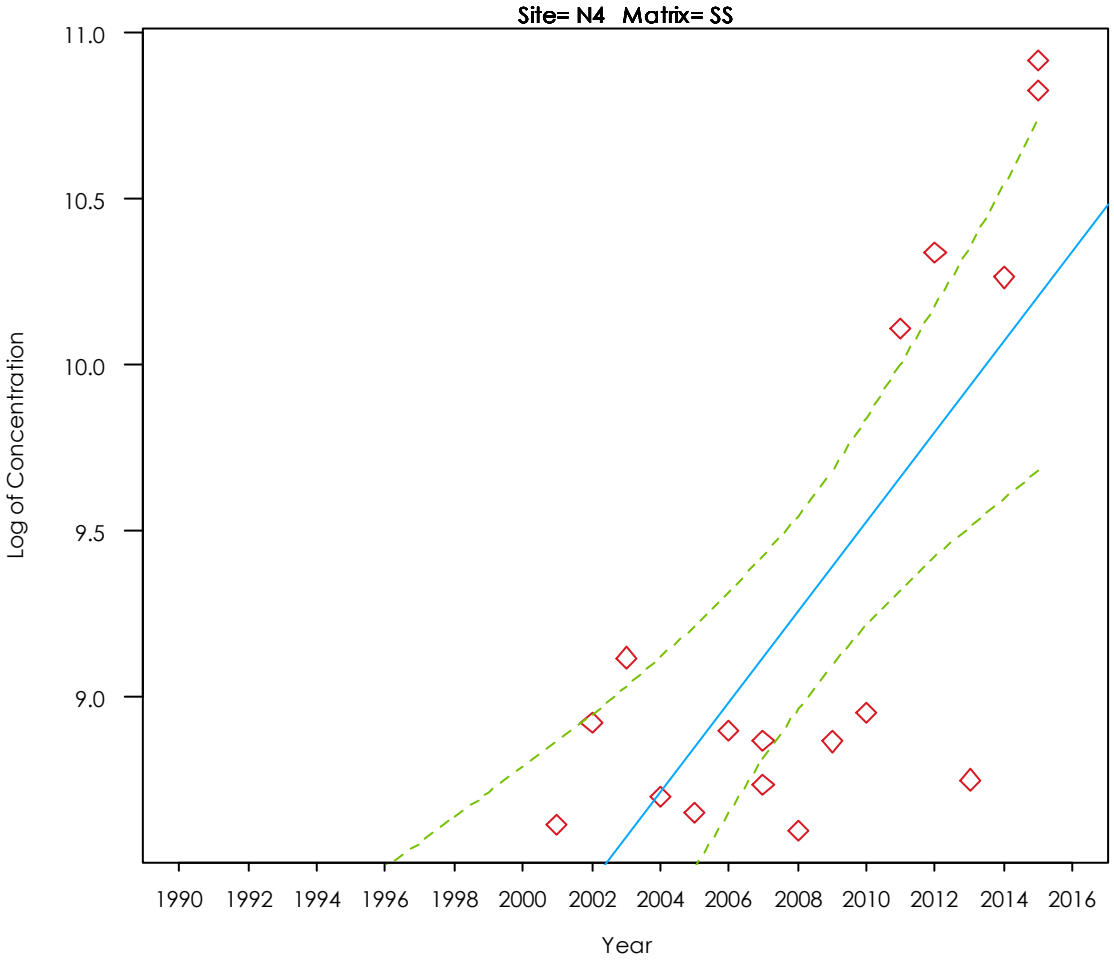
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Calcium



Regression Equation: LogConcentration = -263.9276 + 0.136 * Year

Log base e (natural logarithm)

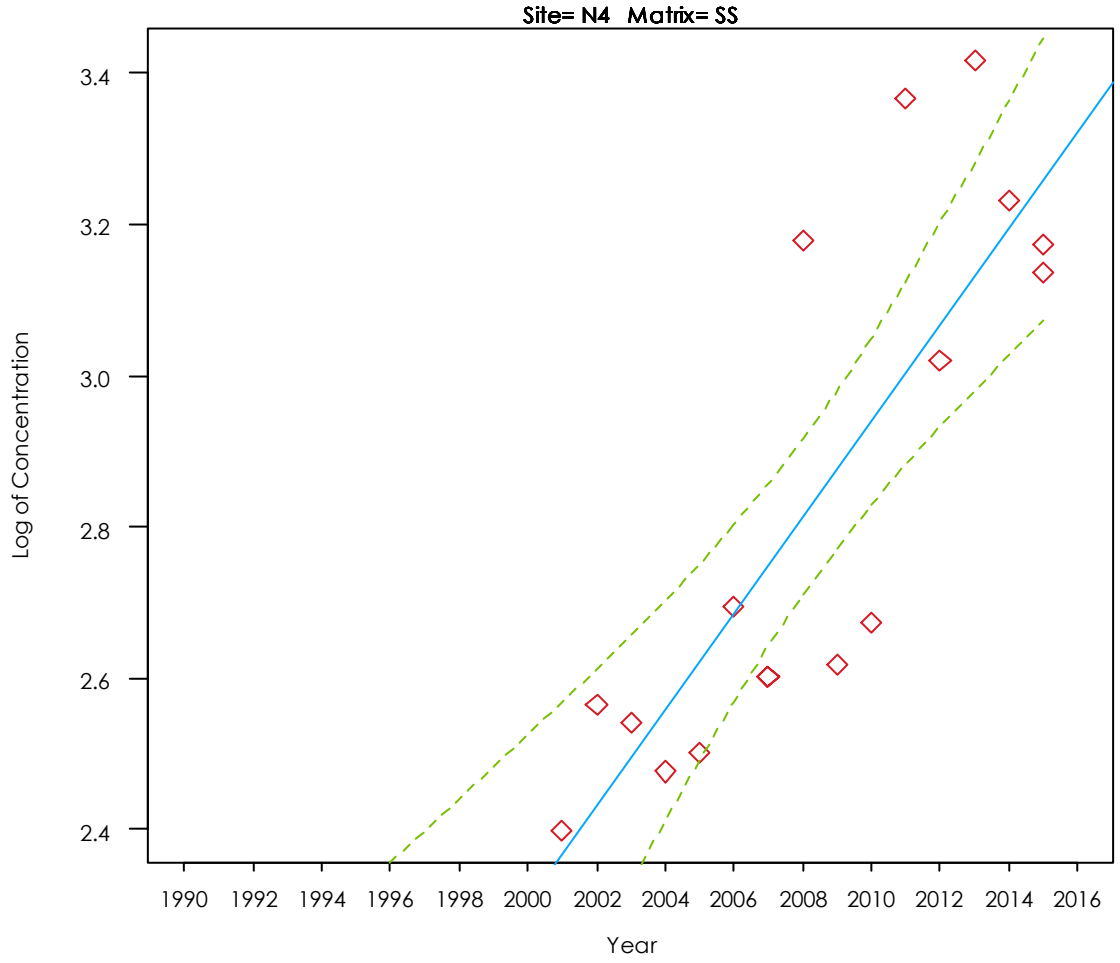
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = -125.1168 + 0.0637 * Year

Log base e (natural logarithm)

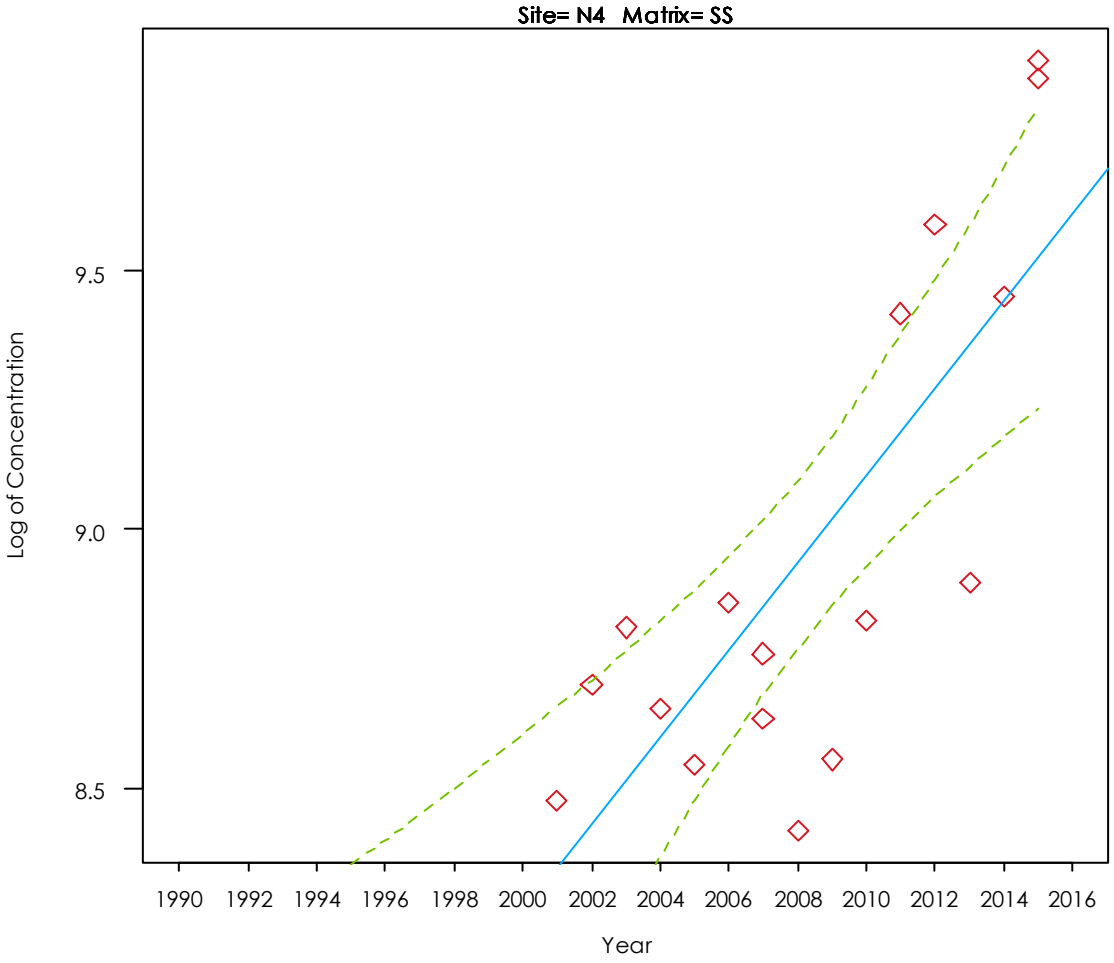
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Magnesium



Regression Equation: LogConcentration = -160.942 + 0.0846 * Year

Log base e (natural logarithm)

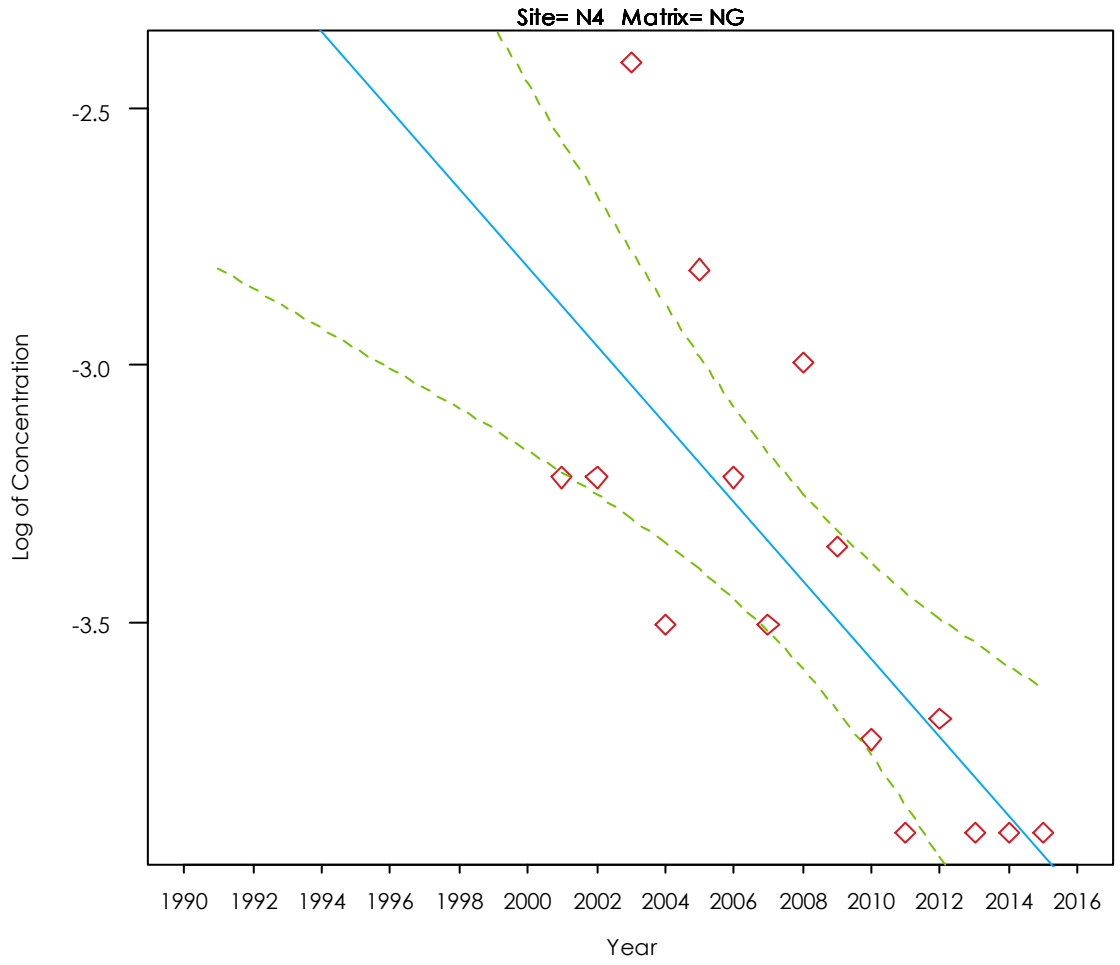
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Mercury



Regression Equation: LogConcentration = 150.2197 + -0.0765 * Year

Log base e (natural logarithm)

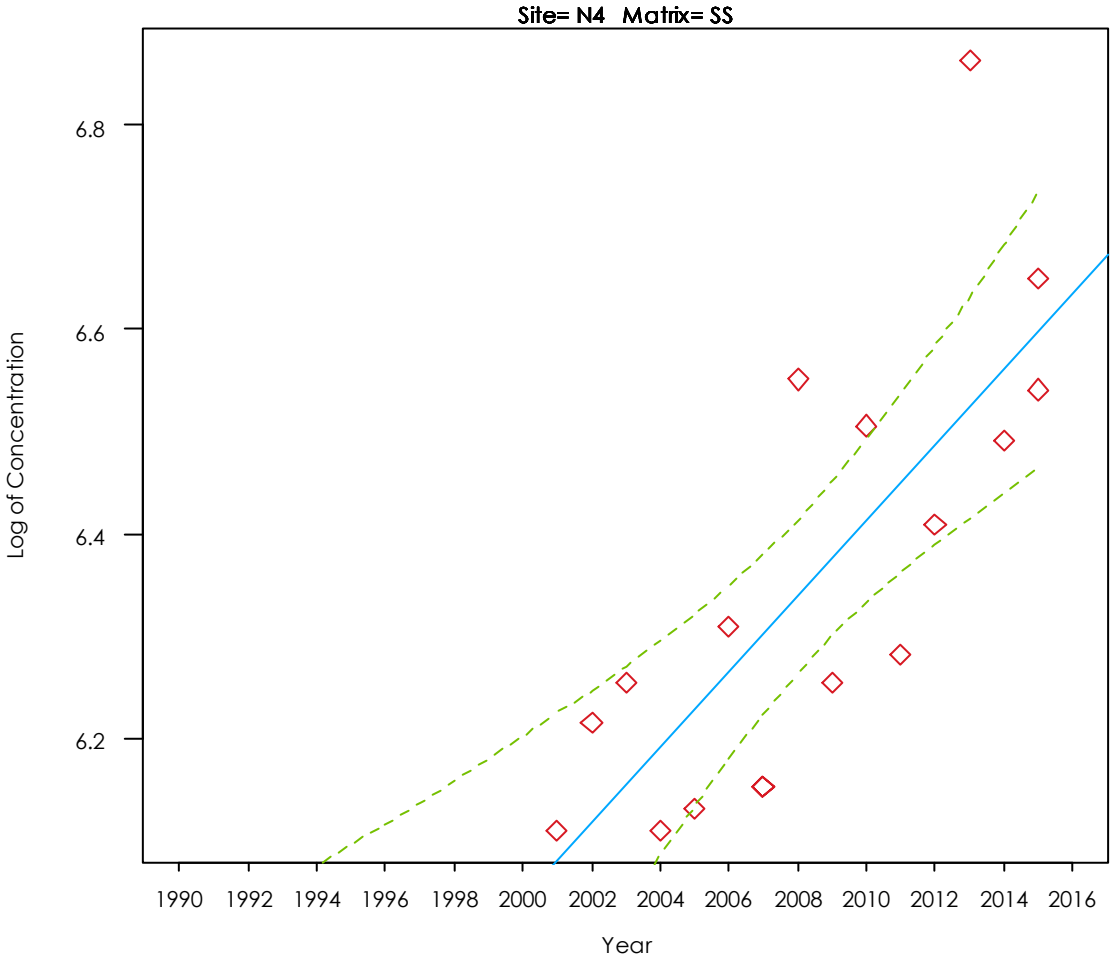
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -68.1336 + 0.0371 * Year

Log base e (natural logarithm)

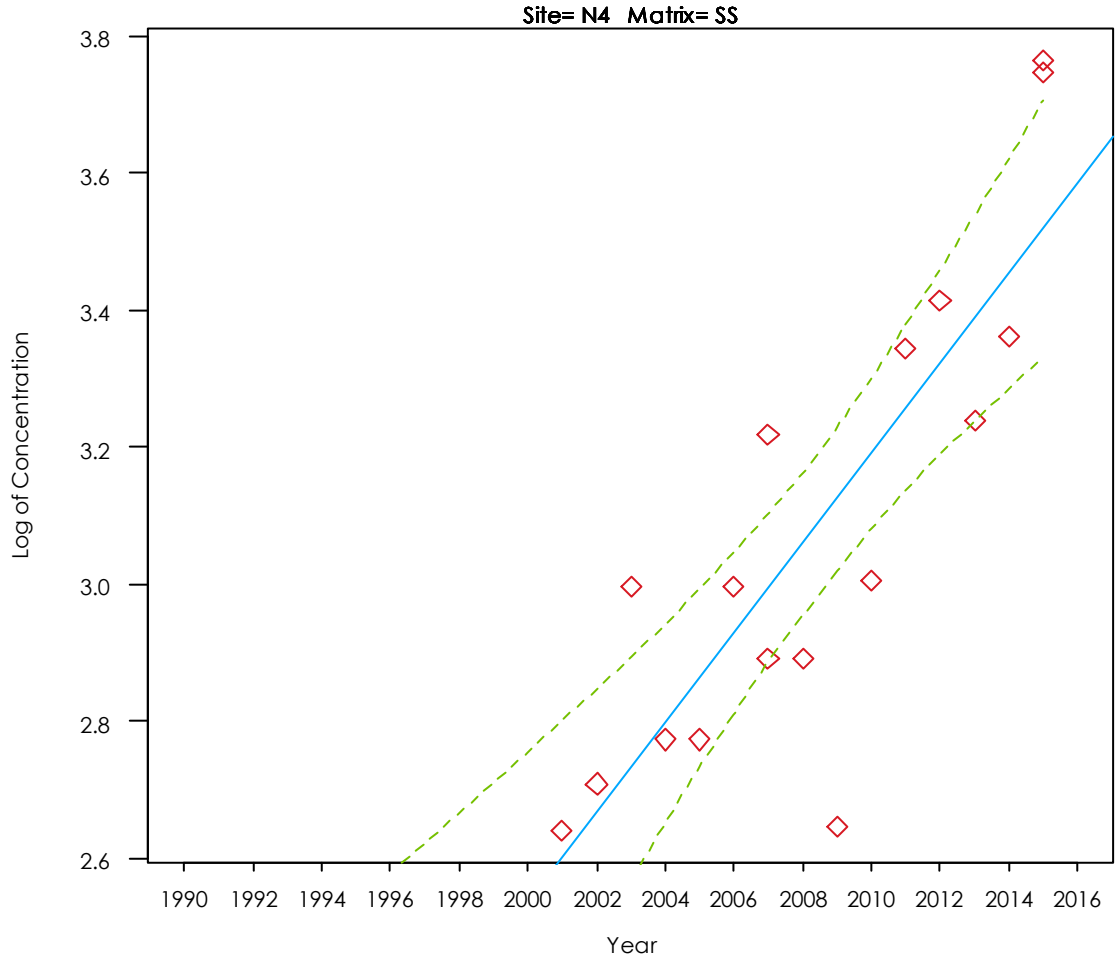
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Strontium



Regression Equation: LogConcentration = -129.1336 + 0.0658 * Year

Log base e (natural logarithm)

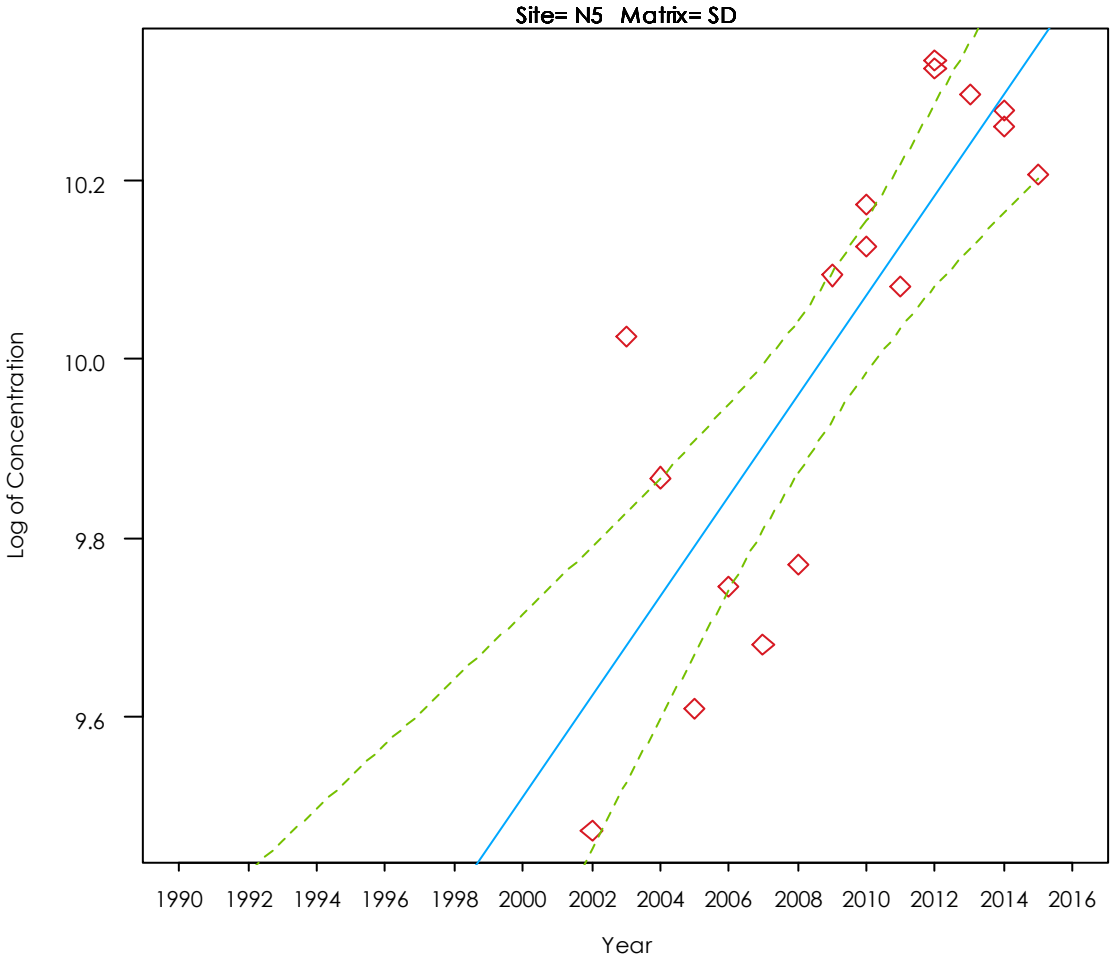
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -102.7585 + 0.0561 * Year

Log base e (natural logarithm)

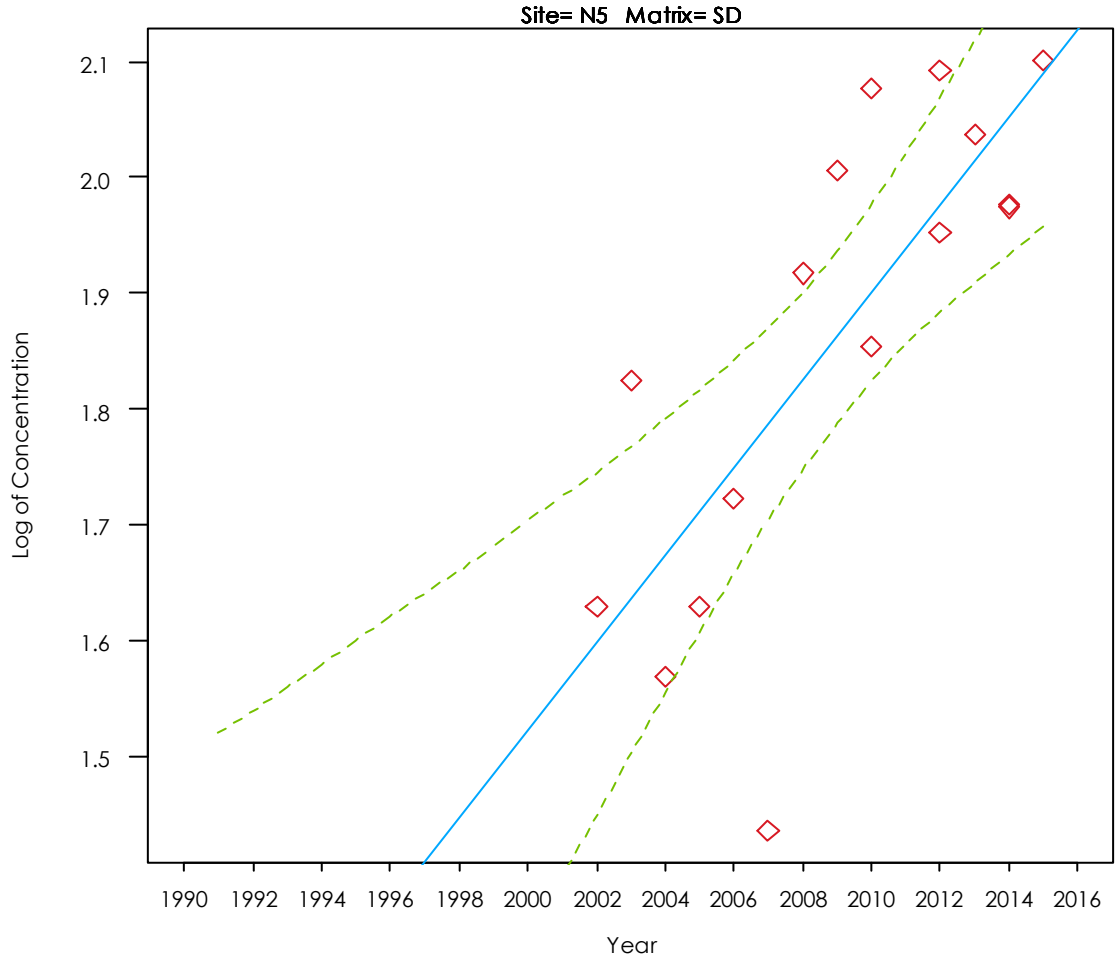
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: LogConcentration = -74.1382 + 0.0378 * Year

Log base e (natural logarithm)

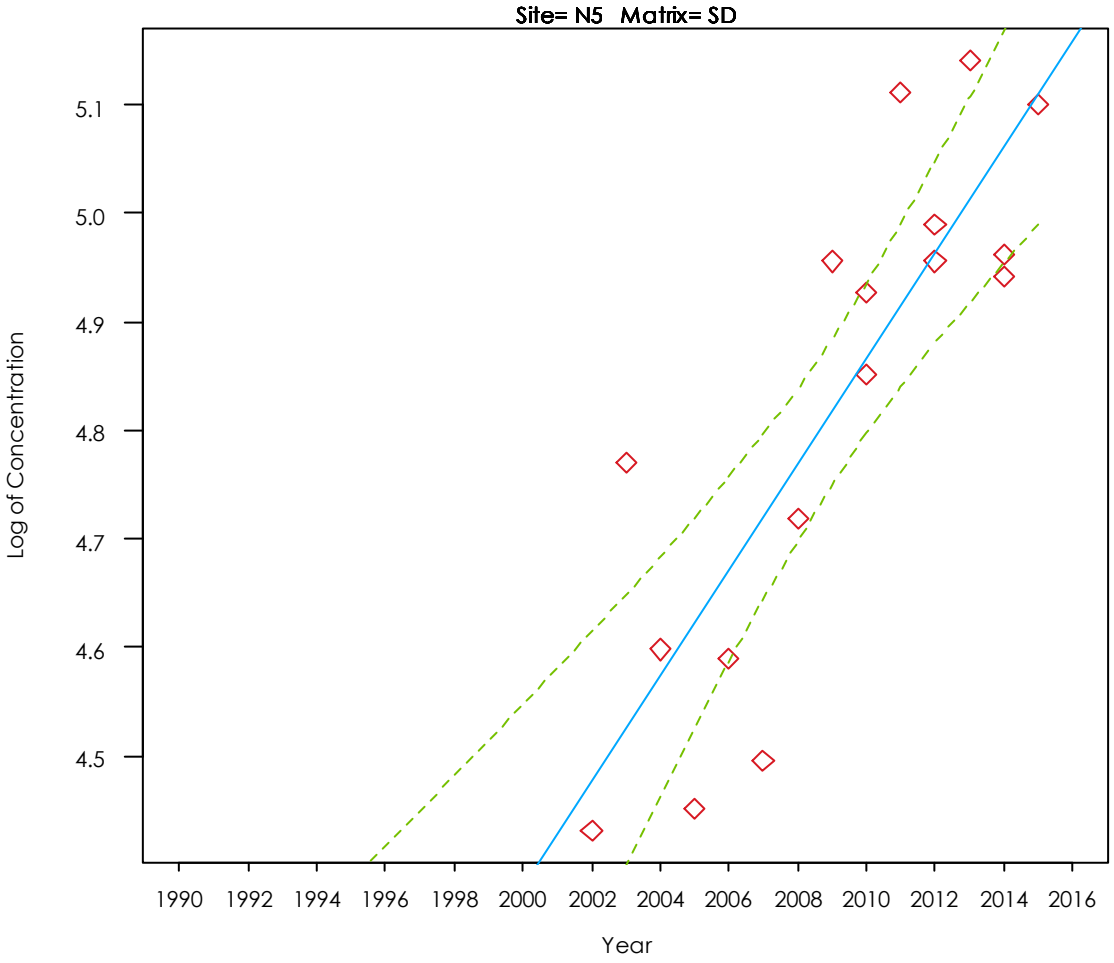
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -93.1955 + 0.0488 * Year

Log base e (natural logarithm)

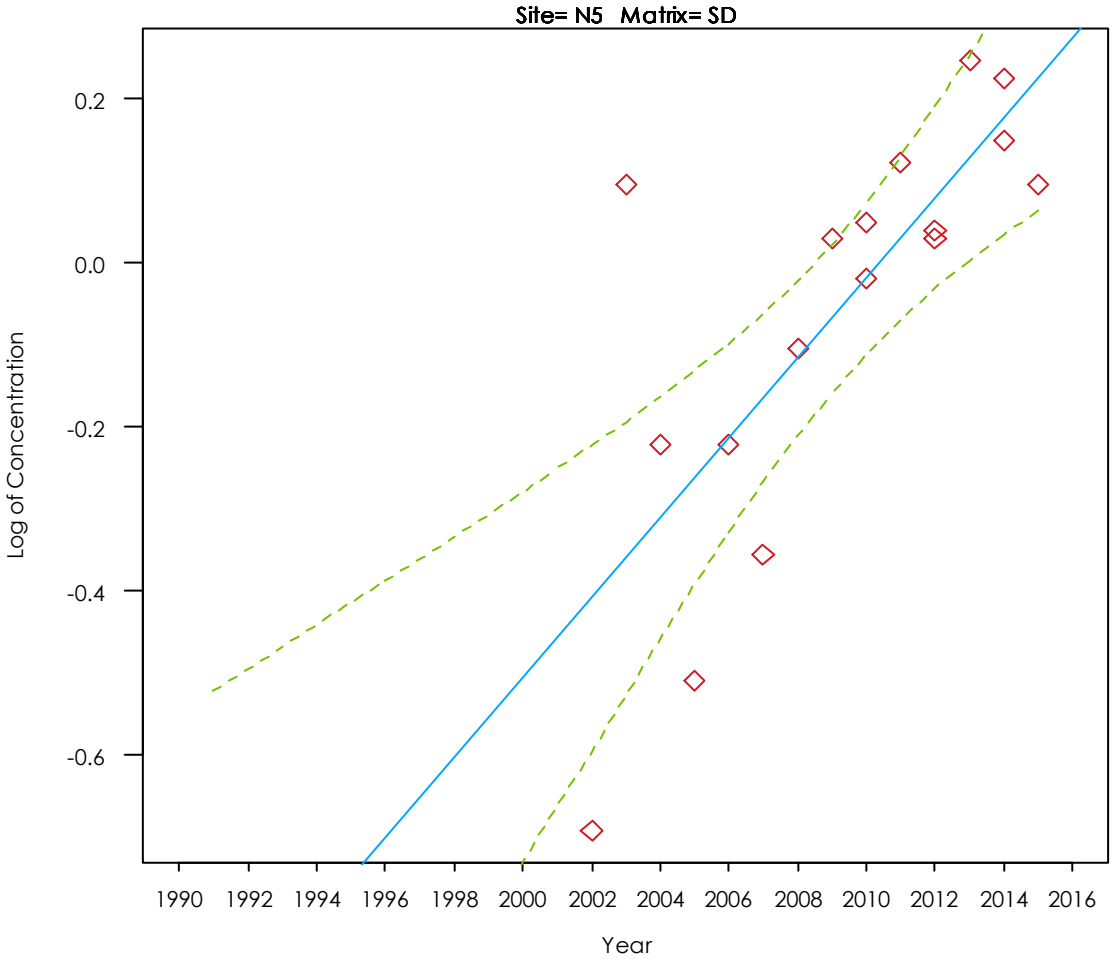
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Beryllium



Regression Equation: LogConcentration = -97.9445 + 0.0487 * Year

Log base e (natural logarithm)

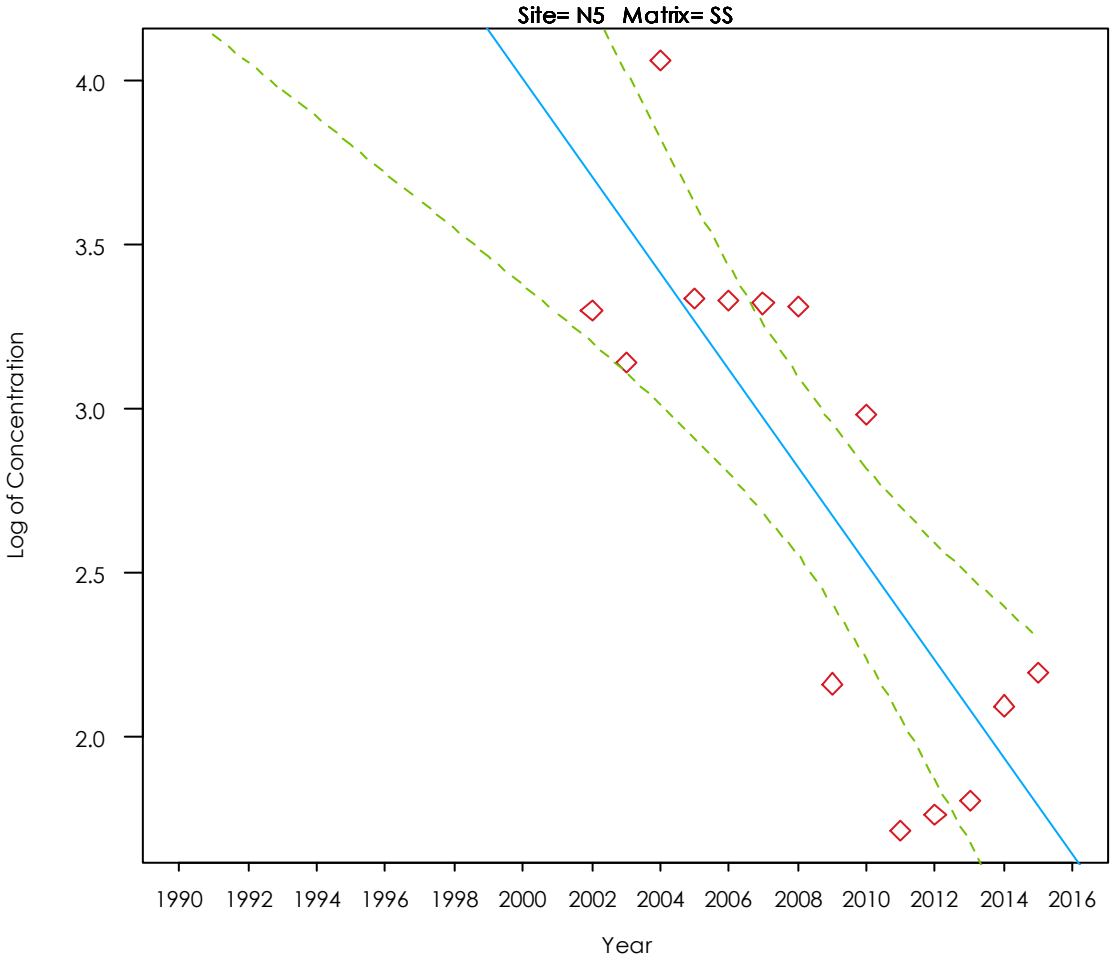
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chloride



Regression Equation: LogConcentration = 300.1843 + -0.1481 * Year

Log base e (natural logarithm)

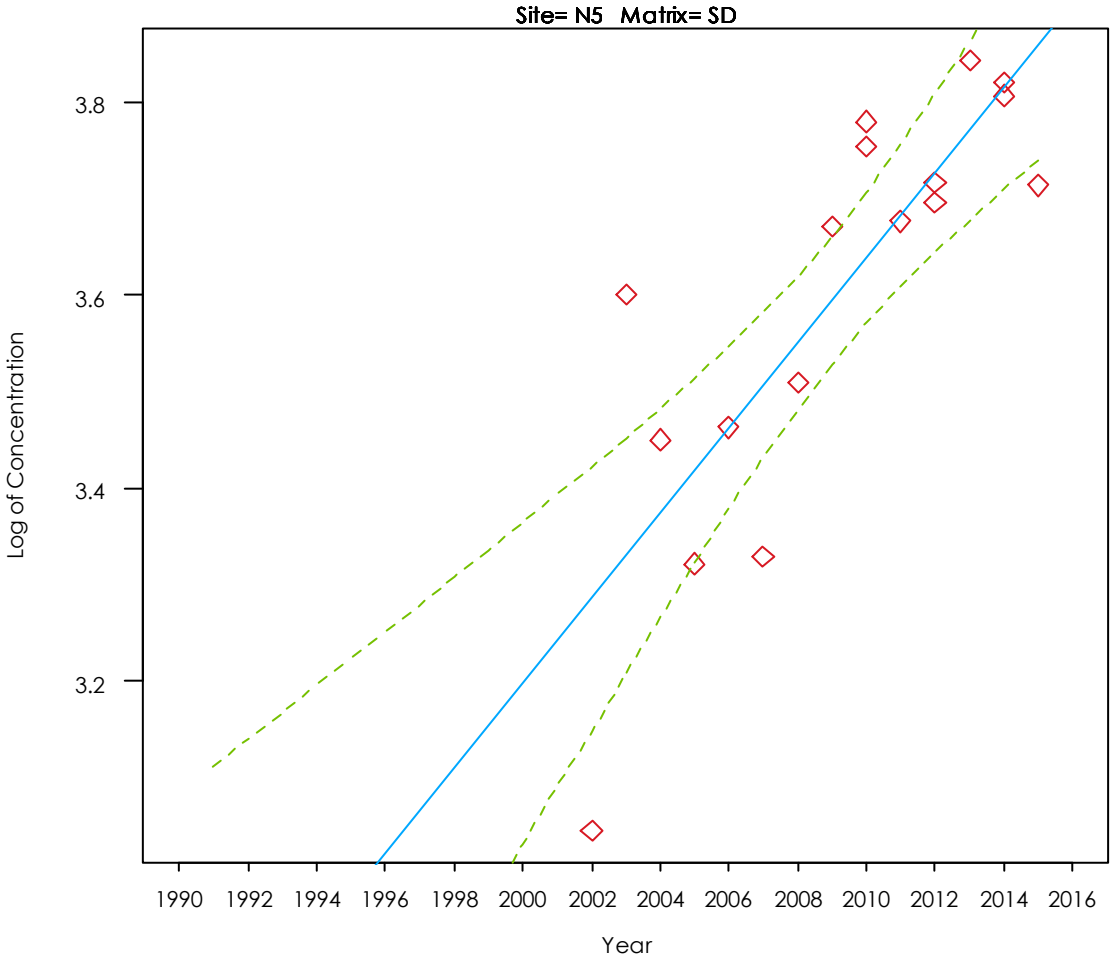
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -84.9427 + 0.0441 * Year

Log base e (natural logarithm)

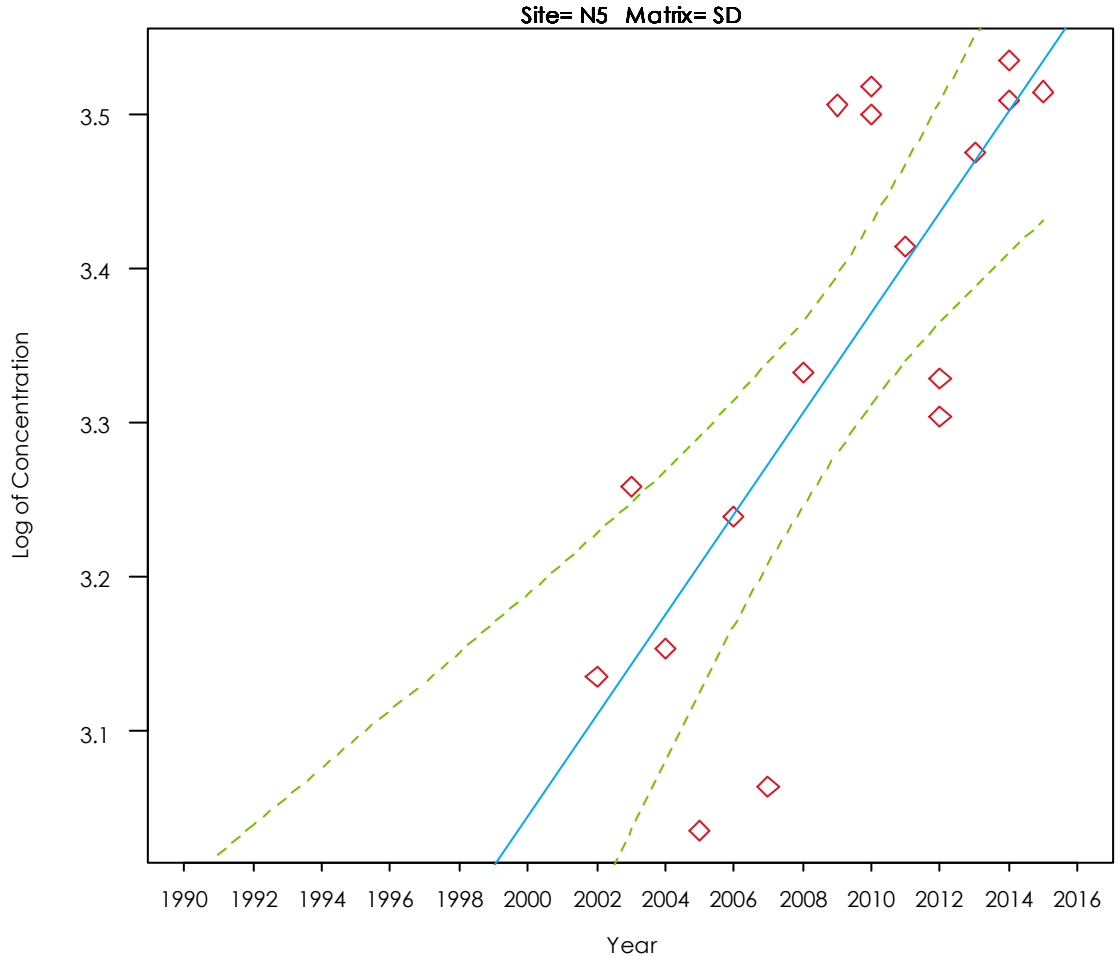
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = -62.3324 + 0.0327 * Year

Log base e (natural logarithm)

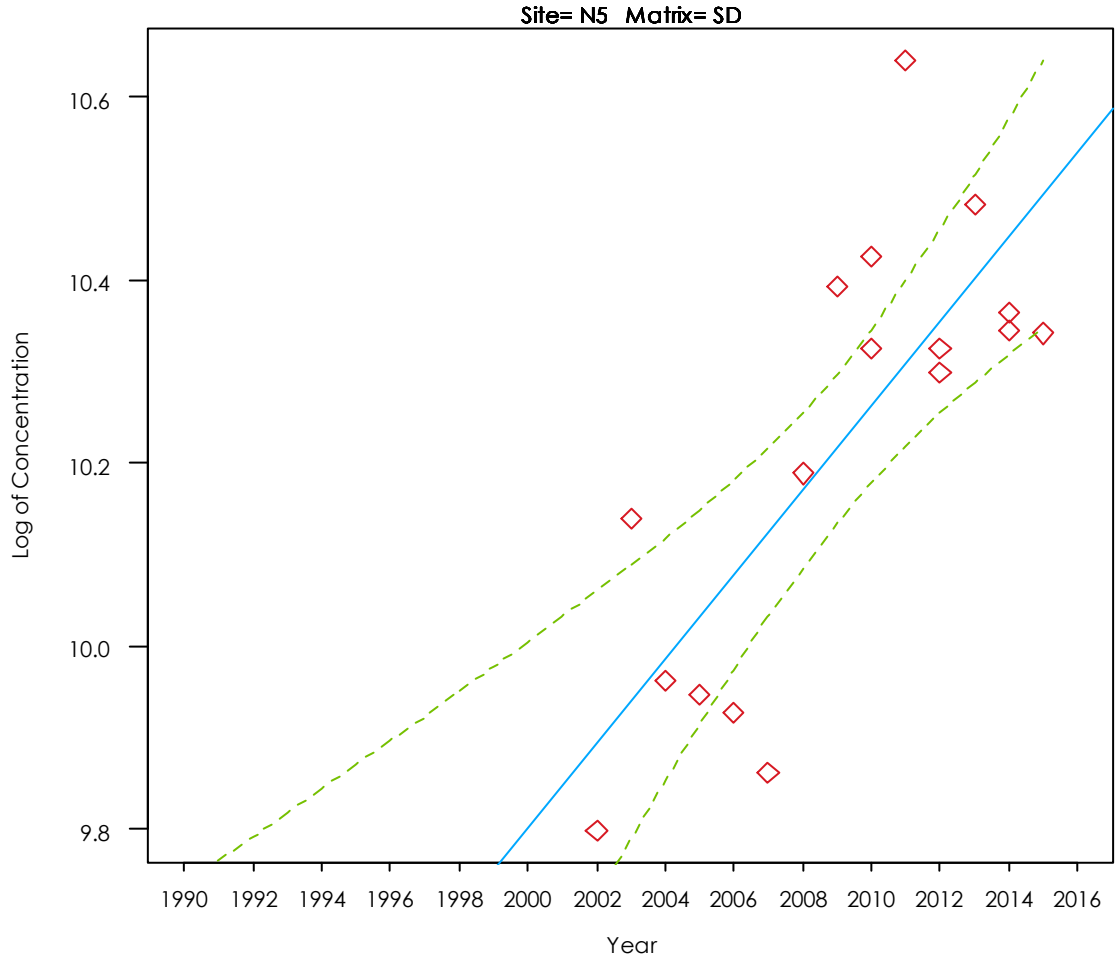
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Iron



Regression Equation: LogConcentration = -82.5645 + 0.0462 * Year

Log base e (natural logarithm)

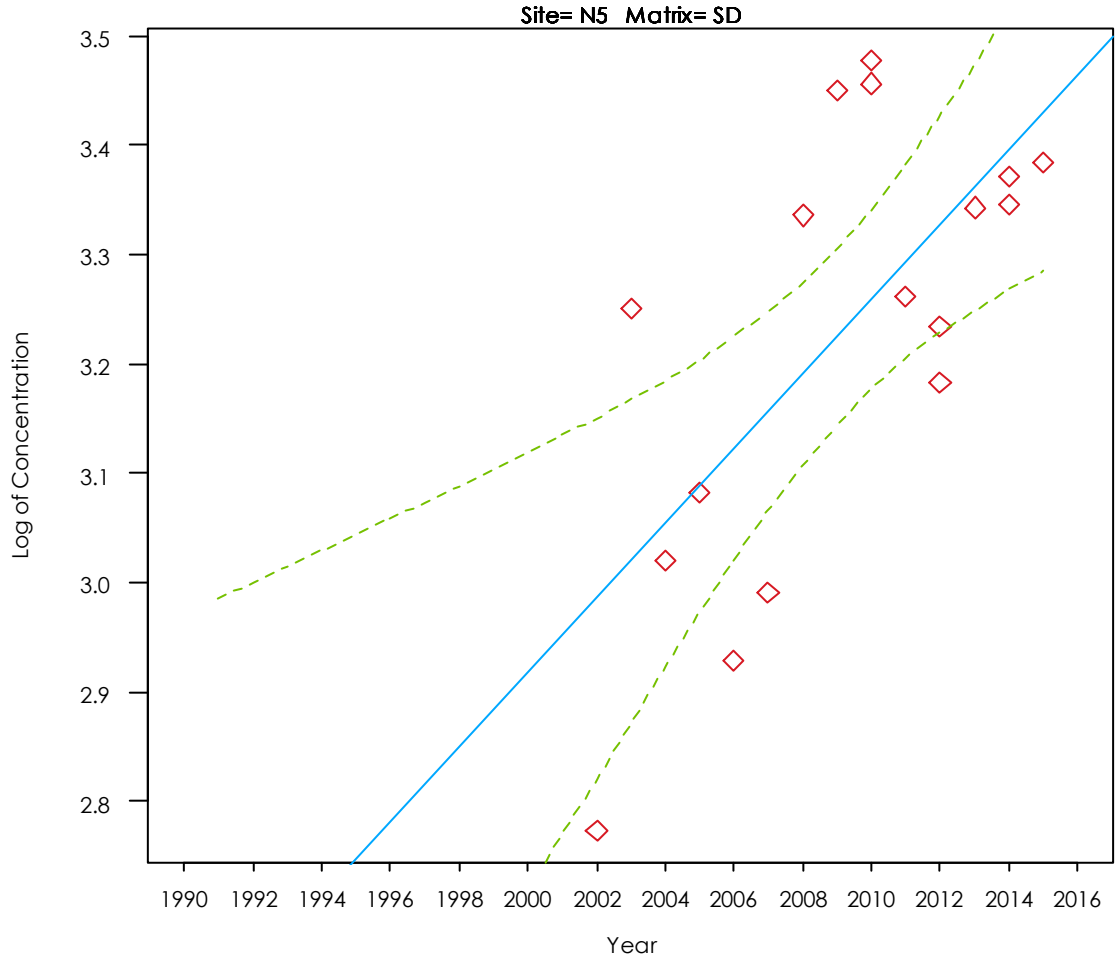
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Lead



Regression Equation: LogConcentration = -65.3559 + 0.0341 * Year

Log base e (natural logarithm)

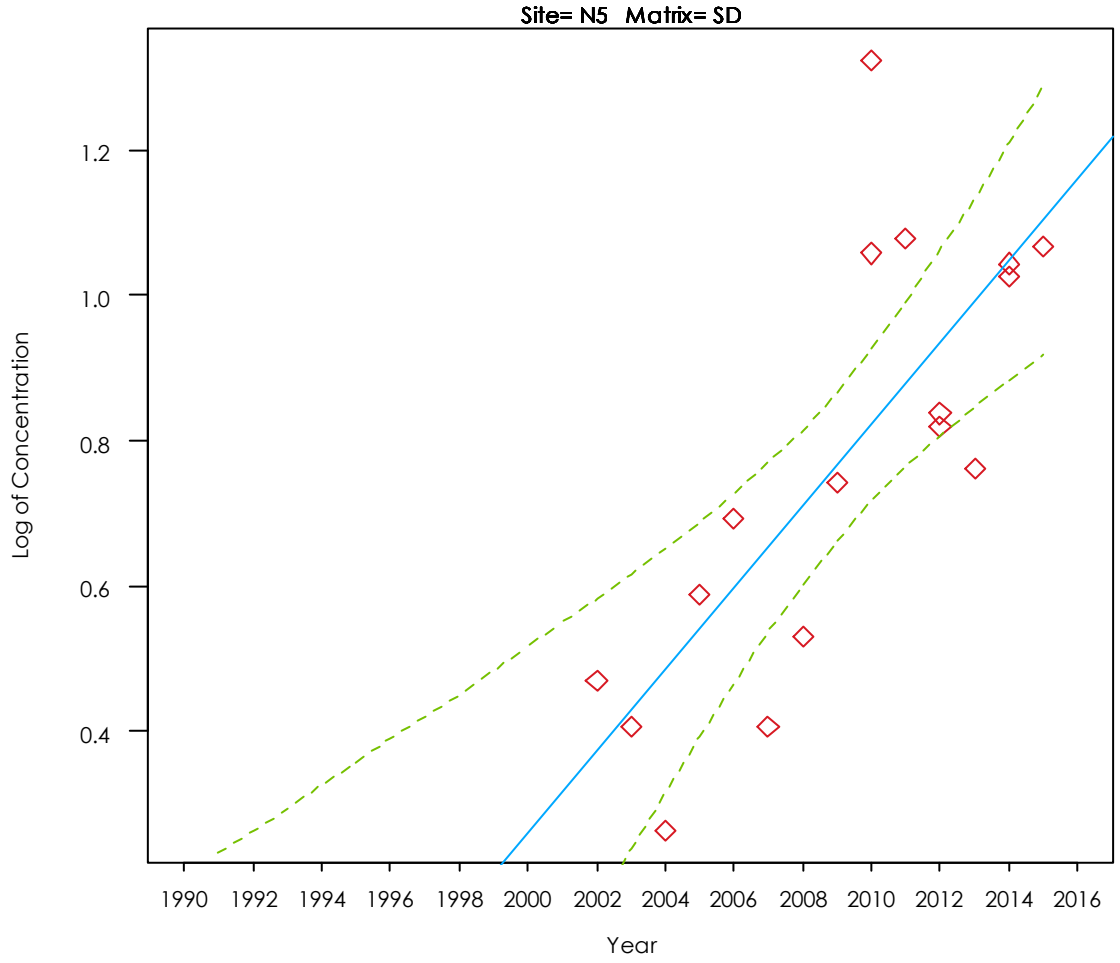
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Molybdenum



Regression Equation: LogConcentration = -112.3375 + 0.0563 * Year

Log base e (natural logarithm)

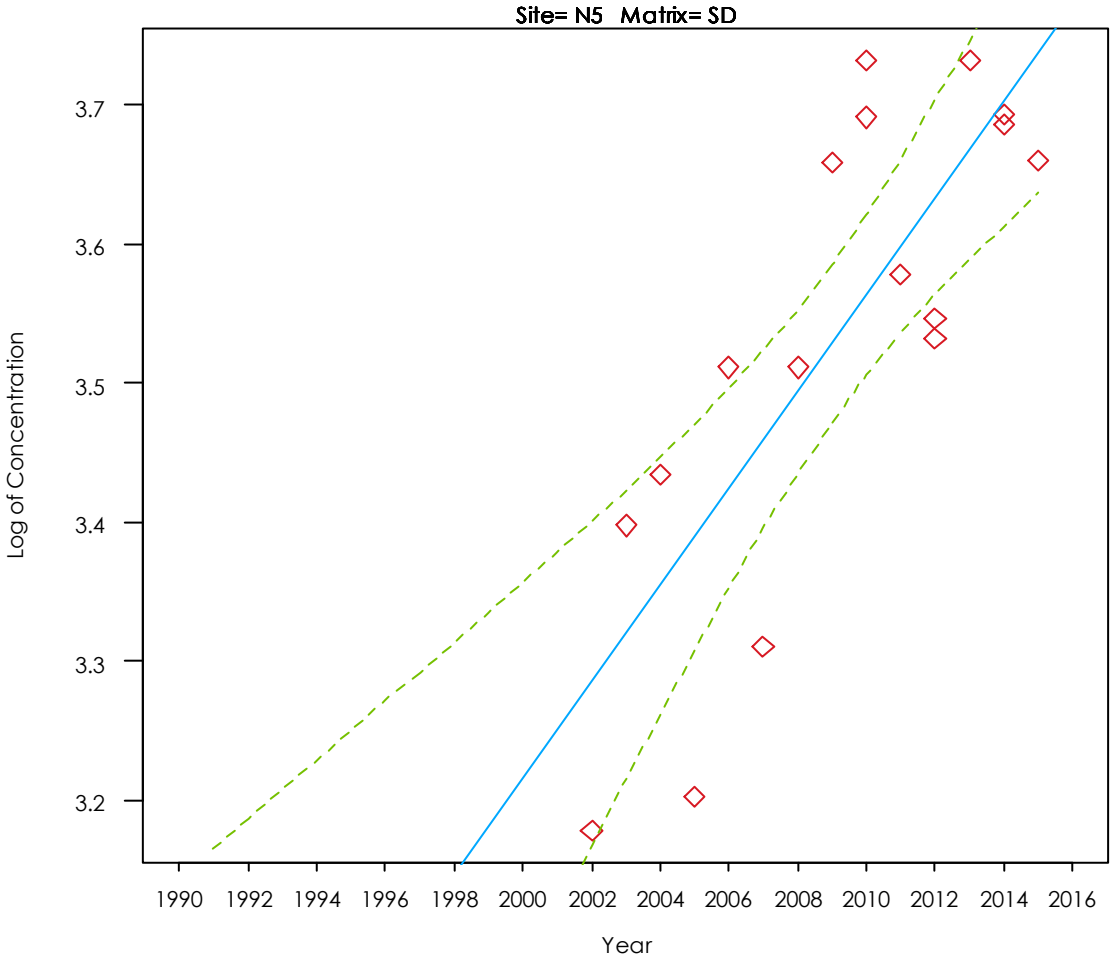
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Nickel



Regression Equation: LogConcentration = -66.5327 + 0.0349 * Year

Log base e (natural logarithm)

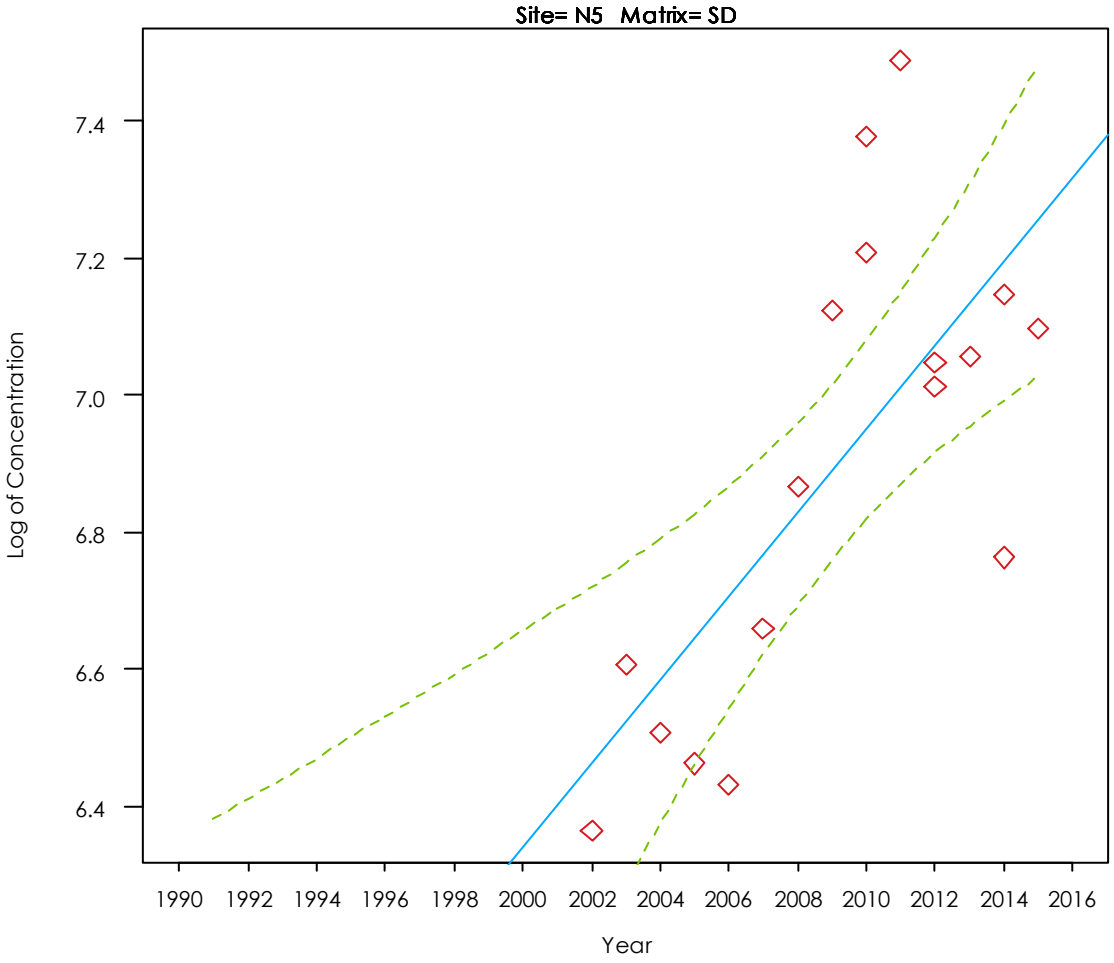
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -116.168 + 0.0613 * Year

Log base e (natural logarithm)

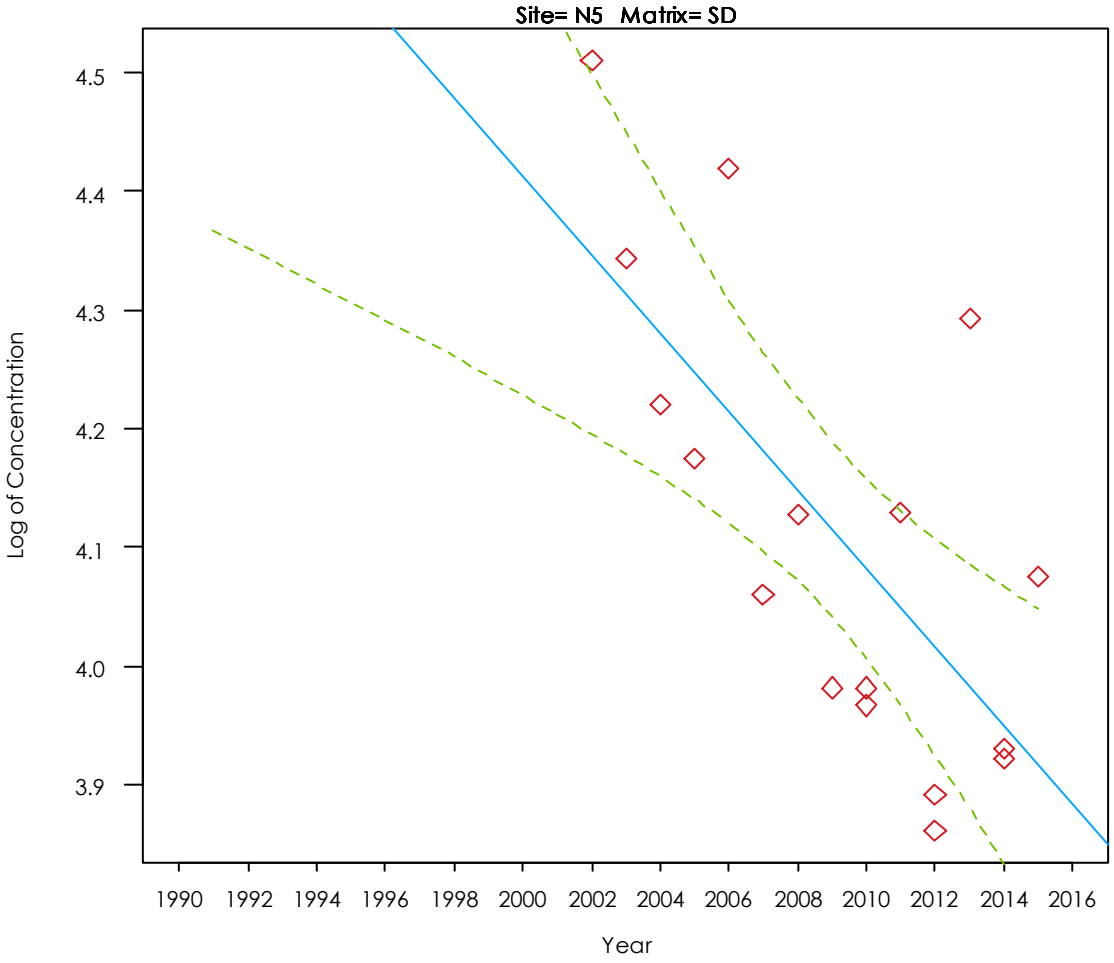
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Strontium



Regression Equation: LogConcentration = 70.7143 + -0.0332 * Year

Log base e (natural logarithm)

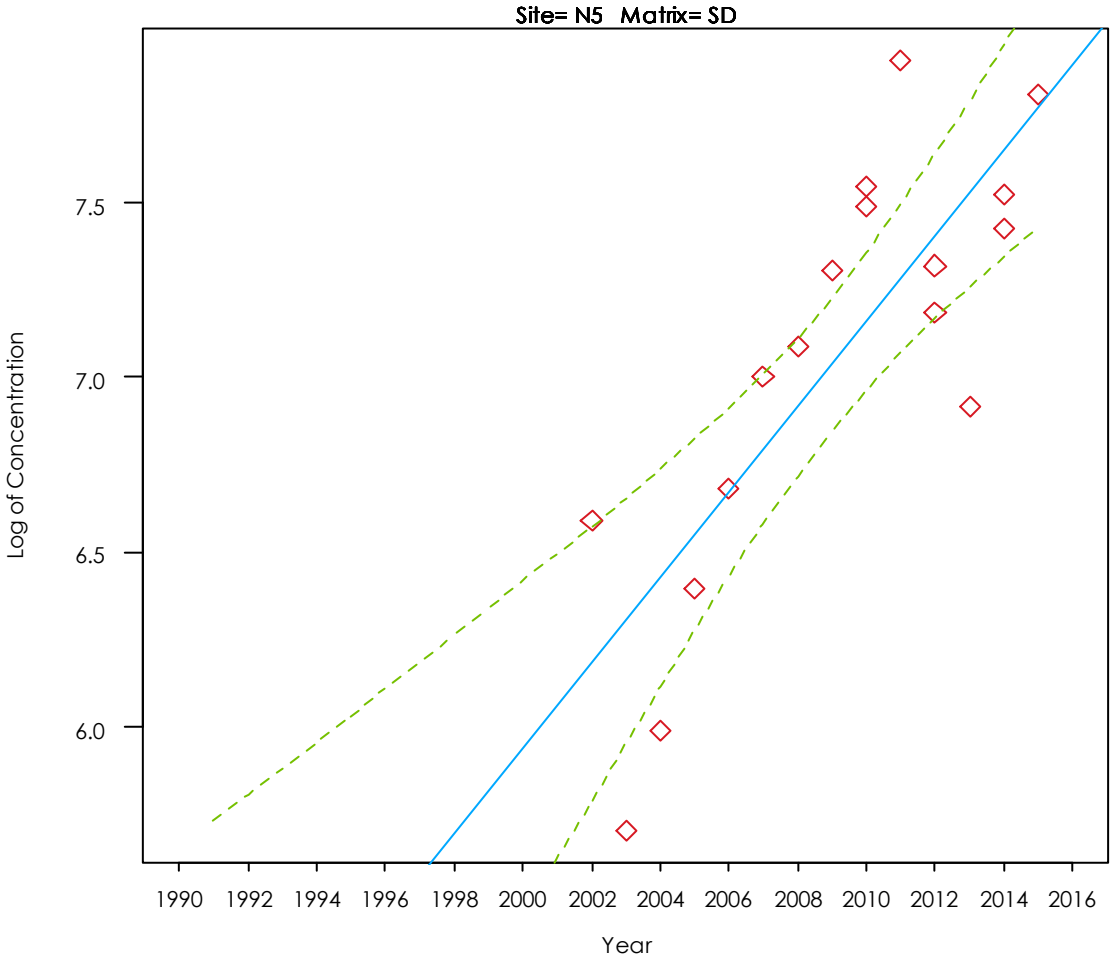
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Sulfur



Regression Equation: LogConcentration = -238.3261 + 0.1221 * Year

Log base e (natural logarithm)

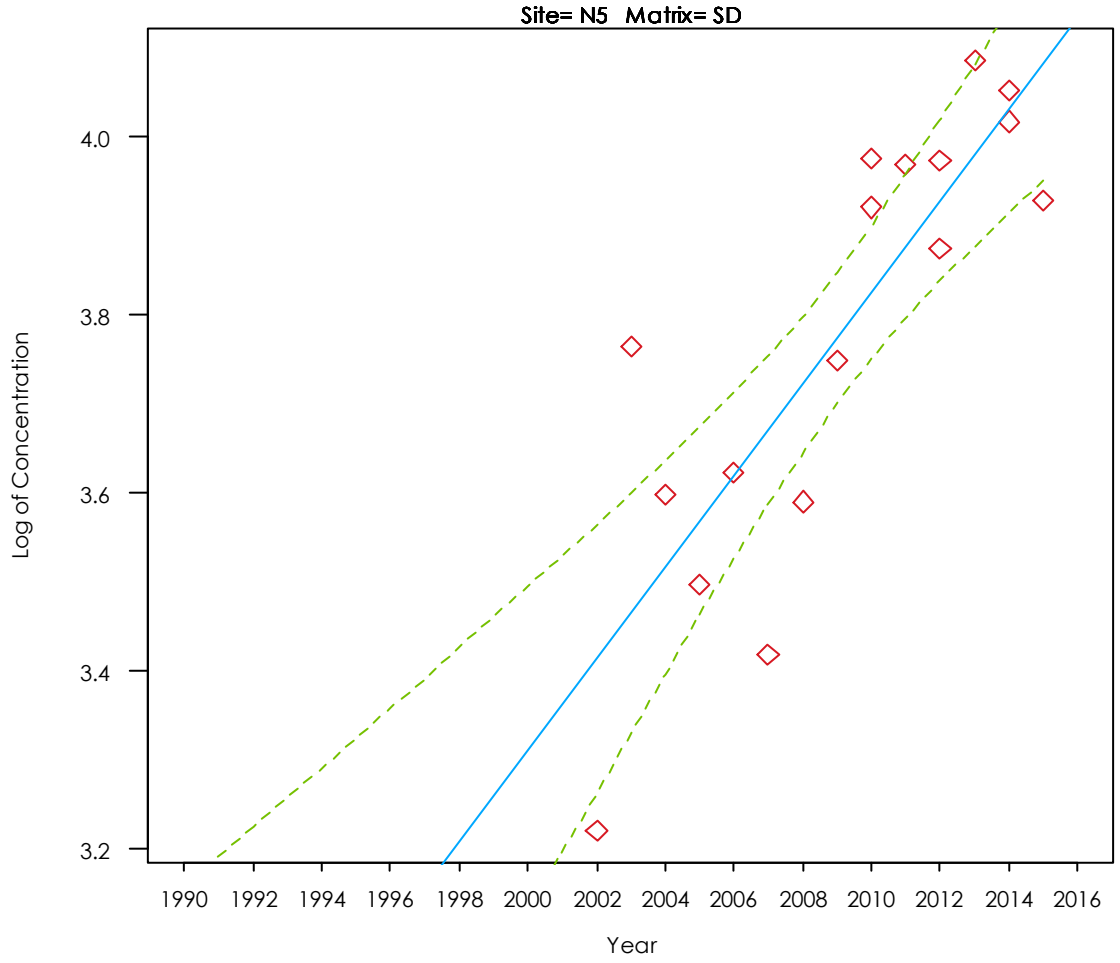
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Vanadium



Regression Equation: LogConcentration = -99.6848 + 0.0515 * Year

Log base e (natural logarithm)

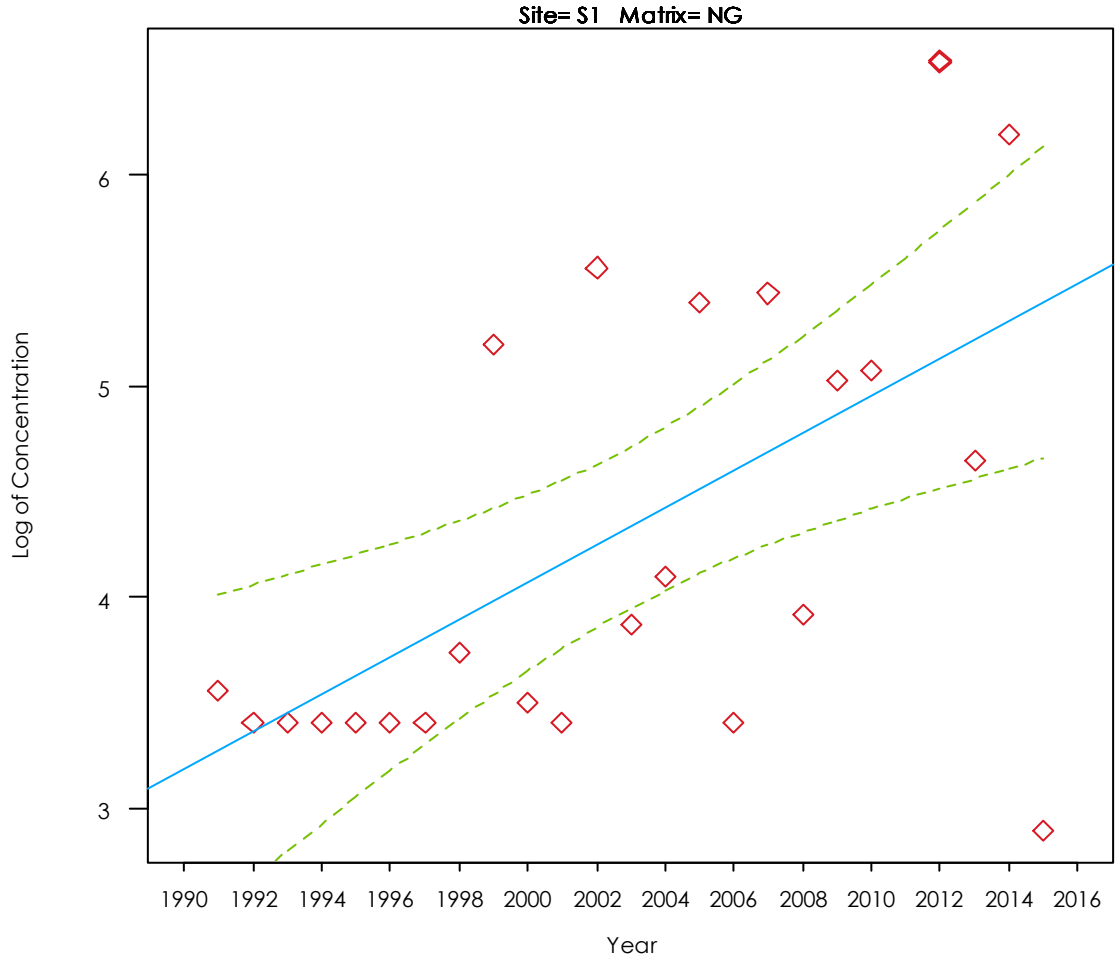
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -172.4979 + 0.0883 * Year

Log base e (natural logarithm)

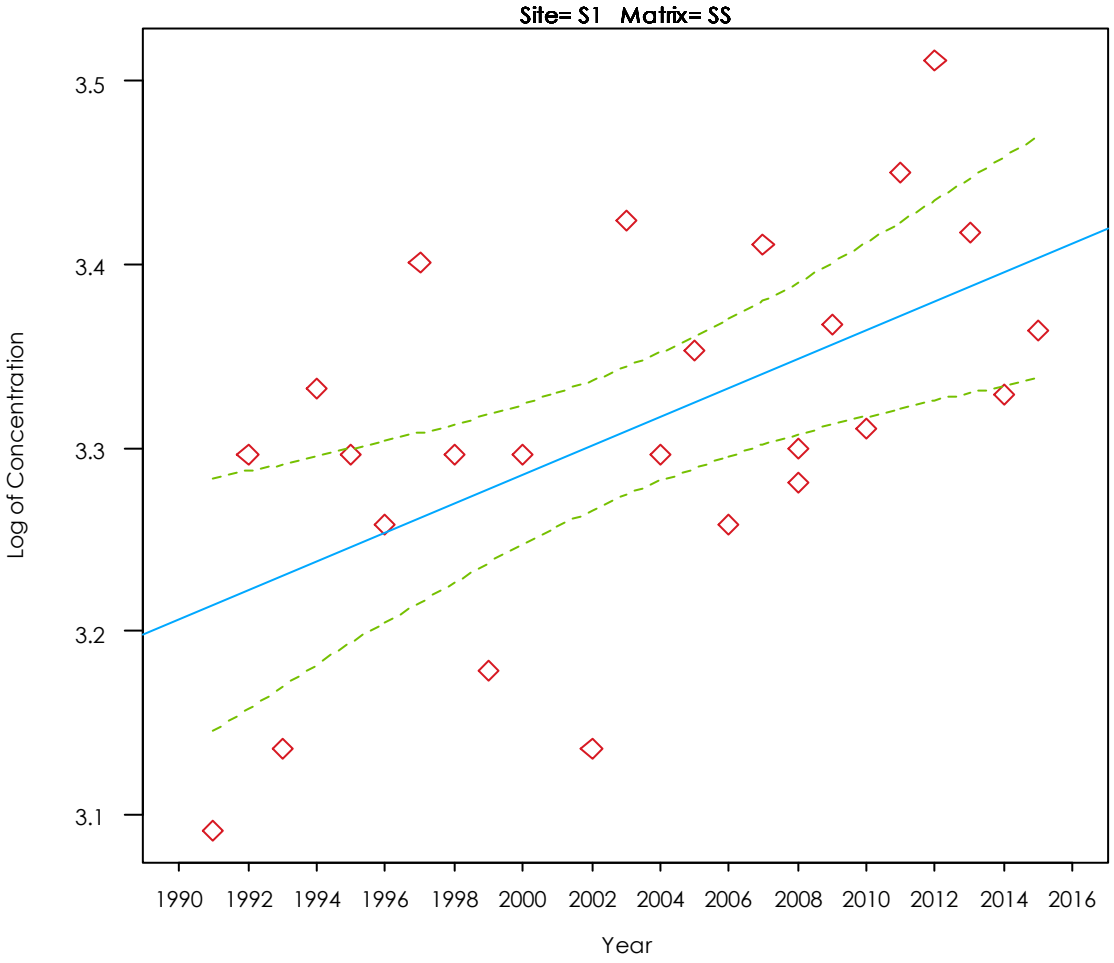
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -12.4779 + 0.0079 * Year

Log base e (natural logarithm)

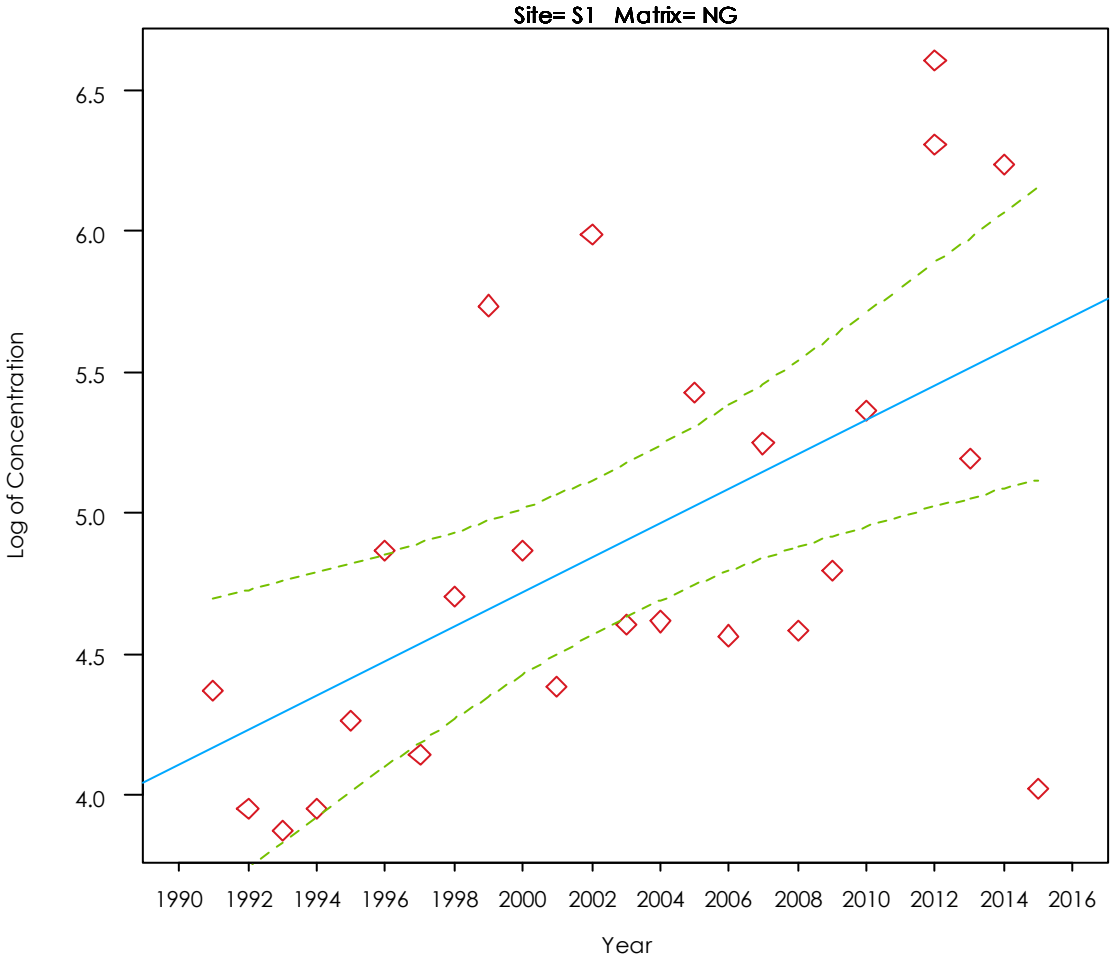
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Iron



Regression Equation: LogConcentration = -117.5698 + 0.0611 * Year

Log base e (natural logarithm)

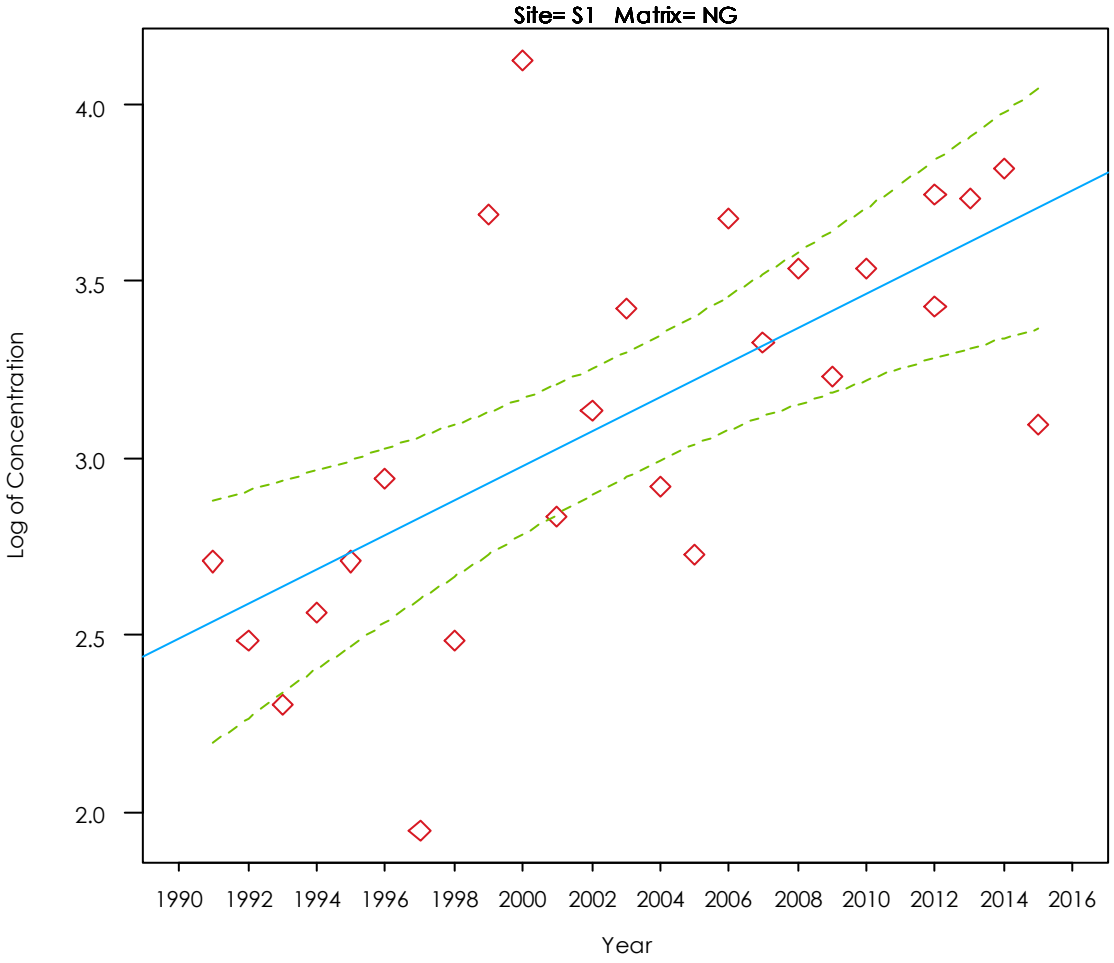
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Manganese



Regression Equation: LogConcentration = -94.5253 + 0.0488 * Year

Log base e (natural logarithm)

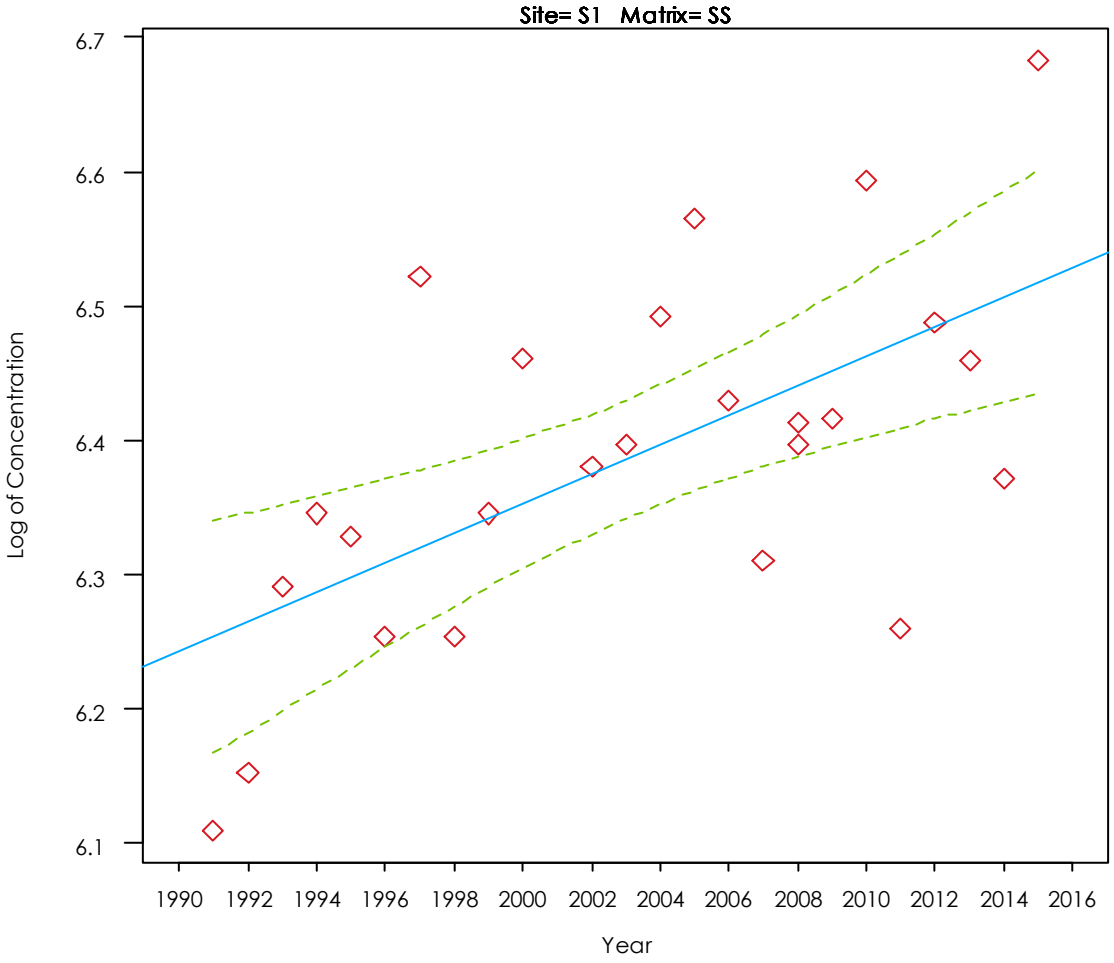
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -15.6632 + 0.011 * Year

Log base e (natural logarithm)

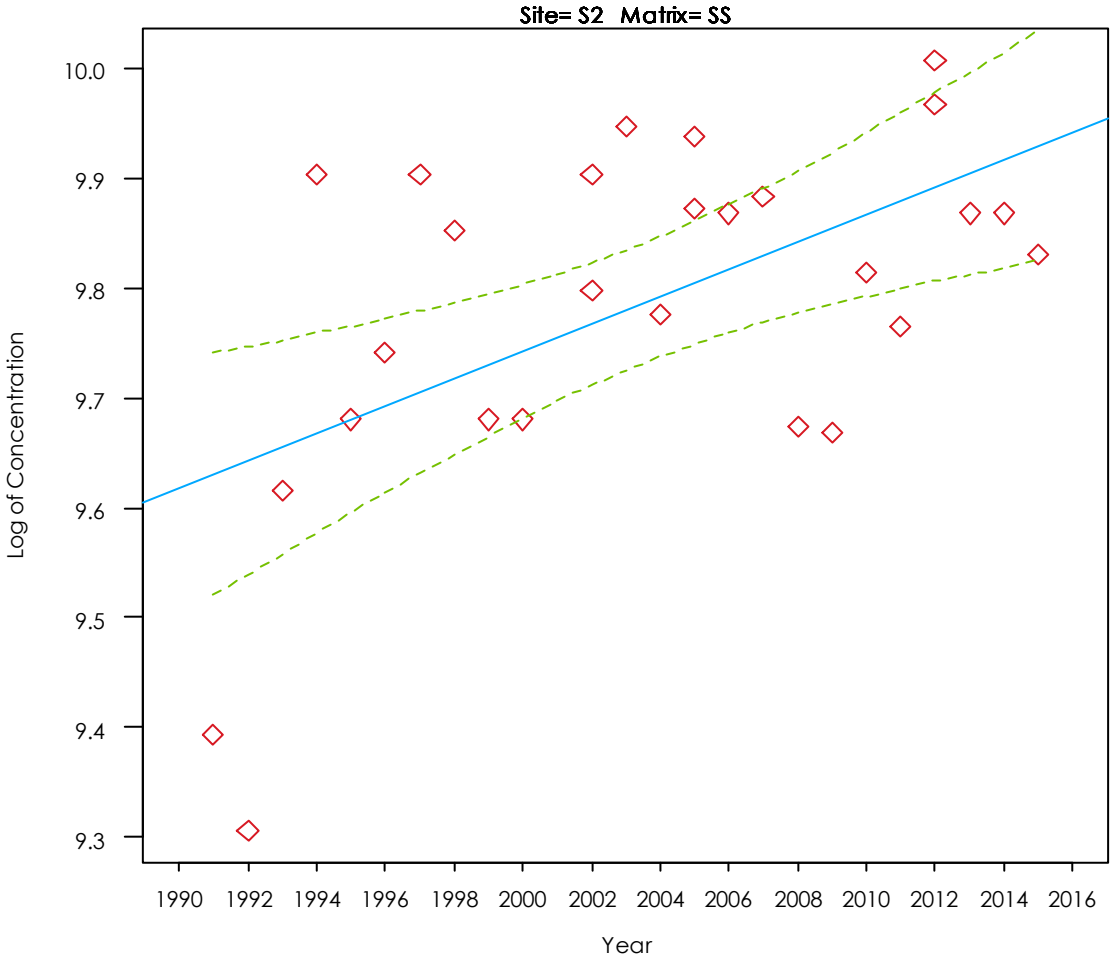
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -15.143 + 0.0124 * Year

Log base e (natural logarithm)

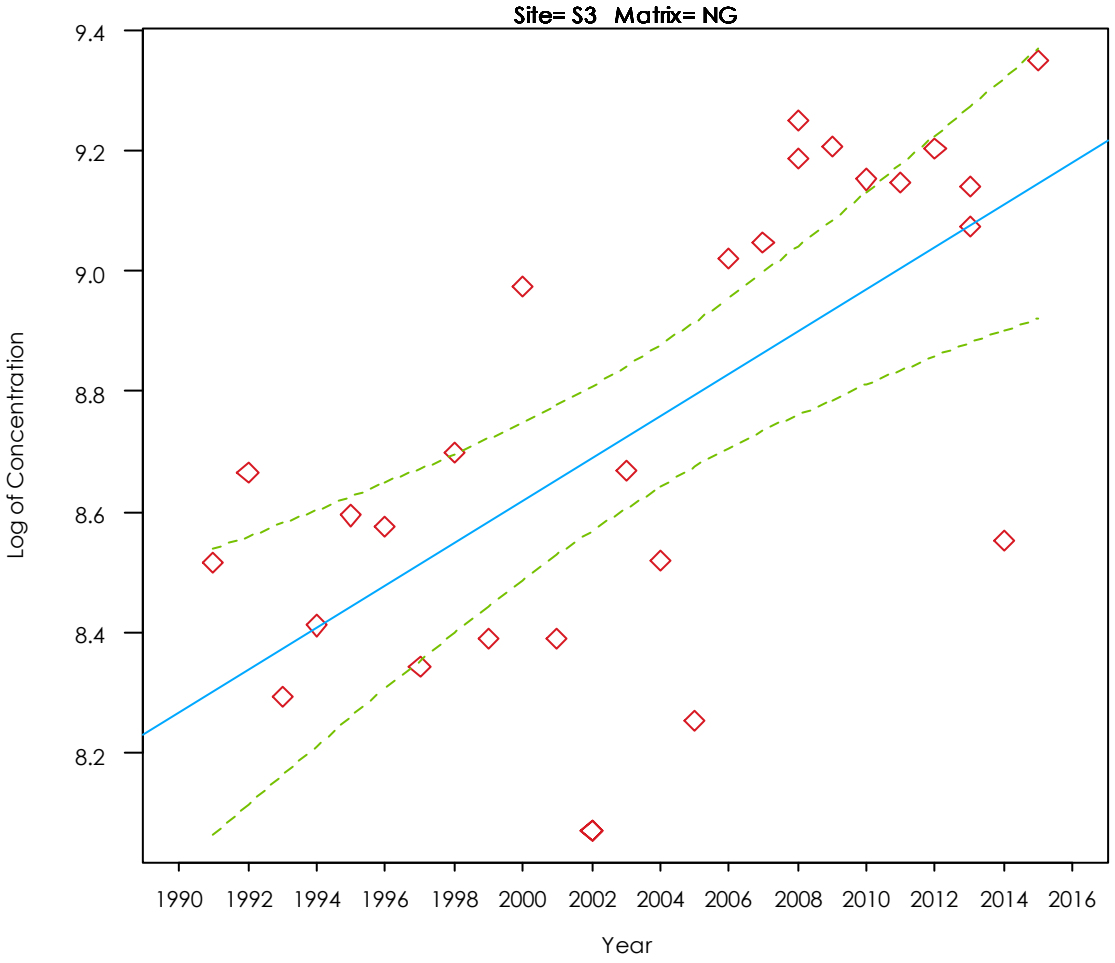
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Calcium



Regression Equation: LogConcentration = -61.6759 + 0.0351 * Year

Log base e (natural logarithm)

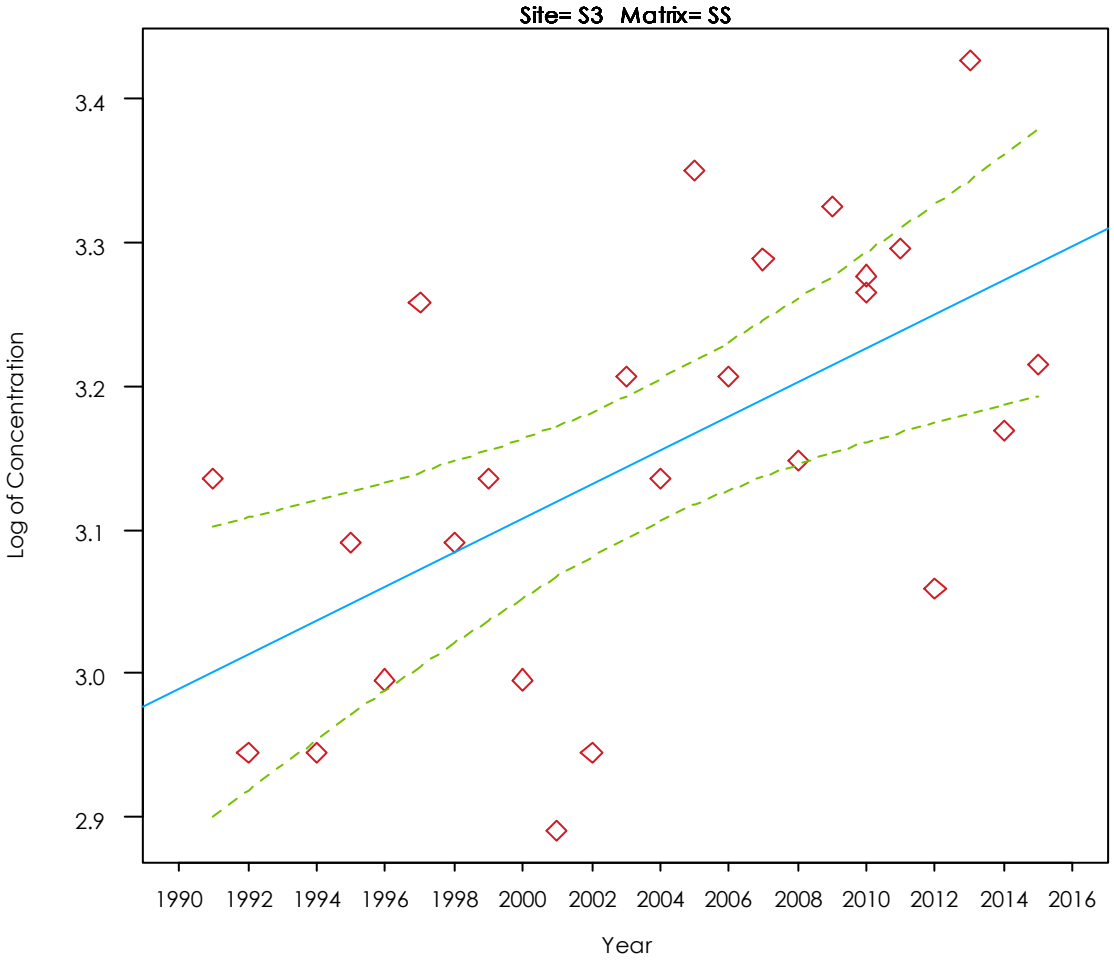
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -20.5926 + 0.0119 * Year

Log base e (natural logarithm)

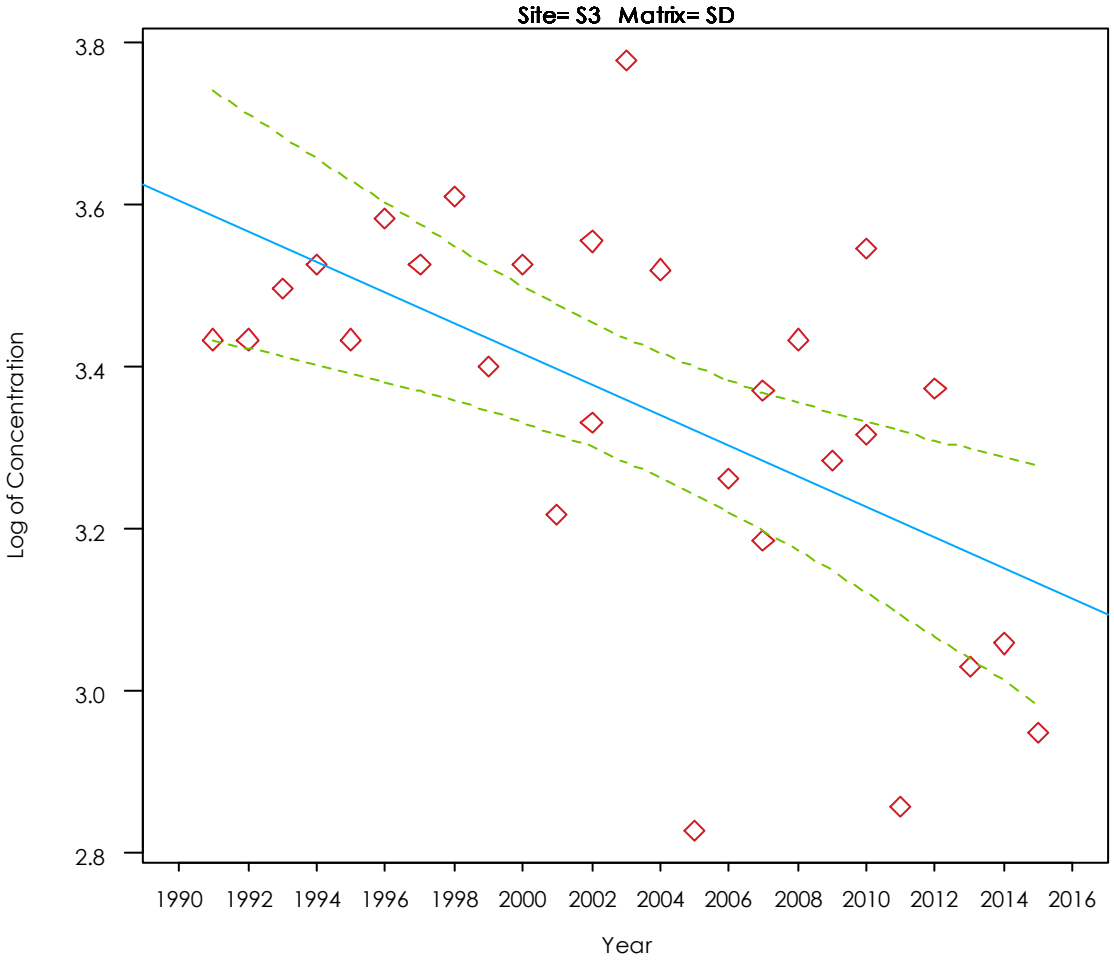
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = 41.3028 + -0.0189 * Year

Log base e (natural logarithm)

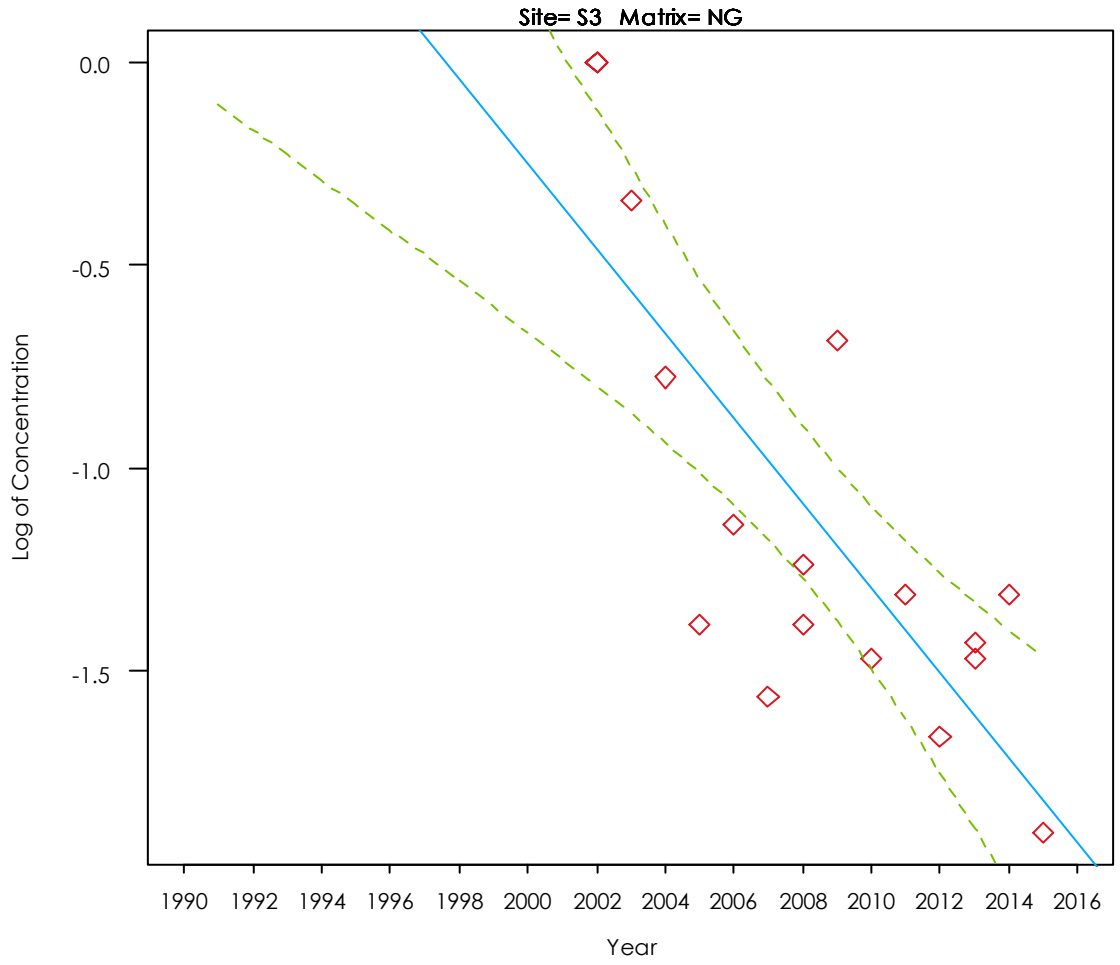
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Lead



Regression Equation: LogConcentration = 208.6174 + -0.1044 * Year

Log base e (natural logarithm)

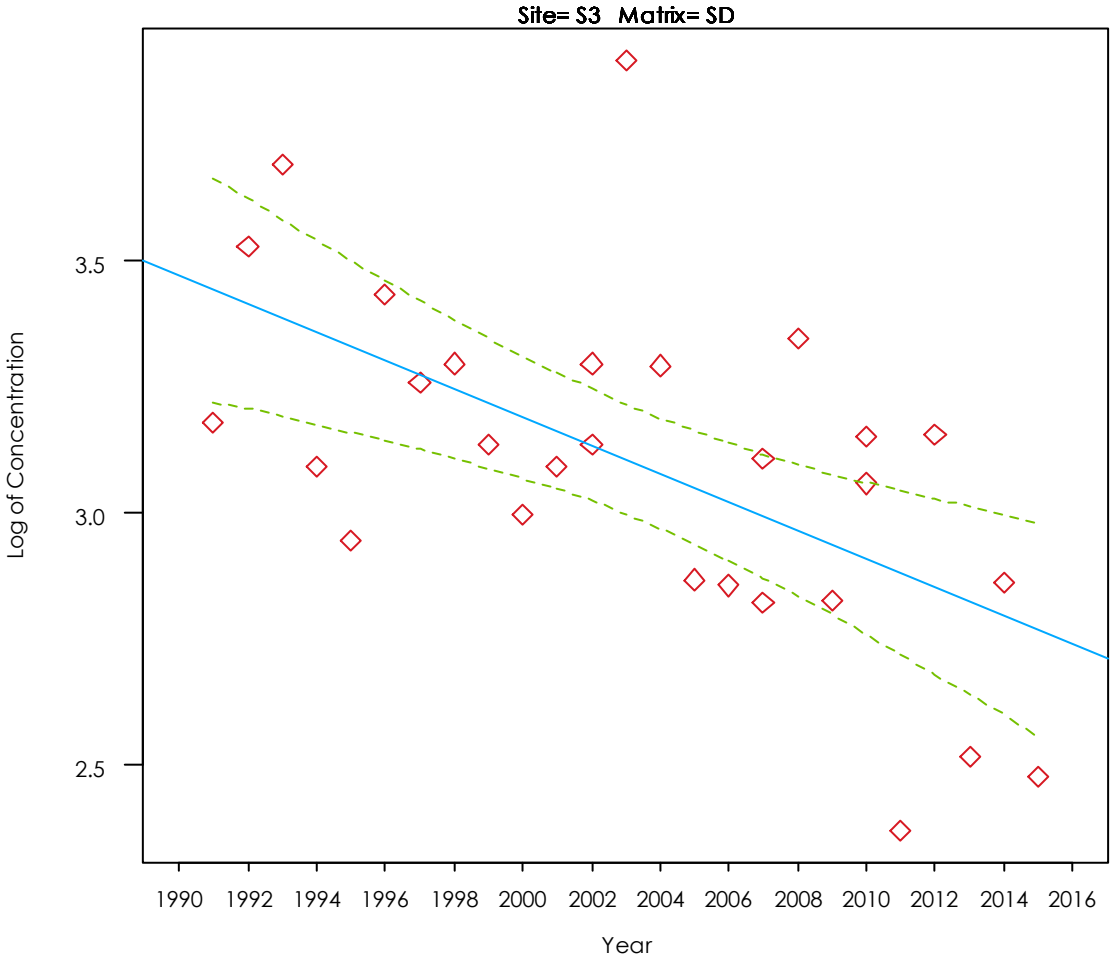
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Lead



Regression Equation: LogConcentration = 59.1303 + -0.028 * Year

Log base e (natural logarithm)

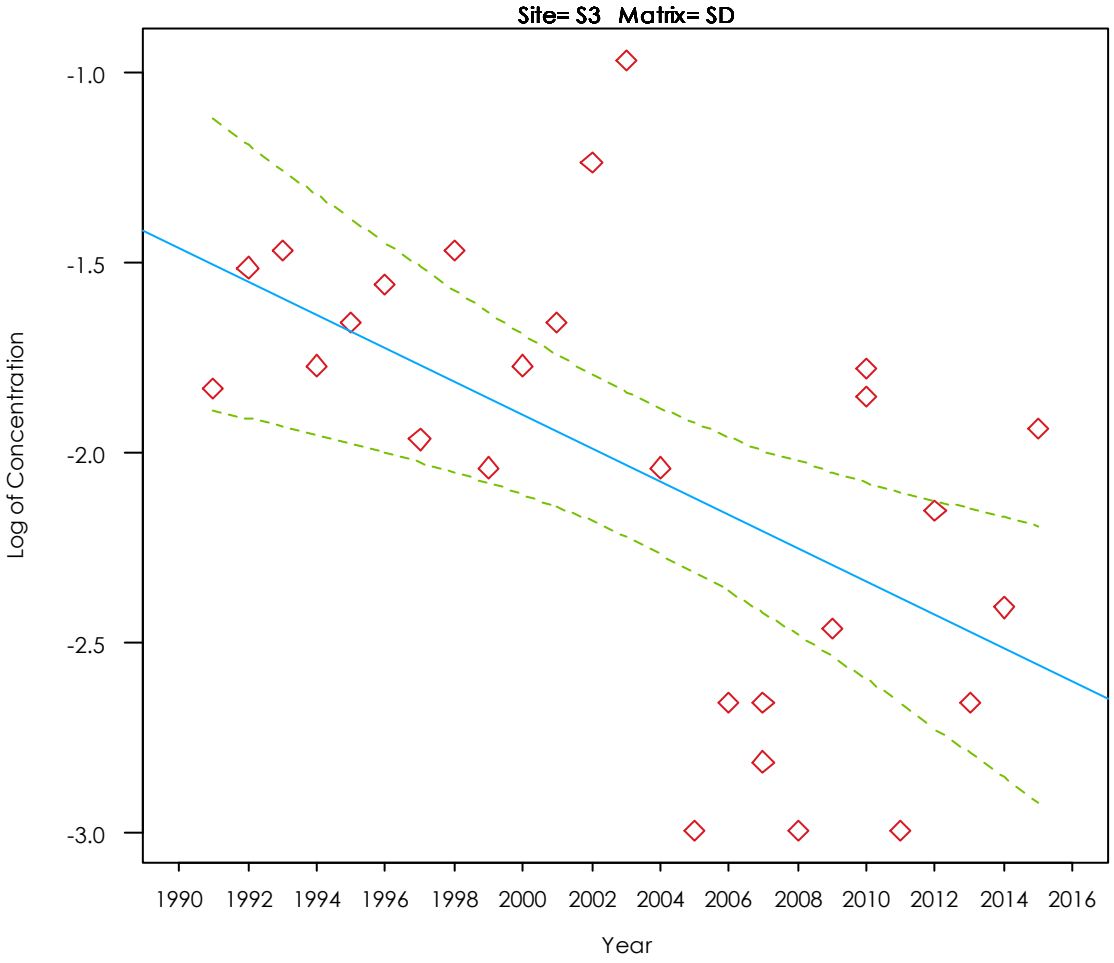
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Mercury



Regression Equation: LogConcentration = 85.6201 + -0.0438 * Year

Log base e (natural logarithm)

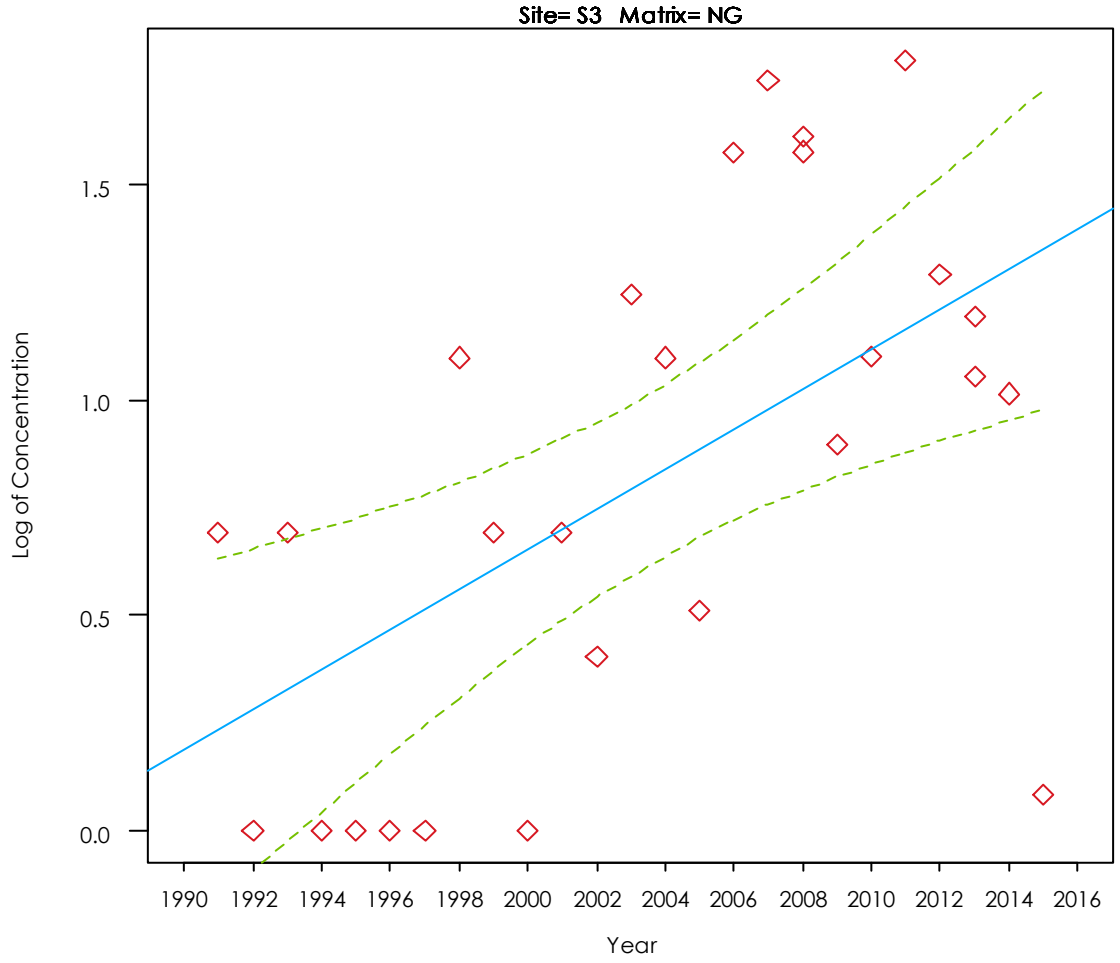
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Molybdenum



Regression Equation: LogConcentration = -92.3949 + 0.0465 * Year

Log base e (natural logarithm)

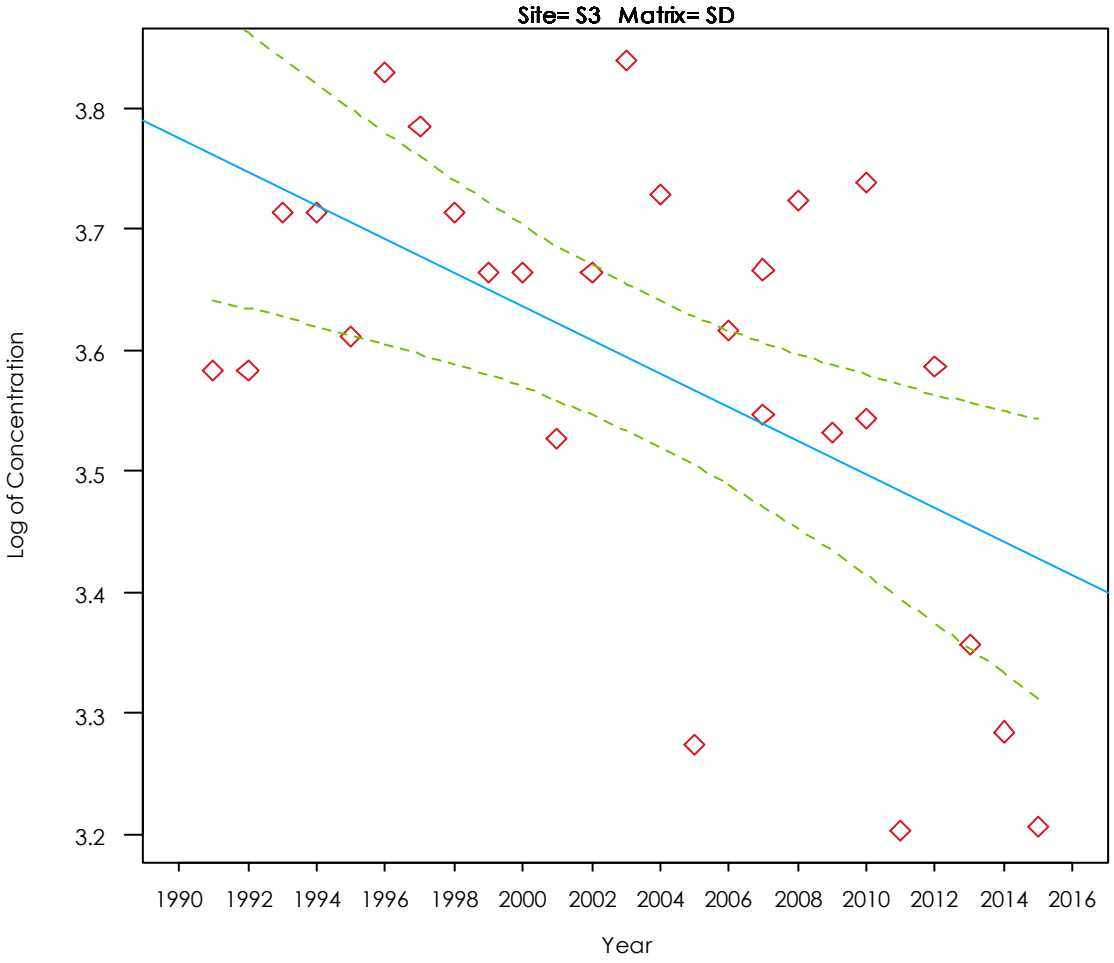
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Nickel



Regression Equation: LogConcentration = 31.4779 + -0.0139 * Year

Log base e (natural logarithm)

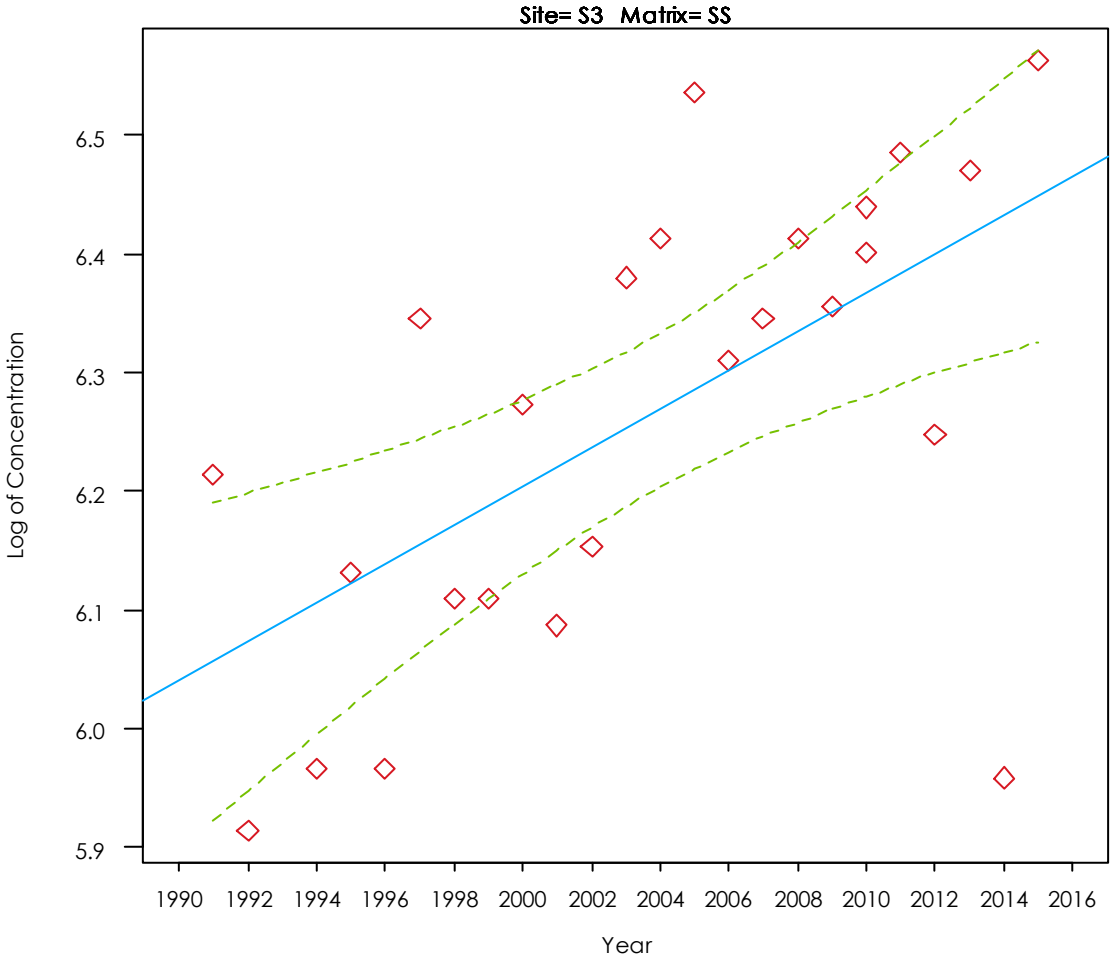
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -26.4671 + 0.0163 * Year

Log base e (natural logarithm)

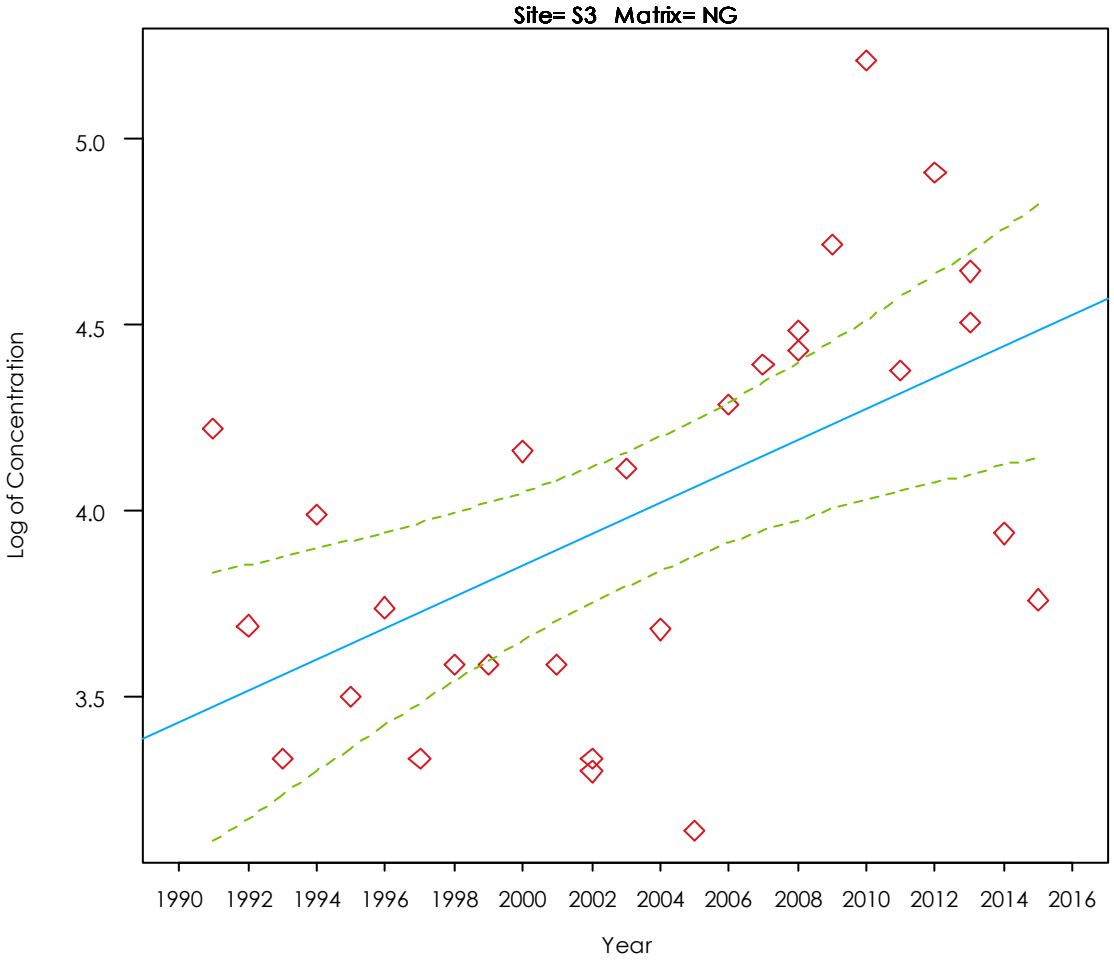
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Strontium



Regression Equation: LogConcentration = -80.5469 + 0.0422 * Year

Log base e (natural logarithm)

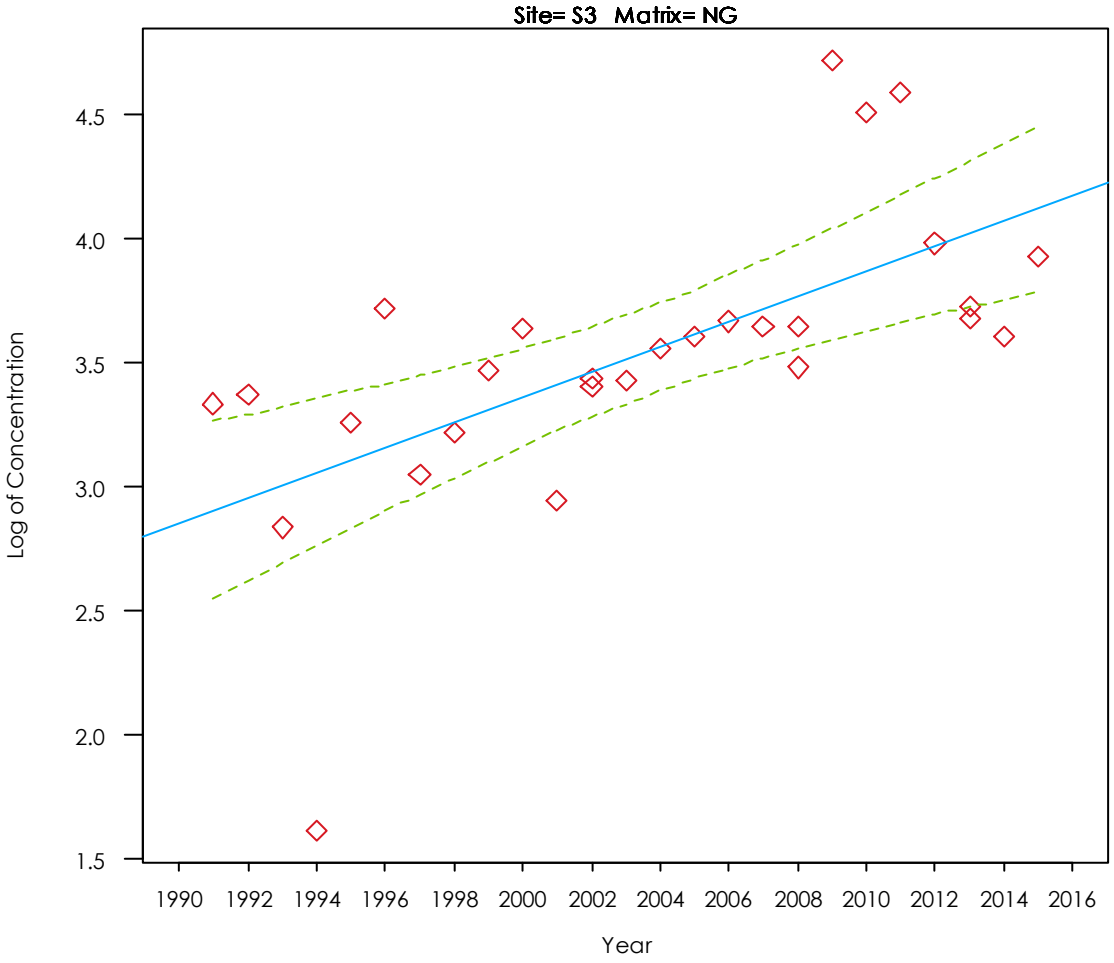
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Zinc



Regression Equation: LogConcentration = -97.7956 + 0.0506 * Year

Log base e (natural logarithm)

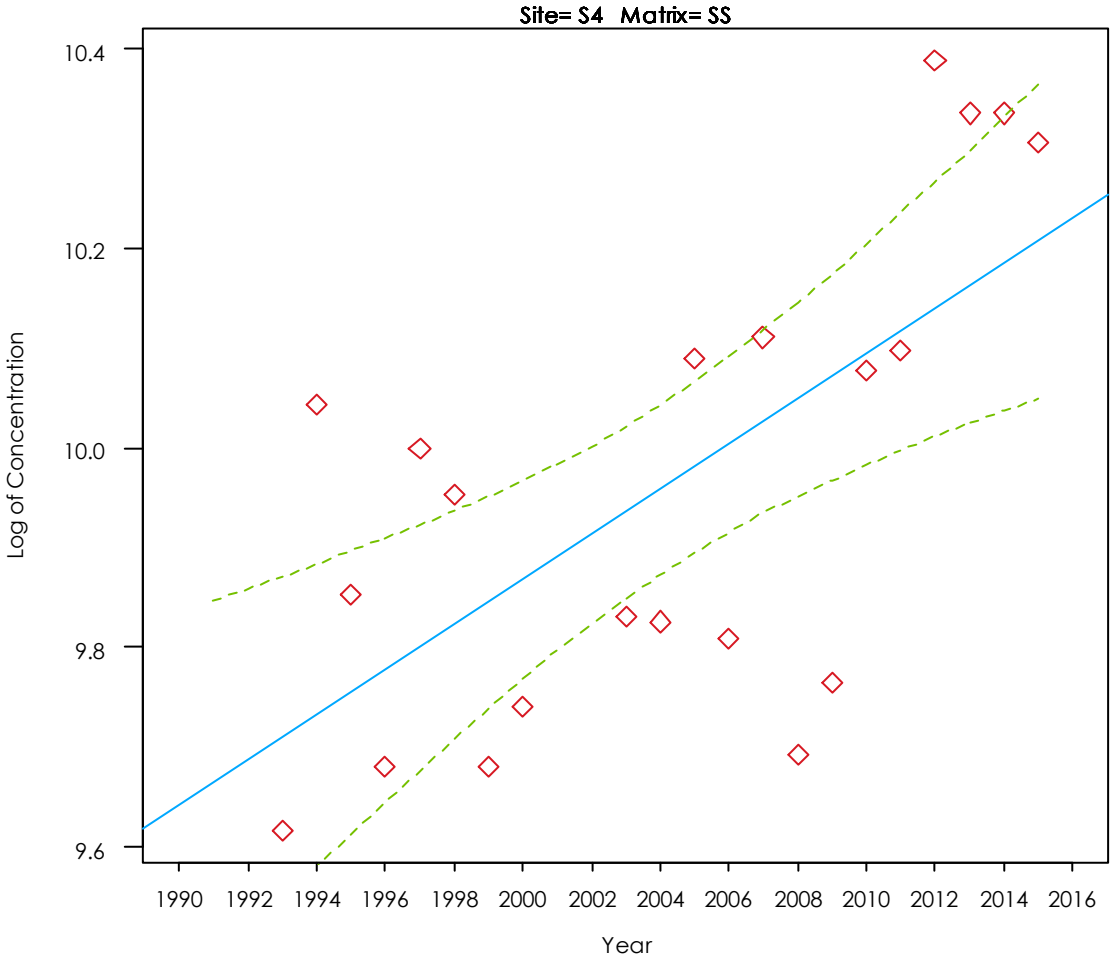
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -35.4146 + 0.0226 * Year

Log base e (natural logarithm)

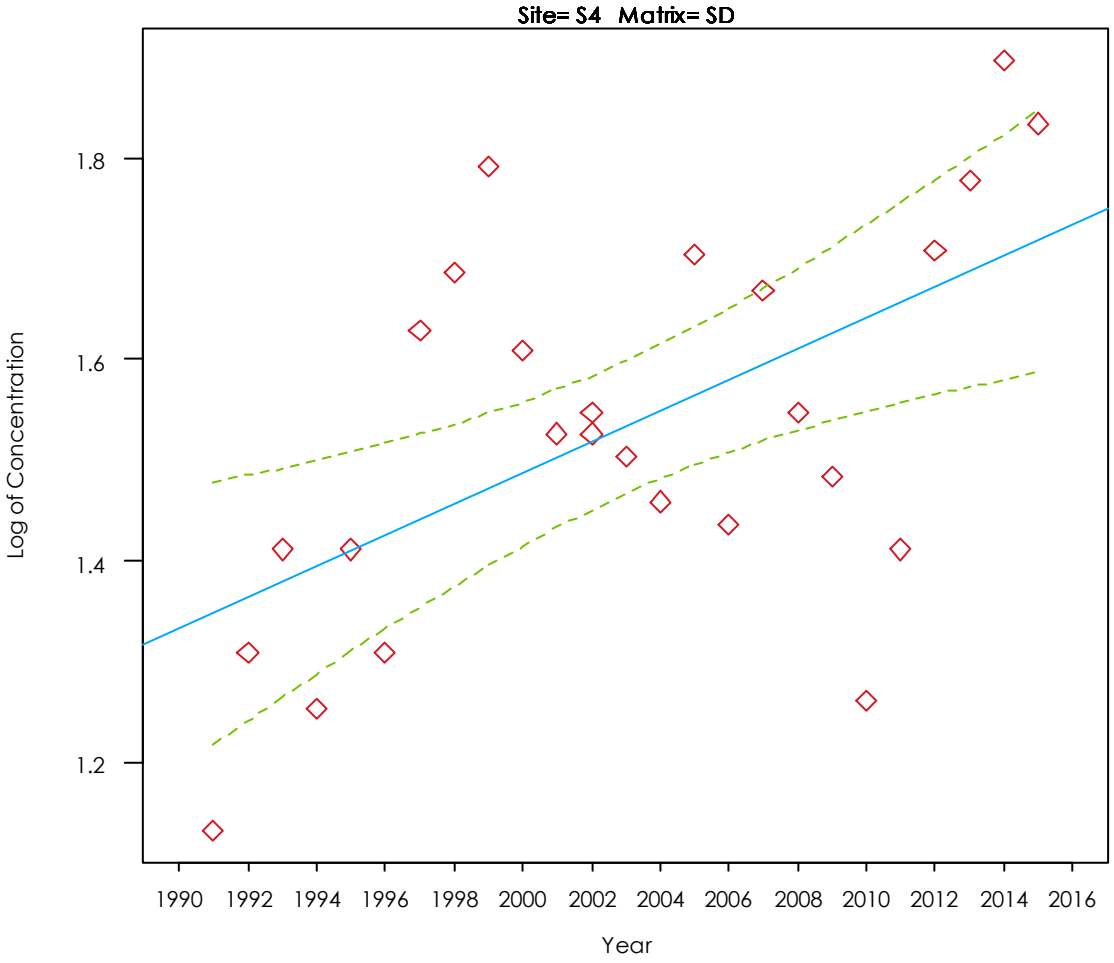
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Arsenic



Regression Equation: LogConcentration = -29.3355 + 0.0154 * Year

Log base e (natural logarithm)

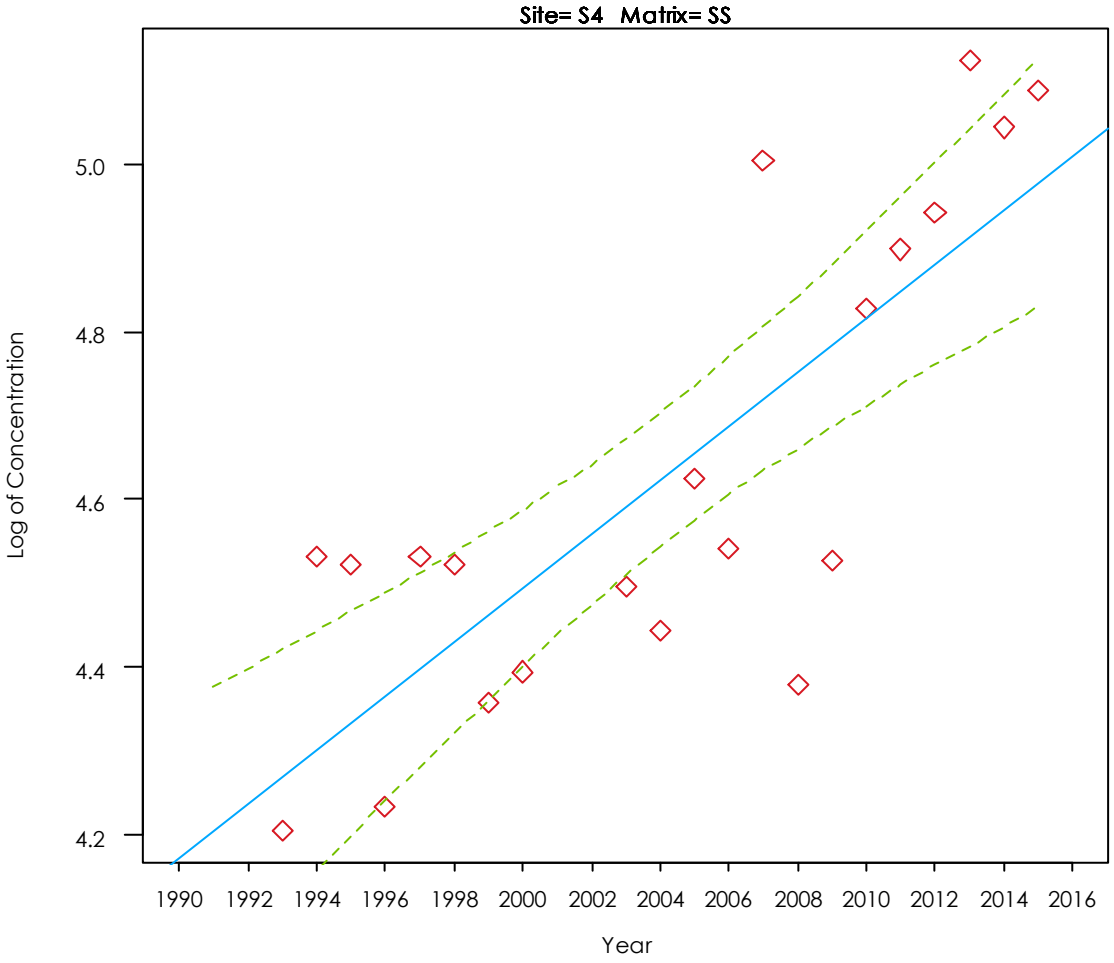
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -59.9469 + 0.0322 * Year

Log base e (natural logarithm)

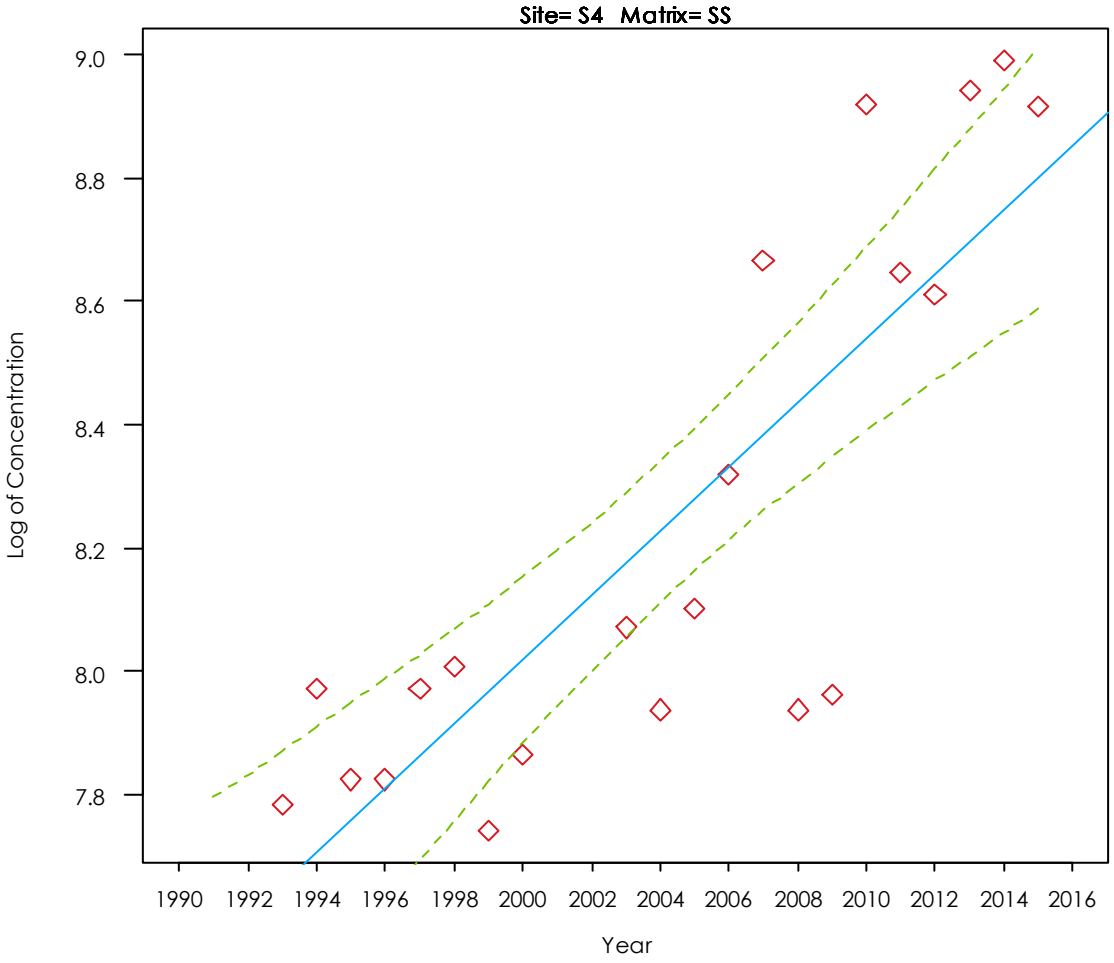
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Calcium



Regression Equation: LogConcentration = -96.3856 + 0.0522 * Year

Log base e (natural logarithm)

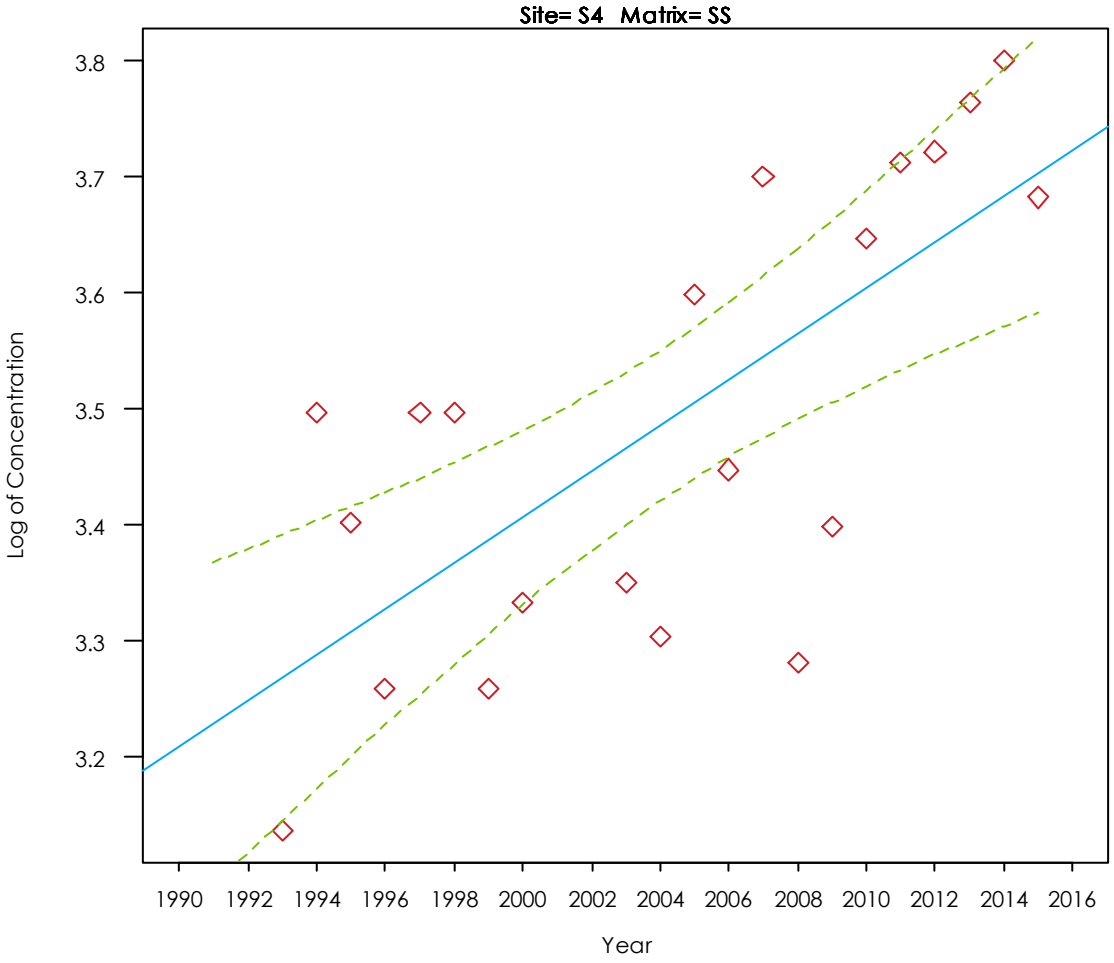
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Chromium



Regression Equation: LogConcentration = -36.0482 + 0.0197 * Year

Log base e (natural logarithm)

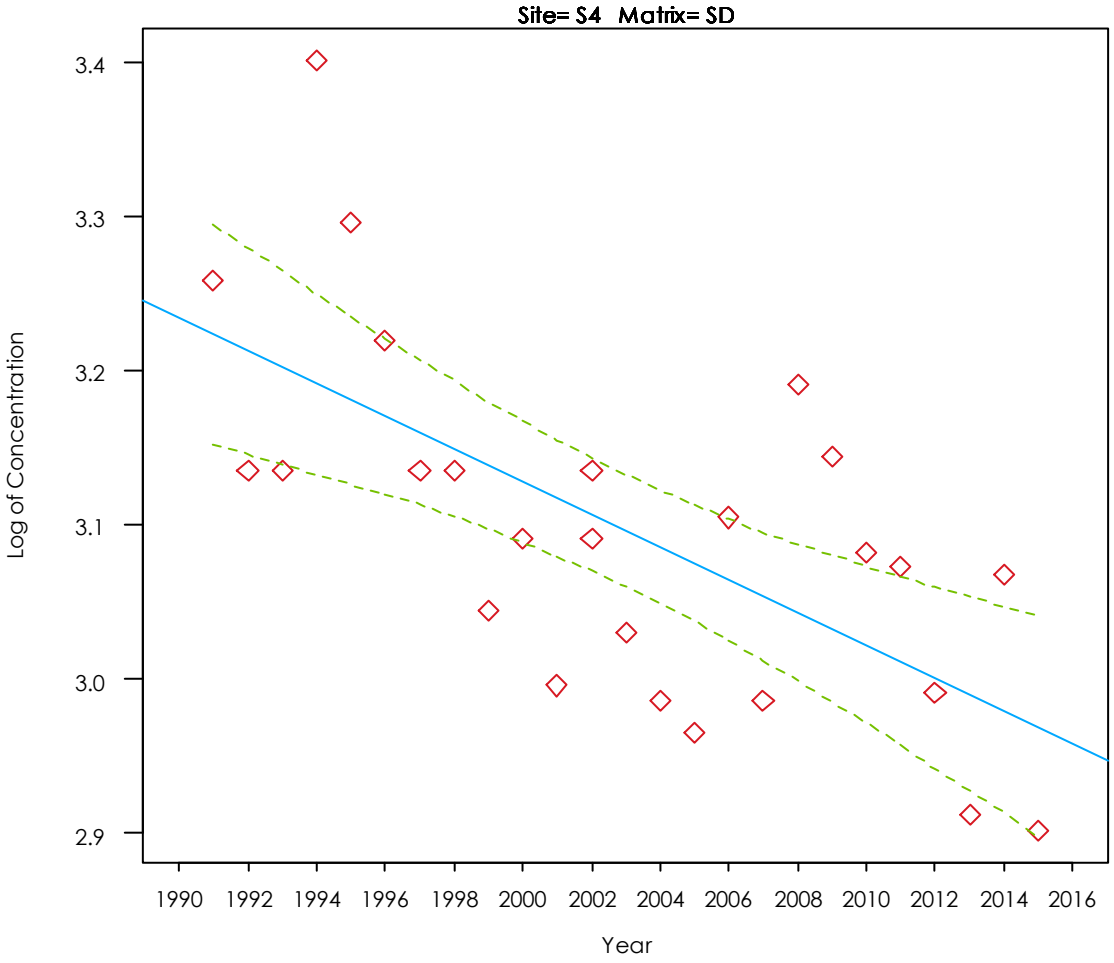
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = 24.2887 + -0.0106 * Year

Log base e (natural logarithm)

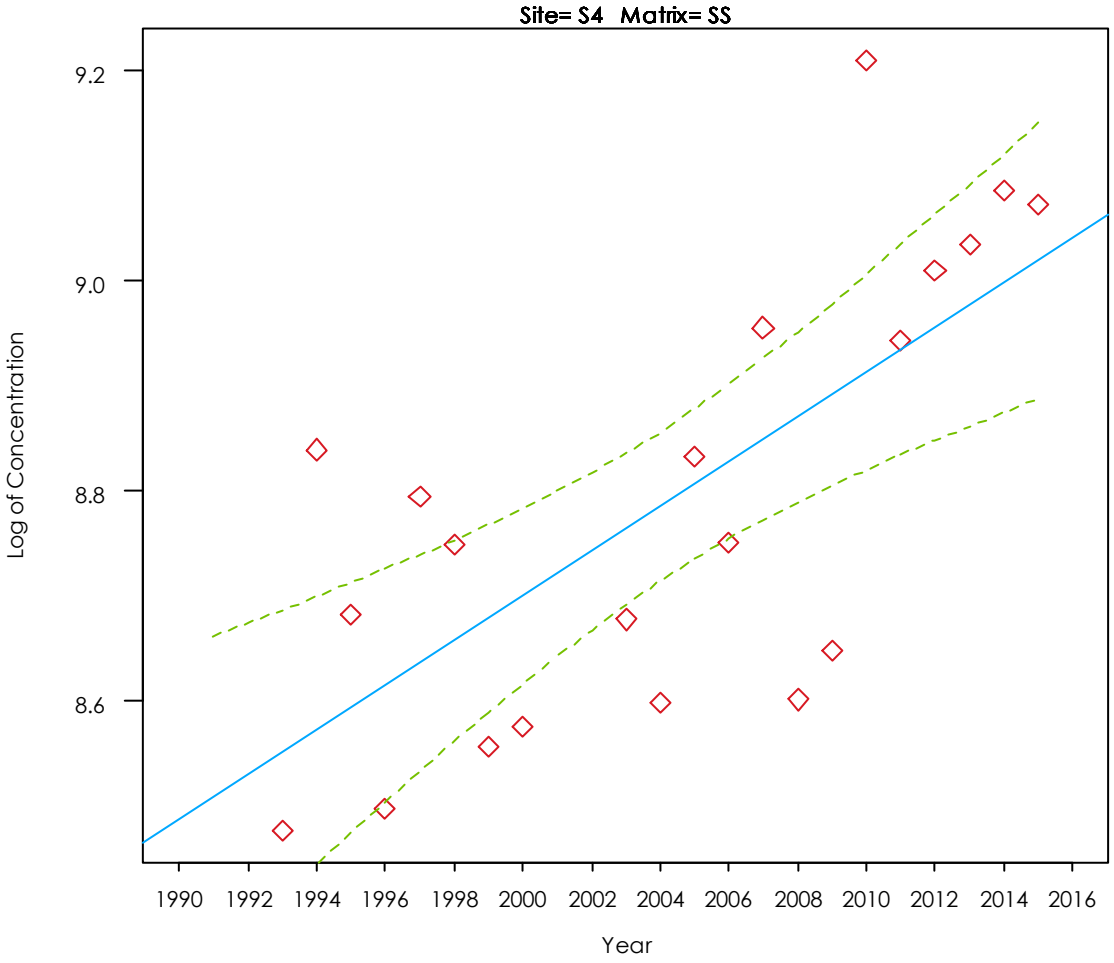
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Magnesium



Regression Equation: LogConcentration = -33.8772 + 0.0213 * Year

Log base e (natural logarithm)

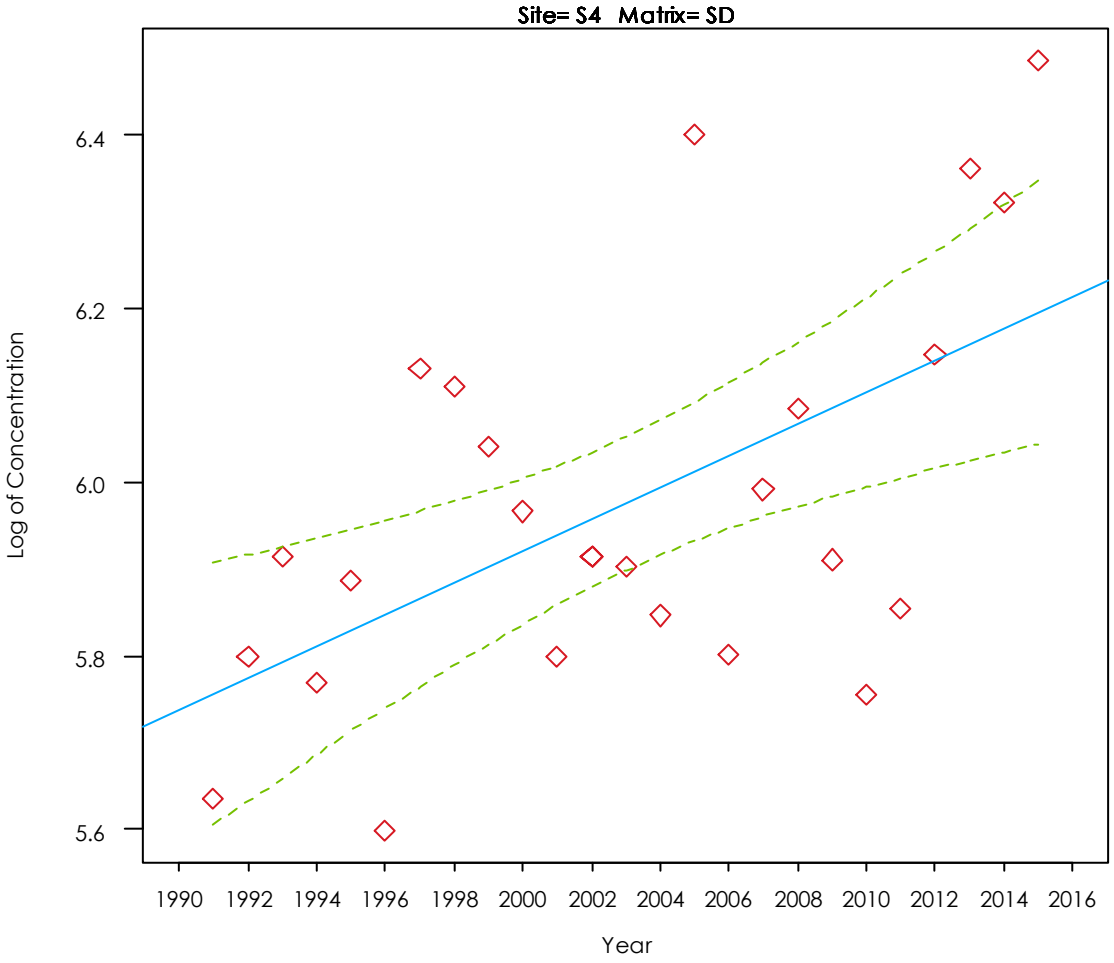
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Manganese



Regression Equation: LogConcentration = -30.6225 + 0.0183 * Year

Log base e (natural logarithm)

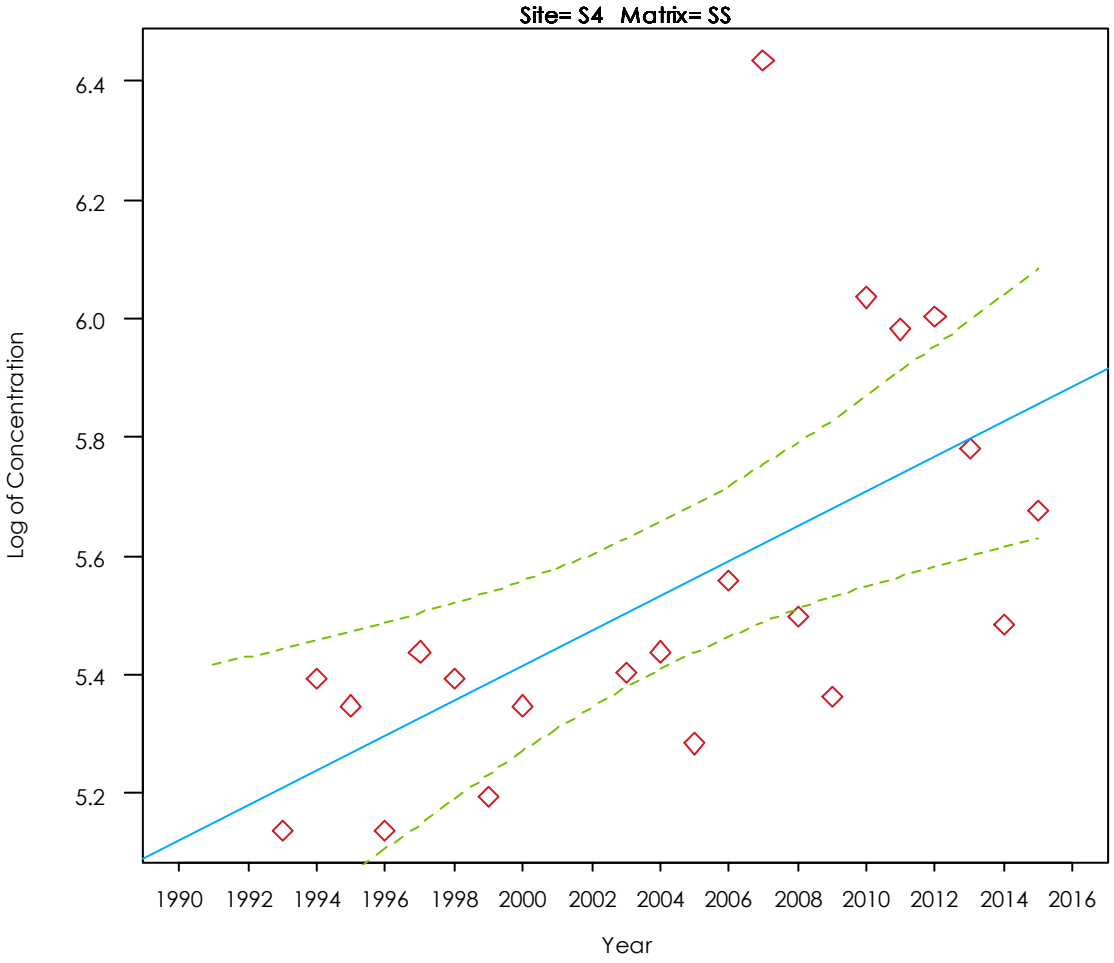
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Manganese



Regression Equation: LogConcentration = -53.5405 + 0.0295 * Year

Log base e (natural logarithm)

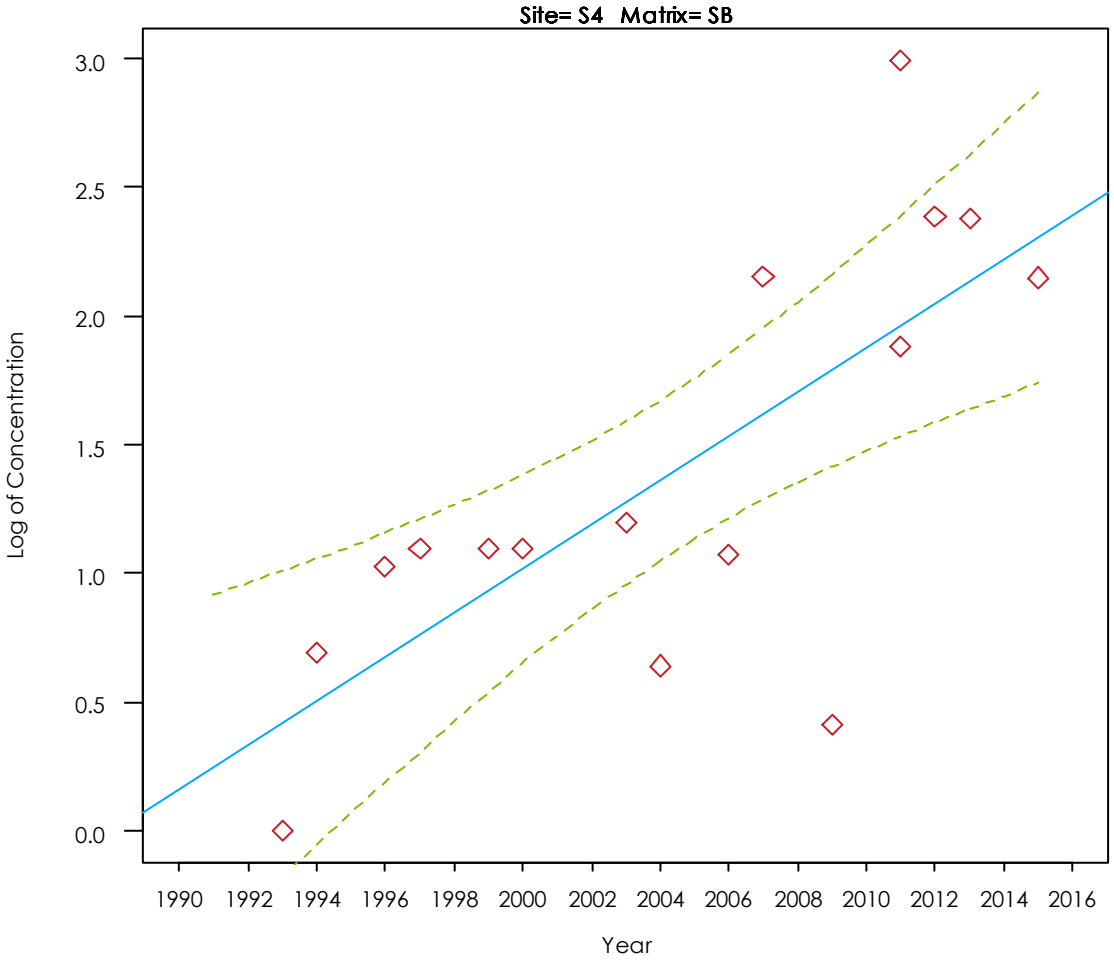
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Molybdenum



Regression Equation: LogConcentration = -170.8734 + 0.0859 * Year

Log base e (natural logarithm)

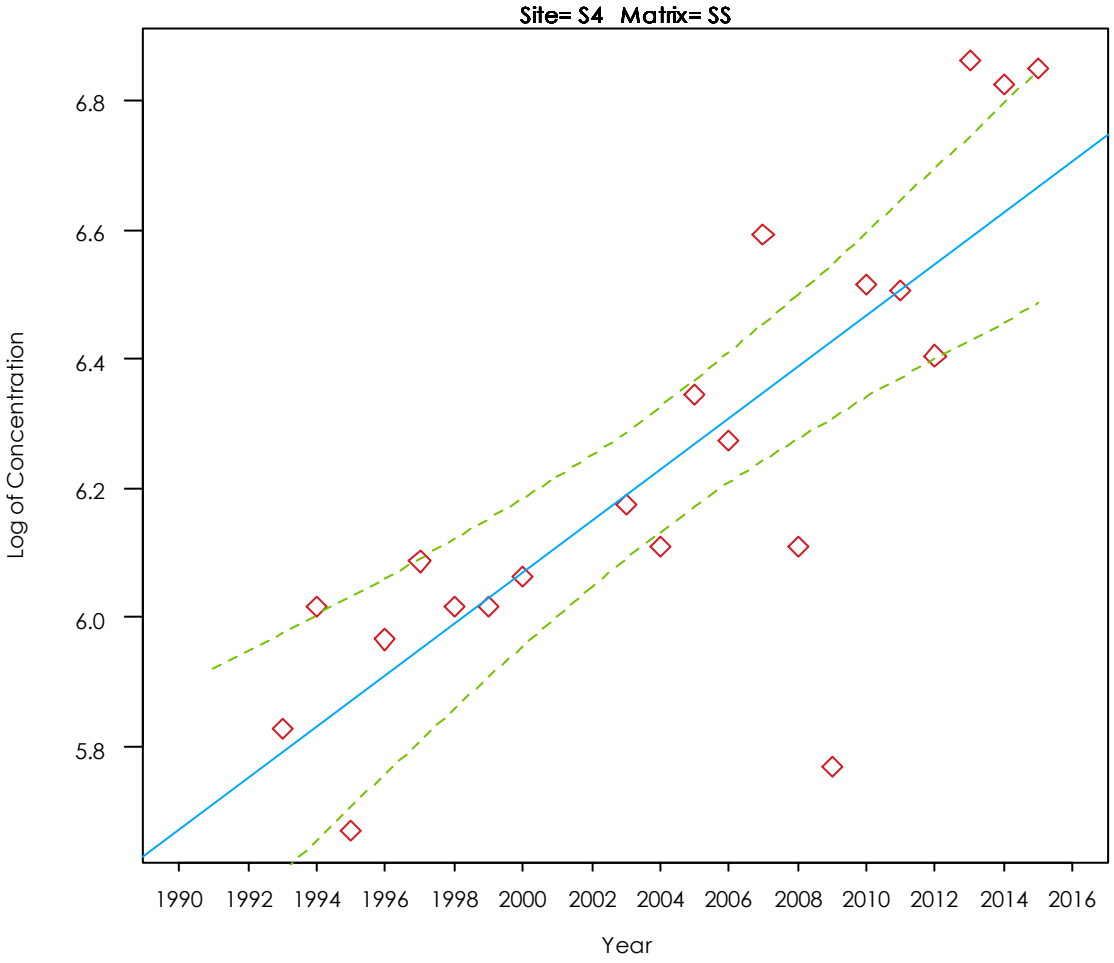
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Phosphorus



Regression Equation: LogConcentration = -73.5552 + 0.0398 * Year

Log base e (natural logarithm)

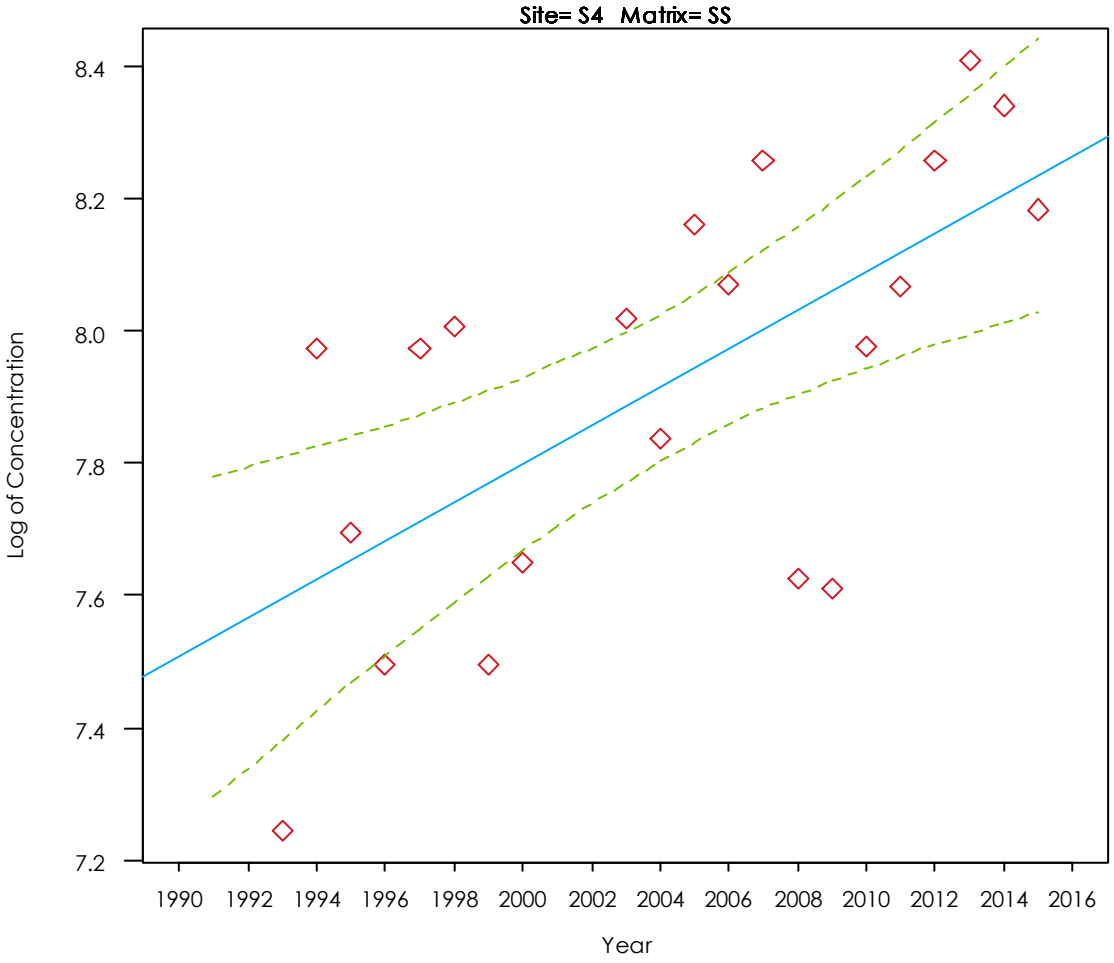
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Potassium



Regression Equation: LogConcentration = -50.2222 + 0.029 * Year

Log base e (natural logarithm)

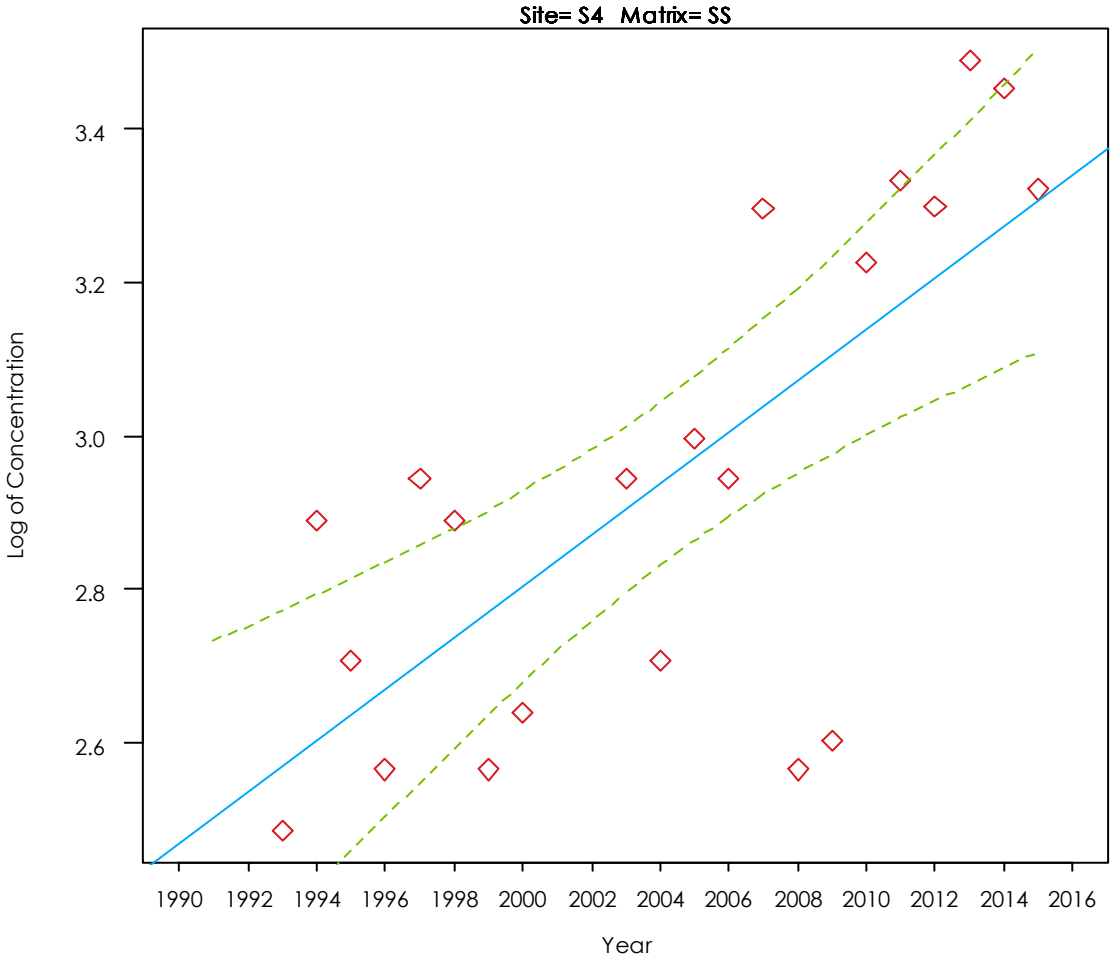
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Strontium



Regression Equation: LogConcentration = -64.2844 + 0.0335 * Year

Log base e (natural logarithm)

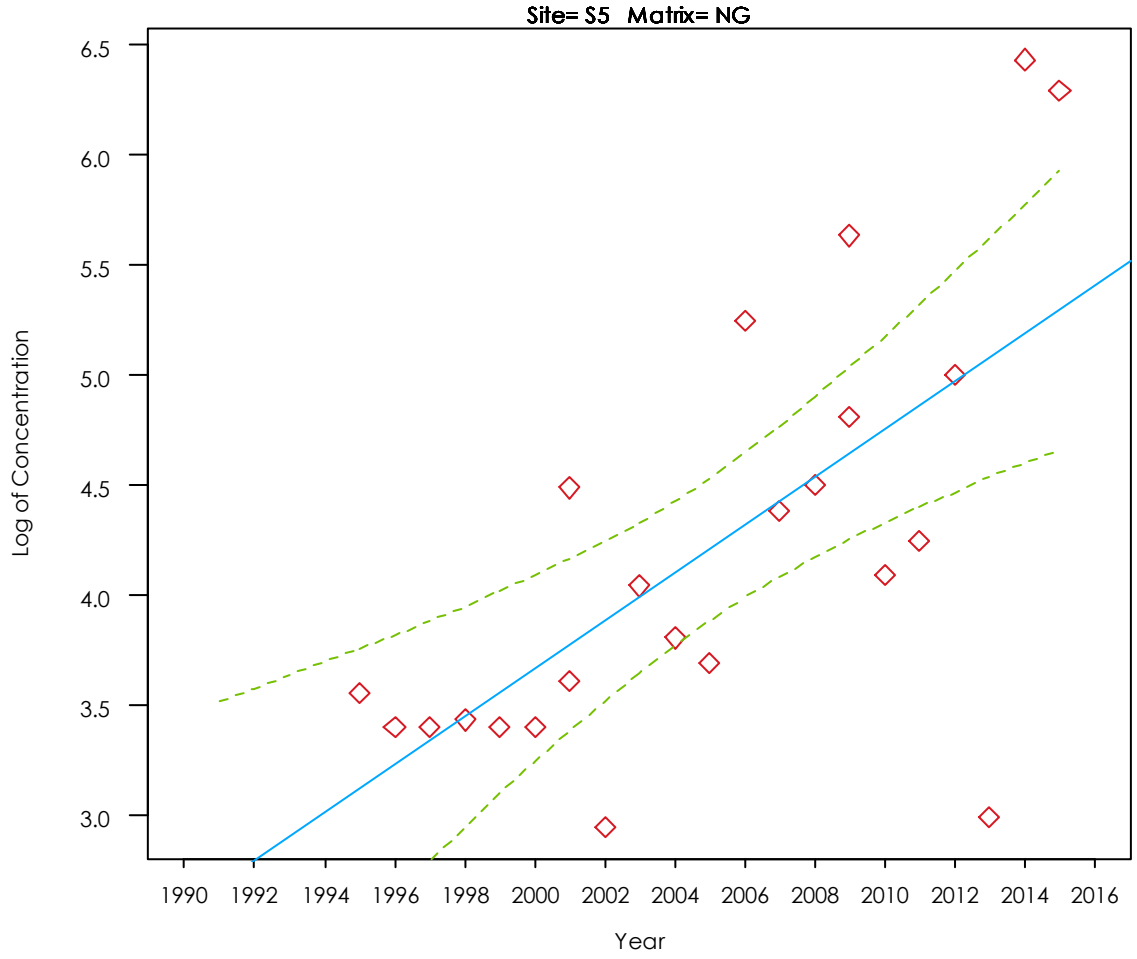
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -213.6665 + 0.1087 * Year

Log base e (natural logarithm)

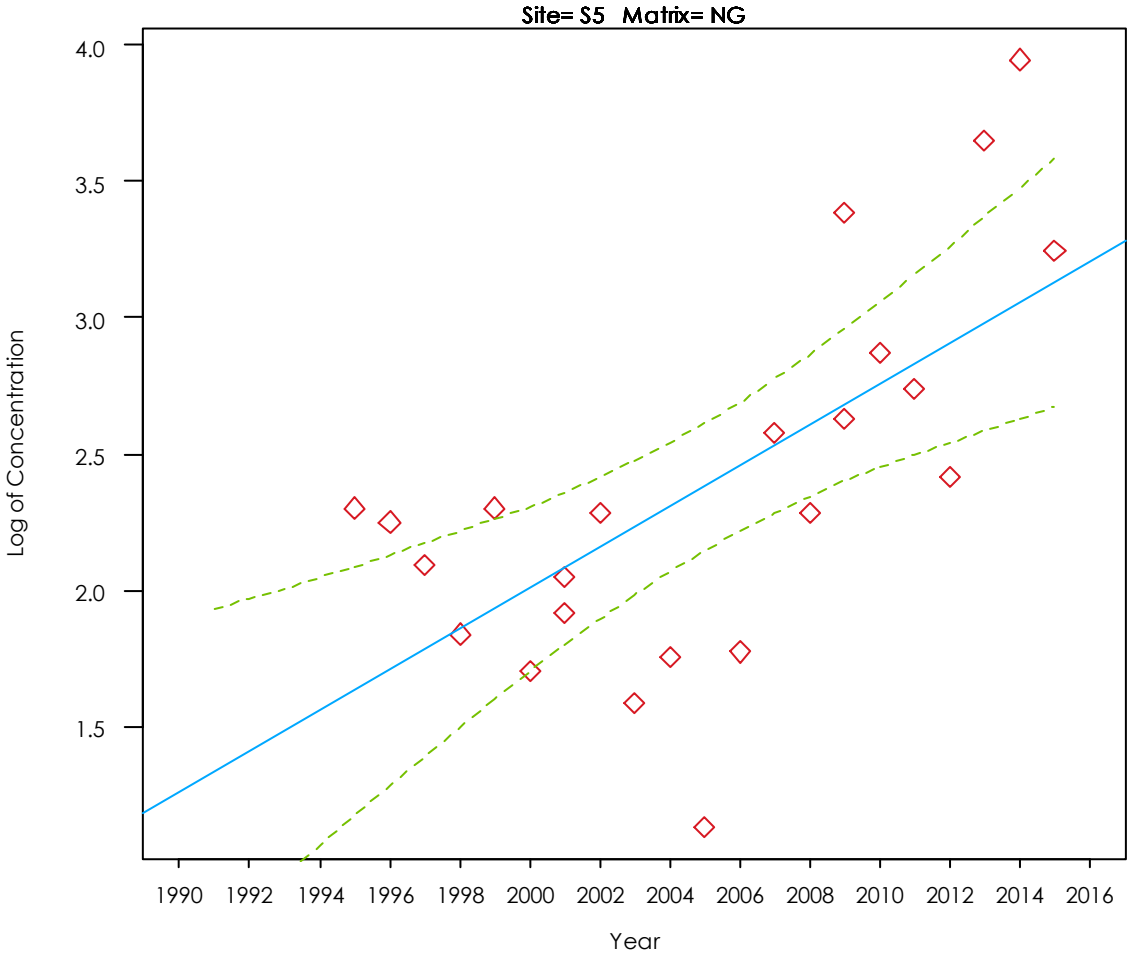
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Barium



Regression Equation: LogConcentration = -147.2739 + 0.0746 * Year

Log base e (natural logarithm)

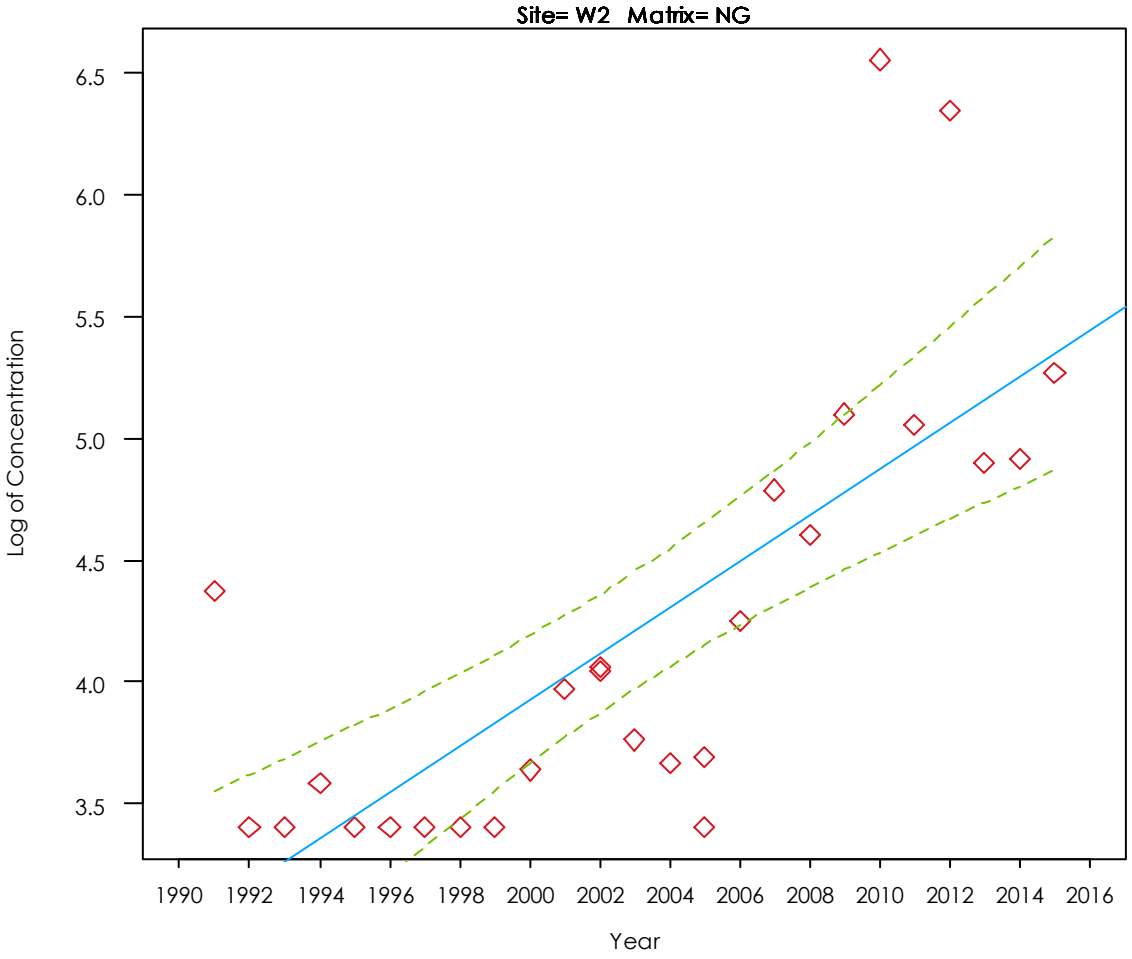
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -185.71 + 0.0948 * Year

Log base e (natural logarithm)

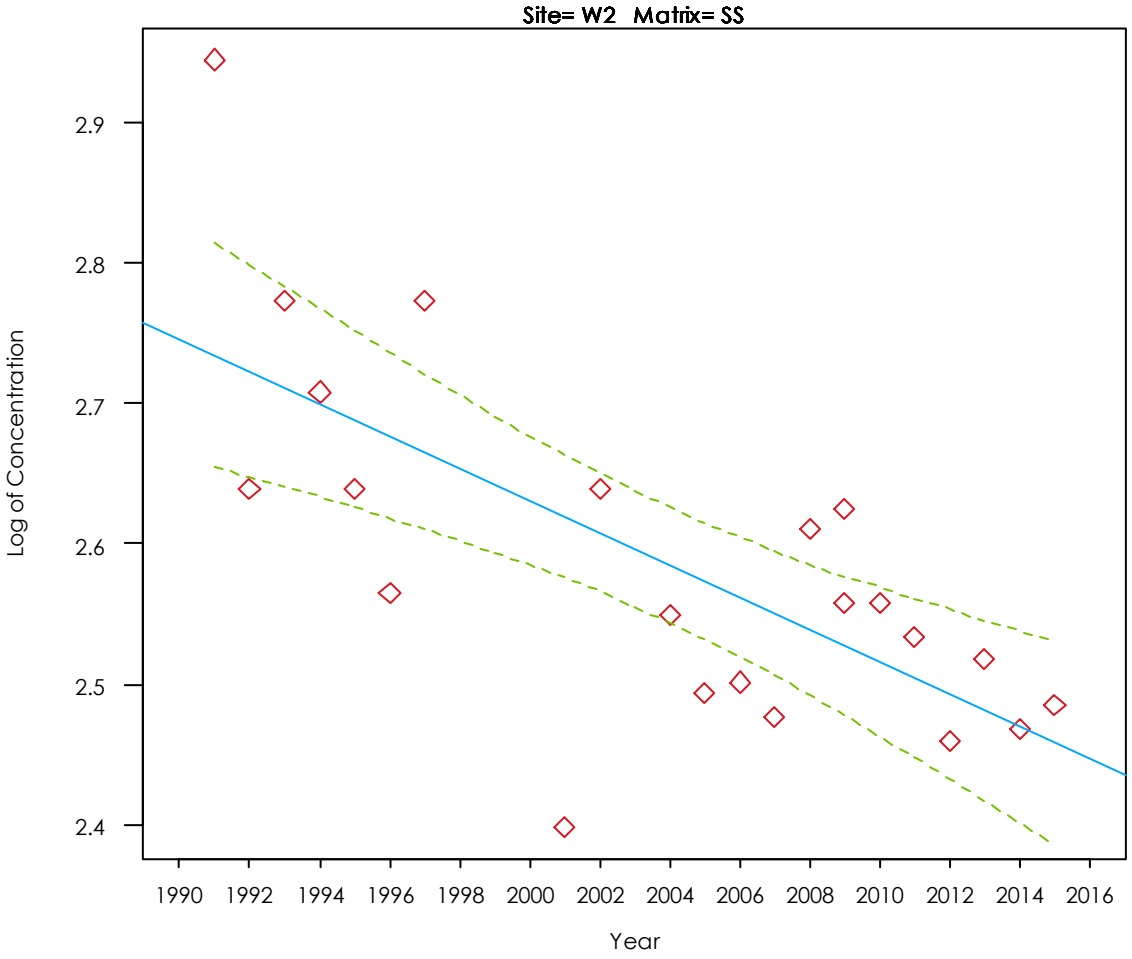
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Copper



Regression Equation: LogConcentration = 25.6364 + -0.0115 * Year

Log base e (natural logarithm)

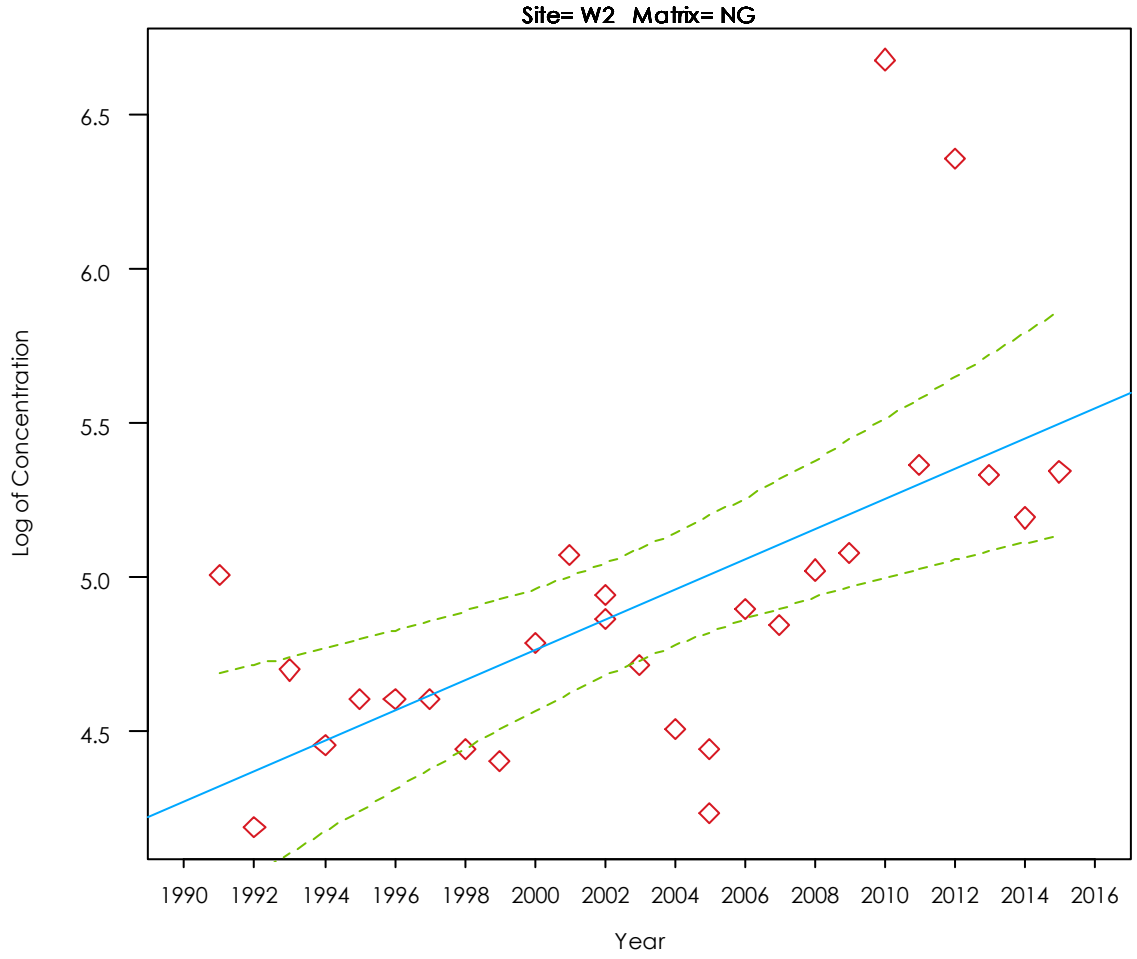
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Iron



Regression Equation: LogConcentration = -93.1109 + 0.0489 * Year

Log base e (natural logarithm)

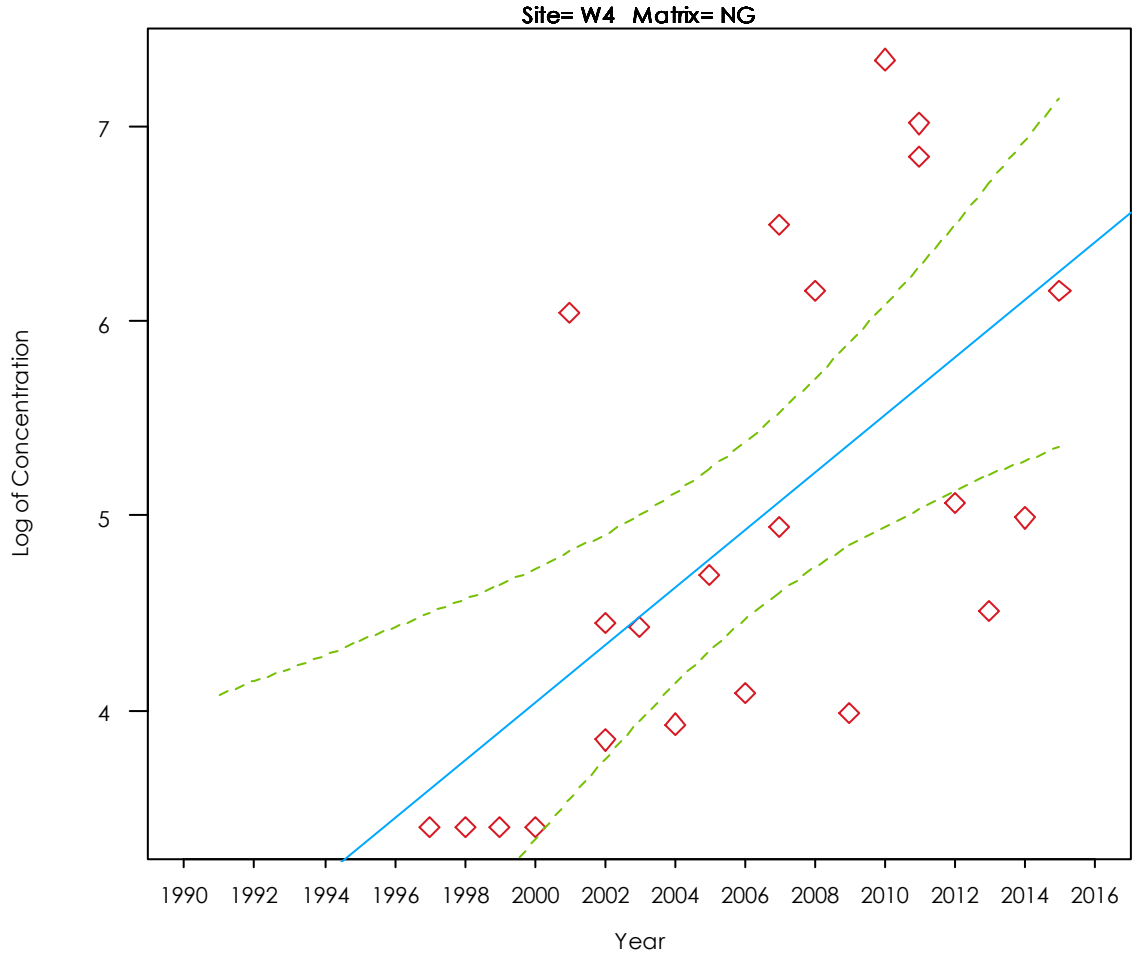
Appendix E-1

Site-Specific Inorganic Trend Line Graphs p<0.003

Lambton Facility 2016 Annual Landfill Report Biomonitoring Program

2015 Field Year

Aluminum



Regression Equation: LogConcentration = -291.411 + 0.1477 * Year

Log base e (natural logarithm)

APPENDIX E-2
SITE-SPECIFIC INORGANIC REGRESSIONS

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Aluminum	E1	NG	Intercept	1	-2.2492	41.2337	-0.0545	0.9569			All available between 1991-2015	Log-normal	
Aluminum	E1	NG	Year	1	0.0030	0.0206	0.1474	0.8840			All available between 1991-2015	Log-normal	
Aluminum	E1	SS	Intercept	1	-6.0340	11.3127	-0.5334	0.5994			All available between 1991-2015	Log-normal	
Aluminum	E1	SS	Year	1	0.0077	0.0056	1.3625	0.1875			All available between 1991-2015	Log-normal	
Aluminum	E2	NG	Intercept	1	-98.3722	42.1400	-2.3344	0.0283			All available between 1991-2015	Log-normal	
Aluminum	E2	NG	Year	1	0.0511	0.0210	2.4274	0.0231			All available between 1991-2015	Log-normal	
Aluminum	E2	SB	Intercept	1	135.8221	42.8784	3.1676	0.0100			All available between 1991-2015	Log-normal	
Aluminum	E2	SB	Year	1	-0.0664	0.0214	-3.0974	0.0113			All available between 1991-2015	Log-normal	
Aluminum	E2	SD	Intercept	1	-36.2149	10.6030	-3.4155	0.0022			All available between 1991-2015	Log-normal	
Aluminum	E2	SD	Year	1	0.0229	0.0053	4.3207	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	E2	SS	Intercept	1	-19.0529	11.6842	-1.6307	0.1172			All available between 1991-2015	Log-normal	
Aluminum	E2	SS	Year	1	0.0142	0.0058	2.4285	0.0238			All available between 1991-2015	Log-normal	
Aluminum	E5	NG	Intercept	1	-23.4022	73.3836	-0.3189	0.7528			All available between 1991-2015	Log-normal	
Aluminum	E5	NG	Year	1	0.0138	0.0366	0.3770	0.7098			All available between 1991-2015	Log-normal	
Aluminum	E5	SB	Intercept	1	128.3218	21.8528	5.8721	<.0001			All available between 1991-2015	Log-normal	
Aluminum	E5	SB	Year	1	-0.0626	0.0109	-5.7402	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Aluminum	E5	SS	Intercept	1	-13.8700	12.0550	-1.1506	0.2628			All available between 1991-2015	Log-normal	
Aluminum	E5	SS	Year	1	0.0117	0.0060	1.9407	0.0658			All available between 1991-2015	Log-normal	
Aluminum	E6	NG	Intercept	1	-89.1360	74.2193	-1.2010	0.2484			All available between 1991-2015	Log-normal	
Aluminum	E6	NG	Year	1	0.0465	0.0370	1.2583	0.2275			All available between 1991-2015	Log-normal	
Aluminum	E6	SS	Intercept	1	-12.8695	14.3324	-0.8979	0.3818			All available between 1991-2015	Log-normal	
Aluminum	E6	SS	Year	1	0.0111	0.0071	1.5571	0.1379			All available between 1991-2015	Log-normal	
Aluminum	N2	NG	Intercept	1	-40.8502	50.3420	-0.8115	0.4251			All available between 1991-2015	Log-normal	
Aluminum	N2	NG	Year	1	0.0224	0.0251	0.8924	0.3810			All available between 1991-2015	Log-normal	
Aluminum	N2	SB	Intercept	1	117.8076	36.0711	3.2660	0.0056			All available between 1991-2015	Log-normal	
Aluminum	N2	SB	Year	1	-0.0573	0.0180	-3.1800	0.0067			All available between 1991-2015	Log-normal	
Aluminum	N2	SD	Intercept	1	-66.3913	10.4526	-6.3517	<.0001			All available between 1991-2015	Log-normal	
Aluminum	N2	SD	Year	1	0.0380	0.0052	7.2829	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	N2	SS	Intercept	1	-27.8897	9.3683	-2.9770	0.0067			All available between 1991-2015	Log-normal	
Aluminum	N2	SS	Year	1	0.0189	0.0047	4.0390	0.0005	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	N4	NG	Intercept	1	-174.6929	121.2060	-1.4413	0.1732			All available between 1991-2015	Log-normal	
Aluminum	N4	NG	Year	1	0.0892	0.0604	1.4778	0.1633			All available between 1991-2015	Log-normal	
Aluminum	N4	SS	Intercept	1	-36.0735	15.8774	-2.2720	0.0382			All available between 1991-2015	Log-normal	
Aluminum	N4	SS	Year	1	0.0228	0.0079	2.8799	0.0115			All available between 1991-2015	Log-normal	
Aluminum	N5	NG	Intercept	1	-74.5621	118.9052	-0.6271	0.5415			All available between 1991-2015	Log-normal	
Aluminum	N5	NG	Year	1	0.0394	0.0592	0.6663	0.5169			All available between 1991-2015	Log-normal	
Aluminum	N5	SD	Intercept	1	-102.7585	19.6035	-5.2418	<.0001			All available between 1991-2015	Log-normal	
Aluminum	N5	SD	Year	1	0.0561	0.0098	5.7530	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	N5	SS	Intercept	1	-4.5538	17.3039	-0.2632	0.7969			All available between 1991-2015	Log-normal	
Aluminum	N5	SS	Year	1	0.0070	0.0086	0.8120	0.4326			All available between 1991-2015	Log-normal	
Aluminum	S1	NG	Intercept	1	-172.4979	51.1981	-3.3692	0.0026			All available between 1991-2015	Log-normal	
Aluminum	S1	NG	Year	1	0.0883	0.0256	3.4539	0.0022	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	S1	SB	Intercept	1	116.7048	35.1969	3.3158	0.0044			All available between 1991-2015	Log-normal	
Aluminum	S1	SB	Year	1	-0.0569	0.0176	-3.2381	0.0051			All available between 1991-2015	Log-normal	
Aluminum	S1	SD	Intercept	1	-13.8337	11.9055	-1.1620	0.2558			All available between 1991-2015	Log-normal	
Aluminum	S1	SD	Year	1	0.0117	0.0059	1.9728	0.0592			All available between 1991-2015	Log-normal	
Aluminum	S1	SS	Intercept	1	-13.8899	8.4352	-1.6467	0.1132			All available between 1991-2015	Log-normal	
Aluminum	S1	SS	Year	1	0.0118	0.0042	2.7995	0.0102			All available between 1991-2015	Log-normal	
Aluminum	S2	NG	Intercept	1	-90.7759	51.6209	-1.7585	0.0914			All available between 1991-2015	Log-normal	
Aluminum	S2	NG	Year	1	0.0475	0.0258	1.8440	0.0776			All available between 1991-2015	Log-normal	
Aluminum	S2	SB	Intercept	1	114.0855	28.4084	4.0159	0.0008			All available between 1991-2015	Log-normal	
Aluminum	S2	SB	Year	1	-0.0556	0.0142	-3.9206	0.0010	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Aluminum	S2	SS	Intercept	1	-15.1430	7.4876	-2.0224	0.0540			All available between 1991-2015	Log-normal	
Aluminum	S2	SS	Year	1	0.0124	0.0037	3.3293	0.0027	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	S3	NG	Intercept	1	55.6052	19.5902	2.8384	0.0087			All available between 1991-2015	Log-normal	
Aluminum	S3	NG	Year	1	-0.0261	0.0098	-2.6669	0.0130			All available between 1991-2015	Log-normal	
Aluminum	S3	SD	Intercept	1	5.4631	8.1135	0.6733	0.5067			All available between 1991-2015	Log-normal	
Aluminum	S3	SD	Year	1	0.0021	0.0040	0.5063	0.6169			All available between 1991-2015	Log-normal	
Aluminum	S3	SS	Intercept	1	-17.8646	8.3726	-2.1337	0.0438			All available between 1991-2015	Log-normal	
Aluminum	S3	SS	Year	1	0.0137	0.0042	3.2700	0.0034			All available between 1991-2015	Log-normal	
Aluminum	S4	NG	Intercept	1	-25.9737	59.0264	-0.4400	0.6638			All available between 1991-2015	Log-normal	
Aluminum	S4	NG	Year	1	0.0149	0.0295	0.5063	0.6173			All available between 1991-2015	Log-normal	
Aluminum	S4	SB	Intercept	1	130.6499	31.6950	4.1221	0.0010			All available between 1991-2015	Log-normal	
Aluminum	S4	SB	Year	1	-0.0638	0.0158	-4.0372	0.0012	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Aluminum	S4	SD	Intercept	1	2.0418	6.2285	0.3278	0.7459			All available between 1991-2015	Log-normal	
Aluminum	S4	SD	Year	1	0.0039	0.0031	1.2523	0.2225			All available between 1991-2015	Log-normal	
Aluminum	S4	SS	Intercept	1	-35.4146	11.7905	-3.0037	0.0073			All available between 1991-2015	Log-normal	
Aluminum	S4	SS	Year	1	0.0226	0.0059	3.8487	0.0011	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	S5	NG	Intercept	1	-213.6665	52.7736	-4.0487	0.0006			All available between 1991-2015	Log-normal	
Aluminum	S5	NG	Year	1	0.1087	0.0263	4.1285	0.0005	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	S5	SB	Intercept	1	117.3142	30.0629	3.9023	0.0025			All available between 1991-2015	Log-normal	
Aluminum	S5	SB	Year	1	-0.0572	0.0150	-3.8122	0.0029	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Aluminum	S5	SS	Intercept	1	-8.5647	8.6476	-0.9904	0.3338			All available between 1991-2015	Log-normal	
Aluminum	S5	SS	Year	1	0.0091	0.0043	2.1190	0.0468			All available between 1991-2015	Log-normal	
Aluminum	W2	NG	Intercept	1	-185.7100	33.7704	-5.4992	<.0001			All available between 1991-2015	Log-normal	
Aluminum	W2	NG	Year	1	0.0948	0.0169	5.6240	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	W2	SB	Intercept	1	116.0361	23.0636	5.0311	<.0001			All available between 1991-2015	Log-normal	
Aluminum	W2	SB	Year	1	-0.0565	0.0115	-4.9104	0.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Aluminum	W2	SS	Intercept	1	-15.4508	8.4571	-1.8270	0.0827			All available between 1991-2015	Log-normal	
Aluminum	W2	SS	Year	1	0.0124	0.0042	2.9422	0.0081			All available between 1991-2015	Log-normal	
Aluminum	W4	NG	Intercept	1	-291.4110	82.9519	-3.5130	0.0022			All available between 1991-2015	Log-normal	
Aluminum	W4	NG	Year	1	0.1477	0.0413	3.5725	0.0019	Yes	pos	All available between 1991-2015	Log-normal	
Aluminum	W4	SB	Intercept	1	-61.0485	95.4371	-0.6397	0.5355			All available between 1991-2015	Log-normal	
Aluminum	W4	SB	Year	1	0.0318	0.0476	0.6673	0.5183			All available between 1991-2015	Log-normal	
Aluminum	W4	SS	Intercept	1	-9.7231	11.3950	-0.8533	0.4061			All available between 1991-2015	Log-normal	
Aluminum	W4	SS	Year	1	0.0098	0.0057	1.7205	0.1046			All available between 1991-2015	Log-normal	
Arsenic	E1	SS	Intercept	1	-131.37239	69.79687	-1.88221	0.07374			All available between 1991-2015	Normal	
Arsenic	E1	SS	Year	1	0.06760	0.03483	1.94076	0.06583	No		All available between 1991-2015	Normal	
Arsenic	E2	SB	Intercept	1	259.5867	85.6899	3.0294	0.0191			All available between 1991-2015	Log-normal	
Arsenic	E2	SB	Year	1	-0.1299	0.0428	-3.0394	0.0189			All available between 1991-2015	Log-normal	
Arsenic	E2	SD	Intercept	1	7.1068	7.9964	0.8887	0.3826			All available between 1991-2015	Log-normal	
Arsenic	E2	SD	Year	1	-0.0028	0.0040	-0.6972	0.4921			All available between 1991-2015	Log-normal	
Arsenic	E2	SS	Intercept	1	-77.92234	28.75033	-2.71031	0.01278			All available between 1991-2015	Normal	
Arsenic	E2	SS	Year	1	0.04097	0.01434	2.85624	0.00918	No		All available between 1991-2015	Normal	
Arsenic	E5	NG	Intercept	1	132.3202	49.1162	2.6940	0.0144			All available between 1991-2015	Log-normal	
Arsenic	E5	NG	Year	1	-0.0666	0.0245	-2.7171	0.0137			All available between 1991-2015	Log-normal	
Arsenic	E5	SS	Intercept	1	-82.59534	28.29020	-2.91957	0.00819			All available between 1991-2015	Normal	
Arsenic	E5	SS	Year	1	0.04363	0.01412	3.09074	0.00554	No		All available between 1991-2015	Normal	
Arsenic	E6	NG	Intercept	1	77.7464	49.3975	1.5739	0.1364			All available between 1991-2015	Log-normal	
Arsenic	E6	NG	Year	1	-0.0394	0.0246	-1.5999	0.1305			All available between 1991-2015	Log-normal	
Arsenic	E6	SS	Intercept	1	-120.50023	59.50351	-2.02509	0.05886			All available between 1991-2015	Normal	
Arsenic	E6	SS	Year	1	0.06252	0.02963	2.11005	0.04998	No		All available between 1991-2015	Normal	
Arsenic	N2	SB	Intercept	1	202.1543	103.7761	1.9480	0.0800			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Arsenic	N2	SB	Year	1	-0.1015	0.0518	-1.9581	0.0787			All available between 1991-2015	Log-normal	
Arsenic	N2	SD	Intercept	1	-19.8287	13.8538	-1.4313	0.1652			All available between 1991-2015	Log-normal	
Arsenic	N2	SD	Year	1	0.0107	0.0069	1.5441	0.1356			All available between 1991-2015	Log-normal	
Arsenic	N2	SS	Intercept	1	-86.38491	25.79417	-3.34901	0.00278			All available between 1991-2015	Normal	
Arsenic	N2	SS	Year	1	0.04518	0.01287	3.51104	0.00188	Yes	Pos	All available between 1991-2015	Normal	
Arsenic	N4	NG	Intercept	1	86.5457	46.2699	1.8705	0.0841			All available between 1991-2015	Log-normal	
Arsenic	N4	NG	Year	1	-0.0438	0.0230	-1.9020	0.0796			All available between 1991-2015	Log-normal	
Arsenic	N4	SS	Intercept	1	-83.27323	37.93781	-2.19499	0.04432			All available between 1991-2015	Normal	
Arsenic	N4	SS	Year	1	0.04392	0.01889	2.32495	0.03452	No		All available between 1991-2015	Normal	
Arsenic	N5	NG	Intercept	1	140.2466	84.5416	1.6589	0.1211			All available between 1991-2015	Log-normal	
Arsenic	N5	NG	Year	1	-0.0704	0.0421	-1.6718	0.1185			All available between 1991-2015	Log-normal	
Arsenic	N5	SD	Intercept	1	-74.1382	17.1558	-4.3215	0.0007			All available between 1991-2015	Log-normal	
Arsenic	N5	SD	Year	1	0.0378	0.0085	4.4300	0.0006	Yes	pos	All available between 1991-2015	Log-normal	
Arsenic	N5	SS	Intercept	1	-253.18286	62.87801	-4.02657	0.00168			All available between 1991-2015	Normal	
Arsenic	N5	SS	Year	1	0.12879	0.03131	4.11396	0.00144	Yes	Pos	All available between 1991-2015	Normal	
Arsenic	S1	NG	Intercept	1	148.1157	52.3417	2.8298	0.0104			All available between 1991-2015	Log-normal	
Arsenic	S1	NG	Year	1	-0.0744	0.0261	-2.8505	0.0099			All available between 1991-2015	Log-normal	
Arsenic	S1	SD	Intercept	1	-12.9941	11.9764	-1.0850	0.2879			All available between 1991-2015	Log-normal	
Arsenic	S1	SD	Year	1	0.0072	0.0060	1.2103	0.2371			All available between 1991-2015	Log-normal	
Arsenic	S1	SS	Intercept	1	-65.99014	39.94679	-1.65195	0.11213			All available between 1991-2015	Normal	
Arsenic	S1	SS	Year	1	0.03598	0.01994	1.80419	0.08432	No		All available between 1991-2015	Normal	
Arsenic	S2	NG	Intercept	1	186.4259	52.3639	3.5602	0.0018			All available between 1991-2015	Log-normal	
Arsenic	S2	NG	Year	1	-0.0935	0.0261	-3.5808	0.0018	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Arsenic	S2	SB	Intercept	1	163.5209	55.0887	2.9683	0.0102			All available between 1991-2015	Log-normal	
Arsenic	S2	SB	Year	1	-0.0821	0.0275	-2.9915	0.0097			All available between 1991-2015	Log-normal	
Arsenic	S2	SS	Intercept	1	-56.43586	33.64681	-1.67730	0.10594			All available between 1991-2015	Normal	
Arsenic	S2	SS	Year	1	0.03099	0.01679	1.84514	0.07690	No		All available between 1991-2015	Normal	
Arsenic	S3	NG	Intercept	1	161.4121	42.5725	3.7915	0.0010			All available between 1991-2015	Log-normal	
Arsenic	S3	NG	Year	1	-0.0811	0.0212	-3.8191	0.0009	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Arsenic	S3	SD	Intercept	1	19.1168	12.2924	1.5552	0.1320			All available between 1991-2015	Log-normal	
Arsenic	S3	SD	Year	1	-0.0085	0.0061	-1.3871	0.1772			All available between 1991-2015	Log-normal	
Arsenic	S3	SS	Intercept	1	-109.23180	36.36268	-3.00395	0.00633			All available between 1991-2015	Normal	
Arsenic	S3	SS	Year	1	0.05710	0.01815	3.14646	0.00452	No		All available between 1991-2015	Normal	
Arsenic	S4	NG	Intercept	1	141.5588	51.4998	2.7487	0.0117			All available between 1991-2015	Log-normal	
Arsenic	S4	NG	Year	1	-0.0713	0.0257	-2.7745	0.0111			All available between 1991-2015	Log-normal	
Arsenic	S4	SB	Intercept	1	200.9639	57.9962	3.4651	0.0047			All available between 1991-2015	Log-normal	
Arsenic	S4	SB	Year	1	-0.1008	0.0289	-3.4858	0.0045			All available between 1991-2015	Log-normal	
Arsenic	S4	SD	Intercept	1	-29.3355	9.0469	-3.2426	0.0035			All available between 1991-2015	Log-normal	
Arsenic	S4	SD	Year	1	0.0154	0.0045	3.4120	0.0023	Yes	pos	All available between 1991-2015	Log-normal	
Arsenic	S4	SS	Intercept	1	-19.16745	37.82992	-0.50667	0.61821			All available between 1991-2015	Normal	
Arsenic	S4	SS	Year	1	0.01197	0.01887	0.63413	0.53356	No		All available between 1991-2015	Normal	
Arsenic	S5	NG	Intercept	1	191.8256	49.7465	3.8561	0.0009			All available between 1991-2015	Log-normal	
Arsenic	S5	NG	Year	1	-0.0962	0.0248	-3.8780	0.0008	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Arsenic	S5	SB	Intercept	1	182.3963	66.5573	2.7404	0.0192			All available between 1991-2015	Log-normal	
Arsenic	S5	SB	Year	1	-0.0915	0.0332	-2.7564	0.0187			All available between 1991-2015	Log-normal	
Arsenic	S5	SS	Intercept	1	-136.15473	37.23933	-3.65621	0.00157			All available between 1991-2015	Normal	
Arsenic	S5	SS	Year	1	0.07064	0.01857	3.80414	0.00111	Yes	Pos	All available between 1991-2015	Normal	
Arsenic	W2	NG	Intercept	1	155.6044	46.9998	3.3107	0.0033			All available between 1991-2015	Log-normal	
Arsenic	W2	NG	Year	1	-0.0782	0.0234	-3.3346	0.0031			All available between 1991-2015	Log-normal	
Arsenic	W2	SB	Intercept	1	112.3633	31.9019	3.5221	0.0031			All available between 1991-2015	Log-normal	
Arsenic	W2	SB	Year	1	-0.0567	0.0159	-3.5626	0.0028	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Arsenic	W2	SS	Intercept	1	-87.21828	21.63938	-4.03054	0.00066			All available between 1991-2015	Normal	
Arsenic	W2	SS	Year	1	0.04620	0.01080	4.27791	0.00037	Yes	Pos	All available between 1991-2015	Normal	
Arsenic	W4	NG	Intercept	1	82.1990	39.2725	2.0930	0.0493			All available between 1991-2015	Log-normal	
Arsenic	W4	NG	Year	1	-0.0417	0.0196	-2.1279	0.0460			All available between 1991-2015	Log-normal	
Arsenic	W4	SS	Intercept	1	-109.25725	41.88082	-2.60877	0.01900			All available between 1991-2015	Normal	
Arsenic	W4	SS	Year	1	0.05677	0.02086	2.72110	0.01510	No		All available between 1991-2015	Normal	
Barium	E1	NG	Intercept	1	128.8937	24.4773	5.2658	<.0001			All available between 1991-2015	Log-normal	
Barium	E1	NG	Year	1	-0.0630	0.0122	-5.1554	<.0001	Yes	neg	All available between 1991-2015	Log-normal	
Barium	E1	SB	Intercept	1	-58.8731	26.0790	-2.2575	0.0405			All available between 1991-2015	Log-normal	
Barium	E1	SB	Year	1	0.0291	0.0130	2.2371	0.0421			All available between 1991-2015	Log-normal	
Barium	E1	SS	Intercept	1	7.5180	13.1348	0.5724	0.5731			All available between 1991-2015	Log-normal	
Barium	E1	SS	Year	1	-0.0017	0.0066	-0.2538	0.8021			All available between 1991-2015	Log-normal	
Barium	E2	NG	Intercept	1	41.8201	35.0371	1.1936	0.2443			All available between 1991-2015	Log-normal	
Barium	E2	NG	Year	1	-0.0195	0.0175	-1.1163	0.2753			All available between 1991-2015	Log-normal	
Barium	E2	SB	Intercept	1	78.9921	104.6026	0.7552	0.4676			All available between 1991-2015	Log-normal	
Barium	E2	SB	Year	1	-0.0394	0.0523	-0.7541	0.4682			All available between 1991-2015	Log-normal	
Barium	E2	SD	Intercept	1	-28.7691	8.6848	-3.3126	0.0028			All available between 1991-2015	Log-normal	
Barium	E2	SD	Year	1	0.0165	0.0043	3.8152	0.0008	Yes	pos	All available between 1991-2015	Log-normal	
Barium	E2	SS	Intercept	1	-9.2087	10.6811	-0.8621	0.3979			All available between 1991-2015	Log-normal	
Barium	E2	SS	Year	1	0.0067	0.0053	1.2528	0.2234			All available between 1991-2015	Log-normal	
Barium	E5	NG	Intercept	1	56.0091	41.1446	1.3613	0.1872			All available between 1991-2015	Log-normal	
Barium	E5	NG	Year	1	-0.0266	0.0205	-1.2946	0.2089			All available between 1991-2015	Log-normal	
Barium	E5	SB	Intercept	1	-30.6215	23.4633	-1.3051	0.2115			All available between 1991-2015	Log-normal	
Barium	E5	SB	Year	1	0.0151	0.0117	1.2929	0.2156			All available between 1991-2015	Log-normal	
Barium	E5	SS	Intercept	1	-13.7173	10.1441	-1.3522	0.1907			All available between 1991-2015	Log-normal	
Barium	E5	SS	Year	1	0.0090	0.0051	1.7724	0.0908			All available between 1991-2015	Log-normal	
Barium	E6	NG	Intercept	1	112.8907	81.1718	1.3908	0.1846			All available between 1991-2015	Log-normal	
Barium	E6	NG	Year	1	-0.0552	0.0404	-1.3649	0.1924			All available between 1991-2015	Log-normal	
Barium	E6	SS	Intercept	1	3.5485	16.4410	0.2158	0.8317			All available between 1991-2015	Log-normal	
Barium	E6	SS	Year	1	0.0003	0.0082	0.0408	0.9679			All available between 1991-2015	Log-normal	
Barium	N2	NG	Intercept	1	97.9756	44.4538	2.2040	0.0374			All available between 1991-2015	Log-normal	
Barium	N2	NG	Year	1	-0.0477	0.0222	-2.1477	0.0420			All available between 1991-2015	Log-normal	
Barium	N2	SB	Intercept	1	83.7223	80.9074	1.0348	0.3183			All available between 1991-2015	Log-normal	
Barium	N2	SB	Year	1	-0.0419	0.0405	-1.0364	0.3176			All available between 1991-2015	Log-normal	
Barium	N2	SD	Intercept	1	-57.8927	8.3375	-6.9436	<.0001			All available between 1991-2015	Log-normal	
Barium	N2	SD	Year	1	0.0311	0.0042	7.4789	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Barium	N2	SS	Intercept	1	-19.8529	6.8335	-2.9053	0.0080			All available between 1991-2015	Log-normal	
Barium	N2	SS	Year	1	0.0122	0.0034	3.5879	0.0016	Yes	pos	All available between 1991-2015	Log-normal	
Barium	N4	NG	Intercept	1	-86.2211	50.9399	-1.6926	0.1143			All available between 1991-2015	Log-normal	
Barium	N4	NG	Year	1	0.0440	0.0254	1.7355	0.1063			All available between 1991-2015	Log-normal	
Barium	N4	SS	Intercept	1	-18.7565	15.4235	-1.2161	0.2427			All available between 1991-2015	Log-normal	
Barium	N4	SS	Year	1	0.0115	0.0077	1.5009	0.1541			All available between 1991-2015	Log-normal	
Barium	N5	NG	Intercept	1	70.6273	52.6026	1.3427	0.2024			All available between 1991-2015	Log-normal	
Barium	N5	NG	Year	1	-0.0339	0.0262	-1.2957	0.2176			All available between 1991-2015	Log-normal	
Barium	N5	SD	Intercept	1	-93.1955	16.0712	-5.7989	<.0001			All available between 1991-2015	Log-normal	
Barium	N5	SD	Year	1	0.0488	0.0080	6.0990	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Barium	N5	SS	Intercept	1	16.5292	17.0773	0.9679	0.3522			All available between 1991-2015	Log-normal	
Barium	N5	SS	Year	1	-0.0061	0.0085	-0.7184	0.4862			All available between 1991-2015	Log-normal	
Barium	S1	NG	Intercept	1	-34.2372	47.7301	-0.7173	0.4801			All available between 1991-2015	Log-normal	
Barium	S1	NG	Year	1	0.0184	0.0238	0.7714	0.4480			All available between 1991-2015	Log-normal	
Barium	S1	SB	Intercept	1	-21.3147	25.6916	-0.8296	0.4190			All available between 1991-2015	Log-normal	
Barium	S1	SB	Year	1	0.0104	0.0128	0.8099	0.4299			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Barium	S1	SD	Intercept	1	-5.3444	9.8373	-0.5433	0.5916			All available between 1991-2015	Log-normal	
Barium	S1	SD	Year	1	0.0049	0.0049	0.9977	0.3276			All available between 1991-2015	Log-normal	
Barium	S1	SS	Intercept	1	-15.9724	6.5124	-2.4526	0.0222			All available between 1991-2015	Log-normal	
Barium	S1	SS	Year	1	0.0103	0.0033	3.1550	0.0044			All available between 1991-2015	Log-normal	
Barium	S2	NG	Intercept	1	110.2034	34.6068	3.1844	0.0040			All available between 1991-2015	Log-normal	
Barium	S2	NG	Year	1	-0.0534	0.0173	-3.0908	0.0050			All available between 1991-2015	Log-normal	
Barium	S2	SB	Intercept	1	-24.7101	22.1769	-1.1142	0.2798			All available between 1991-2015	Log-normal	
Barium	S2	SB	Year	1	0.0122	0.0111	1.0991	0.2862			All available between 1991-2015	Log-normal	
Barium	S2	SS	Intercept	1	-6.6246	5.5750	-1.1883	0.2459			All available between 1991-2015	Log-normal	
Barium	S2	SS	Year	1	0.0056	0.0028	2.0029	0.0561			All available between 1991-2015	Log-normal	
Barium	S3	NG	Intercept	1	36.5768	28.7107	1.2740	0.2139			All available between 1991-2015	Log-normal	
Barium	S3	NG	Year	1	-0.0169	0.0143	-1.1803	0.2486			All available between 1991-2015	Log-normal	
Barium	S3	SD	Intercept	1	34.5794	12.3128	2.8084	0.0093			All available between 1991-2015	Log-normal	
Barium	S3	SD	Year	1	-0.0150	0.0061	-2.4365	0.0220			All available between 1991-2015	Log-normal	
Barium	S3	SS	Intercept	1	6.8462	8.3143	0.8234	0.4187			All available between 1991-2015	Log-normal	
Barium	S3	SS	Year	1	-0.0013	0.0041	-0.3168	0.7543			All available between 1991-2015	Log-normal	
Barium	S4	NG	Intercept	1	72.9297	36.9678	1.9728	0.0607			All available between 1991-2015	Log-normal	
Barium	S4	NG	Year	1	-0.0351	0.0184	-1.9004	0.0700			All available between 1991-2015	Log-normal	
Barium	S4	SB	Intercept	1	-31.0604	29.7024	-1.0457	0.3134			All available between 1991-2015	Log-normal	
Barium	S4	SB	Year	1	0.0154	0.0148	1.0403	0.3158			All available between 1991-2015	Log-normal	
Barium	S4	SD	Intercept	1	-4.6678	5.3092	-0.8792	0.3880			All available between 1991-2015	Log-normal	
Barium	S4	SD	Year	1	0.0046	0.0027	1.7493	0.0930			All available between 1991-2015	Log-normal	
Barium	S4	SS	Intercept	1	-59.9469	11.1015	-5.3999	<.0001			All available between 1991-2015	Log-normal	
Barium	S4	SS	Year	1	0.0322	0.0055	5.8170	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Barium	S4	WW	Intercept	1	-104.5392	40.2604	-2.5966	0.0408			All available between 1991-2015	Log-normal	
Barium	S4	WW	Year	1	0.0526	0.0201	2.6167	0.0398			All available between 1991-2015	Log-normal	
Barium	S5	FC	Intercept	1	31.0749	64.3601	0.4828	0.6496			All available between 1991-2015	Log-normal	
Barium	S5	FC	Year	1	-0.0163	0.0321	-0.5088	0.6325			All available between 1991-2015	Log-normal	
Barium	S5	NG	Intercept	1	-147.2739	37.7809	-3.8981	0.0008			All available between 1991-2015	Log-normal	
Barium	S5	NG	Year	1	0.0746	0.0188	3.9611	0.0007	Yes	pos	All available between 1991-2015	Log-normal	
Barium	S5	SB	Intercept	1	-48.1917	25.1668	-1.9149	0.0819			All available between 1991-2015	Log-normal	
Barium	S5	SB	Year	1	0.0239	0.0126	1.9052	0.0832			All available between 1991-2015	Log-normal	
Barium	S5	SS	Intercept	1	-10.1966	7.4507	-1.3685	0.1863			All available between 1991-2015	Log-normal	
Barium	S5	SS	Year	1	0.0074	0.0037	1.9853	0.0610			All available between 1991-2015	Log-normal	
Barium	W2	NG	Intercept	1	29.4047	34.6073	0.8497	0.4036			All available between 1991-2015	Log-normal	
Barium	W2	NG	Year	1	-0.0138	0.0173	-0.7966	0.4332			All available between 1991-2015	Log-normal	
Barium	W2	SB	Intercept	1	-56.9301	23.4082	-2.4321	0.0257			All available between 1991-2015	Log-normal	
Barium	W2	SB	Year	1	0.0282	0.0117	2.4117	0.0268			All available between 1991-2015	Log-normal	
Barium	W2	SS	Intercept	1	-5.5032	6.8359	-0.8050	0.4303			All available between 1991-2015	Log-normal	
Barium	W2	SS	Year	1	0.0048	0.0034	1.4129	0.1731			All available between 1991-2015	Log-normal	
Barium	W4	NG	Intercept	1	-76.0388	56.3122	-1.3503	0.1920			All available between 1991-2015	Log-normal	
Barium	W4	NG	Year	1	0.0392	0.0281	1.3952	0.1783			All available between 1991-2015	Log-normal	
Barium	W4	SB	Intercept	1	-33.6489	62.3729	-0.5395	0.6003			All available between 1991-2015	Log-normal	
Barium	W4	SB	Year	1	0.0167	0.0311	0.5371	0.6019			All available between 1991-2015	Log-normal	
Barium	W4	SS	Intercept	1	-2.5072	7.8988	-0.3174	0.7550			All available between 1991-2015	Log-normal	
Barium	W4	SS	Year	1	0.0035	0.0039	0.8979	0.3826			All available between 1991-2015	Log-normal	
Beryllium	E1	NG	Intercept	1	-69.8863	18.3009	-3.8187	0.0008			All available between 1991-2015	Log-normal	
Beryllium	E1	NG	Year	1	0.0340	0.0091	3.7182	0.0011	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Beryllium	E1	SS	Intercept	1	-5.15420	7.62733	-0.67575	0.50657			All available between 1991-2015	Normal	
Beryllium	E1	SS	Year	1	0.00288	0.00381	0.75602	0.45803	No		All available between 1991-2015	Normal	
Beryllium	E2	SD	Intercept	1	-61.8291	11.1570	-5.5417	<.0001			All available between 1991-2015	Log-normal	
Beryllium	E2	SD	Year	1	0.0306	0.0056	5.5021	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Beryllium	E2	SS	Intercept	1	-10.95040	7.52417	-1.45536	0.15969			All available between 1991-2015	Normal	
Beryllium	E2	SS	Year	1	0.00572	0.00375	1.52404	0.14175	No		All available between 1991-2015	Normal	
Beryllium	E5	SS	Intercept	1	-12.10762	6.62896	-1.82647	0.08203			All available between 1991-2015	Normal	
Beryllium	E5	SS	Year	1	0.00637	0.00331	1.92500	0.06788	No		All available between 1991-2015	Normal	
Beryllium	E6	SS	Intercept	1	-8.15186	9.09085	-0.89671	0.38240			All available between 1991-2015	Normal	
Beryllium	E6	SS	Year	1	0.00437	0.00453	0.96433	0.34840	No		All available between 1991-2015	Normal	
Beryllium	N2	SD	Intercept	1	-75.9952	11.0245	-6.8933	<.0001			All available between 1991-2015	Log-normal	
Beryllium	N2	SD	Year	1	0.0378	0.0055	6.8675	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Beryllium	N2	SS	Intercept	1	-21.68594	7.32126	-2.96205	0.00698			All available between 1991-2015	Normal	
Beryllium	N2	SS	Year	1	0.01134	0.00365	3.10538	0.00498	No		All available between 1991-2015	Normal	
Beryllium	N4	SS	Intercept	1	-34.28312	14.67762	-2.33574	0.03380			All available between 1991-2015	Normal	
Beryllium	N4	SS	Year	1	0.01745	0.00731	2.38829	0.03052	No		All available between 1991-2015	Normal	
Beryllium	N5	SD	Intercept	1	-97.9445	21.4661	-4.5628	0.0004			All available between 1991-2015	Log-normal	
Beryllium	N5	SD	Year	1	0.0487	0.0107	4.5599	0.0004	Yes	pos	All available between 1991-2015	Log-normal	
Beryllium	N5	SS	Intercept	1	-12.55086	13.18306	-0.95204	0.35986			All available between 1991-2015	Normal	
Beryllium	N5	SS	Year	1	0.00657	0.00656	1.00119	0.33650	No		All available between 1991-2015	Normal	
Beryllium	S1	NG	Intercept	1	-81.5110	16.3996	-4.9703	<.0001			All available between 1991-2015	Log-normal	
Beryllium	S1	NG	Year	1	0.0398	0.0082	4.8565	<.0001	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Beryllium	S1	SB	Intercept	1	-78.6964	12.4918	-6.2999	<.0001			All available between 1991-2015	Log-normal	
Beryllium	S1	SB	Year	1	0.0383	0.0062	6.1464	<.0001	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Beryllium	S1	SD	Intercept	1	-24.3545	11.4151	-2.1335	0.0425			All available between 1991-2015	Log-normal	
Beryllium	S1	SD	Year	1	0.0120	0.0057	2.1077	0.0449			All available between 1991-2015	Log-normal	
Beryllium	S1	SS	Intercept	1	-13.03306	6.72298	-1.93858	0.06492			All available between 1991-2015	Normal	
Beryllium	S1	SS	Year	1	0.00694	0.00336	2.06676	0.05019	No		All available between 1991-2015	Normal	
Beryllium	S2	SS	Intercept	1	-13.50562	6.55124	-2.06154	0.04979			All available between 1991-2015	Normal	
Beryllium	S2	SS	Year	1	0.00716	0.00327	2.18932	0.03812	No		All available between 1991-2015	Normal	
Beryllium	S3	NG	Intercept	1	-78.6747	20.0035	-3.9330	0.0006			All available between 1991-2015	Log-normal	
Beryllium	S3	NG	Year	1	0.0384	0.0100	3.8423	0.0007	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Beryllium	S3	SD	Intercept	1	16.6434	13.3577	1.2460	0.2239			All available between 1991-2015	Log-normal	
Beryllium	S3	SD	Year	1	-0.0084	0.0067	-1.2594	0.2191			All available between 1991-2015	Log-normal	
Beryllium	S3	SS	Intercept	1	-15.93466	6.49657	-2.45278	0.02218			All available between 1991-2015	Normal	
Beryllium	S3	SS	Year	1	0.00829	0.00324	2.55624	0.01765	No		All available between 1991-2015	Normal	
Beryllium	S4	SD	Intercept	1	-19.0001	7.2036	-2.6376	0.0144			All available between 1991-2015	Log-normal	
Beryllium	S4	SD	Year	1	0.0094	0.0036	2.6116	0.0153			All available between 1991-2015	Log-normal	
Beryllium	S4	SS	Intercept	1	-49.26017	10.03059	-4.91100	<.0001			All available between 1991-2015	Normal	
Beryllium	S4	SS	Year	1	0.02505	0.00500	5.00488	<.0001	Yes	Pos	All available between 1991-2015	Normal	
Beryllium	S5	SS	Intercept	1	-6.13009	7.88588	-0.77735	0.44605			All available between 1991-2015	Normal	
Beryllium	S5	SS	Year	1	0.00347	0.00393	0.88203	0.38824	No		All available between 1991-2015	Normal	
Beryllium	W2	NG	Intercept	1	-68.4312	22.3911	-3.0562	0.0053			All available between 1991-2015	Log-normal	
Beryllium	W2	NG	Year	1	0.0333	0.0112	2.9759	0.0064			All available between 1991-2015	Log-normal	
Beryllium	W2	SS	Intercept	1	-10.22852	5.72264	-1.78738	0.08904			All available between 1991-2015	Normal	
Beryllium	W2	SS	Year	1	0.00541	0.00286	1.89327	0.07288	No		All available between 1991-2015	Normal	
Beryllium	W4	SS	Intercept	1	-4.77554	15.46494	-0.30880	0.76146			All available between 1991-2015	Normal	
Beryllium	W4	SS	Year	1	0.00287	0.00770	0.37217	0.71465	No		All available between 1991-2015	Normal	
Boron	E1	NG	Intercept	1	10.7436	23.9606	0.4484	0.6579			All available between 1991-2015	Log-normal	
Boron	E1	NG	Year	1	-0.0043	0.0120	-0.3586	0.7230			All available between 1991-2015	Log-normal	
Boron	E1	SB	Intercept	1	121.38898	456.41797	0.26596	0.79415			All available between 1991-2015	Normal	
Boron	E1	SB	Year	1	-0.04650	0.22798	-0.20398	0.84130	No		All available between 1991-2015	Normal	
Boron	E1	SS	Intercept	1	26.0341	20.4877	1.2707	0.2177			All available between 1991-2015	Log-normal	
Boron	E1	SS	Year	1	-0.0119	0.0102	-1.1671	0.2563			All available between 1991-2015	Log-normal	
Boron	E2	NG	Intercept	1	14.5608	38.3430	0.3798	0.7075			All available between 1991-2015	Log-normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Boron	E2	NG	Year	1	-0.0063	0.0191	-0.3271	0.7464			All available between 1991-2015	Log-normal	
Boron	E2	SB	Intercept	1	-72.83962	317.05908	-0.22974	0.82293			All available between 1991-2015	Normal	
Boron	E2	SB	Year	1	0.04940	0.15844	0.31179	0.76160	No		All available between 1991-2015	Normal	
Boron	E2	SD	Intercept	1	-37.4792	16.3017	-2.2991	0.0301			All available between 1991-2015	Log-normal	
Boron	E2	SD	Year	1	0.0200	0.0081	2.4607	0.0211			All available between 1991-2015	Log-normal	
Boron	E2	SS	Intercept	1	32.3684	15.6792	2.0644	0.0510			All available between 1991-2015	Log-normal	
Boron	E2	SS	Year	1	-0.0151	0.0078	-1.9253	0.0672			All available between 1991-2015	Log-normal	
Boron	E5	NG	Intercept	1	-4.5903	58.1992	-0.0789	0.9378			All available between 1991-2015	Log-normal	
Boron	E5	NG	Year	1	0.0034	0.0290	0.1171	0.9078			All available between 1991-2015	Log-normal	
Boron	E5	SB	Intercept	1	53.82557	332.64394	0.16181	0.87361			All available between 1991-2015	Normal	
Boron	E5	SB	Year	1	-0.01388	0.16606	-0.08360	0.93448	No		All available between 1991-2015	Normal	
Boron	E5	SS	Intercept	1	18.4306	21.2672	0.8666	0.3959			All available between 1991-2015	Log-normal	
Boron	E5	SS	Year	1	-0.0081	0.0106	-0.7679	0.4511			All available between 1991-2015	Log-normal	
Boron	E6	NG	Intercept	1	-176.1469	122.0394	-1.4434	0.1695			All available between 1991-2015	Log-normal	
Boron	E6	NG	Year	1	0.0889	0.0608	1.4629	0.1641			All available between 1991-2015	Log-normal	
Boron	E6	SS	Intercept	1	-18.4193	26.1815	-0.7035	0.4913			All available between 1991-2015	Log-normal	
Boron	E6	SS	Year	1	0.0103	0.0130	0.7907	0.4400			All available between 1991-2015	Log-normal	
Boron	N2	NG	Intercept	1	-21.4259	31.6090	-0.6778	0.5044			All available between 1991-2015	Log-normal	
Boron	N2	NG	Year	1	0.0118	0.0158	0.7466	0.4626			All available between 1991-2015	Log-normal	
Boron	N2	SB	Intercept	1	798.24257	474.89329	1.68089	0.11495			All available between 1991-2015	Normal	
Boron	N2	SB	Year	1	-0.38612	0.23743	-1.62625	0.12619	No		All available between 1991-2015	Normal	
Boron	N2	SD	Intercept	1	-50.5763	16.4188	-3.0804	0.0051			All available between 1991-2015	Log-normal	
Boron	N2	SD	Year	1	0.0266	0.0082	3.2411	0.0035			All available between 1991-2015	Log-normal	
Boron	N2	SS	Intercept	1	-32.0568	18.5892	-1.7245	0.0980			All available between 1991-2015	Log-normal	
Boron	N2	SS	Year	1	0.0173	0.0093	1.8625	0.0754			All available between 1991-2015	Log-normal	
Boron	N4	NG	Intercept	1	-135.2108	110.9148	-1.2191	0.2445			All available between 1991-2015	Log-normal	
Boron	N4	NG	Year	1	0.0684	0.0552	1.2391	0.2372			All available between 1991-2015	Log-normal	
Boron	N4	SS	Intercept	1	-90.2286	47.8829	-1.8844	0.0790			All available between 1991-2015	Log-normal	
Boron	N4	SS	Year	1	0.0461	0.0238	1.9322	0.0724			All available between 1991-2015	Log-normal	
Boron	N5	NG	Intercept	1	-202.3671	120.1812	-1.6839	0.1161			All available between 1991-2015	Log-normal	
Boron	N5	NG	Year	1	0.1020	0.0598	1.7042	0.1121			All available between 1991-2015	Log-normal	
Boron	N5	SD	Intercept	1	-16.2965	36.2447	-0.4496	0.6594			All available between 1991-2015	Log-normal	
Boron	N5	SD	Year	1	0.0095	0.0180	0.5266	0.6062			All available between 1991-2015	Log-normal	
Boron	N5	SS	Intercept	1	-21.4542	27.2886	-0.7862	0.4470			All available between 1991-2015	Log-normal	
Boron	N5	SS	Year	1	0.0120	0.0136	0.8802	0.3960			All available between 1991-2015	Log-normal	
Boron	S1	NG	Intercept	1	-44.6452	46.7064	-0.9559	0.3487			All available between 1991-2015	Log-normal	
Boron	S1	NG	Year	1	0.0234	0.0233	1.0046	0.3251			All available between 1991-2015	Log-normal	
Boron	S1	SB	Intercept	1	-191.29793	329.09520	-0.58128	0.56868			All available between 1991-2015	Normal	
Boron	S1	SB	Year	1	0.10935	0.16434	0.66538	0.51473	No		All available between 1991-2015	Normal	
Boron	S1	SD	Intercept	1	-32.5518	15.4152	-2.1117	0.0445			All available between 1991-2015	Log-normal	
Boron	S1	SD	Year	1	0.0176	0.0077	2.2894	0.0304			All available between 1991-2015	Log-normal	
Boron	S1	SS	Intercept	1	-2.9458	17.4521	-0.1688	0.8674			All available between 1991-2015	Log-normal	
Boron	S1	SS	Year	1	0.0027	0.0087	0.3064	0.7620			All available between 1991-2015	Log-normal	
Boron	S2	NG	Intercept	1	-20.5452	48.5838	-0.4229	0.6761			All available between 1991-2015	Log-normal	
Boron	S2	NG	Year	1	0.0113	0.0243	0.4678	0.6441			All available between 1991-2015	Log-normal	
Boron	S2	SB	Intercept	1	-330.04510	288.23362	-1.14506	0.26718			All available between 1991-2015	Normal	
Boron	S2	SB	Year	1	0.17744	0.14386	1.23338	0.23330	No		All available between 1991-2015	Normal	
Boron	S2	SS	Intercept	1	1.1617	18.5792	0.0625	0.9506			All available between 1991-2015	Log-normal	
Boron	S2	SS	Year	1	0.0006	0.0093	0.0628	0.9504			All available between 1991-2015	Log-normal	
Boron	S3	NG	Intercept	1	61.4361	35.2540	1.7427	0.0932			All available between 1991-2015	Log-normal	
Boron	S3	NG	Year	1	-0.0287	0.0176	-1.6315	0.1148			All available between 1991-2015	Log-normal	
Boron	S3	SD	Intercept	1	-36.5639	17.3852	-2.1032	0.0453			All available between 1991-2015	Log-normal	
Boron	S3	SD	Year	1	0.0197	0.0087	2.2724	0.0316			All available between 1991-2015	Log-normal	
Boron	S3	SS	Intercept	1	-25.9167	18.3788	-1.4101	0.1719			All available between 1991-2015	Log-normal	
Boron	S3	SS	Year	1	0.0144	0.0092	1.5730	0.1294			All available between 1991-2015	Log-normal	
Boron	S4	NG	Intercept	1	5.1278	47.1959	0.1086	0.9144			All available between 1991-2015	Log-normal	
Boron	S4	NG	Year	1	-0.0014	0.0235	-0.0611	0.9518			All available between 1991-2015	Log-normal	
Boron	S4	SB	Intercept	1	-337.41096	365.29464	-0.92367	0.37131			All available between 1991-2015	Normal	
Boron	S4	SB	Year	1	0.18094	0.18225	0.99281	0.33765	No		All available between 1991-2015	Normal	
Boron	S4	SD	Intercept	1	-44.6566	19.5282	-2.2868	0.0313			All available between 1991-2015	Log-normal	
Boron	S4	SD	Year	1	0.0236	0.0097	2.4235	0.0233			All available between 1991-2015	Log-normal	
Boron	S4	SS	Intercept	1	-21.3696	22.8841	-0.9338	0.3621			All available between 1991-2015	Log-normal	
Boron	S4	SS	Year	1	0.0119	0.0114	1.0399	0.3114			All available between 1991-2015	Log-normal	
Boron	S5	FC	Intercept	1	104.0760	56.0920	1.8555	0.1227			All available between 1991-2015	Log-normal	
Boron	S5	FC	Year	1	-0.0514	0.0280	-1.8367	0.1257			All available between 1991-2015	Log-normal	
Boron	S5	NG	Intercept	1	-52.0421	38.1321	-1.3648	0.1868			All available between 1991-2015	Log-normal	
Boron	S5	NG	Year	1	0.0272	0.0190	1.4304	0.1673			All available between 1991-2015	Log-normal	
Boron	S5	SB	Intercept	1	447.09083	278.85462	1.60331	0.13717			All available between 1991-2015	Normal	
Boron	S5	SB	Year	1	-0.20914	0.13908	-1.50376	0.16080	No		All available between 1991-2015	Normal	
Boron	S5	SS	Intercept	1	-6.3316	25.4928	-0.2484	0.8064			All available between 1991-2015	Log-normal	
Boron	S5	SS	Year	1	0.0043	0.0127	0.3359	0.7404			All available between 1991-2015	Log-normal	
Boron	W2	NG	Intercept	1	-19.6496	35.7402	-0.5498	0.5873			All available between 1991-2015	Log-normal	
Boron	W2	NG	Year	1	0.0110	0.0178	0.6190	0.5415			All available between 1991-2015	Log-normal	
Boron	W2	SB	Intercept	1	-145.22291	392.13564	-0.37034	0.71545			All available between 1991-2015	Normal	
Boron	W2	SB	Year	1	0.08647	0.19570	0.44186	0.66385	No		All available between 1991-2015	Normal	
Boron	W2	SS	Intercept	1	57.8032	17.6902	3.2675	0.0039			All available between 1991-2015	Log-normal	
Boron	W2	SS	Year	1	-0.0279	0.0088	-3.1584	0.0049			All available between 1991-2015	Log-normal	
Boron	W4	FC	Intercept	1	127.9235	43.9406	2.9113	0.0269			All available between 1991-2015	Log-normal	
Boron	W4	FC	Year	1	-0.0632	0.0219	-2.8879	0.0278			All available between 1991-2015	Log-normal	
Boron	W4	NG	Intercept	1	-36.7150	77.8226	-0.4718	0.6422			All available between 1991-2015	Log-normal	
Boron	W4	NG	Year	1	0.0193	0.0388	0.4965	0.6249			All available between 1991-2015	Log-normal	
Boron	W4	SB	Intercept	1	-138.02139	465.52210	-0.29649	0.77238			All available between 1991-2015	Normal	
Boron	W4	SB	Year	1	0.08249	0.23207	0.35546	0.72897	No		All available between 1991-2015	Normal	
Boron	W4	SS	Intercept	1	2.9053	38.9009	0.0747	0.9414			All available between 1991-2015	Log-normal	
Boron	W4	SS	Year	1	-0.0002	0.0194	-0.0108	0.9916			All available between 1991-2015	Log-normal	
Cadmium	E1	NG	Intercept	1	211.3506	29.2175	7.2337	<.0001			All available between 1991-2015	Log-normal	
Cadmium	E1	NG	Year	1	-0.1066	0.0146	-7.3056	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	E1	SS	Intercept	1	-11.2153	19.3273	-0.5803	0.5679			All available between 1991-2015	Log-normal	
Cadmium	E1	SS	Year	1	0.0051	0.0096	0.5330	0.5996			All available between 1991-2015	Log-normal	
Cadmium	E2	NG	Intercept	1	168.9353	25.9699	6.5050	<.0001			All available between 1991-2015	Log-normal	
Cadmium	E2	NG	Year	1	-0.0854	0.0130	-6.5894	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	E2	SD	Intercept	1	-17.1287	26.2779	-0.6518	0.5205			All available between 1991-2015	Log-normal	
Cadmium	E2	SD	Year	1	0.0080	0.0131	0.6075	0.5490			All available between 1991-2015	Log-normal	
Cadmium	E2	SS	Intercept	1	5.3842	14.1986	0.3792	0.7082			All available between 1991-2015	Log-normal	
Cadmium	E2	SS	Year	1	-0.0032	0.0071	-0.4525	0.6553			All available between 1991-2015	Log-normal	
Cadmium	E5	NG	Intercept	1	76.1734	33.9723	2.2422	0.0354			All available between 1991-2015	Log-normal	
Cadmium	E5	NG	Year	1	-0.0390	0.0170	-2.2994	0.0313			All available between 1991-2015	Log-normal	
Cadmium	E5	SS	Intercept	1	10.7002	23.1331	0.4625	0.6484			All available between 1991-2015	Log-normal	
Cadmium	E5	SS	Year	1	-0.0058	0.0115	-0.5038	0.6196			All available between 1991-2015	Log-normal	
Cadmium	E6	NG	Intercept	1	61.0913	60.1089	1.0163	0.3256			All available between 1991-2015	Log-normal	
Cadmium	E6	NG	Year	1	-0.0313	0.0299	-1.0450	0.3126			All available between 1991-2015	Log-normal	
Cadmium	E6	SS	Intercept	1	55.1652	19.8622	2.7774	0.0129			All available between 1991-2015	Log-normal	
Cadmium	E6	SS	Year	1	-0.0277	0.0099	-2.8045	0.0122			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Cadmium	N2	NG	Intercept	1	152.9148	22.0192	6.9446	<.0001			All available between 1991-2015	Log-normal	
Cadmium	N2	NG	Year	1	-0.0774	0.0110	-7.0436	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	N2	SB	Intercept	1	216.2256	87.9639	2.4581	0.0574			2002-2015	Log-normal	
Cadmium	N2	SB	Year	1	-0.1089	0.0438	-2.4850	0.0555			2002-2015	Log-normal	
Cadmium	N2	SD	Intercept	1	-54.5802	14.4640	-3.7735	0.0009			All available between 1991-2015	Log-normal	
Cadmium	N2	SD	Year	1	0.0268	0.0072	3.7170	0.0011	Yes	pos	All available between 1991-2015	Log-normal	
Cadmium	N2	SS	Intercept	1	-1.2568	15.5508	-0.0808	0.9363			All available between 1991-2015	Log-normal	
Cadmium	N2	SS	Year	1	0.0003	0.0078	0.0365	0.9712			All available between 1991-2015	Log-normal	
Cadmium	N4	NG	Intercept	1	179.5836	55.8178	3.2173	0.0067			All available between 1991-2015	Log-normal	
Cadmium	N4	NG	Year	1	-0.0907	0.0278	-3.2625	0.0062			All available between 1991-2015	Log-normal	
Cadmium	N4	SS	Intercept	1	-24.4314	27.0259	-0.9040	0.3803			All available between 1991-2015	Log-normal	
Cadmium	N4	SS	Year	1	0.0117	0.0135	0.8671	0.3996			All available between 1991-2015	Log-normal	
Cadmium	N5	NG	Intercept	1	214.9000	74.2682	2.8936	0.0126			All available between 1991-2015	Log-normal	
Cadmium	N5	NG	Year	1	-0.1080	0.0370	-2.9203	0.0119			All available between 1991-2015	Log-normal	
Cadmium	N5	SD	Intercept	1	-82.1314	32.8382	-2.5011	0.0245			All available between 1991-2015	Log-normal	
Cadmium	N5	SD	Year	1	0.0409	0.0163	2.5007	0.0245			All available between 1991-2015	Log-normal	
Cadmium	N5	SS	Intercept	1	17.7142	25.5855	0.6924	0.5019			All available between 1991-2015	Log-normal	
Cadmium	N5	SS	Year	1	-0.0090	0.0127	-0.7068	0.4932			All available between 1991-2015	Log-normal	
Cadmium	S1	NG	Intercept	1	83.2274	32.1685	2.5872	0.0162			All available between 1991-2015	Log-normal	
Cadmium	S1	NG	Year	1	-0.0425	0.0161	-2.6488	0.0141			All available between 1991-2015	Log-normal	
Cadmium	S1	SB	Intercept	1	92.6197	40.1861	2.3048	0.0546			2002-2015	Log-normal	
Cadmium	S1	SB	Year	1	-0.0475	0.0200	-2.3744	0.0493			2002-2015	Log-normal	
Cadmium	S1	SD	Intercept	1	-11.2546	29.4015	-0.3828	0.7050			All available between 1991-2015	Log-normal	
Cadmium	S1	SD	Year	1	0.0054	0.0147	0.3662	0.7172			All available between 1991-2015	Log-normal	
Cadmium	S1	SS	Intercept	1	-7.2046	19.2283	-0.3747	0.7113			All available between 1991-2015	Log-normal	
Cadmium	S1	SS	Year	1	0.0032	0.0096	0.3380	0.7384			All available between 1991-2015	Log-normal	
Cadmium	S2	NG	Intercept	1	80.0621	29.2806	2.7343	0.0116			All available between 1991-2015	Log-normal	
Cadmium	S2	NG	Year	1	-0.0409	0.0146	-2.7986	0.0100			All available between 1991-2015	Log-normal	
Cadmium	S2	SB	Intercept	1	85.9585	35.3887	2.4290	0.0380			2002-2015	Log-normal	
Cadmium	S2	SB	Year	1	-0.0442	0.0176	-2.5088	0.0334			2002-2015	Log-normal	
Cadmium	S2	SS	Intercept	1	57.6079	37.4835	1.5369	0.1369			All available between 1991-2015	Log-normal	
Cadmium	S2	SS	Year	1	-0.0291	0.0187	-1.5572	0.1320			All available between 1991-2015	Log-normal	
Cadmium	S3	NG	Intercept	1	159.1618	28.4604	5.5924	<.0001			All available between 1991-2015	Log-normal	
Cadmium	S3	NG	Year	1	-0.0805	0.0142	-5.6680	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	S3	SD	Intercept	1	9.8195	36.5884	0.2684	0.7905			All available between 1991-2015	Log-normal	
Cadmium	S3	SD	Year	1	-0.0049	0.0183	-0.2684	0.7905			All available between 1991-2015	Log-normal	
Cadmium	S3	SS	Intercept	1	-20.4267	17.4113	-1.1732	0.2527			All available between 1991-2015	Log-normal	
Cadmium	S3	SS	Year	1	0.0098	0.0087	1.1303	0.2700			All available between 1991-2015	Log-normal	
Cadmium	S4	NG	Intercept	1	148.2375	29.6712	4.9960	<.0001			All available between 1991-2015	Log-normal	
Cadmium	S4	NG	Year	1	-0.0751	0.0148	-5.0730	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	S4	SB	Intercept	1	78.3881	55.4086	1.4147	0.1949			2002-2015	Log-normal	
Cadmium	S4	SB	Year	1	-0.0404	0.0276	-1.4646	0.1812			2002-2015	Log-normal	
Cadmium	S4	SD	Intercept	1	73.3964	37.9822	1.9324	0.0652			All available between 1991-2015	Log-normal	
Cadmium	S4	SD	Year	1	-0.0371	0.0190	-1.9591	0.0618			All available between 1991-2015	Log-normal	
Cadmium	S4	SS	Intercept	1	11.6166	30.1744	0.3850	0.7045			All available between 1991-2015	Log-normal	
Cadmium	S4	SS	Year	1	-0.0064	0.0151	-0.4279	0.6735			All available between 1991-2015	Log-normal	
Cadmium	S5	NG	Intercept	1	156.8264	31.7658	4.9370	<.0001			All available between 1991-2015	Log-normal	
Cadmium	S5	NG	Year	1	-0.0794	0.0158	-5.0120	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	S5	SB	Intercept	1	151.7355	68.3344	2.2205	0.0618			2002-2015	Log-normal	
Cadmium	S5	SB	Year	1	-0.0769	0.0340	-2.2598	0.0583			2002-2015	Log-normal	
Cadmium	S5	SS	Intercept	1	-3.3880	27.5832	-0.1228	0.9035			All available between 1991-2015	Log-normal	
Cadmium	S5	SS	Year	1	0.0012	0.0138	0.0845	0.9335			All available between 1991-2015	Log-normal	
Cadmium	W2	NG	Intercept	1	199.8558	32.4628	6.1565	<.0001			All available between 1991-2015	Log-normal	
Cadmium	W2	NG	Year	1	-0.1008	0.0162	-6.2216	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cadmium	W2	SB	Intercept	1	142.8650	60.5636	2.3589	0.0427			2002-2015	Log-normal	
Cadmium	W2	SB	Year	1	-0.0724	0.0301	-2.4033	0.0397			2002-2015	Log-normal	
Cadmium	W2	SS	Intercept	1	21.5693	11.0194	1.9574	0.0644			All available between 1991-2015	Log-normal	
Cadmium	W2	SS	Year	1	-0.0111	0.0055	-2.0215	0.0568			All available between 1991-2015	Log-normal	
Cadmium	W4	NG	Intercept	1	10.4801	41.2890	0.2538	0.8022			All available between 1991-2015	Log-normal	
Cadmium	W4	NG	Year	1	-0.0060	0.0206	-0.2908	0.7742			All available between 1991-2015	Log-normal	
Cadmium	W4	SB	Intercept	1	130.6918	74.9398	1.7440	0.1151			2002-2015	Log-normal	
Cadmium	W4	SB	Year	1	-0.0662	0.0373	-1.7735	0.1099			2002-2015	Log-normal	
Cadmium	W4	SS	Intercept	1	50.6164	53.1150	0.9530	0.3548			All available between 1991-2015	Log-normal	
Cadmium	W4	SS	Year	1	-0.0255	0.0265	-0.9636	0.3496			All available between 1991-2015	Log-normal	
Calcium	E1	NG	Intercept	1	-6.1379	18.4999	-0.3318	0.7429			All available between 1991-2015	Log-normal	
Calcium	E1	NG	Year	1	0.0074	0.0092	0.8019	0.4305			All available between 1991-2015	Log-normal	
Calcium	E1	SB	Intercept	1	-7.3660	17.1915	-0.4285	0.6748			All available between 1991-2015	Log-normal	
Calcium	E1	SB	Year	1	0.0074	0.0086	0.8665	0.4008			All available between 1991-2015	Log-normal	
Calcium	E1	SS	Intercept	1	24.2853	17.3892	1.3966	0.1771			All available between 1991-2015	Log-normal	
Calcium	E1	SS	Year	1	-0.0079	0.0087	-0.9140	0.3711			All available between 1991-2015	Log-normal	
Calcium	E2	NG	Intercept	1	-7.9373	14.8285	-0.5353	0.5974			All available between 1991-2015	Log-normal	
Calcium	E2	NG	Year	1	0.0083	0.0074	1.1247	0.2718			All available between 1991-2015	Log-normal	
Calcium	E2	SB	Intercept	1	12.1388	11.3244	1.0719	0.3089			All available between 1991-2015	Log-normal	
Calcium	E2	SB	Year	1	-0.0023	0.0057	-0.4102	0.6903			All available between 1991-2015	Log-normal	
Calcium	E2	SD	Intercept	1	2254332.74177	839288.28163	2.68601	0.01266			All available between 1991-2015	Normal	
Calcium	E2	SD	Year	1	-1085.67411	418.92779	-2.59155	0.01573	No		All available between 1991-2015	Normal	
Calcium	E2	SS	Intercept	1	-6.9716	15.9918	-0.4360	0.6671			All available between 1991-2015	Log-normal	
Calcium	E2	SS	Year	1	0.0079	0.0080	0.9869	0.3344			All available between 1991-2015	Log-normal	
Calcium	E5	NG	Intercept	1	-60.3510	29.5611	-2.0416	0.0534			All available between 1991-2015	Log-normal	
Calcium	E5	NG	Year	1	0.0346	0.0148	2.3444	0.0285			All available between 1991-2015	Log-normal	
Calcium	E5	SB	Intercept	1	-2.5671	12.0275	-0.2134	0.8339			All available between 1991-2015	Log-normal	
Calcium	E5	SB	Year	1	0.0051	0.0060	0.8540	0.4066			All available between 1991-2015	Log-normal	
Calcium	E5	SS	Intercept	1	40.3507	17.8253	2.2637	0.0343			All available between 1991-2015	Log-normal	
Calcium	E5	SS	Year	1	-0.0157	0.0089	-1.7706	0.0911			All available between 1991-2015	Log-normal	
Calcium	E6	NG	Intercept	1	-40.3507	52.0724	-0.7749	0.4504			All available between 1991-2015	Log-normal	
Calcium	E6	NG	Year	1	0.0245	0.0259	0.9430	0.3606			All available between 1991-2015	Log-normal	
Calcium	E6	SS	Intercept	1	5.7636	22.8240	0.2525	0.8037			All available between 1991-2015	Log-normal	
Calcium	E6	SS	Year	1	0.0021	0.0114	0.1840	0.8562			All available between 1991-2015	Log-normal	
Calcium	N2	NG	Intercept	1	6.8676	25.8664	0.2655	0.7929			All available between 1991-2015	Log-normal	
Calcium	N2	NG	Year	1	0.0010	0.0129	0.0779	0.9386			All available between 1991-2015	Log-normal	
Calcium	N2	SB	Intercept	1	26.8788	16.3037	1.6486	0.1215			All available between 1991-2015	Log-normal	
Calcium	N2	SB	Year	1	-0.0097	0.0082	-1.1861	0.2553			All available between 1991-2015	Log-normal	
Calcium	N2	SD	Year	1	-1362.58953	314.39954	-4.33394	0.00023	Yes	Neg	All available between 1991-2015	Normal	
Calcium	N2	SD	Intercept	1	2792679.36639	629867.40973	4.43376	0.00018			All available between 1991-2015	Normal	
Calcium	N2	SS	Intercept	1	16.9164	6.1230	2.7628	0.0111			All available between 1991-2015	Log-normal	
Calcium	N2	SS	Year	1	-0.0041	0.0031	-1.3475	0.1910			All available between 1991-2015	Log-normal	
Calcium	N4	NG	Intercept	1	-18.1958	67.8642	-0.2681	0.7928			All available between 1991-2015	Log-normal	
Calcium	N4	NG	Year	1	0.0135	0.0338	0.4006	0.6952			All available between 1991-2015	Log-normal	
Calcium	N4	SS	Intercept	1	-263.9276	62.4048	-4.2293	0.0007			All available between 1991-2015	Log-normal	
Calcium	N4	SS	Year	1	0.1360	0.0311	4.3783	0.0005	Yes	pos	All available between 1991-2015	Log-normal	
Calcium	N5	NG	Intercept	1	-77.0542	48.9185	-1.5752	0.1392			All available between 1991-2015	Log-normal	
Calcium	N5	NG	Year	1	0.0428	0.0244	1.7578	0.1023			All available between 1991-2015	Log-normal	
Calcium	N5	SD	Year	1	-3736.69765	720.78110	-5.18423	0.00011	Yes	Neg	All available between 1991-2015	Normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Calcium	N5	SD	Intercept	1	7555206.37450	1448136.82307	5.21719	0.00010			All available between 1991-2015	Normal	
Calcium	N5	SS	Intercept	1	-119.3614	61.2150	-1.9499	0.0749			All available between 1991-2015	Log-normal	
Calcium	N5	SS	Year	1	0.0646	0.0305	2.1202	0.0555			All available between 1991-2015	Log-normal	
Calcium	S1	NG	Intercept	1	-63.4321	27.0646	-2.3437	0.0277			All available between 1991-2015	Log-normal	
Calcium	S1	NG	Year	1	0.0361	0.0135	2.6694	0.0134			All available between 1991-2015	Log-normal	
Calcium	S1	SB	Intercept	1	-3.1833	10.5606	-0.3014	0.7670			All available between 1991-2015	Log-normal	
Calcium	S1	SB	Year	1	0.0054	0.0053	1.0197	0.3230			All available between 1991-2015	Log-normal	
Calcium	S1	SD	Intercept	1	-43915.03664	997747.11164	-0.04401	0.96523			All available between 1991-2015	Normal	
Calcium	S1	SD	Year	1	42.50078	497.95436	0.08535	0.93264	No		All available between 1991-2015	Normal	
Calcium	S1	SS	Intercept	1	12.5314	18.1355	0.6910	0.4965			All available between 1991-2015	Log-normal	
Calcium	S1	SS	Year	1	-0.0016	0.0091	-0.1797	0.8590			All available between 1991-2015	Log-normal	
Calcium	S2	NG	Intercept	1	-30.9100	27.6871	-1.1164	0.2753			All available between 1991-2015	Log-normal	
Calcium	S2	NG	Year	1	0.0198	0.0138	1.4353	0.1641			All available between 1991-2015	Log-normal	
Calcium	S2	SB	Intercept	1	-15.0351	9.8947	-1.5195	0.1460			All available between 1991-2015	Log-normal	
Calcium	S2	SB	Year	1	0.0113	0.0049	2.2807	0.0350			All available between 1991-2015	Log-normal	
Calcium	S2	SS	Intercept	1	-19.0231	14.2891	-1.3313	0.1951			All available between 1991-2015	Log-normal	
Calcium	S2	SS	Year	1	0.0138	0.0071	1.9392	0.0638			All available between 1991-2015	Log-normal	
Calcium	S3	NG	Intercept	1	-61.6759	16.0906	-3.8330	0.0007			All available between 1991-2015	Log-normal	
Calcium	S3	NG	Year	1	0.0351	0.0080	4.3763	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Calcium	S3	SD	Intercept	1	-49558.14722	713850.54605	-0.06942	0.94518			All available between 1991-2015	Normal	
Calcium	S3	SD	Year	1	55.11691	356.32499	0.15468	0.87827	No		All available between 1991-2015	Normal	
Calcium	S3	SS	Intercept	1	-5.8771	25.4206	-0.2312	0.8192			All available between 1991-2015	Log-normal	
Calcium	S3	SS	Year	1	0.0075	0.0127	0.5917	0.5598			All available between 1991-2015	Log-normal	
Calcium	S4	NG	Intercept	1	-33.6520	27.2030	-1.2371	0.2280			All available between 1991-2015	Log-normal	
Calcium	S4	NG	Year	1	0.0212	0.0136	1.5652	0.1306			All available between 1991-2015	Log-normal	
Calcium	S4	SB	Intercept	1	-26.5790	14.4709	-1.8367	0.0876			All available between 1991-2015	Log-normal	
Calcium	S4	SB	Year	1	0.0171	0.0072	2.3641	0.0331			All available between 1991-2015	Log-normal	
Calcium	S4	SD	Intercept	1	-341989.83592	834061.30690	-0.41003	0.68542			All available between 1991-2015	Normal	
Calcium	S4	SD	Year	1	199.13082	416.41144	0.47821	0.63683	No		All available between 1991-2015	Normal	
Calcium	S4	SS	Intercept	1	-96.3856	15.9388	-6.0472	<.0001			All available between 1991-2015	Log-normal	
Calcium	S4	SS	Year	1	0.0522	0.0080	6.5642	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Calcium	S4	WW	Intercept	1	-47.1342	28.0564	-1.6800	0.1440			All available between 1991-2015	Log-normal	
Calcium	S4	WW	Year	1	0.0266	0.0140	1.8975	0.1065			All available between 1991-2015	Log-normal	
Calcium	S5	FC	Intercept	1	51.3178	38.3927	1.3367	0.2389			All available between 1991-2015	Log-normal	
Calcium	S5	FC	Year	1	-0.0236	0.0191	-1.2311	0.2730			All available between 1991-2015	Log-normal	
Calcium	S5	NG	Intercept	1	-86.6174	31.3261	-2.7650	0.0116			All available between 1991-2015	Log-normal	
Calcium	S5	NG	Year	1	0.0477	0.0156	3.0514	0.0061			All available between 1991-2015	Log-normal	
Calcium	S5	SB	Intercept	1	-0.5414	19.4096	-0.0279	0.9782			All available between 1991-2015	Log-normal	
Calcium	S5	SB	Year	1	0.0041	0.0097	0.4256	0.6786			All available between 1991-2015	Log-normal	
Calcium	S5	SS	Intercept	1	17.1703	21.9067	0.7838	0.4423			All available between 1991-2015	Log-normal	
Calcium	S5	SS	Year	1	-0.0041	0.0109	-0.3713	0.7143			All available between 1991-2015	Log-normal	
Calcium	W2	NG	Intercept	1	-27.3186	18.7895	-1.4539	0.1584			All available between 1991-2015	Log-normal	
Calcium	W2	NG	Year	1	0.0182	0.0094	1.9388	0.0639			All available between 1991-2015	Log-normal	
Calcium	W2	SB	Intercept	1	-25.3267	12.3301	-2.0541	0.0548			All available between 1991-2015	Log-normal	
Calcium	W2	SB	Year	1	0.0164	0.0062	2.6649	0.0158			All available between 1991-2015	Log-normal	
Calcium	W2	SS	Intercept	1	9.9204	9.0035	1.1018	0.2836			All available between 1991-2015	Log-normal	
Calcium	W2	SS	Year	1	-0.0007	0.0045	-0.1640	0.8714			All available between 1991-2015	Log-normal	
Calcium	W4	FC	Intercept	1	73.5814	31.7454	2.3179	0.0596			All available between 1991-2015	Log-normal	
Calcium	W4	FC	Year	1	-0.0347	0.0158	-2.1944	0.0706			All available between 1991-2015	Log-normal	
Calcium	W4	NG	Intercept	1	21.3371	56.1646	0.3799	0.7080			All available between 1991-2015	Log-normal	
Calcium	W4	NG	Year	1	-0.0062	0.0280	-0.2215	0.8270			All available between 1991-2015	Log-normal	
Calcium	W4	SB	Intercept	1	-3.0099	34.2249	-0.0879	0.9315			All available between 1991-2015	Log-normal	
Calcium	W4	SB	Year	1	0.0052	0.0171	0.3067	0.7648			All available between 1991-2015	Log-normal	
Calcium	W4	SS	Intercept	1	14.4093	8.5422	1.6868	0.1110			All available between 1991-2015	Log-normal	
Calcium	W4	SS	Year	1	-0.0029	0.0043	-0.6837	0.5039			All available between 1991-2015	Log-normal	
Chloride	E1	NG	Intercept	1	-41600.06263	279265.56358	-0.14896	0.88315			All available between 1991-2015	Normal	
Chloride	E1	NG	Year	1	24.27140	139.23440	0.17432	0.86346	No		All available between 1991-2015	Normal	
Chloride	E1	SB	Intercept	1	-190.0308	159.3904	-1.1922	0.2607			All available between 1991-2015	Log-normal	
Chloride	E1	SB	Year	1	0.0963	0.0795	1.2115	0.2536			All available between 1991-2015	Log-normal	
Chloride	E1	SS	Intercept	1	111.9319	90.6058	1.2354	0.2335			All available between 1991-2015	Log-normal	
Chloride	E1	SS	Year	1	-0.0550	0.0452	-1.2170	0.2402			All available between 1991-2015	Log-normal	
Chloride	E2	NG	Intercept	1	418730.83940	228774.05902	1.83032	0.08293			All available between 1991-2015	Normal	
Chloride	E2	NG	Year	1	-205.98010	114.05796	-1.80592	0.08680	No		All available between 1991-2015	Normal	
Chloride	E2	SB	Intercept	1	-156.2584	182.6823	-0.8554	0.4207			All available between 1991-2015	Log-normal	
Chloride	E2	SB	Year	1	0.0797	0.0911	0.8749	0.4106			All available between 1991-2015	Log-normal	
Chloride	E2	SD	Intercept	1	-190.8704	48.3772	-3.9455	0.0009			All available between 1991-2015	Log-normal	
Chloride	E2	SD	Year	1	0.0974	0.0241	4.0369	0.0007	Yes	pos	All available between 1991-2015	Log-normal	
Chloride	E2	SS	Intercept	1	247.8506	87.1761	2.8431	0.0108			All available between 1991-2015	Log-normal	
Chloride	E2	SS	Year	1	-0.1227	0.0434	-2.8241	0.0112			All available between 1991-2015	Log-normal	
Chloride	E5	NG	Intercept	1	-83170.57895	189744.06127	-0.43833	0.66636			All available between 1991-2015	Normal	
Chloride	E5	NG	Year	1	43.30752	94.61146	0.45774	0.65262	No		All available between 1991-2015	Normal	
Chloride	E5	SB	Intercept	1	-211.1000	163.7089	-1.2895	0.2197			All available between 1991-2015	Log-normal	
Chloride	E5	SB	Year	1	0.1069	0.0817	1.3095	0.2130			All available between 1991-2015	Log-normal	
Chloride	E5	SS	Intercept	1	175.1368	76.8636	2.2785	0.0359			All available between 1991-2015	Log-normal	
Chloride	E5	SS	Year	1	-0.0864	0.0383	-2.2559	0.0375			All available between 1991-2015	Log-normal	
Chloride	E6	NG	Intercept	1	-853573.32435	613570.29562	-1.39116	0.18447			All available between 1991-2015	Normal	
Chloride	E6	NG	Year	1	429.96360	305.57995	1.40704	0.17980	No		All available between 1991-2015	Normal	
Chloride	E6	SS	Year	1	-0.1083	0.0259	-4.1792	0.0006	Yes	neg	All available between 1991-2015	Log-normal	
Chloride	E6	SS	Intercept	1	220.3065	52.0433	4.2331	0.0005			All available between 1991-2015	Log-normal	
Chloride	N2	NG	Intercept	1	-77041.41058	330640.82887	-0.23301	0.81825			All available between 1991-2015	Normal	
Chloride	N2	NG	Year	1	41.88727	164.88398	0.25404	0.80219	No		All available between 1991-2015	Normal	
Chloride	N2	SB	Intercept	1	15.1078	176.7949	0.0855	0.9338			All available between 1991-2015	Log-normal	
Chloride	N2	SB	Year	1	-0.0060	0.0882	-0.0677	0.9475			All available between 1991-2015	Log-normal	
Chloride	N2	SD	Intercept	1	-149.2070	58.5210	-2.5496	0.0196			All available between 1991-2015	Log-normal	
Chloride	N2	SD	Year	1	0.0765	0.0292	2.6212	0.0168			All available between 1991-2015	Log-normal	
Chloride	N2	SS	Intercept	1	14.6816	104.6664	0.1403	0.8900			All available between 1991-2015	Log-normal	
Chloride	N2	SS	Year	1	-0.0063	0.0521	-0.1204	0.9055			All available between 1991-2015	Log-normal	
Chloride	N4	NG	Intercept	1	630015.23810	421536.10628	1.49457	0.15890			All available between 1991-2015	Normal	
Chloride	N4	NG	Year	1	-310.42857	209.92785	-1.47874	0.16303	No		All available between 1991-2015	Normal	
Chloride	N4	SS	Intercept	1	296.2757	97.3581	3.0432	0.0077			All available between 1991-2015	Log-normal	
Chloride	N4	SS	Year	1	-0.1465	0.0485	-3.0226	0.0081			All available between 1991-2015	Log-normal	
Chloride	N5	NG	Intercept	1	402464.02597	271607.40073	1.48179	0.16223			All available between 1991-2015	Normal	
Chloride	N5	NG	Year	1	-197.40759	135.19951	-1.46012	0.16800	No		All available between 1991-2015	Normal	
Chloride	N5	SD	Intercept	1	-32.4132	67.1866	-0.4824	0.6365			All available between 1991-2015	Log-normal	
Chloride	N5	SD	Year	1	0.0190	0.0334	0.5696	0.5774			All available between 1991-2015	Log-normal	
Chloride	N5	SS	Year	1	-0.1481	0.0308	-4.8090	0.0004	Yes	neg	All available between 1991-2015	Log-normal	
Chloride	N5	SS	Intercept	1	300.1843	61.8504	4.8534	0.0004			All available between 1991-2015	Log-normal	
Chloride	S1	NG	Intercept	1	-215509.46388	303111.83072	-0.71099	0.48573			All available between 1991-2015	Normal	
Chloride	S1	NG	Year	1	110.27178	151.11633	0.72971	0.47447	No		All available between 1991-2015	Normal	
Chloride	S1	SB	Intercept	1	-20.1852	135.7595	-0.1487	0.8843			All available between 1991-2015	Log-normal	
Chloride	S1	SB	Year	1	0.0119	0.0677	0.1762	0.8630			All available between 1991-2015	Log-normal	
Chloride	S1	SD	Intercept	1	-23.0827	118.0389	-0.1956	0.8469			All available between 1991-2015	Log-normal	
Chloride	S1	SD	Year	1	0.0132	0.0588	0.2245	0.8247			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Chloride	S1	SS	Intercept	1	26.5756	97.3939	0.2729	0.7881			All available between 1991-2015	Log-normal	
Chloride	S1	SS	Year	1	-0.0122	0.0486	-0.2508	0.8048			All available between 1991-2015	Log-normal	
Chloride	S2	NG	Intercept	1	-115957.41267	213229.36135	-0.54382	0.59289			All available between 1991-2015	Normal	
Chloride	S2	NG	Year	1	60.15449	106.33323	0.56572	0.57821	No		All available between 1991-2015	Normal	
Chloride	S2	SB	Intercept	1	-36.1169	118.1680	-0.3056	0.7644			All available between 1991-2015	Log-normal	
Chloride	S2	SB	Year	1	0.0199	0.0589	0.3381	0.7403			All available between 1991-2015	Log-normal	
Chloride	S2	SS	Intercept	1	75.4014	89.9309	0.8384	0.4122			All available between 1991-2015	Log-normal	
Chloride	S2	SS	Year	1	-0.0365	0.0448	-0.8142	0.4256			All available between 1991-2015	Log-normal	
Chloride	S3	NG	Intercept	1	-278720.36341	235773.46161	-1.18215	0.25101			All available between 1991-2015	Normal	
Chloride	S3	NG	Year	1	142.97768	117.53631	1.21646	0.23797	No		All available between 1991-2015	Normal	
Chloride	S3	SD	Intercept	1	83.4906	62.9956	1.3253	0.2000			All available between 1991-2015	Log-normal	
Chloride	S3	SD	Year	1	-0.0393	0.0314	-1.2528	0.2247			All available between 1991-2015	Log-normal	
Chloride	S3	SS	Intercept	1	64.6358	85.4290	0.7566	0.4596			All available between 1991-2015	Log-normal	
Chloride	S3	SS	Year	1	-0.0300	0.0426	-0.7041	0.4909			All available between 1991-2015	Log-normal	
Chloride	S4	NG	Intercept	1	-342709.18755	263404.90094	-1.30107	0.20802			All available between 1991-2015	Normal	
Chloride	S4	NG	Year	1	173.56061	131.32883	1.32157	0.20123	No		All available between 1991-2015	Normal	
Chloride	S4	SB	Intercept	1	-61.0241	136.4594	-0.4472	0.6627			All available between 1991-2015	Log-normal	
Chloride	S4	SB	Year	1	0.0323	0.0680	0.4749	0.6434			All available between 1991-2015	Log-normal	
Chloride	S4	SD	Intercept	1	69.0920	57.0560	1.2110	0.2416			All available between 1991-2015	Log-normal	
Chloride	S4	SD	Year	1	-0.0330	0.0284	-1.1587	0.2617			All available between 1991-2015	Log-normal	
Chloride	S4	SS	Intercept	1	112.0509	83.9386	1.3349	0.2006			All available between 1991-2015	Log-normal	
Chloride	S4	SS	Year	1	-0.0548	0.0418	-1.3104	0.2086			All available between 1991-2015	Log-normal	
Chloride	S4	WW	Intercept	1	1.5649	73.2505	0.0214	0.9838			All available between 1991-2015	Log-normal	
Chloride	S4	WW	Year	1	0.0026	0.0365	0.0713	0.9459			All available between 1991-2015	Log-normal	
Chloride	S5	FC	Intercept	1	13.7217	19.9401	0.6881	0.5220			All available between 1991-2015	Log-normal	
Chloride	S5	FC	Year	1	-0.0038	0.0099	-0.3779	0.7210			All available between 1991-2015	Log-normal	
Chloride	S5	NG	Intercept	1	-64816.62148	234183.15380	-0.27678	0.78479			All available between 1991-2015	Normal	
Chloride	S5	NG	Year	1	35.11210	116.77264	0.30069	0.76676	No		All available between 1991-2015	Normal	
Chloride	S5	SB	Intercept	1	-82.4440	149.2683	-0.5523	0.5929			All available between 1991-2015	Log-normal	
Chloride	S5	SB	Year	1	0.0432	0.0744	0.5809	0.5742			All available between 1991-2015	Log-normal	
Chloride	S5	SS	Intercept	1	66.3889	81.0276	0.8193	0.4228			All available between 1991-2015	Log-normal	
Chloride	S5	SS	Year	1	-0.0321	0.0404	-0.7951	0.4364			All available between 1991-2015	Log-normal	
Chloride	W2	NG	Intercept	1	-257176.93987	203638.34035	-1.26291	0.22190			All available between 1991-2015	Normal	
Chloride	W2	NG	Year	1	130.66213	101.54074	1.28680	0.21362	No		All available between 1991-2015	Normal	
Chloride	W2	SB	Intercept	1	-185.9905	146.7415	-1.2675	0.2243			All available between 1991-2015	Log-normal	
Chloride	W2	SB	Year	1	0.0945	0.0732	1.2922	0.2158			All available between 1991-2015	Log-normal	
Chloride	W2	SS	Intercept	1	89.0552	94.7561	0.9398	0.3613			All available between 1991-2015	Log-normal	
Chloride	W2	SS	Year	1	-0.0433	0.0472	-0.9175	0.3725			All available between 1991-2015	Log-normal	
Chloride	W4	FC	Intercept	1	84.8224	34.3202	2.4715	0.0484			All available between 1991-2015	Log-normal	
Chloride	W4	FC	Year	1	-0.0394	0.0171	-2.3022	0.0609			All available between 1991-2015	Log-normal	
Chloride	W4	NG	Intercept	1	-934414.46169	506495.01574	-1.84486	0.07921			All available between 1991-2015	Normal	
Chloride	W4	NG	Year	1	471.30856	252.50559	1.86653	0.07599	No		All available between 1991-2015	Normal	
Chloride	W4	SB	Intercept	1	-53.3852	252.8676	-0.2111	0.8370			All available between 1991-2015	Log-normal	
Chloride	W4	SB	Year	1	0.0286	0.1260	0.2270	0.8250			All available between 1991-2015	Log-normal	
Chloride	W4	SS	Intercept	1	254.8774	114.9333	2.2176	0.0424			All available between 1991-2015	Log-normal	
Chloride	W4	SS	Year	1	-0.1261	0.0572	-2.2033	0.0436			All available between 1991-2015	Log-normal	
Chromium	E1	NG	Intercept	1	61.8940	43.2989	1.4295	0.1658			All available between 1991-2015	Log-normal	
Chromium	E1	NG	Year	1	-0.0304	0.0216	-1.4077	0.1720			All available between 1991-2015	Log-normal	
Chromium	E1	SB	Intercept	1	97.9889	57.4281	1.7063	0.1388			2002-2015	Log-normal	
Chromium	E1	SB	Year	1	-0.0495	0.0286	-1.7308	0.1342			2002-2015	Log-normal	
Chromium	E1	SS	Intercept	1	-2.5133	9.5297	-0.2637	0.7946			All available between 1991-2015	Log-normal	
Chromium	E1	SS	Year	1	0.0027	0.0048	0.5769	0.5701			All available between 1991-2015	Log-normal	
Chromium	E2	NG	Intercept	1	42.1619	51.3256	0.8215	0.4195			All available between 1991-2015	Log-normal	
Chromium	E2	NG	Year	1	-0.0206	0.0256	-0.8048	0.4288			All available between 1991-2015	Log-normal	
Chromium	E2	SD	Intercept	1	-24.6914	8.0137	-3.0811	0.0050			All available between 1991-2015	Log-normal	
Chromium	E2	SD	Year	1	0.0139	0.0040	3.4846	0.0018	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	E2	SS	Intercept	1	-17.9693	9.5224	-1.8870	0.0724			All available between 1991-2015	Log-normal	
Chromium	E2	SS	Year	1	0.0104	0.0048	2.1879	0.0396			All available between 1991-2015	Log-normal	
Chromium	E5	NG	Intercept	1	42.8291	59.5421	0.7193	0.4795			All available between 1991-2015	Log-normal	
Chromium	E5	NG	Year	1	-0.0209	0.0297	-0.7033	0.4893			All available between 1991-2015	Log-normal	
Chromium	E5	SB	Intercept	1	144.9370	102.8180	1.4096	0.2015			2002-2015	Log-normal	
Chromium	E5	SB	Year	1	-0.0727	0.0512	-1.4210	0.1983			2002-2015	Log-normal	
Chromium	E5	SS	Intercept	1	-14.1851	8.3896	-1.6908	0.1057			All available between 1991-2015	Log-normal	
Chromium	E5	SS	Year	1	0.0086	0.0042	2.0595	0.0521			All available between 1991-2015	Log-normal	
Chromium	E6	NG	Intercept	1	7.6680	74.7931	0.1025	0.9197			All available between 1991-2015	Log-normal	
Chromium	E6	NG	Year	1	-0.0035	0.0372	-0.0937	0.9266			All available between 1991-2015	Log-normal	
Chromium	E6	SS	Intercept	1	-2.6565	11.7579	-0.2259	0.8239			All available between 1991-2015	Log-normal	
Chromium	E6	SS	Year	1	0.0029	0.0059	0.4940	0.6276			All available between 1991-2015	Log-normal	
Chromium	N2	NG	Intercept	1	103.3871	50.5055	2.0470	0.0518			All available between 1991-2015	Log-normal	
Chromium	N2	NG	Year	1	-0.0512	0.0252	-2.0302	0.0536			All available between 1991-2015	Log-normal	
Chromium	N2	SB	Intercept	1	167.6634	74.2993	2.2566	0.0737			2002-2015	Log-normal	
Chromium	N2	SB	Year	1	-0.0841	0.0370	-2.2723	0.0722			2002-2015	Log-normal	
Chromium	N2	SD	Intercept	1	-56.3309	7.8169	-7.2063	<.0001			All available between 1991-2015	Log-normal	
Chromium	N2	SD	Year	1	0.0298	0.0039	7.6292	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	N2	SS	Intercept	1	-19.2043	8.8531	-2.1692	0.0407			All available between 1991-2015	Log-normal	
Chromium	N2	SS	Year	1	0.0113	0.0044	2.5695	0.0171			All available between 1991-2015	Log-normal	
Chromium	N4	NG	Intercept	1	86.9791	84.7647	1.0261	0.3235			All available between 1991-2015	Log-normal	
Chromium	N4	NG	Year	1	-0.0429	0.0422	-1.0172	0.3276			All available between 1991-2015	Log-normal	
Chromium	N4	SS	Intercept	1	-43.6507	16.2235	-2.6906	0.0168			All available between 1991-2015	Log-normal	
Chromium	N4	SS	Year	1	0.0233	0.0081	2.8880	0.0113			All available between 1991-2015	Log-normal	
Chromium	N5	NG	Intercept	1	108.0682	82.6696	1.3072	0.2138			All available between 1991-2015	Log-normal	
Chromium	N5	NG	Year	1	-0.0534	0.0412	-1.2969	0.2172			All available between 1991-2015	Log-normal	
Chromium	N5	SD	Intercept	1	-84.9427	15.7966	-5.3773	<.0001			All available between 1991-2015	Log-normal	
Chromium	N5	SD	Year	1	0.0441	0.0079	5.6052	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	N5	SS	Intercept	1	-14.9681	12.5070	-1.1968	0.2545			All available between 1991-2015	Log-normal	
Chromium	N5	SS	Year	1	0.0090	0.0062	1.4492	0.1729			All available between 1991-2015	Log-normal	
Chromium	S1	NG	Intercept	1	65.0932	48.3094	1.3474	0.1910			All available between 1991-2015	Log-normal	
Chromium	S1	NG	Year	1	-0.0320	0.0241	-1.3286	0.1970			All available between 1991-2015	Log-normal	
Chromium	S1	SB	Intercept	1	220.9538	99.8976	2.2118	0.0626			2002-2015	Log-normal	
Chromium	S1	SB	Year	1	-0.1105	0.0497	-2.2230	0.0616			2002-2015	Log-normal	
Chromium	S1	SD	Intercept	1	-0.7294	13.0746	-0.0558	0.9559			All available between 1991-2015	Log-normal	
Chromium	S1	SD	Year	1	0.0021	0.0065	0.3294	0.7445			All available between 1991-2015	Log-normal	
Chromium	S1	SS	Intercept	1	-12.4779	4.6568	-2.6795	0.0134			All available between 1991-2015	Log-normal	
Chromium	S1	SS	Year	1	0.0079	0.0023	3.3906	0.0025	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	S2	NG	Intercept	1	61.6655	45.0892	1.3676	0.1836			All available between 1991-2015	Log-normal	
Chromium	S2	NG	Year	1	-0.0304	0.0225	-1.3485	0.1896			All available between 1991-2015	Log-normal	
Chromium	S2	SB	Intercept	1	44.0375	72.3804	0.6084	0.5580			2002-2015	Log-normal	
Chromium	S2	SB	Year	1	-0.0224	0.0360	-0.6231	0.5487			2002-2015	Log-normal	
Chromium	S2	SS	Intercept	1	-10.1648	4.6502	-2.1859	0.0384			All available between 1991-2015	Log-normal	
Chromium	S2	SS	Year	1	0.0067	0.0023	2.9018	0.0076			All available between 1991-2015	Log-normal	
Chromium	S3	NG	Intercept	1	20.7602	47.3440	0.4385	0.6646			All available between 1991-2015	Log-normal	
Chromium	S3	NG	Year	1	-0.0098	0.0236	-0.4138	0.6825			All available between 1991-2015	Log-normal	
Chromium	S3	SD	Intercept	1	21.9263	15.0915	1.4529	0.1582			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Chromium	S3	SD	Year	1	-0.0090	0.0075	-1.1984	0.2416			All available between 1991-2015	Log-normal	
Chromium	S3	SS	Intercept	1	-20.5926	6.7622	-3.0453	0.0057			All available between 1991-2015	Log-normal	
Chromium	S3	SS	Year	1	0.0119	0.0034	3.5114	0.0019	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	S4	NG	Intercept	1	103.8616	55.6499	1.8663	0.0743			All available between 1991-2015	Log-normal	
Chromium	S4	NG	Year	1	-0.0513	0.0278	-1.8491	0.0768			All available between 1991-2015	Log-normal	
Chromium	S4	SB	Intercept	1	106.5816	144.4528	0.7378	0.4817			2002-2015	Log-normal	
Chromium	S4	SB	Year	1	-0.0535	0.0719	-0.7443	0.4780			2002-2015	Log-normal	
Chromium	S4	SD	Intercept	1	-6.9920	6.2280	-1.1227	0.2727			All available between 1991-2015	Log-normal	
Chromium	S4	SD	Year	1	0.0052	0.0031	1.6757	0.1068			All available between 1991-2015	Log-normal	
Chromium	S4	SS	Intercept	1	-36.0482	8.9189	-4.0418	0.0007			All available between 1991-2015	Log-normal	
Chromium	S4	SS	Year	1	0.0197	0.0044	4.4330	0.0003	Yes	pos	All available between 1991-2015	Log-normal	
Chromium	S4	WW	Intercept	1	332.0286	127.7499	2.5991	0.0407			All available between 1991-2015	Log-normal	
Chromium	S4	WW	Year	1	-0.1657	0.0637	-2.5995	0.0407			All available between 1991-2015	Log-normal	
Chromium	S5	NG	Intercept	1	-24.8645	59.8676	-0.4153	0.6821			All available between 1991-2015	Log-normal	
Chromium	S5	NG	Year	1	0.0127	0.0299	0.4264	0.6742			All available between 1991-2015	Log-normal	
Chromium	S5	SB	Intercept	1	64.6053	48.7930	1.3241	0.2271			2002-2015	Log-normal	
Chromium	S5	SB	Year	1	-0.0328	0.0243	-1.3507	0.2188			2002-2015	Log-normal	
Chromium	S5	SS	Intercept	1	-13.4191	6.7333	-1.9929	0.0601			All available between 1991-2015	Log-normal	
Chromium	S5	SS	Year	1	0.0083	0.0034	2.4810	0.0221			All available between 1991-2015	Log-normal	
Chromium	W2	NG	Intercept	1	43.1456	52.0402	0.8291	0.4149			All available between 1991-2015	Log-normal	
Chromium	W2	NG	Year	1	-0.0212	0.0260	-0.8153	0.4226			All available between 1991-2015	Log-normal	
Chromium	W2	SB	Intercept	1	140.2240	56.5472	2.4798	0.0350			2002-2015	Log-normal	
Chromium	W2	SB	Year	1	-0.0704	0.0281	-2.4998	0.0339			2002-2015	Log-normal	
Chromium	W2	SS	Intercept	1	-11.8903	5.9384	-2.0023	0.0590			All available between 1991-2015	Log-normal	
Chromium	W2	SS	Year	1	0.0074	0.0030	2.5017	0.0212			All available between 1991-2015	Log-normal	
Chromium	W4	NG	Intercept	1	-84.7879	80.8868	-1.0482	0.3070			All available between 1991-2015	Log-normal	
Chromium	W4	NG	Year	1	0.0428	0.0403	1.0613	0.3012			All available between 1991-2015	Log-normal	
Chromium	W4	SB	Intercept	1	-103.4596	133.8255	-0.7731	0.4593			2002-2015	Log-normal	
Chromium	W4	SB	Year	1	0.0512	0.0667	0.7681	0.4621			2002-2015	Log-normal	
Chromium	W4	SS	Intercept	1	-12.0246	8.2795	-1.4523	0.1657			All available between 1991-2015	Log-normal	
Chromium	W4	SS	Year	1	0.0077	0.0041	1.8674	0.0803			All available between 1991-2015	Log-normal	
Cobalt	E1	NG	Intercept	1	498.0459	55.1985	9.0228	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E1	NG	Year	1	-0.2489	0.0276	-9.0321	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E1	SB	Intercept	1	499.1503	62.9834	7.9251	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E1	SB	Year	1	-0.2494	0.0315	-7.9267	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E1	SS	Intercept	1	2.2933	15.9282	0.1440	0.8869			All available between 1991-2015	Log-normal	
Cobalt	E1	SS	Year	1	-0.0002	0.0079	-0.0248	0.9804			All available between 1991-2015	Log-normal	
Cobalt	E2	NG	Intercept	1	466.7733	59.0856	7.9000	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E2	NG	Year	1	-0.2332	0.0295	-7.9077	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E2	SB	Intercept	1	514.5416	82.7410	6.2187	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E2	SB	Year	1	-0.2570	0.0413	-6.2170	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E2	SD	Intercept	1	-18.92943	55.16724	-0.34313	0.73437			All available between 1991-2015	Normal	
Cobalt	E2	SD	Year	1	0.01391	0.02754	0.50509	0.61792	No		All available between 1991-2015	Normal	
Cobalt	E2	SS	Intercept	1	-1.1543	11.3518	-0.1017	0.9199			All available between 1991-2015	Log-normal	
Cobalt	E2	SS	Year	1	0.0015	0.0057	0.2703	0.7894			All available between 1991-2015	Log-normal	
Cobalt	E5	NG	Intercept	1	468.9363	69.7043	6.7275	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E5	NG	Year	1	-0.2342	0.0348	-6.7322	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E5	SB	Intercept	1	528.9859	56.3948	9.3800	<.0001			All available between 1991-2015	Log-normal	
Cobalt	E5	SB	Year	1	-0.2642	0.0282	-9.3835	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	E5	SS	Intercept	1	-15.7424	10.1111	-1.5569	0.1344			All available between 1991-2015	Log-normal	
Cobalt	E5	SS	Year	1	0.0089	0.0050	1.7603	0.0929			All available between 1991-2015	Log-normal	
Cobalt	E6	NG	Intercept	1	317.0283	113.6274	2.7901	0.0137			All available between 1991-2015	Log-normal	
Cobalt	E6	NG	Year	1	-0.1587	0.0566	-2.8039	0.0134			All available between 1991-2015	Log-normal	
Cobalt	E6	SS	Intercept	1	-18.3606	19.8042	-0.9271	0.3668			All available between 1991-2015	Log-normal	
Cobalt	E6	SS	Year	1	0.0101	0.0099	1.0285	0.3181			All available between 1991-2015	Log-normal	
Cobalt	N2	NG	Intercept	1	480.0979	57.0971	8.4084	<.0001			All available between 1991-2015	Log-normal	
Cobalt	N2	NG	Year	1	-0.2399	0.0285	-8.4171	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	N2	SB	Intercept	1	566.7027	89.3050	6.3457	<.0001			All available between 1991-2015	Log-normal	
Cobalt	N2	SB	Year	1	-0.2833	0.0446	-6.3449	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	N2	SD	Intercept	1	-243.40460	48.97365	-4.97011	<.0001			All available between 1991-2015	Normal	
Cobalt	N2	SD	Year	1	0.12583	0.02445	5.14758	<.0001	Yes	Pos	All available between 1991-2015	Normal	
Cobalt	N2	SS	Intercept	1	-10.8703	6.3280	-1.7178	0.0993			All available between 1991-2015	Log-normal	
Cobalt	N2	SS	Year	1	0.0066	0.0032	2.0911	0.0478			All available between 1991-2015	Log-normal	
Cobalt	N4	NG	Intercept	1	215.9454	118.3253	1.8250	0.0911			All available between 1991-2015	Log-normal	
Cobalt	N4	NG	Year	1	-0.1084	0.0589	-1.8397	0.0888			All available between 1991-2015	Log-normal	
Cobalt	N4	SS	Intercept	1	-23.3776	13.0129	-1.7965	0.0926			All available between 1991-2015	Log-normal	
Cobalt	N4	SS	Year	1	0.0127	0.0065	1.9601	0.0688			All available between 1991-2015	Log-normal	
Cobalt	N5	NG	Intercept	1	54.2842	72.2724	0.7511	0.4660			All available between 1991-2015	Log-normal	
Cobalt	N5	NG	Year	1	-0.0280	0.0360	-0.7778	0.4506			All available between 1991-2015	Log-normal	
Cobalt	N5	SD	Intercept	1	-368.66942	141.11678	-2.61251	0.01960			All available between 1991-2015	Normal	
Cobalt	N5	SD	Year	1	0.18872	0.07024	2.68690	0.01690	No		All available between 1991-2015	Normal	
Cobalt	N5	SS	Intercept	1	-41.2234	14.9767	-2.7525	0.0175			All available between 1991-2015	Log-normal	
Cobalt	N5	SS	Year	1	0.0216	0.0075	2.8939	0.0135			All available between 1991-2015	Log-normal	
Cobalt	S1	NG	Intercept	1	390.8724	63.4368	6.1616	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S1	NG	Year	1	-0.1952	0.0317	-6.1648	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S1	SB	Intercept	1	483.7464	80.1174	6.0380	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S1	SB	Year	1	-0.2418	0.0400	-6.0437	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S1	SD	Intercept	1	22.22754	69.43365	0.32013	0.75143			All available between 1991-2015	Normal	
Cobalt	S1	SD	Year	1	-0.00607	0.03465	-0.17522	0.86227	No		All available between 1991-2015	Normal	
Cobalt	S1	SS	Intercept	1	-15.3590	7.8739	-1.9506	0.0634			All available between 1991-2015	Log-normal	
Cobalt	S1	SS	Year	1	0.0088	0.0039	2.2500	0.0343			All available between 1991-2015	Log-normal	
Cobalt	S2	NG	Intercept	1	450.4597	64.3863	6.9962	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S2	NG	Year	1	-0.2251	0.0321	-7.0023	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S2	SB	Intercept	1	463.9517	71.5009	6.4888	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S2	SB	Year	1	-0.2319	0.0357	-6.4977	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S2	SS	Intercept	1	-13.6917	8.9723	-1.5260	0.1396			All available between 1991-2015	Log-normal	
Cobalt	S2	SS	Year	1	0.0080	0.0045	1.7940	0.0849			All available between 1991-2015	Log-normal	
Cobalt	S3	NG	Intercept	1	476.0012	56.0055	8.4992	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S3	NG	Year	1	-0.2379	0.0280	-8.5088	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S3	SD	Intercept	1	121.05345	58.40637	2.07261	0.04826			All available between 1991-2015	Normal	
Cobalt	S3	SD	Year	1	-0.05527	0.02915	-1.89575	0.06916	No		All available between 1991-2015	Normal	
Cobalt	S3	SS	Intercept	1	-20.6495	9.8355	-2.0995	0.0469			All available between 1991-2015	Log-normal	
Cobalt	S3	SS	Year	1	0.0114	0.0049	2.3165	0.0298			All available between 1991-2015	Log-normal	
Cobalt	S4	NG	Intercept	1	461.7626	80.8578	5.7108	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S4	NG	Year	1	-0.2309	0.0403	-5.7223	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S4	SB	Intercept	1	475.7233	74.3127	6.4016	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S4	SB	Year	1	-0.2378	0.0371	-6.4133	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S4	SD	Intercept	1	-141.64010	65.89611	-2.14945	0.04189			All available between 1991-2015	Normal	
Cobalt	S4	SD	Year	1	0.07655	0.03290	2.32690	0.02873	No		All available between 1991-2015	Normal	
Cobalt	S4	SS	Intercept	1	-9.9011	13.0158	-0.7607	0.4562			All available between 1991-2015	Log-normal	
Cobalt	S4	SS	Year	1	0.0062	0.0065	0.9545	0.3518			All available between 1991-2015	Log-normal	
Cobalt	S5	NG	Intercept	1	427.1316	88.9580	4.8015	<.0001			All available between 1991-2015	Log-normal	
Cobalt	S5	NG	Year	1	-0.2135	0.0444	-4.8119	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Cobalt	S5	SB	Intercept	1	469.0409	90.7465	5.1687	0.0003			All available between 1991-2015	Log-normal	
Cobalt	S5	SB	Year	1	-0.2344	0.0453	-5.1797	0.0003	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	S5	SS	Intercept	1	-21.7641	12.5560	-1.7334	0.0984			All available between 1991-2015	Log-normal	
Cobalt	S5	SS	Year	1	0.0120	0.0063	1.9172	0.0696			All available between 1991-2015	Log-normal	
Cobalt	W2	NG	Intercept	1	468.0672	58.8375	7.9553	<.0001			All available between 1991-2015	Log-normal	
Cobalt	W2	NG	Year	1	-0.2339	0.0294	-7.9616	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	W2	SB	Intercept	1	512.1975	75.2996	6.8021	<.0001			All available between 1991-2015	Log-normal	
Cobalt	W2	SB	Year	1	-0.2559	0.0376	-6.8094	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Cobalt	W2	SS	Intercept	1	-10.1872	7.8689	-1.2946	0.2102			All available between 1991-2015	Log-normal	
Cobalt	W2	SS	Year	1	0.0060	0.0039	1.5347	0.1405			All available between 1991-2015	Log-normal	
Cobalt	W4	NG	Intercept	1	354.2664	106.3279	3.3318	0.0033			All available between 1991-2015	Log-normal	
Cobalt	W4	NG	Year	1	-0.1771	0.0530	-3.3412	0.0033			All available between 1991-2015	Log-normal	
Cobalt	W4	SB	Intercept	1	348.7566	138.6985	2.5145	0.0288			All available between 1991-2015	Log-normal	
Cobalt	W4	SB	Year	1	-0.1747	0.0691	-2.5264	0.0282			All available between 1991-2015	Log-normal	
Cobalt	W4	SS	Intercept	1	-5.7196	8.6437	-0.6617	0.5176			All available between 1991-2015	Log-normal	
Cobalt	W4	SS	Year	1	0.0040	0.0043	0.9198	0.3713			All available between 1991-2015	Log-normal	
Copper	E1	NG	Intercept	1	43.0716	16.1666	2.6642	0.0136			All available between 1991-2015	Log-normal	
Copper	E1	NG	Year	1	-0.0206	0.0081	-2.5523	0.0175			All available between 1991-2015	Log-normal	
Copper	E1	SB	Intercept	1	-6.7583	19.0089	-0.3555	0.7275			All available between 1991-2015	Log-normal	
Copper	E1	SB	Year	1	0.0045	0.0095	0.4767	0.6410			All available between 1991-2015	Log-normal	
Copper	E1	SS	Intercept	1	36.9301	10.8175	3.4139	0.0026			All available between 1991-2015	Log-normal	
Copper	E1	SS	Year	1	-0.0171	0.0054	-3.1630	0.0047			All available between 1991-2015	Log-normal	
Copper	E2	NG	Intercept	1	11.5964	13.5339	0.8568	0.4000			All available between 1991-2015	Log-normal	
Copper	E2	NG	Year	1	-0.0049	0.0068	-0.7280	0.4737			All available between 1991-2015	Log-normal	
Copper	E2	SB	Intercept	1	50.0629	40.1213	1.2478	0.2405			All available between 1991-2015	Log-normal	
Copper	E2	SB	Year	1	-0.0237	0.0200	-1.1835	0.2640			All available between 1991-2015	Log-normal	
Copper	E2	SD	Intercept	1	-1.7964	9.1312	-0.1967	0.8456			All available between 1991-2015	Log-normal	
Copper	E2	SD	Year	1	0.0024	0.0046	0.5287	0.6017			All available between 1991-2015	Log-normal	
Copper	E2	SS	Intercept	1	8.4950	8.7171	0.9745	0.3404			All available between 1991-2015	Log-normal	
Copper	E2	SS	Year	1	-0.0029	0.0043	-0.6658	0.5125			All available between 1991-2015	Log-normal	
Copper	E5	NG	Intercept	1	10.6177	19.9740	0.5316	0.6003			All available between 1991-2015	Log-normal	
Copper	E5	NG	Year	1	-0.0043	0.0100	-0.4338	0.6687			All available between 1991-2015	Log-normal	
Copper	E5	SB	Intercept	1	3.3758	13.2321	0.2551	0.8021			All available between 1991-2015	Log-normal	
Copper	E5	SB	Year	1	-0.0005	0.0066	-0.0782	0.9387			All available between 1991-2015	Log-normal	
Copper	E5	SS	Intercept	1	15.7308	11.9950	1.3115	0.2039			All available between 1991-2015	Log-normal	
Copper	E5	SS	Year	1	-0.0066	0.0060	-1.1010	0.2834			All available between 1991-2015	Log-normal	
Copper	E6	NG	Intercept	1	-9.1831	57.5229	-0.1596	0.8753			All available between 1991-2015	Log-normal	
Copper	E6	NG	Year	1	0.0056	0.0286	0.1953	0.8478			All available between 1991-2015	Log-normal	
Copper	E6	SS	Intercept	1	15.1338	10.9858	1.3776	0.1862			All available between 1991-2015	Log-normal	
Copper	E6	SS	Year	1	-0.0062	0.0055	-1.1257	0.2759			All available between 1991-2015	Log-normal	
Copper	N2	NG	Intercept	1	17.6289	23.5575	0.7483	0.4615			All available between 1991-2015	Log-normal	
Copper	N2	NG	Year	1	-0.0078	0.0118	-0.6607	0.5151			All available between 1991-2015	Log-normal	
Copper	N2	SB	Intercept	1	10.2538	27.0312	0.3793	0.7101			All available between 1991-2015	Log-normal	
Copper	N2	SB	Year	1	-0.0039	0.0135	-0.2852	0.7796			All available between 1991-2015	Log-normal	
Copper	N2	SD	Intercept	1	-25.6018	6.8424	-3.7416	0.0010			All available between 1991-2015	Log-normal	
Copper	N2	SD	Year	1	0.0143	0.0034	4.1991	0.0003	Yes	pos	All available between 1991-2015	Log-normal	
Copper	N2	SS	Intercept	1	3.7979	13.9342	0.2726	0.7876			All available between 1991-2015	Log-normal	
Copper	N2	SS	Year	1	-0.0002	0.0070	-0.0342	0.9730			All available between 1991-2015	Log-normal	
Copper	N4	NG	Intercept	1	-55.4330	25.7990	-2.1487	0.0511			All available between 1991-2015	Log-normal	
Copper	N4	NG	Year	1	0.0286	0.0128	2.2232	0.0446			All available between 1991-2015	Log-normal	
Copper	N4	SS	Intercept	1	-125.1168	22.1199	-5.6563	<.0001			All available between 1991-2015	Log-normal	
Copper	N4	SS	Year	1	0.0637	0.0110	5.7845	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Copper	N5	NG	Intercept	1	-8.7862	48.6069	-0.1808	0.8593			All available between 1991-2015	Log-normal	
Copper	N5	NG	Year	1	0.0053	0.0242	0.2183	0.8306			All available between 1991-2015	Log-normal	
Copper	N5	SD	Intercept	1	-62.3324	13.7242	-4.5418	0.0004			All available between 1991-2015	Log-normal	
Copper	N5	SD	Year	1	0.0327	0.0068	4.7853	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Copper	N5	SS	Intercept	1	8.4946	15.3841	0.5522	0.5910			All available between 1991-2015	Log-normal	
Copper	N5	SS	Year	1	-0.0028	0.0077	-0.3669	0.7201			All available between 1991-2015	Log-normal	
Copper	S1	NG	Intercept	1	-17.5763	14.3124	-1.2280	0.2313			All available between 1991-2015	Log-normal	
Copper	S1	NG	Year	1	0.0097	0.0071	1.3564	0.1876			All available between 1991-2015	Log-normal	
Copper	S1	SB	Intercept	1	-9.5158	15.0096	-0.6340	0.5351			All available between 1991-2015	Log-normal	
Copper	S1	SB	Year	1	0.0059	0.0075	0.7930	0.4394			All available between 1991-2015	Log-normal	
Copper	S1	SD	Intercept	1	9.4901	14.8576	0.6387	0.5286			All available between 1991-2015	Log-normal	
Copper	S1	SD	Year	1	-0.0031	0.0074	-0.4183	0.6792			All available between 1991-2015	Log-normal	
Copper	S1	SS	Intercept	1	13.3520	6.4403	2.0732	0.0495			All available between 1991-2015	Log-normal	
Copper	S1	SS	Year	1	-0.0053	0.0032	-1.6359	0.1155			All available between 1991-2015	Log-normal	
Copper	S2	NG	Intercept	1	21.3972	19.8347	1.0788	0.2910			All available between 1991-2015	Log-normal	
Copper	S2	NG	Year	1	-0.0097	0.0099	-0.9787	0.3371			All available between 1991-2015	Log-normal	
Copper	S2	SB	Intercept	1	-13.7198	16.5951	-0.8267	0.4192			All available between 1991-2015	Log-normal	
Copper	S2	SB	Year	1	0.0080	0.0083	0.9647	0.3475			All available between 1991-2015	Log-normal	
Copper	S2	SS	Intercept	1	13.9673	9.7699	1.4296	0.1652			All available between 1991-2015	Log-normal	
Copper	S2	SS	Year	1	-0.0056	0.0049	-1.1449	0.2631			All available between 1991-2015	Log-normal	
Copper	S3	NG	Intercept	1	45.0898	30.7135	1.4681	0.1541			All available between 1991-2015	Log-normal	
Copper	S3	NG	Year	1	-0.0216	0.0153	-1.4099	0.1704			All available between 1991-2015	Log-normal	
Copper	S3	SD	Year	1	-0.0189	0.0053	-3.5722	0.0014	Yes	neg	All available between 1991-2015	Log-normal	
Copper	S3	SD	Intercept	1	41.3028	10.6239	3.8877	0.0006			All available between 1991-2015	Log-normal	
Copper	S3	SS	Intercept	1	10.2797	7.8631	1.3073	0.2040			All available between 1991-2015	Log-normal	
Copper	S3	SS	Year	1	-0.0037	0.0039	-0.9493	0.3523			All available between 1991-2015	Log-normal	
Copper	S4	NG	Intercept	1	9.7233	38.7795	0.2507	0.8042			All available between 1991-2015	Log-normal	
Copper	S4	NG	Year	1	-0.0039	0.0193	-0.2018	0.8418			All available between 1991-2015	Log-normal	
Copper	S4	SB	Intercept	1	-29.8716	21.2220	-1.4076	0.1811			All available between 1991-2015	Log-normal	
Copper	S4	SB	Year	1	0.0160	0.0106	1.5128	0.1526			All available between 1991-2015	Log-normal	
Copper	S4	SD	Year	1	-0.0106	0.0025	-4.2819	0.0003	Yes	neg	All available between 1991-2015	Log-normal	
Copper	S4	SD	Intercept	1	24.2887	4.9493	4.9075	<.0001			All available between 1991-2015	Log-normal	
Copper	S4	SS	Intercept	1	-37.1432	14.5451	-2.5536	0.0194			All available between 1991-2015	Log-normal	
Copper	S4	SS	Year	1	0.0199	0.0073	2.7465	0.0128			All available between 1991-2015	Log-normal	
Copper	S4	WW	Intercept	1	26.7955	16.4782	1.6261	0.1551			All available between 1991-2015	Log-normal	
Copper	S4	WW	Year	1	-0.0126	0.0082	-1.5371	0.1752			All available between 1991-2015	Log-normal	
Copper	S5	FC	Intercept	1	162.4852	60.7080	2.6765	0.0440			All available between 1991-2015	Log-normal	
Copper	S5	FC	Year	1	-0.0805	0.0303	-2.6613	0.0448			All available between 1991-2015	Log-normal	
Copper	S5	NG	Intercept	1	56.7768	27.3582	2.0753	0.0504			All available between 1991-2015	Log-normal	
Copper	S5	NG	Year	1	-0.0273	0.0136	-2.0030	0.0582			All available between 1991-2015	Log-normal	
Copper	S5	SB	Intercept	1	29.1894	17.1777	1.6993	0.1173			All available between 1991-2015	Log-normal	
Copper	S5	SB	Year	1	-0.0134	0.0086	-1.5596	0.1471			All available between 1991-2015	Log-normal	
Copper	S5	SS	Intercept	1	6.2695	5.3656	1.1685	0.2564			All available between 1991-2015	Log-normal	
Copper	S5	SS	Year	1	-0.0018	0.0027	-0.6810	0.5037			All available between 1991-2015	Log-normal	
Copper	W2	NG	Intercept	1	9.2129	24.0036	0.3838	0.7044			All available between 1991-2015	Log-normal	
Copper	W2	NG	Year	1	-0.0035	0.0120	-0.2913	0.7732			All available between 1991-2015	Log-normal	
Copper	W2	SB	Intercept	1	-20.0457	18.0614	-1.1099	0.2817			All available between 1991-2015	Log-normal	
Copper	W2	SB	Year	1	0.0111	0.0090	1.2359	0.2324			All available between 1991-2015	Log-normal	
Copper	W2	SS	Year	1	-0.0115	0.0026	-4.4569	0.0002	Yes	neg	All available between 1991-2015	Log-normal	
Copper	W2	SS	Intercept	1	25.6364	5.1717	4.9570	<.0001			All available between 1991-2015	Log-normal	
Copper	W4	FC	Intercept	1	140.3940	57.1810	2.4553	0.0494			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Copper	W4	FC	Year	1	-0.0696	0.0285	-2.4446	0.0502			All available between 1991-2015	Log-normal	
Copper	W4	NG	Intercept	1	13.9257	26.7819	0.5200	0.6088			All available between 1991-2015	Log-normal	
Copper	W4	NG	Year	1	-0.0060	0.0134	-0.4490	0.6582			All available between 1991-2015	Log-normal	
Copper	W4	SB	Intercept	1	-0.7041	13.0780	-0.0538	0.9580			All available between 1991-2015	Log-normal	
Copper	W4	SB	Year	1	0.0015	0.0065	0.2339	0.8194			All available between 1991-2015	Log-normal	
Copper	W4	SS	Intercept	1	-57.5888	32.9091	-1.7499	0.0993			All available between 1991-2015	Log-normal	
Copper	W4	SS	Year	1	0.0302	0.0164	1.8433	0.0839			All available between 1991-2015	Log-normal	
Iron	E1	NG	Intercept	1	27.8503	27.1649	1.0252	0.3155			All available between 1991-2015	Log-normal	
Iron	E1	NG	Year	1	-0.0115	0.0136	-0.8497	0.4039			All available between 1991-2015	Log-normal	
Iron	E1	SB	Intercept	1	6.0094	11.7633	0.5109	0.6174			All available between 1991-2015	Log-normal	
Iron	E1	SB	Year	1	-0.0010	0.0059	-0.1687	0.8684			All available between 1991-2015	Log-normal	
Iron	E1	SS	Intercept	1	-90715.97327	154613.54876	-0.58673	0.56364			All available between 1991-2015	Normal	
Iron	E1	SS	Year	1	53.04794	77.16199	0.68749	0.49930	No		All available between 1991-2015	Normal	
Iron	E2	NG	Intercept	1	-55.3463	27.2410	-2.0317	0.0534			All available between 1991-2015	Log-normal	
Iron	E2	NG	Year	1	0.0300	0.0136	2.2042	0.0373			All available between 1991-2015	Log-normal	
Iron	E2	SB	Intercept	1	-5.8586	16.7894	-0.3489	0.7344			All available between 1991-2015	Log-normal	
Iron	E2	SB	Year	1	0.0050	0.0084	0.5975	0.5634			All available between 1991-2015	Log-normal	
Iron	E2	SD	Intercept	1	-8.1137	5.5331	-1.4664	0.1550			All available between 1991-2015	Log-normal	
Iron	E2	SD	Year	1	0.0090	0.0028	3.2564	0.0032			All available between 1991-2015	Log-normal	
Iron	E2	SS	Intercept	1	-218453.84213	132426.53667	-1.64962	0.11323			All available between 1991-2015	Normal	
Iron	E2	SS	Year	1	116.69180	66.07377	1.76608	0.09126	No		All available between 1991-2015	Normal	
Iron	E5	NG	Intercept	1	34.8911	49.1659	0.7097	0.4854			All available between 1991-2015	Log-normal	
Iron	E5	NG	Year	1	-0.0149	0.0245	-0.6066	0.5503			All available between 1991-2015	Log-normal	
Iron	E5	SB	Intercept	1	3.7869	11.7182	0.3232	0.7510			All available between 1991-2015	Log-normal	
Iron	E5	SB	Year	1	0.0002	0.0058	0.0282	0.9779			All available between 1991-2015	Log-normal	
Iron	E5	SS	Intercept	1	-216840.28618	129134.92833	-1.67918	0.10794			All available between 1991-2015	Normal	
Iron	E5	SS	Year	1	117.48045	64.43678	1.82319	0.08254	No		All available between 1991-2015	Normal	
Iron	E6	NG	Intercept	1	-14.1203	58.5554	-0.2411	0.8127			All available between 1991-2015	Log-normal	
Iron	E6	NG	Year	1	0.0094	0.0292	0.3239	0.7505			All available between 1991-2015	Log-normal	
Iron	E6	SS	Intercept	1	-131030.38102	201649.98453	-0.64979	0.52451			All available between 1991-2015	Normal	
Iron	E6	SS	Year	1	73.89604	100.41250	0.73592	0.47181	No		All available between 1991-2015	Normal	
Iron	N2	NG	Intercept	1	-23.1991	29.9865	-0.7737	0.4467			All available between 1991-2015	Log-normal	
Iron	N2	NG	Year	1	0.0140	0.0150	0.9328	0.3602			All available between 1991-2015	Log-normal	
Iron	N2	SB	Intercept	1	-9.1320	21.0338	-0.4342	0.6708			All available between 1991-2015	Log-normal	
Iron	N2	SB	Year	1	0.0066	0.0105	0.6312	0.5381			All available between 1991-2015	Log-normal	
Iron	N2	SD	Intercept	1	-33.5391	6.6975	-5.0077	<.0001			All available between 1991-2015	Log-normal	
Iron	N2	SD	Year	1	0.0217	0.0033	6.4975	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Iron	N2	SS	Intercept	1	-419972.39554	133363.81430	-3.14907	0.00449			All available between 1991-2015	Normal	
Iron	N2	SS	Year	1	221.26741	66.53505	3.32558	0.00294	Yes	Pos	All available between 1991-2015	Normal	
Iron	N4	NG	Intercept	1	-91.9258	74.7428	-1.2299	0.2405			All available between 1991-2015	Log-normal	
Iron	N4	NG	Year	1	0.0482	0.0372	1.2955	0.2177			All available between 1991-2015	Log-normal	
Iron	N4	SS	Intercept	1	-265506.02799	204175.27376	-1.30038	0.21310			All available between 1991-2015	Normal	
Iron	N4	SS	Year	1	141.98062	101.66280	1.39658	0.18286	No		All available between 1991-2015	Normal	
Iron	N5	NG	Intercept	1	-26.8764	77.9325	-0.3449	0.7357			All available between 1991-2015	Log-normal	
Iron	N5	NG	Year	1	0.0159	0.0388	0.4109	0.6878			All available between 1991-2015	Log-normal	
Iron	N5	SD	Intercept	1	-82.5645	19.3555	-4.2657	0.0007			All available between 1991-2015	Log-normal	
Iron	N5	SD	Year	1	0.0462	0.0096	4.7938	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Iron	N5	SS	Intercept	1	-408114.28571	340496.37901	-1.19859	0.25382			All available between 1991-2015	Normal	
Iron	N5	SS	Year	1	212.08791	169.52736	1.25105	0.23476	No		All available between 1991-2015	Normal	
Iron	S1	NG	Intercept	1	-117.5698	36.3131	-3.2377	0.0036			All available between 1991-2015	Log-normal	
Iron	S1	NG	Year	1	0.0611	0.0181	3.3728	0.0026	Yes	pos	All available between 1991-2015	Log-normal	
Iron	S1	SB	Intercept	1	-9.3792	13.7812	-0.6806	0.5059			All available between 1991-2015	Log-normal	
Iron	S1	SB	Year	1	0.0067	0.0069	0.9759	0.3437			All available between 1991-2015	Log-normal	
Iron	S1	SD	Intercept	1	1.0415	7.6565	0.1360	0.8928			All available between 1991-2015	Log-normal	
Iron	S1	SD	Year	1	0.0045	0.0038	1.1661	0.2542			All available between 1991-2015	Log-normal	
Iron	S1	SS	Intercept	1	-306294.03202	127143.51480	-2.40904	0.02440			All available between 1991-2015	Normal	
Iron	S1	SS	Year	1	163.99806	63.46725	2.58398	0.01659	No		All available between 1991-2015	Normal	
Iron	S2	NG	Intercept	1	-36.4246	34.8640	-1.0448	0.3065			All available between 1991-2015	Log-normal	
Iron	S2	NG	Year	1	0.0207	0.0174	1.1888	0.2461			All available between 1991-2015	Log-normal	
Iron	S2	SB	Intercept	1	-16.4910	11.5036	-1.4336	0.1688			All available between 1991-2015	Log-normal	
Iron	S2	SB	Year	1	0.0103	0.0057	1.7896	0.0904			All available between 1991-2015	Log-normal	
Iron	S2	SS	Intercept	1	-161726.53753	122058.89619	-1.32499	0.19716			All available between 1991-2015	Normal	
Iron	S2	SS	Year	1	92.34867	60.92414	1.51580	0.14211	No		All available between 1991-2015	Normal	
Iron	S3	NG	Intercept	1	11.7167	23.1688	0.5057	0.6173			All available between 1991-2015	Log-normal	
Iron	S3	NG	Year	1	-0.0036	0.0116	-0.3105	0.7586			All available between 1991-2015	Log-normal	
Iron	S3	SD	Intercept	1	14.9630	6.4966	2.3032	0.0295			All available between 1991-2015	Log-normal	
Iron	S3	SD	Year	1	-0.0025	0.0032	-0.7635	0.4521			All available between 1991-2015	Log-normal	
Iron	S3	SS	Intercept	1	-241522.89889	129693.44800	-1.86226	0.07539			All available between 1991-2015	Normal	
Iron	S3	SS	Year	1	129.83256	64.72723	2.00584	0.05677	No		All available between 1991-2015	Normal	
Iron	S4	NG	Intercept	1	41.6134	37.0703	1.1226	0.2727			All available between 1991-2015	Log-normal	
Iron	S4	NG	Year	1	-0.0184	0.0185	-0.9942	0.3300			All available between 1991-2015	Log-normal	
Iron	S4	SB	Intercept	1	-0.3166	15.5191	-0.0204	0.9840			All available between 1991-2015	Log-normal	
Iron	S4	SB	Year	1	0.0022	0.0077	0.2861	0.7790			All available between 1991-2015	Log-normal	
Iron	S4	SD	Intercept	1	-0.9436	5.4315	-0.1737	0.8635			All available between 1991-2015	Log-normal	
Iron	S4	SD	Year	1	0.0055	0.0027	2.0360	0.0529			All available between 1991-2015	Log-normal	
Iron	S4	SS	Intercept	1	-314182.23728	216342.89105	-1.45224	0.16275			All available between 1991-2015	Normal	
Iron	S4	SS	Year	1	169.76234	107.94207	1.57272	0.13229	No		All available between 1991-2015	Normal	
Iron	S4	WW	Intercept	1	-35.4596	17.3883	-2.0393	0.0875			All available between 1991-2015	Log-normal	
Iron	S4	WW	Year	1	0.0195	0.0087	2.2499	0.0654			All available between 1991-2015	Log-normal	
Iron	S5	FC	Intercept	1	2.9452	19.9135	0.1479	0.8882			All available between 1991-2015	Log-normal	
Iron	S5	FC	Year	1	-0.0001	0.0099	-0.0106	0.9919			All available between 1991-2015	Log-normal	
Iron	S5	NG	Intercept	1	-71.0868	33.8755	-2.0985	0.0481			All available between 1991-2015	Log-normal	
Iron	S5	NG	Year	1	0.0379	0.0169	2.2427	0.0358			All available between 1991-2015	Log-normal	
Iron	S5	SB	Intercept	1	15.1144	15.8260	0.9550	0.3601			All available between 1991-2015	Log-normal	
Iron	S5	SB	Year	1	-0.0054	0.0079	-0.6887	0.5053			All available between 1991-2015	Log-normal	
Iron	S5	SS	Intercept	1	-121063.86772	142827.77531	-0.84762	0.40668			All available between 1991-2015	Normal	
Iron	S5	SS	Year	1	71.69904	71.21613	1.00678	0.32607	No		All available between 1991-2015	Normal	
Iron	W2	NG	Intercept	1	-93.1109	25.3624	-3.6712	0.0011			All available between 1991-2015	Log-normal	
Iron	W2	NG	Year	1	0.0489	0.0127	3.8650	0.0007	Yes	pos	All available between 1991-2015	Log-normal	
Iron	W2	SB	Intercept	1	-15.1361	11.0622	-1.3683	0.1881			All available between 1991-2015	Log-normal	
Iron	W2	SB	Year	1	0.0096	0.0055	1.7446	0.0981			All available between 1991-2015	Log-normal	
Iron	W2	SS	Intercept	1	-198713.54405	100499.79906	-1.97725	0.06196			All available between 1991-2015	Normal	
Iron	W2	SS	Year	1	107.64445	50.15379	2.14629	0.04430	No		All available between 1991-2015	Normal	
Iron	W4	FC	Intercept	1	28.0217	14.4911	1.9337	0.1013			All available between 1991-2015	Log-normal	
Iron	W4	FC	Year	1	-0.0125	0.0072	-1.7327	0.1339			All available between 1991-2015	Log-normal	
Iron	W4	NG	Intercept	1	-166.5672	65.2626	-2.5523	0.0190			All available between 1991-2015	Log-normal	
Iron	W4	NG	Year	1	0.0857	0.0325	2.6346	0.0159			All available between 1991-2015	Log-normal	
Iron	W4	SB	Intercept	1	-23.4153	18.9631	-1.2348	0.2426			All available between 1991-2015	Log-normal	
Iron	W4	SB	Year	1	0.0138	0.0095	1.4601	0.1722			All available between 1991-2015	Log-normal	
Iron	W4	SS	Intercept	1	46237.63066	144926.78062	0.31904	0.75382			All available between 1991-2015	Normal	
Iron	W4	SS	Year	1	-11.52315	72.19444	-0.15961	0.87518	No		All available between 1991-2015	Normal	
Lead	E1	NG	Intercept	1	204.4778	85.0019	2.4056	0.0318			2002-2015	Log-normal	
Lead	E1	NG	Year	1	-0.1023	0.0423	-2.4181	0.0310			2002-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Lead	E1	SB	Intercept	1	23.0592	264.2228	0.0873	0.9333			2002-2015	Log-normal	
Lead	E1	SB	Year	1	-0.0129	0.1315	-0.0978	0.9253			2002-2015	Log-normal	
Lead	E1	SS	Intercept	1	12.0549	12.4170	0.9708	0.3427			All available between 1991-2015	Log-normal	
Lead	E1	SS	Year	1	-0.0047	0.0062	-0.7600	0.4557			All available between 1991-2015	Log-normal	
Lead	E2	NG	Intercept	1	0.0262	90.5215	0.0003	0.9998			2002-2015	Log-normal	
Lead	E2	NG	Year	1	-0.0008	0.0451	-0.0170	0.9867			2002-2015	Log-normal	
Lead	E2	SD	Intercept	1	1.1171	11.7121	0.0954	0.9248			All available between 1991-2015	Log-normal	
Lead	E2	SD	Year	1	0.0007	0.0058	0.1125	0.9113			All available between 1991-2015	Log-normal	
Lead	E2	SS	Intercept	1	-37.8385	17.1212	-2.2100	0.0378			All available between 1991-2015	Log-normal	
Lead	E2	SS	Year	1	0.0205	0.0085	2.3955	0.0255			All available between 1991-2015	Log-normal	
Lead	E5	NG	Intercept	1	-14.4167	112.7646	-0.1278	0.9004			2002-2015	Log-normal	
Lead	E5	NG	Year	1	0.0066	0.0561	0.1182	0.9078			2002-2015	Log-normal	
Lead	E5	SS	Intercept	1	2.4171	10.1121	0.2390	0.8134			All available between 1991-2015	Log-normal	
Lead	E5	SS	Year	1	0.0001	0.0050	0.0230	0.9818			All available between 1991-2015	Log-normal	
Lead	E6	NG	Intercept	1	236.5653	73.3389	3.2256	0.0066			2002-2015	Log-normal	
Lead	E6	NG	Year	1	-0.1178	0.0365	-3.2281	0.0066			2002-2015	Log-normal	
Lead	E6	SS	Intercept	1	16.6472	12.6104	1.3201	0.2043			All available between 1991-2015	Log-normal	
Lead	E6	SS	Year	1	-0.0069	0.0063	-1.0997	0.2868			All available between 1991-2015	Log-normal	
Lead	N2	NG	Intercept	1	264.0314	73.6132	3.5867	0.0037			2002-2015	Log-normal	
Lead	N2	NG	Year	1	-0.1321	0.0367	-3.6055	0.0036			2002-2015	Log-normal	
Lead	N2	SB	Intercept	1	129.6052	284.4588	0.4556	0.6678			2002-2015	Log-normal	
Lead	N2	SB	Year	1	-0.0659	0.1418	-0.4651	0.6614			2002-2015	Log-normal	
Lead	N2	SD	Intercept	1	-36.4155	8.0451	-4.5264	0.0001			All available between 1991-2015	Log-normal	
Lead	N2	SD	Year	1	0.0195	0.0040	4.8507	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Lead	N2	SS	Intercept	1	-0.4884	11.4570	-0.0426	0.9664			All available between 1991-2015	Log-normal	
Lead	N2	SS	Year	1	0.0016	0.0057	0.2843	0.7787			All available between 1991-2015	Log-normal	
Lead	N4	NG	Intercept	1	252.8375	76.4979	3.3052	0.0063			2002-2015	Log-normal	
Lead	N4	NG	Year	1	-0.1265	0.0381	-3.3210	0.0061			2002-2015	Log-normal	
Lead	N4	SS	Intercept	1	10.5338	13.4674	0.7822	0.4463			All available between 1991-2015	Log-normal	
Lead	N4	SS	Year	1	-0.0039	0.0067	-0.5870	0.5660			All available between 1991-2015	Log-normal	
Lead	N5	NG	Intercept	1	248.2811	85.6210	2.8998	0.0124			2002-2015	Log-normal	
Lead	N5	NG	Year	1	-0.1234	0.0426	-2.8958	0.0125			2002-2015	Log-normal	
Lead	N5	SD	Intercept	1	-65.3559	19.0805	-3.4253	0.0038			All available between 1991-2015	Log-normal	
Lead	N5	SD	Year	1	0.0341	0.0095	3.5945	0.0027	Yes	pos	All available between 1991-2015	Log-normal	
Lead	N5	SS	Intercept	1	62.6691	23.5871	2.6569	0.0209			All available between 1991-2015	Log-normal	
Lead	N5	SS	Year	1	-0.0297	0.0117	-2.5281	0.0265			All available between 1991-2015	Log-normal	
Lead	S1	NG	Intercept	1	-20.3952	117.4686	-0.1736	0.8648			2002-2015	Log-normal	
Lead	S1	NG	Year	1	0.0097	0.0585	0.1656	0.8710			2002-2015	Log-normal	
Lead	S1	SB	Intercept	1	-181.8781	102.2821	-1.7782	0.1186			2002-2015	Log-normal	
Lead	S1	SB	Year	1	0.0891	0.0509	1.7503	0.1235			2002-2015	Log-normal	
Lead	S1	SD	Intercept	1	-1.3165	10.0115	-0.1315	0.8964			All available between 1991-2015	Log-normal	
Lead	S1	SD	Year	1	0.0021	0.0050	0.4184	0.6791			All available between 1991-2015	Log-normal	
Lead	S1	SS	Intercept	1	2.5076	10.7804	0.2326	0.8181			All available between 1991-2015	Log-normal	
Lead	S1	SS	Year	1	0.0001	0.0054	0.0198	0.9844			All available between 1991-2015	Log-normal	
Lead	S2	NG	Intercept	1	111.2520	77.4456	1.4365	0.1764			2002-2015	Log-normal	
Lead	S2	NG	Year	1	-0.0559	0.0386	-1.4499	0.1727			2002-2015	Log-normal	
Lead	S2	SS	Intercept	1	4.7468	10.5963	0.4480	0.6580			All available between 1991-2015	Log-normal	
Lead	S2	SS	Year	1	-0.0010	0.0053	-0.1886	0.8519			All available between 1991-2015	Log-normal	
Lead	S3	NG	Year	1	-0.1044	0.0210	-4.9774	0.0002	Yes	neg	2002-2015	Log-normal	
Lead	S3	NG	Intercept	1	208.6174	42.1386	4.9507	0.0002			2002-2015	Log-normal	
Lead	S3	SD	Year	1	-0.0280	0.0076	-3.6826	0.0011	Yes	neg	All available between 1991-2015	Log-normal	
Lead	S3	SD	Intercept	1	59.1303	15.2160	3.8861	0.0006			All available between 1991-2015	Log-normal	
Lead	S3	SS	Intercept	1	-20.7914	14.4232	-1.4415	0.1629			All available between 1991-2015	Log-normal	
Lead	S3	SS	Year	1	0.0118	0.0072	1.6342	0.1158			All available between 1991-2015	Log-normal	
Lead	S4	NG	Intercept	1	88.5484	74.5814	1.1873	0.2536			2002-2015	Log-normal	
Lead	S4	NG	Year	1	-0.0449	0.0371	-1.2091	0.2454			2002-2015	Log-normal	
Lead	S4	SD	Intercept	1	21.5729	11.3252	1.9049	0.0689			All available between 1991-2015	Log-normal	
Lead	S4	SD	Year	1	-0.0095	0.0057	-1.6760	0.1067			All available between 1991-2015	Log-normal	
Lead	S4	SS	Intercept	1	-16.2925	12.1285	-1.3433	0.1950			All available between 1991-2015	Log-normal	
Lead	S4	SS	Year	1	0.0095	0.0061	1.5677	0.1335			All available between 1991-2015	Log-normal	
Lead	S5	NG	Intercept	1	31.3337	81.2913	0.3854	0.7061			2002-2015	Log-normal	
Lead	S5	NG	Year	1	-0.0162	0.0405	-0.3996	0.6959			2002-2015	Log-normal	
Lead	S5	SB	Intercept	1	11.9155	204.0408	0.0584	0.9551			2002-2015	Log-normal	
Lead	S5	SB	Year	1	-0.0073	0.1016	-0.0716	0.9450			2002-2015	Log-normal	
Lead	S5	SS	Intercept	1	-22.9532	9.4849	-2.4200	0.0252			All available between 1991-2015	Log-normal	
Lead	S5	SS	Year	1	0.0128	0.0047	2.6975	0.0139			All available between 1991-2015	Log-normal	
Lead	W2	NG	Intercept	1	47.8782	78.6626	0.6087	0.5525			2002-2015	Log-normal	
Lead	W2	NG	Year	1	-0.0243	0.0392	-0.6200	0.5452			2002-2015	Log-normal	
Lead	W2	SB	Intercept	1	-36.3545	181.7901	-0.2000	0.8459			2002-2015	Log-normal	
Lead	W2	SB	Year	1	0.0168	0.0905	0.1853	0.8571			2002-2015	Log-normal	
Lead	W2	SS	Intercept	1	2.9126	7.8453	0.3713	0.7143			All available between 1991-2015	Log-normal	
Lead	W2	SS	Year	1	-0.0001	0.0039	-0.0204	0.9840			All available between 1991-2015	Log-normal	
Lead	W4	NG	Intercept	1	-61.7041	80.8963	-0.7628	0.4574			2002-2015	Log-normal	
Lead	W4	NG	Year	1	0.0303	0.0403	0.7514	0.4640			2002-2015	Log-normal	
Lead	W4	SB	Intercept	1	59.9953	175.5778	0.3417	0.7404			2002-2015	Log-normal	
Lead	W4	SB	Year	1	-0.0312	0.0875	-0.3569	0.7294			2002-2015	Log-normal	
Lead	W4	SS	Intercept	1	-22.8616	12.5813	-1.8171	0.0880			All available between 1991-2015	Log-normal	
Lead	W4	SS	Year	1	0.0128	0.0063	2.0413	0.0581			All available between 1991-2015	Log-normal	
Magnesium	E1	NG	Intercept	1	21.1800	17.4199	1.2159	0.2359			All available between 1991-2015	Log-normal	
Magnesium	E1	NG	Year	1	-0.0067	0.0087	-0.7711	0.4482			All available between 1991-2015	Log-normal	
Magnesium	E1	SB	Intercept	1	-5148.17797	21245.26666	-0.24232	0.81205			All available between 1991-2015	Normal	
Magnesium	E1	SB	Year	1	3.58051	10.61194	0.33740	0.74082	No		All available between 1991-2015	Normal	
Magnesium	E1	SS	Intercept	1	1.8438	13.5798	0.1358	0.8933			All available between 1991-2015	Log-normal	
Magnesium	E1	SS	Year	1	0.0032	0.0068	0.4696	0.6435			All available between 1991-2015	Log-normal	
Magnesium	E2	NG	Intercept	1	-10.3288	15.0417	-0.6867	0.4989			All available between 1991-2015	Log-normal	
Magnesium	E2	NG	Year	1	0.0091	0.0075	1.2069	0.2392			All available between 1991-2015	Log-normal	
Magnesium	E2	SB	Intercept	1	-6277.41230	18293.16920	-0.34316	0.73859			All available between 1991-2015	Normal	
Magnesium	E2	SB	Year	1	4.25997	9.14119	0.46602	0.65119	No		All available between 1991-2015	Normal	
Magnesium	E2	SD	Intercept	1	43231.75340	154502.48716	0.27981	0.78192			All available between 1991-2015	Normal	
Magnesium	E2	SD	Year	1	-6.66193	77.11937	-0.08638	0.93185	No		All available between 1991-2015	Normal	
Magnesium	E2	SS	Intercept	1	-11.5835	12.8562	-0.9010	0.3773			All available between 1991-2015	Log-normal	
Magnesium	E2	SS	Year	1	0.0099	0.0064	1.5489	0.1357			All available between 1991-2015	Log-normal	
Magnesium	E5	NG	Intercept	1	-65.5358	26.0176	-2.5189	0.0195			All available between 1991-2015	Log-normal	
Magnesium	E5	NG	Year	1	0.0367	0.0130	2.8262	0.0098			All available between 1991-2015	Log-normal	
Magnesium	E5	SB	Intercept	1	-15525.06501	15923.82887	-0.97496	0.34504			All available between 1991-2015	Normal	
Magnesium	E5	SB	Year	1	8.79236	7.94947	1.10603	0.28614	No		All available between 1991-2015	Normal	
Magnesium	E5	SS	Intercept	1	5.5407	12.1261	0.4569	0.6524			All available between 1991-2015	Log-normal	
Magnesium	E5	SS	Year	1	0.0015	0.0061	0.2489	0.8059			All available between 1991-2015	Log-normal	
Magnesium	E6	NG	Intercept	1	-51.7917	20.3302	-2.5475	0.0223			All available between 1991-2015	Log-normal	
Magnesium	E6	NG	Year	1	0.0296	0.0101	2.9283	0.0104			All available between 1991-2015	Log-normal	
Magnesium	E6	SS	Intercept	1	3.0116	17.5935	0.1712	0.8661			All available between 1991-2015	Log-normal	
Magnesium	E6	SS	Year	1	0.0031	0.0088	0.3497	0.7309			All available between 1991-2015	Log-normal	
Magnesium	N2	NG	Intercept	1	-18.7658	11.4286	-1.6420	0.1136			All available between 1991-2015	Log-normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Magnesium	N2	NG	Year	1	0.0133	0.0057	2.3287	0.0286			All available between 1991-2015	Log-normal	
Magnesium	N2	SB	Intercept	1	4512.03289	18049.42869	0.24998	0.80623			All available between 1991-2015	Normal	
Magnesium	N2	SB	Year	1	-1.17094	9.02410	-0.12976	0.89860	No		All available between 1991-2015	Normal	
Magnesium	N2	SD	Intercept	1	588459.25620	172054.42552	3.42019	0.00224			All available between 1991-2015	Normal	
Magnesium	N2	SD	Year	1	-281.73554	85.88130	-3.28052	0.00316	No		All available between 1991-2015	Normal	
Magnesium	N2	SS	Intercept	1	-10.4353	5.9943	-1.7409	0.0951			All available between 1991-2015	Log-normal	
Magnesium	N2	SS	Year	1	0.0096	0.0030	3.2059	0.0039			All available between 1991-2015	Log-normal	
Magnesium	N4	NG	Intercept	1	12.7934	31.8825	0.4013	0.6947			All available between 1991-2015	Log-normal	
Magnesium	N4	NG	Year	1	-0.0024	0.0159	-0.1536	0.8803			All available between 1991-2015	Log-normal	
Magnesium	N4	SS	Intercept	1	-160.9420	34.6058	-4.6507	0.0003			All available between 1991-2015	Log-normal	
Magnesium	N4	SS	Year	1	0.0846	0.0172	4.9097	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Magnesium	N5	NG	Intercept	1	-3.4476	34.4055	-0.1002	0.9217			All available between 1991-2015	Log-normal	
Magnesium	N5	NG	Year	1	0.0055	0.0171	0.3238	0.7512			All available between 1991-2015	Log-normal	
Magnesium	N5	SD	Intercept	1	975009.76096	382231.86495	2.55083	0.02216			All available between 1991-2015	Normal	
Magnesium	N5	SD	Year	1	-475.98495	190.24825	-2.50191	0.02441	No		All available between 1991-2015	Normal	
Magnesium	N5	SS	Intercept	1	-79.2387	41.9991	-1.8867	0.0836			All available between 1991-2015	Log-normal	
Magnesium	N5	SS	Year	1	0.0442	0.0209	2.1140	0.0561			All available between 1991-2015	Log-normal	
Magnesium	S1	NG	Intercept	1	-24.9580	20.5338	-1.2155	0.2360			All available between 1991-2015	Log-normal	
Magnesium	S1	NG	Year	1	0.0164	0.0102	1.5969	0.1234			All available between 1991-2015	Log-normal	
Magnesium	S1	SB	Intercept	1	-5253.62914	12631.24927	-0.41592	0.68299			All available between 1991-2015	Normal	
Magnesium	S1	SB	Year	1	3.68794	6.30752	0.58469	0.56691	No		All available between 1991-2015	Normal	
Magnesium	S1	SD	Intercept	1	-38940.90855	305493.46656	-0.12747	0.89955			All available between 1991-2015	Normal	
Magnesium	S1	SD	Year	1	29.04204	152.46529	0.19048	0.85041	No		All available between 1991-2015	Normal	
Magnesium	S1	SS	Intercept	1	-5.3825	11.4937	-0.4683	0.6440			All available between 1991-2015	Log-normal	
Magnesium	S1	SS	Year	1	0.0072	0.0057	1.2469	0.2250			All available between 1991-2015	Log-normal	
Magnesium	S2	NG	Intercept	1	-27.0049	25.2980	-1.0675	0.2964			All available between 1991-2015	Log-normal	
Magnesium	S2	NG	Year	1	0.0174	0.0126	1.3784	0.1808			All available between 1991-2015	Log-normal	
Magnesium	S2	SB	Intercept	1	-21545.61384	14248.31247	-1.51215	0.14785			All available between 1991-2015	Normal	
Magnesium	S2	SB	Year	1	11.76397	7.11166	1.65418	0.11542	No		All available between 1991-2015	Normal	
Magnesium	S2	SS	Intercept	1	-10.5319	9.1766	-1.1477	0.2620			All available between 1991-2015	Log-normal	
Magnesium	S2	SS	Year	1	0.0096	0.0046	2.1036	0.0456			All available between 1991-2015	Log-normal	
Magnesium	S3	NG	Intercept	1	-12.9066	14.3830	-0.8974	0.3778			All available between 1991-2015	Log-normal	
Magnesium	S3	NG	Year	1	0.0101	0.0072	1.4097	0.1705			All available between 1991-2015	Log-normal	
Magnesium	S3	SD	Intercept	1	-62354.21516	196236.25917	-0.31775	0.75321			All available between 1991-2015	Normal	
Magnesium	S3	SD	Year	1	42.09395	97.95311	0.42974	0.67093	No		All available between 1991-2015	Normal	
Magnesium	S3	SS	Intercept	1	-11.0213	14.2925	-0.7711	0.4485			All available between 1991-2015	Log-normal	
Magnesium	S3	SS	Year	1	0.0099	0.0071	1.3830	0.1799			All available between 1991-2015	Log-normal	
Magnesium	S4	NG	Intercept	1	-53.6685	26.5439	-2.0219	0.0545			All available between 1991-2015	Log-normal	
Magnesium	S4	NG	Year	1	0.0306	0.0132	2.3079	0.0299			All available between 1991-2015	Log-normal	
Magnesium	S4	SB	Intercept	1	-30259.99194	18520.27703	-1.63388	0.12456			All available between 1991-2015	Normal	
Magnesium	S4	SB	Year	1	16.15372	9.23987	1.74826	0.10230	No		All available between 1991-2015	Normal	
Magnesium	S4	SD	Intercept	1	118457.88027	185720.45267	0.63783	0.52962			All available between 1991-2015	Normal	
Magnesium	S4	SD	Year	1	-48.23060	92.72235	-0.52016	0.60772	No		All available between 1991-2015	Normal	
Magnesium	S4	SS	Intercept	1	-33.8772	9.8709	-3.4320	0.0028			All available between 1991-2015	Log-normal	
Magnesium	S4	SS	Year	1	0.0213	0.0049	4.3226	0.0004	Yes	pos	All available between 1991-2015	Log-normal	
Magnesium	S4	WW	Intercept	1	-23720.79137	15655.75635	-1.51515	0.18051			All available between 1991-2015	Normal	
Magnesium	S4	WW	Year	1	12.42806	7.81027	1.59125	0.16266	No		All available between 1991-2015	Normal	
Magnesium	S5	FC	Intercept	1	-1286.98008	10060.30609	-0.12793	0.90319			All available between 1991-2015	Normal	
Magnesium	S5	FC	Year	1	1.08765	5.01473	0.21689	0.83687	No		All available between 1991-2015	Normal	
Magnesium	S5	NG	Intercept	1	-9.8159	21.6922	-0.4525	0.6555			All available between 1991-2015	Log-normal	
Magnesium	S5	NG	Year	1	0.0088	0.0108	0.8104	0.4268			All available between 1991-2015	Log-normal	
Magnesium	S5	SB	Intercept	1	-39749.28100	25198.74608	-1.57743	0.14300			All available between 1991-2015	Normal	
Magnesium	S5	SB	Year	1	20.95149	12.56789	1.66707	0.12369	No		All available between 1991-2015	Normal	
Magnesium	S5	SS	Intercept	1	6.0251	10.0239	0.6011	0.5545			All available between 1991-2015	Log-normal	
Magnesium	S5	SS	Year	1	0.0015	0.0050	0.2902	0.7747			All available between 1991-2015	Log-normal	
Magnesium	W2	NG	Intercept	1	-9.1941	11.1170	-0.8270	0.4160			All available between 1991-2015	Log-normal	
Magnesium	W2	NG	Year	1	0.0085	0.0056	1.5357	0.1372			All available between 1991-2015	Log-normal	
Magnesium	W2	SB	Intercept	1	-47357.60337	30026.87504	-1.57717	0.13217			All available between 1991-2015	Normal	
Magnesium	W2	SB	Year	1	24.67291	14.98562	1.64644	0.11702	No		All available between 1991-2015	Normal	
Magnesium	W2	SS	Intercept	1	-10.0170	9.0728	-1.1041	0.2827			All available between 1991-2015	Log-normal	
Magnesium	W2	SS	Year	1	0.0091	0.0045	2.0102	0.0581			All available between 1991-2015	Log-normal	
Magnesium	W4	FC	Intercept	1	3147.37776	16636.52867	0.18918	0.85619			All available between 1991-2015	Normal	
Magnesium	W4	FC	Year	1	-1.07875	8.28560	-0.13020	0.90067	No		All available between 1991-2015	Normal	
Magnesium	W4	NG	Intercept	1	-9.9814	45.9625	-0.2172	0.8303			All available between 1991-2015	Log-normal	
Magnesium	W4	NG	Year	1	0.0090	0.0229	0.3919	0.6992			All available between 1991-2015	Log-normal	
Magnesium	W4	SB	Intercept	1	-22081.30910	35825.79099	-0.61635	0.55020			All available between 1991-2015	Normal	
Magnesium	W4	SB	Year	1	12.19224	17.85994	0.68266	0.50894	No		All available between 1991-2015	Normal	
Magnesium	W4	SS	Intercept	1	5.7157	8.3866	0.6815	0.5053			All available between 1991-2015	Log-normal	
Magnesium	W4	SS	Year	1	0.0015	0.0042	0.3558	0.7266			All available between 1991-2015	Log-normal	
Manganese	E1	NG	Intercept	1	32.6040	18.9273	1.7226	0.0978			All available between 1991-2015	Log-normal	
Manganese	E1	NG	Year	1	-0.0148	0.0094	-1.5642	0.1309			All available between 1991-2015	Log-normal	
Manganese	E1	SB	Intercept	1	-0.4132	12.9320	-0.0319	0.9750			All available between 1991-2015	Log-normal	
Manganese	E1	SB	Year	1	0.0017	0.0065	0.2585	0.7998			All available between 1991-2015	Log-normal	
Manganese	E1	SS	Intercept	1	5.6853	21.9446	0.2591	0.7981			All available between 1991-2015	Log-normal	
Manganese	E1	SS	Year	1	0.0001	0.0110	0.0067	0.9947			All available between 1991-2015	Log-normal	
Manganese	E2	NG	Intercept	1	-43.2681	28.0711	-1.5414	0.1363			All available between 1991-2015	Log-normal	
Manganese	E2	NG	Year	1	0.0231	0.0140	1.6482	0.1123			All available between 1991-2015	Log-normal	
Manganese	E2	SB	Intercept	1	-5.4018	13.0689	-0.4133	0.6881			All available between 1991-2015	Log-normal	
Manganese	E2	SB	Year	1	0.0041	0.0065	0.6277	0.5443			All available between 1991-2015	Log-normal	
Manganese	E2	SD	Intercept	1	21.1652	8.5498	2.4755	0.0204			All available between 1991-2015	Log-normal	
Manganese	E2	SD	Year	1	-0.0077	0.0043	-1.8074	0.0828			All available between 1991-2015	Log-normal	
Manganese	E2	SS	Intercept	1	-21.1011	15.8959	-1.3275	0.1980			All available between 1991-2015	Log-normal	
Manganese	E2	SS	Year	1	0.0133	0.0079	1.6808	0.1069			All available between 1991-2015	Log-normal	
Manganese	E5	NG	Intercept	1	76.0020	26.9510	2.8200	0.0100			All available between 1991-2015	Log-normal	
Manganese	E5	NG	Year	1	-0.0362	0.0135	-2.6933	0.0133			All available between 1991-2015	Log-normal	
Manganese	E5	SB	Intercept	1	0.7261	11.5650	0.0628	0.9508			All available between 1991-2015	Log-normal	
Manganese	E5	SB	Year	1	0.0011	0.0058	0.1915	0.8507			All available between 1991-2015	Log-normal	
Manganese	E5	SS	Intercept	1	-34.2164	13.3429	-2.5644	0.0181			All available between 1991-2015	Log-normal	
Manganese	E5	SS	Year	1	0.0200	0.0067	2.9965	0.0069			All available between 1991-2015	Log-normal	
Manganese	E6	NG	Intercept	1	9.5877	61.1907	0.1567	0.8776			All available between 1991-2015	Log-normal	
Manganese	E6	NG	Year	1	-0.0030	0.0305	-0.0981	0.9232			All available between 1991-2015	Log-normal	
Manganese	E6	SS	Intercept	1	-42.3062	28.0090	-1.5104	0.1493			All available between 1991-2015	Log-normal	
Manganese	E6	SS	Year	1	0.0240	0.0139	1.7216	0.1033			All available between 1991-2015	Log-normal	
Manganese	N2	NG	Intercept	1	-15.2155	21.8891	-0.6951	0.4937			All available between 1991-2015	Log-normal	
Manganese	N2	NG	Year	1	0.0094	0.0109	0.8612	0.3976			All available between 1991-2015	Log-normal	
Manganese	N2	SB	Intercept	1	-5.8683	11.8951	-0.4933	0.6294			All available between 1991-2015	Log-normal	
Manganese	N2	SB	Year	1	0.0044	0.0059	0.7341	0.4750			All available between 1991-2015	Log-normal	
Manganese	N2	SD	Intercept	1	-2.3416	6.7099	-0.3490	0.7301			All available between 1991-2015	Log-normal	
Manganese	N2	SD	Year	1	0.0040	0.0033	1.1926	0.2447			All available between 1991-2015	Log-normal	
Manganese	N2	SS	Intercept	1	-12.2996	9.0297	-1.3621	0.1863			All available between 1991-2015	Log-normal	
Manganese	N2	SS	Year	1	0.0090	0.0045	2.0034	0.0571			All available between 1991-2015	Log-normal	
Manganese	N4	NG	Intercept	1	-0.2547	38.6366	-0.0066	0.9948			All available between 1991-2015	Log-normal	
Manganese	N4	NG	Year	1	0.0019	0.0192	0.0964	0.9247			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Manganese	N4	SS	Intercept	1	-13.7004	21.7888	-0.6288	0.5390			All available between 1991-2015	Log-normal	
Manganese	N4	SS	Year	1	0.0097	0.0108	0.8912	0.3869			All available between 1991-2015	Log-normal	
Manganese	N5	NG	Intercept	1	-7.0114	22.7437	-0.3083	0.7628			All available between 1991-2015	Log-normal	
Manganese	N5	NG	Year	1	0.0051	0.0113	0.4484	0.6612			All available between 1991-2015	Log-normal	
Manganese	N5	SD	Intercept	1	6.4038	24.1745	0.2649	0.7947			All available between 1991-2015	Log-normal	
Manganese	N5	SD	Year	1	-0.0002	0.0120	-0.0180	0.9859			All available between 1991-2015	Log-normal	
Manganese	N5	SS	Intercept	1	-48.7616	21.6845	-2.2487	0.0441			All available between 1991-2015	Log-normal	
Manganese	N5	SS	Year	1	0.0272	0.0108	2.5185	0.0270			All available between 1991-2015	Log-normal	
Manganese	S1	NG	Intercept	1	-94.5253	23.5136	-4.0200	0.0005			All available between 1991-2015	Log-normal	
Manganese	S1	NG	Year	1	0.0488	0.0117	4.1530	0.0004	Yes	pos	All available between 1991-2015	Log-normal	
Manganese	S1	SB	Intercept	1	-6.0688	10.8157	-0.5611	0.5825			All available between 1991-2015	Log-normal	
Manganese	S1	SB	Year	1	0.0045	0.0054	0.8358	0.4156			All available between 1991-2015	Log-normal	
Manganese	S1	SD	Intercept	1	3.3412	17.8452	0.1872	0.8529			All available between 1991-2015	Log-normal	
Manganese	S1	SD	Year	1	0.0011	0.0089	0.1267	0.9002			All available between 1991-2015	Log-normal	
Manganese	S1	SS	Intercept	1	-22.4036	15.3095	-1.4634	0.1569			All available between 1991-2015	Log-normal	
Manganese	S1	SS	Year	1	0.0143	0.0076	1.8674	0.0746			All available between 1991-2015	Log-normal	
Manganese	S2	NG	Intercept	1	-9.6503	19.5295	-0.4941	0.6257			All available between 1991-2015	Log-normal	
Manganese	S2	NG	Year	1	0.0064	0.0098	0.6538	0.5195			All available between 1991-2015	Log-normal	
Manganese	S2	SB	Intercept	1	-17.5341	10.8387	-1.6177	0.1231			All available between 1991-2015	Log-normal	
Manganese	S2	SB	Year	1	0.0102	0.0054	1.8878	0.0753			All available between 1991-2015	Log-normal	
Manganese	S2	SS	Intercept	1	-19.5934	15.1141	-1.2964	0.2067			All available between 1991-2015	Log-normal	
Manganese	S2	SS	Year	1	0.0128	0.0075	1.6924	0.1030			All available between 1991-2015	Log-normal	
Manganese	S3	NG	Intercept	1	-23.1412	33.8734	-0.6832	0.5005			All available between 1991-2015	Log-normal	
Manganese	S3	NG	Year	1	0.0137	0.0169	0.8131	0.4236			All available between 1991-2015	Log-normal	
Manganese	S3	SD	Intercept	1	8.2961	8.5703	0.9680	0.3420			All available between 1991-2015	Log-normal	
Manganese	S3	SD	Year	1	-0.0012	0.0043	-0.2749	0.7856			All available between 1991-2015	Log-normal	
Manganese	S3	SS	Intercept	1	-35.1094	17.8516	-1.9667	0.0614			All available between 1991-2015	Log-normal	
Manganese	S3	SS	Year	1	0.0206	0.0089	2.3089	0.0303			All available between 1991-2015	Log-normal	
Manganese	S4	NG	Intercept	1	22.9574	22.5964	1.0160	0.3202			All available between 1991-2015	Log-normal	
Manganese	S4	NG	Year	1	-0.0098	0.0113	-0.8699	0.3934			All available between 1991-2015	Log-normal	
Manganese	S4	SB	Intercept	1	10.4948	18.5977	0.5643	0.5815			All available between 1991-2015	Log-normal	
Manganese	S4	SB	Year	1	-0.0039	0.0093	-0.4167	0.6832			All available between 1991-2015	Log-normal	
Manganese	S4	SD	Intercept	1	-30.6225	10.5477	-2.9032	0.0078			All available between 1991-2015	Log-normal	
Manganese	S4	SD	Year	1	0.0183	0.0053	3.4697	0.0020	Yes	pos	All available between 1991-2015	Log-normal	
Manganese	S4	SS	Intercept	1	-53.5405	17.0713	-3.1363	0.0054			All available between 1991-2015	Log-normal	
Manganese	S4	SS	Year	1	0.0295	0.0085	3.4608	0.0026	Yes	pos	All available between 1991-2015	Log-normal	
Manganese	S4	WW	Intercept	1	95.8184	28.5681	3.3540	0.0153			All available between 1991-2015	Log-normal	
Manganese	S4	WW	Year	1	-0.0464	0.0143	-3.2575	0.0173			All available between 1991-2015	Log-normal	
Manganese	S5	FC	Year	1	-0.17120	0.02799	-6.11724	0.00169	Yes	Neg	All available between 1991-2015	Normal	
Manganese	S5	FC	Intercept	1	347.11064	56.14363	6.18255	0.00161			All available between 1991-2015	Normal	
Manganese	S5	NG	Intercept	1	58.4088	28.3465	2.0605	0.0520			All available between 1991-2015	Log-normal	
Manganese	S5	NG	Year	1	-0.0274	0.0141	-1.9377	0.0662			All available between 1991-2015	Log-normal	
Manganese	S5	SB	Intercept	1	8.1754	13.7275	0.5956	0.5635			All available between 1991-2015	Log-normal	
Manganese	S5	SB	Year	1	-0.0026	0.0068	-0.3758	0.7142			All available between 1991-2015	Log-normal	
Manganese	S5	SS	Intercept	1	-38.2759	22.7305	-1.6839	0.1077			All available between 1991-2015	Log-normal	
Manganese	S5	SS	Year	1	0.0220	0.0113	1.9425	0.0663			All available between 1991-2015	Log-normal	
Manganese	W2	NG	Intercept	1	-53.4377	35.3572	-1.5114	0.1432			All available between 1991-2015	Log-normal	
Manganese	W2	NG	Year	1	0.0284	0.0177	1.6095	0.1201			All available between 1991-2015	Log-normal	
Manganese	W2	SB	Intercept	1	-21.5228	15.9297	-1.3511	0.1934			All available between 1991-2015	Log-normal	
Manganese	W2	SB	Year	1	0.0122	0.0080	1.5379	0.1415			All available between 1991-2015	Log-normal	
Manganese	W2	SS	Intercept	1	-23.9586	9.6530	-2.4820	0.0221			All available between 1991-2015	Log-normal	
Manganese	W2	SS	Year	1	0.0149	0.0048	3.0850	0.0058			All available between 1991-2015	Log-normal	
Manganese	W4	FC	Intercept	1	205.68516	61.01701	3.37095	0.01502			All available between 1991-2015	Normal	
Manganese	W4	FC	Year	1	-0.10051	0.03039	-3.30764	0.01625	No		All available between 1991-2015	Normal	
Manganese	W4	NG	Intercept	1	-155.7682	55.5336	-2.8049	0.0109			All available between 1991-2015	Log-normal	
Manganese	W4	NG	Year	1	0.0794	0.0277	2.8697	0.0095			All available between 1991-2015	Log-normal	
Manganese	W4	SB	Intercept	1	-16.8292	11.3779	-1.4791	0.1672			All available between 1991-2015	Log-normal	
Manganese	W4	SB	Year	1	0.0099	0.0057	1.7444	0.1089			All available between 1991-2015	Log-normal	
Manganese	W4	SS	Intercept	1	-3.8735	22.8993	-0.1692	0.8678			All available between 1991-2015	Log-normal	
Manganese	W4	SS	Year	1	0.0047	0.0114	0.4151	0.6835			All available between 1991-2015	Log-normal	
Mercury	E1	NG	Intercept	1	79.5693	37.7701	2.1067	0.0480			All available between 1991-2015	Log-normal	
Mercury	E1	NG	Year	1	-0.0413	0.0188	-2.1911	0.0405			All available between 1991-2015	Log-normal	
Mercury	E1	SB	Intercept	1	37.3892	61.0053	0.6129	0.5536			All available between 1991-2015	Log-normal	
Mercury	E1	SB	Year	1	-0.0205	0.0304	-0.6745	0.5153			All available between 1991-2015	Log-normal	
Mercury	E1	SS	Intercept	1	-0.54223	0.60157	-0.90135	0.37762			All available between 1991-2015	Normal	
Mercury	E1	SS	Year	1	0.00029	0.00030	0.98173	0.33741	No		All available between 1991-2015	Normal	
Mercury	E2	NG	Intercept	1	97.1227	30.6221	3.1717	0.0048			All available between 1991-2015	Log-normal	
Mercury	E2	NG	Year	1	-0.0501	0.0153	-3.2839	0.0037			All available between 1991-2015	Log-normal	
Mercury	E2	SB	Intercept	1	-41.1858	65.9021	-0.6250	0.5518			All available between 1991-2015	Log-normal	
Mercury	E2	SB	Year	1	0.0185	0.0329	0.5632	0.5909			All available between 1991-2015	Log-normal	
Mercury	E2	SD	Intercept	1	-42.0715	20.0054	-2.1030	0.0457			All available between 1991-2015	Log-normal	
Mercury	E2	SD	Year	1	0.0194	0.0100	1.9460	0.0630			All available between 1991-2015	Log-normal	
Mercury	E2	SS	Intercept	1	-2.22326	1.11848	-1.98775	0.05943			All available between 1991-2015	Normal	
Mercury	E2	SS	Year	1	0.00114	0.00056	2.04133	0.05339	No		All available between 1991-2015	Normal	
Mercury	E5	NG	Intercept	1	86.9780	46.3588	1.8762	0.0761			All available between 1991-2015	Log-normal	
Mercury	E5	NG	Year	1	-0.0450	0.0231	-1.9463	0.0666			All available between 1991-2015	Log-normal	
Mercury	E5	SB	Intercept	1	16.4812	43.1563	0.3819	0.7087			All available between 1991-2015	Log-normal	
Mercury	E5	SB	Year	1	-0.0101	0.0215	-0.4703	0.6460			All available between 1991-2015	Log-normal	
Mercury	E5	SS	Intercept	1	0.01366	1.06426	0.01283	0.98988			All available between 1991-2015	Normal	
Mercury	E5	SS	Year	1	0.00002	0.00053	0.03333	0.97372	No		All available between 1991-2015	Normal	
Mercury	E6	NG	Intercept	1	71.9611	49.8802	1.4427	0.1697			All available between 1991-2015	Log-normal	
Mercury	E6	NG	Year	1	-0.0374	0.0248	-1.5036	0.1534			All available between 1991-2015	Log-normal	
Mercury	E6	SS	Intercept	1	3.14650	1.59217	1.97624	0.06459			All available between 1991-2015	Normal	
Mercury	E6	SS	Year	1	-0.00153	0.00079	-1.93525	0.06977	No		All available between 1991-2015	Normal	
Mercury	N2	NG	Intercept	1	103.8316	37.6044	2.7612	0.0120			All available between 1991-2015	Log-normal	
Mercury	N2	NG	Year	1	-0.0535	0.0188	-2.8498	0.0099			All available between 1991-2015	Log-normal	
Mercury	N2	SB	Intercept	1	40.8061	44.4057	0.9189	0.3798			All available between 1991-2015	Log-normal	
Mercury	N2	SB	Year	1	-0.0222	0.0222	-1.0008	0.3405			All available between 1991-2015	Log-normal	
Mercury	N2	SD	Intercept	1	-25.5264	24.2483	-1.0527	0.3030			All available between 1991-2015	Log-normal	
Mercury	N2	SD	Year	1	0.0113	0.0121	0.9303	0.3615			All available between 1991-2015	Log-normal	
Mercury	N2	SS	Intercept	1	0.41513	1.00655	0.41243	0.68385			All available between 1991-2015	Normal	
Mercury	N2	SS	Year	1	-0.00018	0.00050	-0.35556	0.72541	No		All available between 1991-2015	Normal	
Mercury	N4	NG	Year	1	-0.0765	0.0182	-4.1959	0.0010	Yes	neg	All available between 1991-2015	Log-normal	
Mercury	N4	NG	Intercept	1	150.2197	36.6172	4.1024	0.0012			All available between 1991-2015	Log-normal	
Mercury	N4	SS	Intercept	1	-0.62339	0.58635	-1.06317	0.30452			All available between 1991-2015	Normal	
Mercury	N4	SS	Year	1	0.00034	0.00029	1.15095	0.26777	No		All available between 1991-2015	Normal	
Mercury	N5	NG	Intercept	1	126.7150	63.6507	1.9908	0.0680			All available between 1991-2015	Log-normal	
Mercury	N5	NG	Year	1	-0.0643	0.0317	-2.0296	0.0634			All available between 1991-2015	Log-normal	
Mercury	N5	SD	Intercept	1	-193.0810	72.3360	-2.6692	0.0175			All available between 1991-2015	Log-normal	
Mercury	N5	SD	Year	1	0.0950	0.0360	2.6387	0.0186			All available between 1991-2015	Log-normal	
Mercury	N5	SS	Intercept	1	-1.00280	3.27975	-0.30576	0.76503			All available between 1991-2015	Normal	
Mercury	N5	SS	Year	1	0.00054	0.00163	0.32841	0.74826	No		All available between 1991-2015	Normal	
Mercury	S1	NG	Intercept	1	43.1958	47.4185	0.9109	0.3732			All available between 1991-2015	Log-normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Mercury	S1	NG	Year	1	-0.0232	0.0236	-0.9808	0.3384			All available between 1991-2015	Log-normal	
Mercury	S1	SB	Intercept	1	-10.7146	51.3761	-0.2086	0.8383			All available between 1991-2015	Log-normal	
Mercury	S1	SB	Year	1	0.0034	0.0256	0.1328	0.8966			All available between 1991-2015	Log-normal	
Mercury	S1	SD	Intercept	1	-21.4062	22.4071	-0.9553	0.3486			All available between 1991-2015	Log-normal	
Mercury	S1	SD	Year	1	0.0093	0.0112	0.8290	0.4149			All available between 1991-2015	Log-normal	
Mercury	S1	SS	Intercept	1	0.27004	0.97563	0.27679	0.78442			All available between 1991-2015	Normal	
Mercury	S1	SS	Year	1	-0.00011	0.00049	-0.22435	0.82447	No		All available between 1991-2015	Normal	
Mercury	S2	NG	Intercept	1	66.5628	37.5929	1.7706	0.0919			All available between 1991-2015	Log-normal	
Mercury	S2	NG	Year	1	-0.0349	0.0188	-1.8611	0.0775			All available between 1991-2015	Log-normal	
Mercury	S2	SB	Intercept	1	-35.3051	41.7661	-0.8453	0.4122			All available between 1991-2015	Log-normal	
Mercury	S2	SB	Year	1	0.0156	0.0208	0.7495	0.4660			All available between 1991-2015	Log-normal	
Mercury	S2	SS	Intercept	1	-1.26432	0.80578	-1.56907	0.12972			All available between 1991-2015	Normal	
Mercury	S2	SS	Year	1	0.00065	0.00040	1.62626	0.11695	No		All available between 1991-2015	Normal	
Mercury	S3	NG	Intercept	1	86.0659	27.1139	3.1742	0.0046			All available between 1991-2015	Log-normal	
Mercury	S3	NG	Year	1	-0.0447	0.0135	-3.3051	0.0034			All available between 1991-2015	Log-normal	
Mercury	S3	SD	Year	1	-0.0438	0.0130	-3.3642	0.0025	Yes	neg	All available between 1991-2015	Log-normal	
Mercury	S3	SD	Intercept	1	85.6201	26.0601	3.2855	0.0030			All available between 1991-2015	Log-normal	
Mercury	S3	SS	Intercept	1	-0.29400	0.48336	-0.60824	0.54899			All available between 1991-2015	Normal	
Mercury	S3	SS	Year	1	0.00017	0.00024	0.71433	0.48221	No		All available between 1991-2015	Normal	
Mercury	S4	NG	Intercept	1	123.3341	39.6381	3.1115	0.0051			All available between 1991-2015	Log-normal	
Mercury	S4	NG	Year	1	-0.0632	0.0198	-3.1966	0.0042			All available between 1991-2015	Log-normal	
Mercury	S4	SB	Intercept	1	0.5998	54.5411	0.0110	0.9914			All available between 1991-2015	Log-normal	
Mercury	S4	SB	Year	1	-0.0023	0.0272	-0.0829	0.9353			All available between 1991-2015	Log-normal	
Mercury	S4	SD	Intercept	1	31.8528	21.5499	1.4781	0.1529			All available between 1991-2015	Log-normal	
Mercury	S4	SD	Year	1	-0.0174	0.0108	-1.6152	0.1199			All available between 1991-2015	Log-normal	
Mercury	S4	SS	Intercept	1	1.56847	1.81944	0.86206	0.39940			All available between 1991-2015	Normal	
Mercury	S4	SS	Year	1	-0.00076	0.00091	-0.83299	0.41520	No		All available between 1991-2015	Normal	
Mercury	S4	WW	Intercept	1	68.7540	66.7590	1.0299	0.3428			All available between 1991-2015	Log-normal	
Mercury	S4	WW	Year	1	-0.0359	0.0333	-1.0792	0.3220			All available between 1991-2015	Log-normal	
Mercury	S5	NG	Intercept	1	56.6983	40.8549	1.3878	0.1797			All available between 1991-2015	Log-normal	
Mercury	S5	NG	Year	1	-0.0299	0.0204	-1.4667	0.1573			All available between 1991-2015	Log-normal	
Mercury	S5	SB	Intercept	1	117.8458	30.1887	3.9036	0.0025			All available between 1991-2015	Log-normal	
Mercury	S5	SB	Year	1	-0.0605	0.0151	-4.0177	0.0020	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Mercury	S5	SS	Intercept	1	-1.59844	0.49457	-3.23195	0.00418			All available between 1991-2015	Normal	
Mercury	S5	SS	Year	1	0.00082	0.00025	3.32525	0.00337	No		All available between 1991-2015	Normal	
Mercury	W2	NG	Intercept	1	55.5244	42.7450	1.2990	0.2087			All available between 1991-2015	Log-normal	
Mercury	W2	NG	Year	1	-0.0293	0.0213	-1.3741	0.1846			All available between 1991-2015	Log-normal	
Mercury	W2	SS	Intercept	1	-1.19040	0.81804	-1.45518	0.16114			All available between 1991-2015	Normal	
Mercury	W2	SS	Year	1	0.00062	0.00041	1.51520	0.14537	No		All available between 1991-2015	Normal	
Mercury	W4	NG	Intercept	1	-2.7093	36.6548	-0.0739	0.9418			All available between 1991-2015	Log-normal	
Mercury	W4	NG	Year	1	-0.0005	0.0183	-0.0254	0.9800			All available between 1991-2015	Log-normal	
Mercury	W4	SS	Intercept	1	0.25137	0.63673	0.39478	0.69856			All available between 1991-2015	Normal	
Mercury	W4	SS	Year	1	-0.00010	0.00032	-0.31237	0.75906	No		All available between 1991-2015	Normal	
Mercury	W4	FC	Intercept	1	2.35347	0.70141	3.35534	0.01532			All available between 1991-2015	Normal	
Mercury	W4	FC	Year	1	-0.00116	0.00035	-3.31971	0.01601			All available between 1991-2015	Normal	
Molybdenum	E1	NG	Intercept	1	-65.1886	32.9740	-1.9770	0.0596			All available between 1991-2015	Log-normal	
Molybdenum	E1	NG	Year	1	0.0329	0.0165	1.9966	0.0573			All available between 1991-2015	Log-normal	
Molybdenum	E1	SB	Intercept	1	-15.6167	42.0293	-0.3716	0.7158			All available between 1991-2015	Log-normal	
Molybdenum	E1	SB	Year	1	0.0084	0.0210	0.4003	0.6950			All available between 1991-2015	Log-normal	
Molybdenum	E1	SS	Intercept	1	-3.7844	16.8990	-0.2239	0.8250			All available between 1991-2015	Log-normal	
Molybdenum	E1	SS	Year	1	0.0019	0.0084	0.2263	0.8231			All available between 1991-2015	Log-normal	
Molybdenum	E2	NG	Intercept	1	-46.8684	27.5578	-1.7007	0.1019			All available between 1991-2015	Log-normal	
Molybdenum	E2	NG	Year	1	0.0238	0.0138	1.7299	0.0965			All available between 1991-2015	Log-normal	
Molybdenum	E2	SB	Intercept	1	-0.2486	29.5879	-0.0084	0.9935			All available between 1991-2015	Log-normal	
Molybdenum	E2	SB	Year	1	0.0013	0.0148	0.0872	0.9323			All available between 1991-2015	Log-normal	
Molybdenum	E2	SD	Intercept	1	39.1233	21.1601	1.8489	0.0763			All available between 1991-2015	Log-normal	
Molybdenum	E2	SD	Year	1	-0.0192	0.0106	-1.8191	0.0809			All available between 1991-2015	Log-normal	
Molybdenum	E2	SS	Intercept	1	12.2156	13.9592	0.8751	0.3910			All available between 1991-2015	Log-normal	
Molybdenum	E2	SS	Year	1	-0.0059	0.0070	-0.8469	0.4062			All available between 1991-2015	Log-normal	
Molybdenum	E5	NG	Intercept	1	-82.1839	34.8709	-2.3568	0.0277			All available between 1991-2015	Log-normal	
Molybdenum	E5	NG	Year	1	0.0415	0.0174	2.3846	0.0261			All available between 1991-2015	Log-normal	
Molybdenum	E5	SB	Intercept	1	-17.9777	28.9392	-0.6212	0.5438			All available between 1991-2015	Log-normal	
Molybdenum	E5	SB	Year	1	0.0100	0.0144	0.6932	0.4988			All available between 1991-2015	Log-normal	
Molybdenum	E5	SS	Intercept	1	6.9092	16.1916	0.4267	0.6739			All available between 1991-2015	Log-normal	
Molybdenum	E5	SS	Year	1	-0.0032	0.0081	-0.3994	0.6937			All available between 1991-2015	Log-normal	
Molybdenum	E6	NG	Intercept	1	-208.2706	50.5596	-4.1193	0.0009			All available between 1991-2015	Log-normal	
Molybdenum	E6	NG	Year	1	0.1045	0.0252	4.1484	0.0009	Yes	pos	All available between 1991-2015	Log-normal	
Molybdenum	E6	SS	Intercept	1	-22.7570	27.6252	-0.8238	0.4215			All available between 1991-2015	Log-normal	
Molybdenum	E6	SS	Year	1	0.0116	0.0138	0.8462	0.4092			All available between 1991-2015	Log-normal	
Molybdenum	N2	NG	Intercept	1	-46.8398	34.4670	-1.3590	0.1868			All available between 1991-2015	Log-normal	
Molybdenum	N2	NG	Year	1	0.0240	0.0172	1.3951	0.1758			All available between 1991-2015	Log-normal	
Molybdenum	N2	SB	Intercept	1	19.6867	22.1389	0.8892	0.3900			All available between 1991-2015	Log-normal	
Molybdenum	N2	SB	Year	1	-0.0089	0.0111	-0.8040	0.4359			All available between 1991-2015	Log-normal	
Molybdenum	N2	SD	Intercept	1	20.5112	21.0286	0.9754	0.3391			All available between 1991-2015	Log-normal	
Molybdenum	N2	SD	Year	1	-0.0100	0.0105	-0.9515	0.3508			All available between 1991-2015	Log-normal	
Molybdenum	N2	SS	Intercept	1	25.0946	15.4142	1.6280	0.1171			All available between 1991-2015	Log-normal	
Molybdenum	N2	SS	Year	1	-0.0125	0.0077	-1.6197	0.1189			All available between 1991-2015	Log-normal	
Molybdenum	N4	NG	Intercept	1	-2.3766	64.8555	-0.0366	0.9713			All available between 1991-2015	Log-normal	
Molybdenum	N4	NG	Year	1	0.0018	0.0323	0.0568	0.9555			All available between 1991-2015	Log-normal	
Molybdenum	N4	SS	Intercept	1	-21.2083	30.4041	-0.6975	0.4961			All available between 1991-2015	Log-normal	
Molybdenum	N4	SS	Year	1	0.0108	0.0151	0.7107	0.4882			All available between 1991-2015	Log-normal	
Molybdenum	N5	NG	Intercept	1	119.8814	75.3912	1.5901	0.1358			All available between 1991-2015	Log-normal	
Molybdenum	N5	NG	Year	1	-0.0594	0.0375	-1.5827	0.1375			All available between 1991-2015	Log-normal	
Molybdenum	N5	SD	Intercept	1	-112.3375	24.4447	-4.5956	0.0004			All available between 1991-2015	Log-normal	
Molybdenum	N5	SD	Year	1	0.0563	0.0122	4.6271	0.0003	Yes	pos	All available between 1991-2015	Log-normal	
Molybdenum	N5	SS	Intercept	1	-99.6599	31.6953	-3.1443	0.0085			All available between 1991-2015	Log-normal	
Molybdenum	N5	SS	Year	1	0.0499	0.0158	3.1641	0.0082			All available between 1991-2015	Log-normal	
Molybdenum	S1	NG	Intercept	1	-24.9804	29.0489	-0.8599	0.3983			All available between 1991-2015	Log-normal	
Molybdenum	S1	NG	Year	1	0.0128	0.0145	0.8839	0.3855			All available between 1991-2015	Log-normal	
Molybdenum	S1	SB	Intercept	1	41.1514	24.9421	1.6499	0.1185			All available between 1991-2015	Log-normal	
Molybdenum	S1	SB	Year	1	-0.0195	0.0125	-1.5681	0.1364			All available between 1991-2015	Log-normal	
Molybdenum	S1	SD	Intercept	1	40.5767	25.4965	1.5915	0.1241			All available between 1991-2015	Log-normal	
Molybdenum	S1	SD	Year	1	-0.0196	0.0127	-1.5400	0.1361			All available between 1991-2015	Log-normal	
Molybdenum	S1	SS	Intercept	1	29.0483	16.7691	1.7323	0.0966			All available between 1991-2015	Log-normal	
Molybdenum	S1	SS	Year	1	-0.0144	0.0084	-1.7216	0.0986			All available between 1991-2015	Log-normal	
Molybdenum	S2	NG	Intercept	1	-58.2201	33.1337	-1.7571	0.0916			All available between 1991-2015	Log-normal	
Molybdenum	S2	NG	Year	1	0.0293	0.0165	1.7733	0.0889			All available between 1991-2015	Log-normal	
Molybdenum	S2	SB	Intercept	1	19.4545	22.7860	0.8538	0.4044			All available between 1991-2015	Log-normal	
Molybdenum	S2	SB	Year	1	-0.0087	0.0114	-0.7680	0.4525			All available between 1991-2015	Log-normal	
Molybdenum	S2	SS	Intercept	1	28.7752	12.8792	2.2342	0.0350			All available between 1991-2015	Log-normal	
Molybdenum	S2	SS	Year	1	-0.0141	0.0064	-2.1992	0.0377			All available between 1991-2015	Log-normal	
Molybdenum	S3	NG	Intercept	1	-92.3949	26.6646	-3.4651	0.0019			All available between 1991-2015	Log-normal	
Molybdenum	S3	NG	Year	1	0.0465	0.0133	3.4958	0.0018	Yes	pos	All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Molybdenum	S3	SD	Intercept	1	-26.0102	29.0053	-0.8967	0.3784			All available between 1991-2015	Log-normal	
Molybdenum	S3	SD	Year	1	0.0139	0.0145	0.9577	0.3474			All available between 1991-2015	Log-normal	
Molybdenum	S3	SS	Intercept	1	-42.7518	32.8806	-1.3002	0.2064			All available between 1991-2015	Log-normal	
Molybdenum	S3	SS	Year	1	0.0220	0.0164	1.3423	0.1926			All available between 1991-2015	Log-normal	
Molybdenum	S4	NG	Intercept	1	-93.1092	36.8868	-2.5242	0.0193			All available between 1991-2015	Log-normal	
Molybdenum	S4	NG	Year	1	0.0468	0.0184	2.5419	0.0186			All available between 1991-2015	Log-normal	
Molybdenum	S4	SB	Intercept	1	-170.8734	41.6065	-4.1069	0.0011			All available between 1991-2015	Log-normal	
Molybdenum	S4	SB	Year	1	0.0859	0.0208	4.1404	0.0010	Yes	pos	All available between 1991-2015	Log-normal	
Molybdenum	S4	SD	Intercept	1	24.4521	16.3974	1.4912	0.1495			All available between 1991-2015	Log-normal	
Molybdenum	S4	SD	Year	1	-0.0121	0.0082	-1.4813	0.1521			All available between 1991-2015	Log-normal	
Molybdenum	S4	SS	Year	1	-0.0258	0.0067	-3.8566	0.0011	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Molybdenum	S4	SS	Intercept	1	51.4444	13.3831	3.8440	0.0011			All available between 1991-2015	Log-normal	
Molybdenum	S4	WW	Intercept	1	-16.5959	25.9239	-0.6402	0.5457			All available between 1991-2015	Log-normal	
Molybdenum	S4	WW	Year	1	0.0083	0.0129	0.6415	0.5449			All available between 1991-2015	Log-normal	
Molybdenum	S5	FC	Intercept	1	66.8541	55.2698	1.2096	0.2805			All available between 1991-2015	Log-normal	
Molybdenum	S5	FC	Year	1	-0.0335	0.0276	-1.2156	0.2784			All available between 1991-2015	Log-normal	
Molybdenum	S5	NG	Intercept	1	-51.5212	24.5529	-2.0984	0.0481			All available between 1991-2015	Log-normal	
Molybdenum	S5	NG	Year	1	0.0262	0.0122	2.1404	0.0442			All available between 1991-2015	Log-normal	
Molybdenum	S5	SB	Intercept	1	62.6823	25.0387	2.5034	0.0293			All available between 1991-2015	Log-normal	
Molybdenum	S5	SB	Year	1	-0.0300	0.0125	-2.4028	0.0351			All available between 1991-2015	Log-normal	
Molybdenum	S5	SS	Intercept	1	-21.4580	19.4536	-1.1030	0.2831			All available between 1991-2015	Log-normal	
Molybdenum	S5	SS	Year	1	0.0108	0.0097	1.1137	0.2786			All available between 1991-2015	Log-normal	
Molybdenum	W2	NG	Intercept	1	-87.3115	29.9083	-2.9193	0.0077			All available between 1991-2015	Log-normal	
Molybdenum	W2	NG	Year	1	0.0441	0.0149	2.9558	0.0071			All available between 1991-2015	Log-normal	
Molybdenum	W2	SB	Intercept	1	18.4818	28.1799	0.6558	0.5202			All available between 1991-2015	Log-normal	
Molybdenum	W2	SB	Year	1	-0.0082	0.0141	-0.5852	0.5657			All available between 1991-2015	Log-normal	
Molybdenum	W2	SS	Intercept	1	0.8535	11.3382	0.0753	0.9407			All available between 1991-2015	Log-normal	
Molybdenum	W2	SS	Year	1	-0.0001	0.0057	-0.0262	0.9793			All available between 1991-2015	Log-normal	
Molybdenum	W4	FC	Intercept	1	119.7987	23.1400	5.1771	0.0021			All available between 1991-2015	Log-normal	
Molybdenum	W4	FC	Year	1	-0.0600	0.0115	-5.2062	0.0020	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Molybdenum	W4	NG	Intercept	1	-77.9738	38.4458	-2.0282	0.0561			All available between 1991-2015	Log-normal	
Molybdenum	W4	NG	Year	1	0.0395	0.0192	2.0635	0.0523			All available between 1991-2015	Log-normal	
Molybdenum	W4	SB	Intercept	1	-12.7688	21.1553	-0.6036	0.5596			All available between 1991-2015	Log-normal	
Molybdenum	W4	SB	Year	1	0.0073	0.0105	0.6883	0.5069			All available between 1991-2015	Log-normal	
Molybdenum	W4	SS	Intercept	1	-12.4940	25.5881	-0.4883	0.6324			All available between 1991-2015	Log-normal	
Molybdenum	W4	SS	Year	1	0.0064	0.0127	0.5024	0.6227			All available between 1991-2015	Log-normal	
Nickel	E1	NG	Intercept	1	147.7653	35.3800	4.1765	0.0003			All available between 1991-2015	Log-normal	
Nickel	E1	NG	Year	1	-0.0734	0.0177	-4.1536	0.0004	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	E1	SB	Intercept	1	55.8070	64.8447	0.8606	0.4225			2002-2015	Log-normal	
Nickel	E1	SB	Year	1	-0.0275	0.0323	-0.8531	0.4263			2002-2015	Log-normal	
Nickel	E1	SS	Intercept	1	98.12373	183.31106	0.53529	0.59808			All available between 1991-2015	Normal	
Nickel	E1	SS	Year	1	-0.03965	0.09148	-0.43342	0.66913	No		All available between 1991-2015	Normal	
Nickel	E2	NG	Intercept	1	152.5630	32.6440	4.6735	<.0001			All available between 1991-2015	Log-normal	
Nickel	E2	NG	Year	1	-0.0757	0.0163	-4.6459	0.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	E2	SD	Intercept	1	-13.2678	5.8310	-2.2754	0.0317			All available between 1991-2015	Log-normal	
Nickel	E2	SD	Year	1	0.0083	0.0029	2.8398	0.0088			All available between 1991-2015	Log-normal	
Nickel	E2	SS	Intercept	1	-142.97870	149.30680	-0.95762	0.34866			All available between 1991-2015	Normal	
Nickel	E2	SS	Year	1	0.07913	0.07450	1.06219	0.29967	No		All available between 1991-2015	Normal	
Nickel	E5	NG	Intercept	1	141.1076	52.8412	2.6704	0.0140			All available between 1991-2015	Log-normal	
Nickel	E5	NG	Year	1	-0.0700	0.0264	-2.6537	0.0145			All available between 1991-2015	Log-normal	
Nickel	E5	SB	Intercept	1	-57.3134	35.2052	-1.6280	0.1476			2002-2015	Log-normal	
Nickel	E5	SB	Year	1	0.0286	0.0175	1.6339	0.1463			2002-2015	Log-normal	
Nickel	E5	SS	Intercept	1	43.46351	218.41298	0.19900	0.84418			All available between 1991-2015	Normal	
Nickel	E5	SS	Year	1	-0.01174	0.10899	-0.10771	0.91525	No		All available between 1991-2015	Normal	
Nickel	E6	NG	Intercept	1	97.3749	51.0226	1.9085	0.0757			All available between 1991-2015	Log-normal	
Nickel	E6	NG	Year	1	-0.0482	0.0254	-1.8963	0.0774			All available between 1991-2015	Log-normal	
Nickel	E6	SS	Intercept	1	-36.35513	223.21597	-0.16287	0.87254			All available between 1991-2015	Normal	
Nickel	E6	SS	Year	1	0.02867	0.11115	0.25789	0.79959	No		All available between 1991-2015	Normal	
Nickel	N2	NG	Intercept	1	135.1350	29.8952	4.5203	0.0001			All available between 1991-2015	Log-normal	
Nickel	N2	NG	Year	1	-0.0670	0.0149	-4.4893	0.0002	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	N2	SB	Intercept	1	-1.5008	52.8676	-0.0284	0.9785			2002-2015	Log-normal	
Nickel	N2	SB	Year	1	0.0012	0.0263	0.0452	0.9657			2002-2015	Log-normal	
Nickel	N2	SD	Intercept	1	-38.4432	5.4045	-7.1131	<.0001			All available between 1991-2015	Log-normal	
Nickel	N2	SD	Year	1	0.0209	0.0027	7.7313	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Nickel	N2	SS	Intercept	1	-314.22070	214.10959	-1.46757	0.15576			All available between 1991-2015	Normal	
Nickel	N2	SS	Year	1	0.17322	0.10682	1.62160	0.11852	No		All available between 1991-2015	Normal	
Nickel	N4	NG	Intercept	1	76.8214	72.1390	1.0649	0.3063			All available between 1991-2015	Log-normal	
Nickel	N4	NG	Year	1	-0.0380	0.0359	-1.0578	0.3094			All available between 1991-2015	Log-normal	
Nickel	N4	SS	Intercept	1	-1529.51055	364.82213	-4.19248	0.00078			All available between 1991-2015	Normal	
Nickel	N4	SS	Year	1	0.77347	0.18165	4.25796	0.00069	Yes	Pos	All available between 1991-2015	Normal	
Nickel	N5	NG	Intercept	1	10.8118	60.8612	0.1776	0.8617			All available between 1991-2015	Log-normal	
Nickel	N5	NG	Year	1	-0.0052	0.0303	-0.1712	0.8667			All available between 1991-2015	Log-normal	
Nickel	N5	SD	Intercept	1	-66.5327	13.4642	-4.9414	0.0002			All available between 1991-2015	Log-normal	
Nickel	N5	SD	Year	1	0.0349	0.0067	5.2038	0.0001	Yes	pos	All available between 1991-2015	Log-normal	
Nickel	N5	SS	Intercept	1	-849.77714	330.56711	-2.57066	0.02452			All available between 1991-2015	Normal	
Nickel	N5	SS	Year	1	0.43429	0.16458	2.63869	0.02163	No		All available between 1991-2015	Normal	
Nickel	S1	NG	Intercept	1	121.1866	38.0594	3.1841	0.0041			All available between 1991-2015	Log-normal	
Nickel	S1	NG	Year	1	-0.0601	0.0190	-3.1607	0.0044			All available between 1991-2015	Log-normal	
Nickel	S1	SB	Intercept	1	7.8117	48.1185	0.1623	0.8756			2002-2015	Log-normal	
Nickel	S1	SB	Year	1	-0.0037	0.0240	-0.1524	0.8832			2002-2015	Log-normal	
Nickel	S1	SD	Intercept	1	-3.7638	8.7058	-0.4323	0.6692			All available between 1991-2015	Log-normal	
Nickel	S1	SD	Year	1	0.0036	0.0043	0.8286	0.4152			All available between 1991-2015	Log-normal	
Nickel	S1	SS	Intercept	1	-332.58117	153.79815	-2.16245	0.04123			All available between 1991-2015	Normal	
Nickel	S1	SS	Year	1	0.17974	0.07677	2.34120	0.02825	No		All available between 1991-2015	Normal	
Nickel	S2	NG	Intercept	1	158.7473	31.0621	5.1107	<.0001			All available between 1991-2015	Log-normal	
Nickel	S2	NG	Year	1	-0.0789	0.0155	-5.0847	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	S2	SB	Intercept	1	14.7655	39.1945	0.3767	0.7151			2002-2015	Log-normal	
Nickel	S2	SB	Year	1	-0.0072	0.0195	-0.3696	0.7202			2002-2015	Log-normal	
Nickel	S2	SS	Intercept	1	-140.51396	130.14868	-1.07964	0.29103			All available between 1991-2015	Normal	
Nickel	S2	SS	Year	1	0.08312	0.06496	1.27957	0.21293	No		All available between 1991-2015	Normal	
Nickel	S3	NG	Intercept	1	75.7538	47.3987	1.5982	0.1221			All available between 1991-2015	Log-normal	
Nickel	S3	NG	Year	1	-0.0373	0.0237	-1.5749	0.1274			All available between 1991-2015	Log-normal	
Nickel	S3	SD	Year	1	-0.0139	0.0041	-3.3802	0.0024	Yes	neg	All available between 1991-2015	Log-normal	
Nickel	S3	SD	Intercept	1	31.4779	8.2509	3.8151	0.0008			All available between 1991-2015	Log-normal	
Nickel	S3	SS	Intercept	1	-363.48999	178.08289	-2.04113	0.05288			All available between 1991-2015	Normal	
Nickel	S3	SS	Year	1	0.19302	0.08888	2.17173	0.04044	No		All available between 1991-2015	Normal	
Nickel	S4	NG	Intercept	1	110.2775	49.4158	2.2316	0.0352			All available between 1991-2015	Log-normal	
Nickel	S4	NG	Year	1	-0.0545	0.0247	-2.2104	0.0369			All available between 1991-2015	Log-normal	
Nickel	S4	SB	Intercept	1	-50.0948	72.1918	-0.6939	0.5074			2002-2015	Log-normal	
Nickel	S4	SB	Year	1	0.0252	0.0359	0.7009	0.5032			2002-2015	Log-normal	
Nickel	S4	SD	Intercept	1	-2.9729	4.0958	-0.7258	0.4753			All available between 1991-2015	Log-normal	
Nickel	S4	SD	Year	1	0.0032	0.0020	1.5666	0.1309			All available between 1991-2015	Log-normal	
Nickel	S4	SS	Intercept	1	-935.84020	251.43132	-3.72205	0.00145			All available between 1991-2015	Normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Nickel	S4	SS	Year	1	0.48146	0.12545	3.83789	0.00111	Yes	Pos	All available between 1991-2015	Normal	
Nickel	S4	WW	Intercept	1	429.0749	132.5622	3.2368	0.0178			All available between 1991-2015	Log-normal	
Nickel	S4	WW	Year	1	-0.2143	0.0661	-3.2398	0.0177			All available between 1991-2015	Log-normal	
Nickel	S5	FC	Intercept	1	472.8589	65.7366	7.1932	0.0008			All available between 1991-2015	Log-normal	
Nickel	S5	FC	Year	1	-0.2358	0.0328	-7.1963	0.0008	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	S5	NG	Intercept	1	136.5213	63.2545	2.1583	0.0426			All available between 1991-2015	Log-normal	
Nickel	S5	NG	Year	1	-0.0678	0.0315	-2.1504	0.0433			All available between 1991-2015	Log-normal	
Nickel	S5	SB	Intercept	1	64.3298	19.6073	3.2809	0.0135			2002-2015	Log-normal	
Nickel	S5	SB	Year	1	-0.0318	0.0098	-3.2586	0.0139			2002-2015	Log-normal	
Nickel	S5	SS	Intercept	1	-161.67525	137.32484	-1.17732	0.25289			All available between 1991-2015	Normal	
Nickel	S5	SS	Year	1	0.09332	0.06847	1.36295	0.18805	No		All available between 1991-2015	Normal	
Nickel	W2	NG	Intercept	1	184.2484	59.0962	3.1178	0.0045			All available between 1991-2015	Log-normal	
Nickel	W2	NG	Year	1	-0.0916	0.0295	-3.1047	0.0047			All available between 1991-2015	Log-normal	
Nickel	W2	SB	Intercept	1	-50.5590	48.5704	-1.0409	0.3251			2002-2015	Log-normal	
Nickel	W2	SB	Year	1	0.0251	0.0242	1.0371	0.3267			2002-2015	Log-normal	
Nickel	W2	SS	Intercept	1	-69.20329	86.82413	-0.79705	0.43478			All available between 1991-2015	Normal	
Nickel	W2	SS	Year	1	0.04309	0.04333	0.99453	0.33185	No		All available between 1991-2015	Normal	
Nickel	W4	FC	Intercept	1	361.1216	71.8783	5.0241	0.0024			All available between 1991-2015	Log-normal	
Nickel	W4	FC	Year	1	-0.1800	0.0358	-5.0294	0.0024	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Nickel	W4	NG	Intercept	1	19.0771	57.3826	0.3325	0.7430			All available between 1991-2015	Log-normal	
Nickel	W4	NG	Year	1	-0.0090	0.0286	-0.3136	0.7571			All available between 1991-2015	Log-normal	
Nickel	W4	SB	Intercept	1	-5.0342	31.9835	-0.1574	0.8784			2002-2015	Log-normal	
Nickel	W4	SB	Year	1	0.0032	0.0159	0.1992	0.8465			2002-2015	Log-normal	
Nickel	W4	SS	Intercept	1	-252.71071	154.18624	-1.63900	0.12201			All available between 1991-2015	Normal	
Nickel	W4	SS	Year	1	0.14043	0.07679	1.82869	0.08740	No		All available between 1991-2015	Normal	
Phosphorus	E1	NG	Intercept	1	-33.2756	19.9741	-1.6659	0.1087			All available between 1991-2015	Log-normal	
Phosphorus	E1	NG	Year	1	0.0207	0.0100	2.0713	0.0492			All available between 1991-2015	Log-normal	
Phosphorus	E1	SB	Intercept	1	8953.15593	65720.12756	0.13623	0.89373			All available between 1991-2015	Normal	
Phosphorus	E1	SB	Year	1	-2.20800	32.83136	-0.06725	0.94740	No		All available between 1991-2015	Normal	
Phosphorus	E1	SS	Intercept	1	13.9357	9.7937	1.4229	0.1694			All available between 1991-2015	Log-normal	
Phosphorus	E1	SS	Year	1	-0.0037	0.0049	-0.7670	0.4516			All available between 1991-2015	Log-normal	
Phosphorus	E2	NG	Intercept	1	-15.3951	24.9948	-0.6159	0.5437			All available between 1991-2015	Log-normal	
Phosphorus	E2	NG	Year	1	0.0117	0.0125	0.9380	0.3576			All available between 1991-2015	Log-normal	
Phosphorus	E2	SB	Intercept	1	-35259.90630	48771.04593	-0.72297	0.48626			All available between 1991-2015	Normal	
Phosphorus	E2	SB	Year	1	20.16819	24.37113	0.82754	0.42724	No		All available between 1991-2015	Normal	
Phosphorus	E2	SD	Intercept	1	-43.0528	9.2759	-4.6414	<.0001			All available between 1991-2015	Log-normal	
Phosphorus	E2	SD	Year	1	0.0246	0.0046	5.3203	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	E2	SS	Intercept	1	-4.8624	14.4032	-0.3376	0.7389			All available between 1991-2015	Log-normal	
Phosphorus	E2	SS	Year	1	0.0056	0.0072	0.7826	0.4422			All available between 1991-2015	Log-normal	
Phosphorus	E5	NG	Intercept	1	12.8076	24.8771	0.5148	0.6118			All available between 1991-2015	Log-normal	
Phosphorus	E5	NG	Year	1	-0.0026	0.0124	-0.2080	0.8372			All available between 1991-2015	Log-normal	
Phosphorus	E5	SB	Intercept	1	-10099.59417	52545.98378	-0.19220	0.85016			All available between 1991-2015	Normal	
Phosphorus	E5	SB	Year	1	7.43761	26.23193	0.28353	0.78064	No		All available between 1991-2015	Normal	
Phosphorus	E5	SS	Intercept	1	1.8435	9.9112	0.1860	0.8542			All available between 1991-2015	Log-normal	
Phosphorus	E5	SS	Year	1	0.0021	0.0049	0.4331	0.6694			All available between 1991-2015	Log-normal	
Phosphorus	E6	NG	Intercept	1	42.0001	21.1079	1.9898	0.0652			All available between 1991-2015	Log-normal	
Phosphorus	E6	NG	Year	1	-0.0173	0.0105	-1.6425	0.1213			All available between 1991-2015	Log-normal	
Phosphorus	E6	SS	Intercept	1	1.6108	18.0608	0.0892	0.9300			All available between 1991-2015	Log-normal	
Phosphorus	E6	SS	Year	1	0.0023	0.0090	0.2552	0.8016			All available between 1991-2015	Log-normal	
Phosphorus	N2	NG	Intercept	1	17.7082	16.0937	1.1003	0.2821			All available between 1991-2015	Log-normal	
Phosphorus	N2	NG	Year	1	-0.0049	0.0080	-0.6123	0.5461			All available between 1991-2015	Log-normal	
Phosphorus	N2	SB	Intercept	1	-56989.94940	77828.67331	-0.73225	0.47610			All available between 1991-2015	Normal	
Phosphorus	N2	SB	Year	1	30.89086	38.91169	0.79387	0.44052	No		All available between 1991-2015	Normal	
Phosphorus	N2	SD	Intercept	1	-61.8229	10.5559	-5.8567	<.0001			All available between 1991-2015	Log-normal	
Phosphorus	N2	SD	Year	1	0.0341	0.0053	6.4708	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	N2	SS	Intercept	1	-10.0512	4.3914	-2.2888	0.0316			All available between 1991-2015	Log-normal	
Phosphorus	N2	SS	Year	1	0.0084	0.0022	3.8167	0.0009	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	N4	NG	Intercept	1	38.0460	31.8953	1.1928	0.2543			All available between 1991-2015	Log-normal	
Phosphorus	N4	NG	Year	1	-0.0150	0.0159	-0.9475	0.3607			All available between 1991-2015	Log-normal	
Phosphorus	N4	SS	Intercept	1	-68.1336	16.0002	-4.2583	0.0007			All available between 1991-2015	Log-normal	
Phosphorus	N4	SS	Year	1	0.0371	0.0080	4.6553	0.0003	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	N5	NG	Intercept	1	54.1678	41.6680	1.3000	0.2162			All available between 1991-2015	Log-normal	
Phosphorus	N5	NG	Year	1	-0.0233	0.0207	-1.1226	0.2819			All available between 1991-2015	Log-normal	
Phosphorus	N5	SD	Intercept	1	-116.1680	30.2247	-3.8435	0.0016			All available between 1991-2015	Log-normal	
Phosphorus	N5	SD	Year	1	0.0613	0.0150	4.0716	0.0010	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	N5	SS	Intercept	1	30.6233	21.6991	1.4113	0.1836			All available between 1991-2015	Log-normal	
Phosphorus	N5	SS	Year	1	-0.0121	0.0108	-1.1217	0.2839			All available between 1991-2015	Log-normal	
Phosphorus	S1	NG	Intercept	1	-20.0234	19.5300	-1.0253	0.3155			All available between 1991-2015	Log-normal	
Phosphorus	S1	NG	Year	1	0.0138	0.0097	1.4197	0.1685			All available between 1991-2015	Log-normal	
Phosphorus	S1	SB	Intercept	1	-33731.87718	48317.33893	-0.69813	0.49512			All available between 1991-2015	Normal	
Phosphorus	S1	SB	Year	1	19.34233	24.12767	0.80167	0.43449	No		All available between 1991-2015	Normal	
Phosphorus	S1	SD	Intercept	1	6.8554	9.5106	0.7208	0.4775			All available between 1991-2015	Log-normal	
Phosphorus	S1	SD	Year	1	-0.0001	0.0047	-0.0256	0.9797			All available between 1991-2015	Log-normal	
Phosphorus	S1	SS	Intercept	1	-15.6632	5.8877	-2.6603	0.0140			All available between 1991-2015	Log-normal	
Phosphorus	S1	SS	Year	1	0.0110	0.0029	3.7455	0.0011	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	S2	NG	Intercept	1	-4.6618	17.0290	-0.2738	0.7866			All available between 1991-2015	Log-normal	
Phosphorus	S2	NG	Year	1	0.0062	0.0085	0.7279	0.4737			All available between 1991-2015	Log-normal	
Phosphorus	S2	SB	Intercept	1	-87183.63803	50073.21939	-1.74112	0.09873			All available between 1991-2015	Normal	
Phosphorus	S2	SB	Year	1	45.92994	24.99269	1.83774	0.08267	No		All available between 1991-2015	Normal	
Phosphorus	S2	SS	Intercept	1	-27.7111	15.1090	-1.8341	0.0786			All available between 1991-2015	Log-normal	
Phosphorus	S2	SS	Year	1	0.0170	0.0075	2.2496	0.0335			All available between 1991-2015	Log-normal	
Phosphorus	S3	NG	Intercept	1	62.5178	23.0610	2.7110	0.0117			All available between 1991-2015	Log-normal	
Phosphorus	S3	NG	Year	1	-0.0275	0.0115	-2.3905	0.0244			All available between 1991-2015	Log-normal	
Phosphorus	S3	SD	Intercept	1	6.5977	9.7962	0.6735	0.5066			All available between 1991-2015	Log-normal	
Phosphorus	S3	SD	Year	1	-0.0002	0.0049	-0.0383	0.9697			All available between 1991-2015	Log-normal	
Phosphorus	S3	SS	Intercept	1	-26.4671	8.9179	-2.9679	0.0069			All available between 1991-2015	Log-normal	
Phosphorus	S3	SS	Year	1	0.0163	0.0045	3.6703	0.0013	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	S4	NG	Intercept	1	-8.9555	26.3311	-0.3401	0.7367			All available between 1991-2015	Log-normal	
Phosphorus	S4	NG	Year	1	0.0084	0.0131	0.6356	0.5310			All available between 1991-2015	Log-normal	
Phosphorus	S4	SB	Intercept	1	-205872.19948	75486.34685	-2.72728	0.01636			All available between 1991-2015	Normal	
Phosphorus	S4	SB	Year	1	105.03384	37.66056	2.78896	0.01449	No		All available between 1991-2015	Normal	
Phosphorus	S4	SD	Intercept	1	6.2355	10.5081	0.5934	0.5585			All available between 1991-2015	Log-normal	
Phosphorus	S4	SD	Year	1	0.0001	0.0052	0.0233	0.9816			All available between 1991-2015	Log-normal	
Phosphorus	S4	SS	Intercept	1	-73.5552	13.5290	-5.4369	<.0001			All available between 1991-2015	Log-normal	
Phosphorus	S4	SS	Year	1	0.0398	0.0068	5.8980	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Phosphorus	S4	WW	Intercept	1	-24191.94245	31484.67401	-0.76837	0.47142			All available between 1991-2015	Normal	
Phosphorus	S4	WW	Year	1	13.68705	15.70693	0.87140	0.41703	No		All available between 1991-2015	Normal	
Phosphorus	S5	FC	Intercept	1	-8828.28685	49964.92109	-0.17669	0.86669			All available between 1991-2015	Normal	
Phosphorus	S5	FC	Year	1	5.53785	24.90584	0.22235	0.83284	No		All available between 1991-2015	Normal	
Phosphorus	S5	NG	Intercept	1	65.5695	25.8646	2.5351	0.0193			All available between 1991-2015	Log-normal	
Phosphorus	S5	NG	Year	1	-0.0288	0.0129	-2.2292	0.0368			All available between 1991-2015	Log-normal	
Phosphorus	S5	SB	Intercept	1	30199.40011	44340.57186	0.68108	0.50991			All available between 1991-2015	Normal	
Phosphorus	S5	SB	Year	1	-12.35075	22.11489	-0.55848	0.58770	No		All available between 1991-2015	Normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Phosphorus	S5	SS	Intercept	1	-16.5262	9.0480	-1.8265	0.0827			All available between 1991-2015	Log-normal	
Phosphorus	S5	SS	Year	1	0.0114	0.0045	2.5227	0.0202			All available between 1991-2015	Log-normal	
Phosphorus	W2	NG	Intercept	1	16.1593	15.6838	1.0303	0.3127			All available between 1991-2015	Log-normal	
Phosphorus	W2	NG	Year	1	-0.0041	0.0078	-0.5218	0.6064			All available between 1991-2015	Log-normal	
Phosphorus	W2	SB	Intercept	1	-84663.28636	55882.55077	-1.51502	0.14713			All available between 1991-2015	Normal	
Phosphorus	W2	SB	Year	1	44.67599	27.88951	1.60189	0.12658	No		All available between 1991-2015	Normal	
Phosphorus	W2	SS	Intercept	1	-13.2631	7.6342	-1.7373	0.0977			All available between 1991-2015	Log-normal	
Phosphorus	W2	SS	Year	1	0.0097	0.0038	2.5582	0.0187			All available between 1991-2015	Log-normal	
Phosphorus	W4	FC	Intercept	1	32114.73388	49449.50734	0.64944	0.54010			All available between 1991-2015	Normal	
Phosphorus	W4	FC	Year	1	-14.75552	24.62767	-0.59914	0.57099	No		All available between 1991-2015	Normal	
Phosphorus	W4	NG	Intercept	1	-20.6050	23.0623	-0.8934	0.3822			All available between 1991-2015	Log-normal	
Phosphorus	W4	NG	Year	1	0.0143	0.0115	1.2404	0.2292			All available between 1991-2015	Log-normal	
Phosphorus	W4	SB	Intercept	1	20999.08787	67646.90653	0.31042	0.76204			All available between 1991-2015	Normal	
Phosphorus	W4	SB	Year	1	-7.91035	33.72347	-0.23457	0.81886	No		All available between 1991-2015	Normal	
Phosphorus	W4	SS	Intercept	1	3.4559	15.2129	0.2272	0.8232			All available between 1991-2015	Log-normal	
Phosphorus	W4	SS	Year	1	0.0017	0.0076	0.2293	0.8215			All available between 1991-2015	Log-normal	
Potassium	E1	NG	Intercept	1	1212398.65525	362874.13307	3.34110	0.00272			All available between 1991-2015	Normal	
Potassium	E1	NG	Year	1	-595.87837	181.13980	-3.28960	0.00309	No		All available between 1991-2015	Normal	
Potassium	E1	SB	Intercept	1	-70098.20975	167627.89582	-0.41818	0.68216			All available between 1991-2015	Normal	
Potassium	E1	SB	Year	1	43.10381	83.72960	0.51480	0.61473	No		All available between 1991-2015	Normal	
Potassium	E1	SS	Intercept	1	-30.1536	17.5971	-1.7136	0.1013			All available between 1991-2015	Log-normal	
Potassium	E1	SS	Year	1	0.0187	0.0088	2.1306	0.0451			All available between 1991-2015	Log-normal	
Potassium	E2	NG	Intercept	1	1106166.10000	387348.05283	2.85574	0.00872			All available between 1991-2015	Normal	
Potassium	E2	NG	Year	1	-541.76667	193.35299	-2.80196	0.00988	No		All available between 1991-2015	Normal	
Potassium	E2	SB	Intercept	1	-46520.68717	147455.89499	-0.31549	0.75888			All available between 1991-2015	Normal	
Potassium	E2	SB	Year	1	32.09995	73.68443	0.43564	0.67235	No		All available between 1991-2015	Normal	
Potassium	E2	SD	Intercept	1	-35.8446	12.7176	-2.8185	0.0093			All available between 1991-2015	Log-normal	
Potassium	E2	SD	Year	1	0.0218	0.0063	3.4376	0.0021	Yes	pos	All available between 1991-2015	Log-normal	
Potassium	E2	SS	Intercept	1	-8.9109	18.0475	-0.4937	0.6264			All available between 1991-2015	Log-normal	
Potassium	E2	SS	Year	1	0.0082	0.0090	0.9113	0.3720			All available between 1991-2015	Log-normal	
Potassium	E5	NG	Intercept	1	365289.11884	386762.00689	0.94448	0.35518			All available between 1991-2015	Normal	
Potassium	E5	NG	Year	1	-173.06087	193.04203	-0.89649	0.37969	No		All available between 1991-2015	Normal	
Potassium	E5	SB	Intercept	1	36855.98897	125735.12453	0.29312	0.77344			All available between 1991-2015	Normal	
Potassium	E5	SB	Year	1	-10.46756	62.76930	-0.16676	0.86978	No		All available between 1991-2015	Normal	
Potassium	E5	SS	Intercept	1	-33.7422	17.4987	-1.9283	0.0675			All available between 1991-2015	Log-normal	
Potassium	E5	SS	Year	1	0.0205	0.0087	2.3512	0.0286			All available between 1991-2015	Log-normal	
Potassium	E6	NG	Intercept	1	-616811.41264	539073.47274	-1.14421	0.27047			All available between 1991-2015	Normal	
Potassium	E6	NG	Year	1	316.18340	268.47787	1.17769	0.25727	No		All available between 1991-2015	Normal	
Potassium	E6	SS	Intercept	1	16.4050	20.2732	0.8092	0.4296			All available between 1991-2015	Log-normal	
Potassium	E6	SS	Year	1	-0.0044	0.0101	-0.4374	0.6674			All available between 1991-2015	Log-normal	
Potassium	N2	NG	Year	1	-699.64484	159.41317	-4.38888	0.00020	Yes	Neg	All available between 1991-2015	Normal	
Potassium	N2	NG	Intercept	1	1421965.17581	319294.31575	4.45346	0.00017			All available between 1991-2015	Normal	
Potassium	N2	SB	Intercept	1	-17755.49331	182124.95164	-0.09749	0.92372			All available between 1991-2015	Normal	
Potassium	N2	SB	Year	1	17.56415	91.05629	0.19289	0.84981	No		All available between 1991-2015	Normal	
Potassium	N2	SD	Intercept	1	-61.3832	12.3683	-4.9629	<.0001			All available between 1991-2015	Log-normal	
Potassium	N2	SD	Year	1	0.0346	0.0062	5.6021	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Potassium	N2	SS	Intercept	1	-41.7054	12.7942	-3.2597	0.0036			All available between 1991-2015	Log-normal	
Potassium	N2	SS	Year	1	0.0248	0.0064	3.8886	0.0008	Yes	pos	All available between 1991-2015	Log-normal	
Potassium	N4	NG	Intercept	1	-719814.09524	835307.05302	-0.86174	0.40445			All available between 1991-2015	Normal	
Potassium	N4	NG	Year	1	369.07143	415.98861	0.88722	0.39108	No		All available between 1991-2015	Normal	
Potassium	N4	SS	Intercept	1	-58.2360	27.7180	-2.1010	0.0530			All available between 1991-2015	Log-normal	
Potassium	N4	SS	Year	1	0.0328	0.0138	2.3781	0.0311			All available between 1991-2015	Log-normal	
Potassium	N5	NG	Intercept	1	-54441.03896	912599.25120	-0.05965	0.95334			All available between 1991-2015	Normal	
Potassium	N5	NG	Year	1	34.38062	454.26955	0.07568	0.94082	No		All available between 1991-2015	Normal	
Potassium	N5	SD	Intercept	1	-63.7248	24.2485	-2.6280	0.0190			All available between 1991-2015	Log-normal	
Potassium	N5	SD	Year	1	0.0358	0.0121	2.9665	0.0096			All available between 1991-2015	Log-normal	
Potassium	N5	SS	Intercept	1	11.4033	20.5898	0.5538	0.5899			All available between 1991-2015	Log-normal	
Potassium	N5	SS	Year	1	-0.0018	0.0103	-0.1785	0.8613			All available between 1991-2015	Log-normal	
Potassium	S1	NG	Intercept	1	325943.23517	419997.86642	0.77606	0.44529			All available between 1991-2015	Normal	
Potassium	S1	NG	Year	1	-152.81786	209.64679	-0.72893	0.47310	No		All available between 1991-2015	Normal	
Potassium	S1	SB	Intercept	1	-15981.42422	140906.41310	-0.11342	0.91111			All available between 1991-2015	Normal	
Potassium	S1	SB	Year	1	16.13676	70.36280	0.22934	0.82151	No		All available between 1991-2015	Normal	
Potassium	S1	SD	Intercept	1	-21.9511	11.7532	-1.8677	0.0731			All available between 1991-2015	Log-normal	
Potassium	S1	SD	Year	1	0.0149	0.0059	2.5409	0.0174			All available between 1991-2015	Log-normal	
Potassium	S1	SS	Intercept	1	-38.8534	15.2946	-2.5403	0.0183			All available between 1991-2015	Log-normal	
Potassium	S1	SS	Year	1	0.0232	0.0076	3.0421	0.0058			All available between 1991-2015	Log-normal	
Potassium	S2	NG	Intercept	1	-127418.31268	359175.72599	-0.35475	0.72587			All available between 1991-2015	Normal	
Potassium	S2	NG	Year	1	72.73746	179.32465	0.40562	0.68862	No		All available between 1991-2015	Normal	
Potassium	S2	SB	Intercept	1	-162517.31443	112499.70778	-1.44460	0.16575			All available between 1991-2015	Normal	
Potassium	S2	SB	Year	1	89.15763	56.15117	1.58781	0.12974	No		All available between 1991-2015	Normal	
Potassium	S2	SS	Intercept	1	-39.4297	14.9451	-2.6383	0.0141			All available between 1991-2015	Log-normal	
Potassium	S2	SS	Year	1	0.0235	0.0075	3.1552	0.0041			All available between 1991-2015	Log-normal	
Potassium	S3	NG	Intercept	1	590313.04037	365630.77823	1.61451	0.11849			All available between 1991-2015	Normal	
Potassium	S3	NG	Year	1	-287.31853	182.49487	-1.57439	0.12749	No		All available between 1991-2015	Normal	
Potassium	S3	SD	Intercept	1	-19.2223	13.1139	-1.4658	0.1547			All available between 1991-2015	Log-normal	
Potassium	S3	SD	Year	1	0.0135	0.0065	2.0648	0.0490			All available between 1991-2015	Log-normal	
Potassium	S3	SS	Intercept	1	-42.6155	15.9190	-2.6770	0.0135			All available between 1991-2015	Log-normal	
Potassium	S3	SS	Year	1	0.0251	0.0079	3.1586	0.0044			All available between 1991-2015	Log-normal	
Potassium	S4	NG	Intercept	1	460643.79566	405920.10551	1.13481	0.26766			All available between 1991-2015	Normal	
Potassium	S4	NG	Year	1	-220.38243	202.52669	-1.08816	0.28733	No		All available between 1991-2015	Normal	
Potassium	S4	SB	Intercept	1	55203.70609	189457.34743	0.29138	0.77503			All available between 1991-2015	Normal	
Potassium	S4	SB	Year	1	-19.28779	94.52134	-0.20406	0.84125	No		All available between 1991-2015	Normal	
Potassium	S4	SD	Intercept	1	-27.2006	11.5920	-2.3465	0.0275			All available between 1991-2015	Log-normal	
Potassium	S4	SD	Year	1	0.0176	0.0058	3.0396	0.0056			All available between 1991-2015	Log-normal	
Potassium	S4	SS	Intercept	1	-50.2222	15.4935	-3.2415	0.0043			All available between 1991-2015	Log-normal	
Potassium	S4	SS	Year	1	0.0290	0.0077	3.7528	0.0013	Yes	pos	All available between 1991-2015	Log-normal	
Potassium	S4	WW	Intercept	1	-116662.28417	97524.17318	-1.19624	0.27673			All available between 1991-2015	Normal	
Potassium	S4	WW	Year	1	60.70144	48.65241	1.24766	0.25864	No		All available between 1991-2015	Normal	
Potassium	S5	FC	Intercept	1	-13.1003	11.5725	-1.1320	0.3090			All available between 1991-2015	Log-normal	
Potassium	S5	FC	Year	1	0.0106	0.0058	1.8311	0.1266			All available between 1991-2015	Log-normal	
Potassium	S5	NG	Intercept	1	1750214.34783	531355.80500	3.29387	0.00346			All available between 1991-2015	Normal	
Potassium	S5	NG	Year	1	-862.91771	265.01421	-3.25612	0.00378	No		All available between 1991-2015	Normal	
Potassium	S5	SB	Intercept	1	245919.43169	125686.26189	1.95661	0.07625			All available between 1991-2015	Normal	
Potassium	S5	SB	Year	1	-113.80597	62.68609	-1.81549	0.09678	No		All available between 1991-2015	Normal	
Potassium	S5	SS	Intercept	1	-22.6344	14.9240	-1.5166	0.1450			All available between 1991-2015	Log-normal	
Potassium	S5	SS	Year	1	0.0151	0.0074	2.0352	0.0553			All available between 1991-2015	Log-normal	
Potassium	W2	NG	Intercept	1	975657.53534	433595.77901	2.25015	0.03349			All available between 1991-2015	Normal	
Potassium	W2	NG	Year	1	-475.59176	216.46787	-2.19705	0.03750	No		All available between 1991-2015	Normal	
Potassium	W2	SB	Intercept	1	-29589.97634	176947.73561	-0.16722	0.86906			All available between 1991-2015	Normal	
Potassium	W2	SB	Year	1	22.53754	88.30996	0.25521	0.80145	No		All available between 1991-2015	Normal	
Potassium	W2	SS	Intercept	1	-35.0969	13.8445	-2.5351	0.0197			All available between 1991-2015	Log-normal	
Potassium	W2	SS	Year	1	0.0211	0.0069	3.0478	0.0064			All available between 1991-2015	Log-normal	
Potassium	W4	FC	Intercept	1	-4.8746	16.7508	-0.2910	0.7808			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Potassium	W4	FC	Year	1	0.0065	0.0083	0.7748	0.4679			All available between 1991-2015	Log-normal	
Potassium	W4	NG	Intercept	1	-513149.18574	783070.30546	-0.65530	0.51974			All available between 1991-2015	Normal	
Potassium	W4	NG	Year	1	269.69688	390.34502	0.69092	0.49756	No		All available between 1991-2015	Normal	
Potassium	W4	SB	Intercept	1	-20908.65299	179764.18689	-0.11631	0.90950			All available between 1991-2015	Normal	
Potassium	W4	SB	Year	1	19.09010	89.61639	0.21302	0.83521	No		All available between 1991-2015	Normal	
Potassium	W4	SS	Intercept	1	0.0114	20.3207	0.0006	0.9996			All available between 1991-2015	Log-normal	
Potassium	W4	SS	Year	1	0.0040	0.0101	0.3978	0.6960			All available between 1991-2015	Log-normal	
Silicon	E1	NG	Intercept	1	258.5041	97.4938	2.6515	0.0211			2003-2015	Log-normal	
Silicon	E1	NG	Year	1	-0.1239	0.0485	-2.5535	0.0253			2003-2015	Log-normal	
Silicon	E1	SB	Intercept	1	-153.8160	56.2993	-2.7321	0.0162			All available between 1991-2015	Log-normal	
Silicon	E1	SB	Year	1	0.0783	0.0281	2.7859	0.0146			All available between 1991-2015	Log-normal	
Silicon	E2	NG	Intercept	1	220.7544	110.0481	2.0060	0.0679			2003-2015	Log-normal	
Silicon	E2	NG	Year	1	-0.1051	0.0548	-1.9191	0.0791			2003-2015	Log-normal	
Silicon	E2	SB	Intercept	1	-88.7989	112.1531	-0.7918	0.4469			All available between 1991-2015	Log-normal	
Silicon	E2	SB	Year	1	0.0457	0.0560	0.8158	0.4336			All available between 1991-2015	Log-normal	
Silicon	E5	NG	Intercept	1	144.5769	119.2682	1.2122	0.2508			2003-2015	Log-normal	
Silicon	E5	NG	Year	1	-0.0673	0.0594	-1.1334	0.2811			2003-2015	Log-normal	
Silicon	E5	SB	Intercept	1	-201.9957	75.4478	-2.6773	0.0172			All available between 1991-2015	Log-normal	
Silicon	E5	SB	Year	1	0.1025	0.0377	2.7214	0.0158			All available between 1991-2015	Log-normal	
Silicon	E6	NG	Intercept	1	-71.9243	149.4741	-0.4812	0.6398			2003-2015	Log-normal	
Silicon	E6	NG	Year	1	0.0401	0.0744	0.5395	0.6003			2003-2015	Log-normal	
Silicon	N2	NG	Intercept	1	81.6264	72.5650	1.1249	0.2846			2003-2015	Log-normal	
Silicon	N2	NG	Year	1	-0.0357	0.0361	-0.9896	0.3436			2003-2015	Log-normal	
Silicon	N2	SB	Intercept	1	-185.3940	86.0027	-2.1557	0.0504			All available between 1991-2015	Log-normal	
Silicon	N2	SB	Year	1	0.0942	0.0430	2.1917	0.0472			All available between 1991-2015	Log-normal	
Silicon	N4	NG	Intercept	1	197.0909	104.0584	1.8940	0.0848			2003-2015	Log-normal	
Silicon	N4	NG	Year	1	-0.0935	0.0518	-1.8043	0.0986			2003-2015	Log-normal	
Silicon	N5	NG	Intercept	1	144.7022	128.0138	1.1304	0.2804			2003-2015	Log-normal	
Silicon	N5	NG	Year	1	-0.0673	0.0637	-1.0558	0.3118			2003-2015	Log-normal	
Silicon	S1	NG	Intercept	1	155.8230	136.1339	1.1446	0.2747			2003-2015	Log-normal	
Silicon	S1	NG	Year	1	-0.0729	0.0678	-1.0758	0.3032			2003-2015	Log-normal	
Silicon	S1	SB	Intercept	1	-114.7569	101.2769	-1.1331	0.2739			All available between 1991-2015	Log-normal	
Silicon	S1	SB	Year	1	0.0589	0.0506	1.1643	0.2614			All available between 1991-2015	Log-normal	
Silicon	S2	NG	Intercept	1	51.6164	126.0223	0.4096	0.6900			2003-2015	Log-normal	
Silicon	S2	NG	Year	1	-0.0211	0.0627	-0.3356	0.7435			2003-2015	Log-normal	
Silicon	S2	SB	Intercept	1	-104.7200	76.9232	-1.3614	0.1902			All available between 1991-2015	Log-normal	
Silicon	S2	SB	Year	1	0.0540	0.0384	1.4060	0.1768			All available between 1991-2015	Log-normal	
Silicon	S3	NG	Intercept	1	127.4883	124.7740	1.0218	0.3255			2003-2015	Log-normal	
Silicon	S3	NG	Year	1	-0.0587	0.0621	-0.9452	0.3618			2003-2015	Log-normal	
Silicon	S4	NG	Intercept	1	45.6163	100.3251	0.4547	0.6575			2003-2015	Log-normal	
Silicon	S4	NG	Year	1	-0.0180	0.0499	-0.3598	0.7253			2003-2015	Log-normal	
Silicon	S4	SB	Intercept	1	-227.4719	86.8182	-2.6201	0.0212			All available between 1991-2015	Log-normal	
Silicon	S4	SB	Year	1	0.1154	0.0433	2.6634	0.0195			All available between 1991-2015	Log-normal	
Silicon	S4	WW	Intercept	1	-580839.90108	313581.15281	-1.85228	0.11343			All available between 1991-2015	Normal	
Silicon	S4	WW	Year	1	291.25899	156.43791	1.86182	0.11194	No		All available between 1991-2015	Normal	
Silicon	S5	FC	Intercept	1	-188.6162	105.1272	-1.7942	0.1327			All available between 1991-2015	Log-normal	
Silicon	S5	FC	Year	1	0.0958	0.0524	1.8274	0.1272			All available between 1991-2015	Log-normal	
Silicon	S5	NG	Intercept	1	-0.9543	73.4519	-0.0130	0.9898			2003-2015	Log-normal	
Silicon	S5	NG	Year	1	0.0051	0.0366	0.1409	0.8903			2003-2015	Log-normal	
Silicon	S5	SB	Intercept	1	-120.2244	143.7325	-0.8364	0.4207			All available between 1991-2015	Log-normal	
Silicon	S5	SB	Year	1	0.0618	0.0717	0.8614	0.4074			All available between 1991-2015	Log-normal	
Silicon	W2	NG	Intercept	1	70.9999	78.6151	0.9031	0.3842			2003-2015	Log-normal	
Silicon	W2	NG	Year	1	-0.0307	0.0391	-0.7838	0.4483			2003-2015	Log-normal	
Silicon	W2	SB	Intercept	1	-131.8349	96.9277	-1.3601	0.1906			All available between 1991-2015	Log-normal	
Silicon	W2	SB	Year	1	0.0673	0.0484	1.3921	0.1809			All available between 1991-2015	Log-normal	
Silicon	W4	FC	Intercept	1	12.6633	132.0489	0.0959	0.9267			All available between 1991-2015	Log-normal	
Silicon	W4	FC	Year	1	-0.0045	0.0658	-0.0682	0.9478			All available between 1991-2015	Log-normal	
Silicon	W4	NG	Intercept	1	56.2226	157.8333	0.3562	0.7274			2003-2015	Log-normal	
Silicon	W4	NG	Year	1	-0.0233	0.0786	-0.2971	0.7711			2003-2015	Log-normal	
Silicon	W4	SB	Intercept	1	-141.2576	170.2334	-0.8298	0.4281			All available between 1991-2015	Log-normal	
Silicon	W4	SB	Year	1	0.0724	0.0848	0.8529	0.4159			All available between 1991-2015	Log-normal	
Silicon	E1	SS	Intercept	1	-2992000.0000	11163596.0715	-0.2680	0.8019			All available between 1991-2015	Normal	
Silicon	E1	SS	Year	1	1657.1429	5547.1265	0.2987	0.7800			All available between 1991-2015	Normal	
Silicon	E2	SD	Intercept	1	-2384333.3333	8954755.2216	-0.2663	0.8032			2010-2015	Normal	
Silicon	E2	SD	Year	1	1285.7143	4449.5662	0.2890	0.7870			2010-2015	Normal	
Silicon	E6	SS	Intercept	1	-1619879.7814	5767561.1124	-0.2809	0.7883			2010-2015	Normal	
Silicon	E6	SS	Year	1	961.7486	2865.3340	0.3356	0.7486			2010-2015	Normal	
Silicon	N5	SD	Intercept	1	5774858.9744	8351841.9395	0.6914	0.5116			2010-2015	Normal	
Silicon	N5	SD	Year	1	-2782.0513	4150.3258	-0.6703	0.5241			2010-2015	Normal	
Silicon	N5	SS	Intercept	1	18085666.6667	13705444.8524	1.3196	0.2574			2010-2015	Normal	
Silicon	N5	SS	Year	1	-8857.1429	6810.1565	-1.3006	0.2633			2010-2015	Normal	
Silicon	S3	SD	Intercept	1	-50822528.1250	29049459.3229	-1.7495	0.1406			2010-2015	Normal	
Silicon	S3	SD	Year	1	25359.3750	14437.0702	1.7565	0.1393			2010-2015	Normal	
Silicon	S5	SS	Intercept	1	5397375.0000	4639889.4280	1.1633	0.2972			2010-2015	Normal	
Silicon	S5	SS	Year	1	-2525.0000	2305.9434	-1.0950	0.3234			2010-2015	Normal	
Silicon	W4	SS	Intercept	1	4317000.0000	7711459.8952	0.5598	0.5998			2010-2015	Normal	
Silicon	W4	SS	Year	1	-2000.0000	3831.3720	-0.5220	0.6240			2010-2015	Normal	
Silver	E1	SS	Intercept	1	148.2363	16.6612	8.8971	<.0001			All available between 1991-2015	Log-normal	
Silver	E1	SS	Year	1	-0.0745	0.0083	-8.9652	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	E2	SD	Intercept	1	149.8732	17.1899	8.7187	<.0001			All available between 1991-2015	Log-normal	
Silver	E2	SD	Year	1	-0.0754	0.0086	-8.7848	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	E2	SS	Intercept	1	132.4615	14.8398	8.9261	<.0001			All available between 1991-2015	Log-normal	
Silver	E2	SS	Year	1	-0.0667	0.0074	-9.0082	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	E5	SS	Intercept	1	144.8994	18.9032	7.6654	<.0001			All available between 1991-2015	Log-normal	
Silver	E5	SS	Year	1	-0.0729	0.0094	-7.7265	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	N2	SD	Intercept	1	120.8073	13.0139	9.2829	<.0001			All available between 1991-2015	Log-normal	
Silver	N2	SD	Year	1	-0.0609	0.0065	-9.3735	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	N2	SS	Intercept	1	156.1809	16.5596	9.4314	<.0001			All available between 1991-2015	Log-normal	
Silver	N2	SS	Year	1	-0.0785	0.0083	-9.5002	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	N5	SD	Intercept	1	8.3393	6.8559	1.2164	0.2426			All available between 1991-2015	Log-normal	
Silver	N5	SD	Year	1	-0.0049	0.0034	-1.4484	0.1681			All available between 1991-2015	Log-normal	
Silver	S1	SD	Intercept	1	156.6860	16.7231	9.3694	<.0001			All available between 1991-2015	Log-normal	
Silver	S1	SD	Year	1	-0.0788	0.0083	-9.4357	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	S1	SS	Intercept	1	145.1751	16.5595	8.7669	<.0001			All available between 1991-2015	Log-normal	
Silver	S1	SS	Year	1	-0.0730	0.0083	-8.8358	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	S2	SS	Intercept	1	159.9467	18.0685	8.8523	<.0001			All available between 1991-2015	Log-normal	
Silver	S2	SS	Year	1	-0.0804	0.0090	-8.9144	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	S3	SD	Intercept	1	159.0259	17.0712	9.3155	<.0001			All available between 1991-2015	Log-normal	
Silver	S3	SD	Year	1	-0.0799	0.0085	-9.3813	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	S3	SS	Intercept	1	132.4734	14.8156	8.9415	<.0001			All available between 1991-2015	Log-normal	
Silver	S3	SS	Year	1	-0.0667	0.0074	-9.0214	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	S4	SD	Intercept	1	163.7921	18.2146	8.9924	<.0001			All available between 1991-2015	Log-normal	
Silver	S4	SD	Year	1	-0.0823	0.0091	-9.0512	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Silver	S4	SS	Intercept	1	165.5189	24.0345	6.8867	<.0001			All available between 1991-2015	Log-normal	
Silver	S4	SS	Year	1	-0.0832	0.0120	-6.9344	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	W2	SS	Intercept	1	156.4266	16.5037	9.4783	<.0001			All available between 1991-2015	Log-normal	
Silver	W2	SS	Year	1	-0.0786	0.0082	-9.5467	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Silver	W2	NG	Intercept	1	53.8587	5.9830	9.0020	0.0000			All available between 1991-2015	Normal	
Silver	W2	NG	Year	1	-0.0267	0.0030	-8.9546	0.0000	Yes	Neg	All available between 1991-2015	Normal	Effect of RDL. Ignore
Silver	W2	SB	Intercept	1	57.6923	9.8349	5.8661	0.0000			All available between 1991-2015	Normal	
Silver	W2	SB	Year	1	-0.0286	0.0049	-5.8365	0.0000	Yes	Neg	All available between 1991-2015	Normal	Effect of RDL. Ignore
Sodium	E1	NG	Intercept	1	83.0053	24.3370	3.4107	0.0023			All available between 1991-2015	Log-normal	
Sodium	E1	NG	Year	1	-0.0396	0.0121	-3.2579	0.0033			All available between 1991-2015	Log-normal	
Sodium	E1	SS	Intercept	1	-83.9826	14.1024	-5.9552	<.0001			All available between 1991-2015	Log-normal	
Sodium	E1	SS	Year	1	0.0441	0.0070	6.2617	<.0001	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	E2	NG	Intercept	1	82.5700	30.8142	2.6796	0.0131			All available between 1991-2015	Log-normal	
Sodium	E2	NG	Year	1	-0.0394	0.0154	-2.5615	0.0171			All available between 1991-2015	Log-normal	
Sodium	E2	SB	Intercept	1	96.2668	61.8255	1.5571	0.1505			All available between 1991-2015	Log-normal	
Sodium	E2	SB	Year	1	-0.0463	0.0309	-1.4973	0.1652			All available between 1991-2015	Log-normal	
Sodium	E2	SD	Intercept	1	-47.5484	16.9350	-2.8077	0.0095			All available between 1991-2015	Log-normal	
Sodium	E2	SD	Year	1	0.0264	0.0085	3.1227	0.0045			All available between 1991-2015	Log-normal	
Sodium	E2	SS	Intercept	1	-76.2598	21.0259	-3.6270	0.0015			All available between 1991-2015	Log-normal	
Sodium	E2	SS	Year	1	0.0403	0.0105	3.8402	0.0009	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	E5	NG	Intercept	1	54.9638	33.0885	1.6611	0.1109			All available between 1991-2015	Log-normal	
Sodium	E5	NG	Year	1	-0.0255	0.0165	-1.5466	0.1362			All available between 1991-2015	Log-normal	
Sodium	E5	SS	Intercept	1	-77.1628	25.1315	-3.0704	0.0058			All available between 1991-2015	Log-normal	
Sodium	E5	SS	Year	1	0.0407	0.0125	3.2466	0.0039			All available between 1991-2015	Log-normal	
Sodium	E6	NG	Intercept	1	-174.0696	118.2732	-1.4718	0.1618			All available between 1991-2015	Log-normal	
Sodium	E6	NG	Year	1	0.0888	0.0589	1.5075	0.1525			All available between 1991-2015	Log-normal	
Sodium	E6	SS	Intercept	1	-4.7590	52.1211	-0.0913	0.9283			All available between 1991-2015	Log-normal	
Sodium	E6	SS	Year	1	0.0047	0.0260	0.1821	0.8577			All available between 1991-2015	Log-normal	
Sodium	N2	NG	Intercept	1	78.1210	25.8492	3.0222	0.0059			All available between 1991-2015	Log-normal	
Sodium	N2	NG	Year	1	-0.0372	0.0129	-2.8803	0.0082			All available between 1991-2015	Log-normal	
Sodium	N2	SB	Intercept	1	147.2443	48.4100	3.0416	0.0088			All available between 1991-2015	Log-normal	
Sodium	N2	SB	Year	1	-0.0719	0.0242	-2.9707	0.0101			All available between 1991-2015	Log-normal	
Sodium	N2	SD	Intercept	1	-47.4161	17.2630	-2.7467	0.0112			All available between 1991-2015	Log-normal	
Sodium	N2	SD	Year	1	0.0262	0.0086	3.0447	0.0056			All available between 1991-2015	Log-normal	
Sodium	N2	SS	Intercept	1	-74.2640	20.1929	-3.6777	0.0012			All available between 1991-2015	Log-normal	
Sodium	N2	SS	Year	1	0.0393	0.0101	3.8991	0.0007	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	N4	NG	Intercept	1	-25.9415	74.0265	-0.3504	0.7316			All available between 1991-2015	Log-normal	
Sodium	N4	NG	Year	1	0.0149	0.0369	0.4038	0.6929			All available between 1991-2015	Log-normal	
Sodium	N4	SS	Intercept	1	-6.2977	58.3412	-0.1079	0.9155			All available between 1991-2015	Log-normal	
Sodium	N4	SS	Year	1	0.0055	0.0290	0.1890	0.8526			All available between 1991-2015	Log-normal	
Sodium	N5	NG	Intercept	1	-33.2774	94.6002	-0.3518	0.7306			All available between 1991-2015	Log-normal	
Sodium	N5	NG	Year	1	0.0186	0.0471	0.3959	0.6986			All available between 1991-2015	Log-normal	
Sodium	N5	SD	Intercept	1	31.4486	36.8414	0.8536	0.4067			All available between 1991-2015	Log-normal	
Sodium	N5	SD	Year	1	-0.0125	0.0183	-0.6841	0.5043			All available between 1991-2015	Log-normal	
Sodium	N5	SS	Intercept	1	78.1138	44.6357	1.7500	0.1056			All available between 1991-2015	Log-normal	
Sodium	N5	SS	Year	1	-0.0363	0.0222	-1.6352	0.1280			All available between 1991-2015	Log-normal	
Sodium	S1	NG	Intercept	1	14.9383	37.0624	0.4031	0.6905			All available between 1991-2015	Log-normal	
Sodium	S1	NG	Year	1	-0.0055	0.0185	-0.2964	0.7695			All available between 1991-2015	Log-normal	
Sodium	S1	SB	Intercept	1	92.8432	52.1444	1.7805	0.0940			All available between 1991-2015	Log-normal	
Sodium	S1	SB	Year	1	-0.0447	0.0260	-1.7173	0.1052			All available between 1991-2015	Log-normal	
Sodium	S1	SD	Intercept	1	-28.7801	21.6728	-1.3279	0.1957			All available between 1991-2015	Log-normal	
Sodium	S1	SD	Year	1	0.0169	0.0108	1.5642	0.1299			All available between 1991-2015	Log-normal	
Sodium	S1	SS	Intercept	1	-73.5901	25.7793	-2.8546	0.0090			All available between 1991-2015	Log-normal	
Sodium	S1	SS	Year	1	0.0390	0.0129	3.0288	0.0060			All available between 1991-2015	Log-normal	
Sodium	S2	NG	Intercept	1	38.8091	26.7439	1.4511	0.1597			All available between 1991-2015	Log-normal	
Sodium	S2	NG	Year	1	-0.0175	0.0134	-1.3071	0.2036			All available between 1991-2015	Log-normal	
Sodium	S2	SB	Intercept	1	96.9993	37.6789	2.5744	0.0191			All available between 1991-2015	Log-normal	
Sodium	S2	SB	Year	1	-0.0468	0.0188	-2.4886	0.0228			All available between 1991-2015	Log-normal	
Sodium	S2	SS	Intercept	1	-81.0309	25.6372	-3.1607	0.0041			All available between 1991-2015	Log-normal	
Sodium	S2	SS	Year	1	0.0427	0.0128	3.3359	0.0027	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	S3	NG	Intercept	1	44.5644	61.7535	0.7217	0.4769			All available between 1991-2015	Log-normal	
Sodium	S3	NG	Year	1	-0.0194	0.0308	-0.6307	0.5337			All available between 1991-2015	Log-normal	
Sodium	S3	SD	Intercept	1	38.0559	16.0517	2.3708	0.0254			All available between 1991-2015	Log-normal	
Sodium	S3	SD	Year	1	-0.0161	0.0080	-2.0084	0.0551			All available between 1991-2015	Log-normal	
Sodium	S3	SS	Intercept	1	-23.2034	32.2334	-0.7199	0.4789			All available between 1991-2015	Log-normal	
Sodium	S3	SS	Year	1	0.0146	0.0161	0.9091	0.3727			All available between 1991-2015	Log-normal	
Sodium	S4	NG	Intercept	1	79.3451	29.4737	2.6921	0.0127			All available between 1991-2015	Log-normal	
Sodium	S4	NG	Year	1	-0.0377	0.0147	-2.5671	0.0169			All available between 1991-2015	Log-normal	
Sodium	S4	SB	Intercept	1	104.5046	70.9401	1.4731	0.1628			All available between 1991-2015	Log-normal	
Sodium	S4	SB	Year	1	-0.0506	0.0354	-1.4301	0.1746			All available between 1991-2015	Log-normal	
Sodium	S4	SD	Intercept	1	-23.8647	19.1661	-1.2452	0.2251			All available between 1991-2015	Log-normal	
Sodium	S4	SD	Year	1	0.0144	0.0096	1.5100	0.1441			All available between 1991-2015	Log-normal	
Sodium	S4	SS	Intercept	1	-78.1898	21.4691	-3.6420	0.0017			All available between 1991-2015	Log-normal	
Sodium	S4	SS	Year	1	0.0412	0.0107	3.8497	0.0011	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	S4	WW	Intercept	1	4266.05634	1226.90300	3.47709	0.01771			All available between 1991-2015	Normal	
Sodium	S4	WW	Year	1	-2.11268	0.61231	-3.45033	0.01823	No		All available between 1991-2015	Normal	
Sodium	S5	NG	Intercept	1	47.9687	39.4629	1.2155	0.2376			All available between 1991-2015	Log-normal	
Sodium	S5	NG	Year	1	-0.0222	0.0197	-1.1268	0.2726			All available between 1991-2015	Log-normal	
Sodium	S5	SB	Intercept	1	87.7966	48.2432	1.8199	0.0961			All available between 1991-2015	Log-normal	
Sodium	S5	SB	Year	1	-0.0421	0.0241	-1.7516	0.1076			All available between 1991-2015	Log-normal	
Sodium	S5	SS	Intercept	1	-72.7179	27.9023	-2.6062	0.0169			All available between 1991-2015	Log-normal	
Sodium	S5	SS	Year	1	0.0385	0.0139	2.7682	0.0119			All available between 1991-2015	Log-normal	
Sodium	W2	NG	Intercept	1	73.8307	32.1538	2.2962	0.0303			All available between 1991-2015	Log-normal	
Sodium	W2	NG	Year	1	-0.0350	0.0161	-2.1808	0.0388			All available between 1991-2015	Log-normal	
Sodium	W2	SB	Intercept	1	97.9443	34.0804	2.8739	0.0101			All available between 1991-2015	Log-normal	
Sodium	W2	SB	Year	1	-0.0472	0.0170	-2.7771	0.0124			All available between 1991-2015	Log-normal	
Sodium	W2	SS	Intercept	1	-83.2235	15.2367	-5.4620	<.0001			All available between 1991-2015	Log-normal	
Sodium	W2	SS	Year	1	0.0437	0.0076	5.7486	<.0001	Yes	pos	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Sodium	W4	FC	Intercept	1	2609.93033	1736.53691	1.50295	0.18354			All available between 1991-2015	Normal	
Sodium	W4	FC	Year	1	-1.28559	0.86486	-1.48647	0.18771	No		All available between 1991-2015	Normal	
Sodium	W4	NG	Intercept	1	-15.6000	86.9154	-0.1795	0.8594			All available between 1991-2015	Log-normal	
Sodium	W4	NG	Year	1	0.0098	0.0433	0.2271	0.8227			All available between 1991-2015	Log-normal	
Sodium	W4	SB	Intercept	1	-39.6544	136.0038	-0.2916	0.7760			All available between 1991-2015	Log-normal	
Sodium	W4	SB	Year	1	0.0211	0.0678	0.3110	0.7616			All available between 1991-2015	Log-normal	
Sodium	W4	SS	Intercept	1	-34.2660	38.9528	-0.8797	0.3921			All available between 1991-2015	Log-normal	
Sodium	W4	SS	Year	1	0.0194	0.0194	0.9979	0.3332			All available between 1991-2015	Log-normal	
Strontium	E1	NG	Intercept	1	-18.6142	21.0246	-0.8854	0.3848			All available between 1991-2015	Log-normal	
Strontium	E1	NG	Year	1	0.0106	0.0105	1.0114	0.3219			All available between 1991-2015	Log-normal	
Strontium	E1	SB	Intercept	1	-34.7182	23.1483	-1.4998	0.1559			All available between 1991-2015	Log-normal	
Strontium	E1	SB	Year	1	0.0175	0.0116	1.5124	0.1527			All available between 1991-2015	Log-normal	
Strontium	E1	SS	Intercept	1	3.7933	11.8853	0.3192	0.7528			All available between 1991-2015	Log-normal	
Strontium	E1	SS	Year	1	-0.0006	0.0059	-0.1069	0.9159			All available between 1991-2015	Log-normal	
Strontium	E2	NG	Intercept	1	2.9499	17.6361	0.1673	0.8686			All available between 1991-2015	Log-normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Strontium	E2	NG	Year	1	-0.0001	0.0088	-0.0154	0.9878			All available between 1991-2015	Log-normal	
Strontium	E2	SB	Intercept	1	-38.2650	79.0986	-0.4838	0.6390			All available between 1991-2015	Log-normal	
Strontium	E2	SB	Year	1	0.0194	0.0395	0.4917	0.6335			All available between 1991-2015	Log-normal	
Strontium	E2	SD	Intercept	1	17.2815	8.6221	2.0043	0.0560			All available between 1991-2015	Log-normal	
Strontium	E2	SD	Year	1	-0.0065	0.0043	-1.5039	0.1451			All available between 1991-2015	Log-normal	
Strontium	E2	SS	Intercept	1	-6.9648	9.4861	-0.7342	0.4706			All available between 1991-2015	Log-normal	
Strontium	E2	SS	Year	1	0.0049	0.0047	1.0439	0.3079			All available between 1991-2015	Log-normal	
Strontium	E5	NG	Intercept	1	-50.4655	31.0743	-1.6240	0.1186			All available between 1991-2015	Log-normal	
Strontium	E5	NG	Year	1	0.0265	0.0155	1.7101	0.1013			All available between 1991-2015	Log-normal	
Strontium	E5	SB	Intercept	1	-4.6053	30.5066	-0.1510	0.8820			All available between 1991-2015	Log-normal	
Strontium	E5	SB	Year	1	0.0027	0.0152	0.1782	0.8610			All available between 1991-2015	Log-normal	
Strontium	E5	SS	Intercept	1	0.3678	9.3982	0.0391	0.9692			All available between 1991-2015	Log-normal	
Strontium	E5	SS	Year	1	0.0012	0.0047	0.2538	0.8021			All available between 1991-2015	Log-normal	
Strontium	E6	NG	Intercept	1	-42.1931	48.2352	-0.8747	0.3955			All available between 1991-2015	Log-normal	
Strontium	E6	NG	Year	1	0.0228	0.0240	0.9511	0.3566			All available between 1991-2015	Log-normal	
Strontium	E6	SS	Intercept	1	-90.8664	25.2280	-3.6018	0.0022			All available between 1991-2015	Log-normal	
Strontium	E6	SS	Year	1	0.0470	0.0126	3.7445	0.0016	Yes	pos	All available between 1991-2015	Log-normal	
Strontium	N2	NG	Intercept	1	22.9048	32.5798	0.7030	0.4888			All available between 1991-2015	Log-normal	
Strontium	N2	NG	Year	1	-0.0102	0.0163	-0.6267	0.5368			All available between 1991-2015	Log-normal	
Strontium	N2	SB	Intercept	1	39.8135	21.4116	1.8594	0.0841			All available between 1991-2015	Log-normal	
Strontium	N2	SB	Year	1	-0.0197	0.0107	-1.8388	0.0872			All available between 1991-2015	Log-normal	
Strontium	N2	SD	Intercept	1	14.0439	7.3001	1.9238	0.0663			All available between 1991-2015	Log-normal	
Strontium	N2	SD	Year	1	-0.0050	0.0036	-1.3673	0.1842			All available between 1991-2015	Log-normal	
Strontium	N2	SS	Intercept	1	-15.6250	7.7047	-2.0280	0.0543			All available between 1991-2015	Log-normal	
Strontium	N2	SS	Year	1	0.0093	0.0038	2.4169	0.0240			All available between 1991-2015	Log-normal	
Strontium	N4	NG	Intercept	1	16.3078	52.0848	0.3131	0.7592			All available between 1991-2015	Log-normal	
Strontium	N4	NG	Year	1	-0.0070	0.0259	-0.2681	0.7928			All available between 1991-2015	Log-normal	
Strontium	N4	SS	Intercept	1	-129.1336	22.1817	-5.8216	<.0001			All available between 1991-2015	Log-normal	
Strontium	N4	SS	Year	1	0.0658	0.0110	5.9606	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Strontium	N5	NG	Intercept	1	-72.6133	72.1510	-1.0064	0.3326			All available between 1991-2015	Log-normal	
Strontium	N5	NG	Year	1	0.0379	0.0359	1.0557	0.3103			All available between 1991-2015	Log-normal	
Strontium	N5	SD	Year	1	-0.0332	0.0087	-3.7977	0.0018	Yes	neg	All available between 1991-2015	Log-normal	
Strontium	N5	SD	Intercept	1	70.7143	17.5376	4.0321	0.0011			All available between 1991-2015	Log-normal	
Strontium	N5	SS	Intercept	1	-53.8909	33.5759	-1.6050	0.1345			All available between 1991-2015	Log-normal	
Strontium	N5	SS	Year	1	0.0289	0.0167	1.7294	0.1094			All available between 1991-2015	Log-normal	
Strontium	S1	NG	Intercept	1	-43.3397	24.7629	-1.7502	0.0929			All available between 1991-2015	Log-normal	
Strontium	S1	NG	Year	1	0.0229	0.0124	1.8549	0.0759			All available between 1991-2015	Log-normal	
Strontium	S1	SB	Intercept	1	-12.9188	27.3286	-0.4727	0.6428			All available between 1991-2015	Log-normal	
Strontium	S1	SB	Year	1	0.0067	0.0136	0.4934	0.6285			All available between 1991-2015	Log-normal	
Strontium	S1	SD	Intercept	1	-11.8898	16.3613	-0.7267	0.4739			All available between 1991-2015	Log-normal	
Strontium	S1	SD	Year	1	0.0078	0.0082	0.9541	0.3488			All available between 1991-2015	Log-normal	
Strontium	S1	SS	Intercept	1	-8.0294	9.5239	-0.8431	0.4079			All available between 1991-2015	Log-normal	
Strontium	S1	SS	Year	1	0.0055	0.0048	1.1574	0.2590			All available between 1991-2015	Log-normal	
Strontium	S2	NG	Intercept	1	-1.7242	21.1590	-0.0815	0.9357			All available between 1991-2015	Log-normal	
Strontium	S2	NG	Year	1	0.0023	0.0106	0.2181	0.8292			All available between 1991-2015	Log-normal	
Strontium	S2	SB	Intercept	1	-19.3391	13.9810	-1.3832	0.1835			All available between 1991-2015	Log-normal	
Strontium	S2	SB	Year	1	0.0101	0.0070	1.4459	0.1654			All available between 1991-2015	Log-normal	
Strontium	S2	SS	Intercept	1	-14.2539	8.3135	-1.7146	0.0988			All available between 1991-2015	Log-normal	
Strontium	S2	SS	Year	1	0.0086	0.0041	2.0684	0.0491			All available between 1991-2015	Log-normal	
Strontium	S3	NG	Intercept	1	-80.5469	24.5498	-3.2810	0.0029			All available between 1991-2015	Log-normal	
Strontium	S3	NG	Year	1	0.0422	0.0123	3.4438	0.0020	Yes	pos	All available between 1991-2015	Log-normal	
Strontium	S3	SD	Intercept	1	31.9141	12.3039	2.5938	0.0154			All available between 1991-2015	Log-normal	
Strontium	S3	SD	Year	1	-0.0137	0.0061	-2.2328	0.0344			All available between 1991-2015	Log-normal	
Strontium	S3	SS	Intercept	1	-22.8106	14.3442	-1.5902	0.1254			All available between 1991-2015	Log-normal	
Strontium	S3	SS	Year	1	0.0132	0.0072	1.8489	0.0774			All available between 1991-2015	Log-normal	
Strontium	S4	NG	Intercept	1	-29.5039	31.1179	-0.9481	0.3529			All available between 1991-2015	Log-normal	
Strontium	S4	NG	Year	1	0.0163	0.0155	1.0492	0.3050			All available between 1991-2015	Log-normal	
Strontium	S4	SB	Intercept	1	-45.4075	26.4955	-1.7138	0.1086			All available between 1991-2015	Log-normal	
Strontium	S4	SB	Year	1	0.0231	0.0132	1.7498	0.1020			All available between 1991-2015	Log-normal	
Strontium	S4	SD	Intercept	1	-4.8387	11.6591	-0.4150	0.6818			All available between 1991-2015	Log-normal	
Strontium	S4	SD	Year	1	0.0045	0.0058	0.7740	0.4465			All available between 1991-2015	Log-normal	
Strontium	S4	SS	Intercept	1	-64.2844	14.7688	-4.3527	0.0003			All available between 1991-2015	Log-normal	
Strontium	S4	SS	Year	1	0.0335	0.0074	4.5522	0.0002	Yes	pos	All available between 1991-2015	Log-normal	
Strontium	S4	WW	Intercept	1	-72.5541	15.9004	-4.5630	0.0038			All available between 1991-2015	Log-normal	
Strontium	S4	WW	Year	1	0.0364	0.0079	4.5907	0.0037			All available between 1991-2015	Log-normal	
Strontium	S5	FC	Intercept	1	17.1597	43.6346	0.3933	0.7103			All available between 1991-2015	Log-normal	
Strontium	S5	FC	Year	1	-0.0094	0.0218	-0.4330	0.6831			All available between 1991-2015	Log-normal	
Strontium	S5	NG	Intercept	1	-104.2564	32.3960	-3.2182	0.0041			All available between 1991-2015	Log-normal	
Strontium	S5	NG	Year	1	0.0534	0.0162	3.3048	0.0034			All available between 1991-2015	Log-normal	
Strontium	S5	SB	Intercept	1	-23.4629	27.6197	-0.8495	0.4137			All available between 1991-2015	Log-normal	
Strontium	S5	SB	Year	1	0.0123	0.0138	0.8915	0.3918			All available between 1991-2015	Log-normal	
Strontium	S5	SS	Intercept	1	3.3948	9.1493	0.3710	0.7145			All available between 1991-2015	Log-normal	
Strontium	S5	SS	Year	1	-0.0002	0.0046	-0.0467	0.9632			All available between 1991-2015	Log-normal	
Strontium	W2	NG	Intercept	1	-15.0486	14.1876	-1.0607	0.2990			All available between 1991-2015	Log-normal	
Strontium	W2	NG	Year	1	0.0088	0.0071	1.2430	0.2254			All available between 1991-2015	Log-normal	
Strontium	W2	SB	Intercept	1	-50.4594	19.3069	-2.6135	0.0176			All available between 1991-2015	Log-normal	
Strontium	W2	SB	Year	1	0.0254	0.0096	2.6409	0.0166			All available between 1991-2015	Log-normal	
Strontium	W2	SS	Intercept	1	1.7053	6.6926	0.2548	0.8015			All available between 1991-2015	Log-normal	
Strontium	W2	SS	Year	1	0.0004	0.0033	0.1238	0.9027			All available between 1991-2015	Log-normal	
Strontium	W4	FC	Intercept	1	17.6878	25.2401	0.7008	0.5097			All available between 1991-2015	Log-normal	
Strontium	W4	FC	Year	1	-0.0099	0.0126	-0.7891	0.4601			All available between 1991-2015	Log-normal	
Strontium	W4	NG	Intercept	1	19.1497	43.2637	0.4426	0.6628			All available between 1991-2015	Log-normal	
Strontium	W4	NG	Year	1	-0.0083	0.0216	-0.3870	0.7028			All available between 1991-2015	Log-normal	
Strontium	W4	SB	Intercept	1	-8.5977	49.2629	-0.1745	0.8646			All available between 1991-2015	Log-normal	
Strontium	W4	SB	Year	1	0.0044	0.0246	0.1791	0.8611			All available between 1991-2015	Log-normal	
Strontium	W4	SS	Intercept	1	2.7943	12.9100	0.2164	0.8314			All available between 1991-2015	Log-normal	
Strontium	W4	SS	Year	1	0.0000	0.0064	0.0062	0.9951			All available between 1991-2015	Log-normal	
Sulfur	E1	NG	Intercept	1	-84291.01071	81089.83939	-1.03948	0.30894			All available between 1991-2015	Normal	
Sulfur	E1	NG	Year	1	43.96403	40.47849	1.08611	0.28822	No		All available between 1991-2015	Normal	
Sulfur	E1	SB	Intercept	1	-73985.40254	53552.52053	-1.38155	0.18876			All available between 1991-2015	Normal	
Sulfur	E1	SB	Year	1	38.33686	26.74931	1.43319	0.17376	No		All available between 1991-2015	Normal	
Sulfur	E1	SS	Intercept	1	19.4878	10.0074	1.9473	0.0650			All available between 1991-2015	Log-normal	
Sulfur	E1	SS	Year	1	-0.0069	0.0050	-1.3735	0.1841			All available between 1991-2015	Log-normal	
Sulfur	E2	NG	Intercept	1	-79569.66949	80807.97765	-0.98468	0.33461			All available between 1991-2015	Normal	
Sulfur	E2	NG	Year	1	41.67514	40.33701	1.03317	0.31182	No		All available between 1991-2015	Normal	
Sulfur	E2	SB	Intercept	1	-30750.12013	24346.04259	-1.26304	0.23523			All available between 1991-2015	Normal	
Sulfur	E2	SB	Year	1	16.83566	12.16584	1.38385	0.19651	No		All available between 1991-2015	Normal	
Sulfur	E2	SD	Intercept	1	32.1344	37.1545	0.8649	0.3953			All available between 1991-2015	Log-normal	
Sulfur	E2	SD	Year	1	-0.0129	0.0185	-0.6931	0.4947			All available between 1991-2015	Log-normal	
Sulfur	E2	SS	Intercept	1	22.8896	11.9329	1.9182	0.0682			All available between 1991-2015	Log-normal	
Sulfur	E2	SS	Year	1	-0.0084	0.0060	-1.4166	0.1706			All available between 1991-2015	Log-normal	
Sulfur	E5	NG	Intercept	1	103881.48986	66908.83451	1.55258	0.13479			All available between 1991-2015	Normal	
Sulfur	E5	NG	Year	1	-50.48261	33.39577	-1.51165	0.14486	No		All available between 1991-2015	Normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Sulfur	E5	SB	Intercept	1	-51892.16509	19315.96439	-2.68649	0.01691			All available between 1991-2015	Normal	
Sulfur	E5	SB	Year	1	27.40806	9.64289	2.84231	0.01236	No		All available between 1991-2015	Normal	
Sulfur	E5	SS	Intercept	1	19.6891	22.0747	0.8919	0.3825			All available between 1991-2015	Log-normal	
Sulfur	E5	SS	Year	1	-0.0071	0.0110	-0.6411	0.5284			All available between 1991-2015	Log-normal	
Sulfur	E6	NG	Intercept	1	-124326.54275	50508.22303	-2.46151	0.02644			All available between 1991-2015	Normal	
Sulfur	E6	NG	Year	1	63.46344	25.15490	2.52291	0.02342	No		All available between 1991-2015	Normal	
Sulfur	E6	SS	Intercept	1	-38.3937	42.8099	-0.8968	0.3823			All available between 1991-2015	Log-normal	
Sulfur	E6	SS	Year	1	0.0221	0.0213	1.0359	0.3148			All available between 1991-2015	Log-normal	
Sulfur	N2	NG	Intercept	1	-95067.12696	72083.47382	-1.31885	0.19967			All available between 1991-2015	Normal	
Sulfur	N2	NG	Year	1	49.20661	35.98891	1.36727	0.18421	No		All available between 1991-2015	Normal	
Sulfur	N2	SB	Intercept	1	-18109.92230	53601.87577	-0.33786	0.74048			All available between 1991-2015	Normal	
Sulfur	N2	SB	Year	1	10.47524	26.79912	0.39088	0.70177	No		All available between 1991-2015	Normal	
Sulfur	N2	SD	Intercept	1	17.6090	29.8036	0.5908	0.5602			All available between 1991-2015	Log-normal	
Sulfur	N2	SD	Year	1	-0.0055	0.0149	-0.3718	0.7133			All available between 1991-2015	Log-normal	
Sulfur	N2	SS	Intercept	1	21.9465	7.4620	2.9411	0.0073			All available between 1991-2015	Log-normal	
Sulfur	N2	SS	Year	1	-0.0080	0.0037	-2.1621	0.0413			All available between 1991-2015	Log-normal	
Sulfur	N4	NG	Intercept	1	188035.23810	130697.77829	1.43870	0.17387			All available between 1991-2015	Normal	
Sulfur	N4	NG	Year	1	-91.92857	65.08838	-1.41237	0.18133	No		All available between 1991-2015	Normal	
Sulfur	N4	SS	Intercept	1	-72.2585	39.7947	-1.8158	0.0894			All available between 1991-2015	Log-normal	
Sulfur	N4	SS	Year	1	0.0388	0.0198	1.9565	0.0693			All available between 1991-2015	Log-normal	
Sulfur	N5	NG	Intercept	1	312254.93506	149664.46424	2.08637	0.05721			All available between 1991-2015	Normal	
Sulfur	N5	NG	Year	1	-153.59640	74.49930	-2.06172	0.05982	No		All available between 1991-2015	Normal	
Sulfur	N5	SD	Intercept	1	-238.3261	45.3401	-5.2564	<.0001			All available between 1991-2015	Log-normal	
Sulfur	N5	SD	Year	1	0.1221	0.0226	5.4120	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Sulfur	N5	SS	Intercept	1	-62.1339	47.9785	-1.2950	0.2197			All available between 1991-2015	Log-normal	
Sulfur	N5	SS	Year	1	0.0341	0.0239	1.4295	0.1784			All available between 1991-2015	Log-normal	
Sulfur	S1	NG	Intercept	1	20397.56678	43925.30277	0.46437	0.64657			All available between 1991-2015	Normal	
Sulfur	S1	NG	Year	1	-8.87202	21.92582	-0.40464	0.68933	No		All available between 1991-2015	Normal	
Sulfur	S1	SB	Intercept	1	-43804.14743	24248.86227	-1.80644	0.08969			All available between 1991-2015	Normal	
Sulfur	S1	SB	Year	1	23.41355	12.10887	1.93359	0.07106	No		All available between 1991-2015	Normal	
Sulfur	S1	SD	Intercept	1	-2.2570	31.8835	-0.0708	0.9441			All available between 1991-2015	Log-normal	
Sulfur	S1	SD	Year	1	0.0044	0.0159	0.2789	0.7825			All available between 1991-2015	Log-normal	
Sulfur	S1	SS	Intercept	1	16.0350	18.8397	0.8511	0.4035			All available between 1991-2015	Log-normal	
Sulfur	S1	SS	Year	1	-0.0052	0.0094	-0.5529	0.5857			All available between 1991-2015	Log-normal	
Sulfur	S2	NG	Intercept	1	29053.77227	40784.31325	0.71238	0.48310			All available between 1991-2015	Normal	
Sulfur	S2	NG	Year	1	-13.28555	20.36227	-0.65246	0.52031	No		All available between 1991-2015	Normal	
Sulfur	S2	SB	Intercept	1	-64948.31193	25458.76569	-2.55112	0.02005			All available between 1991-2015	Normal	
Sulfur	S2	SB	Year	1	33.89908	12.70705	2.66774	0.01569	No		All available between 1991-2015	Normal	
Sulfur	S2	SS	Intercept	1	-5.0689	19.4599	-0.2605	0.7966			All available between 1991-2015	Log-normal	
Sulfur	S2	SS	Year	1	0.0053	0.0097	0.5418	0.5928			All available between 1991-2015	Log-normal	
Sulfur	S3	NG	Intercept	1	-151114.91795	53431.65175	-2.82819	0.00889			All available between 1991-2015	Normal	
Sulfur	S3	NG	Year	1	76.84637	26.66899	2.88149	0.00783	No		All available between 1991-2015	Normal	
Sulfur	S3	SD	Intercept	1	-20.9015	36.8369	-0.5674	0.5753			All available between 1991-2015	Log-normal	
Sulfur	S3	SD	Year	1	0.0140	0.0184	0.7598	0.4542			All available between 1991-2015	Log-normal	
Sulfur	S3	SS	Intercept	1	24.3203	16.2205	1.4994	0.1474			All available between 1991-2015	Log-normal	
Sulfur	S3	SS	Year	1	-0.0090	0.0081	-1.1106	0.2782			All available between 1991-2015	Log-normal	
Sulfur	S4	NG	Intercept	1	-41339.81433	81031.98941	-0.51017	0.61480			All available between 1991-2015	Normal	
Sulfur	S4	NG	Year	1	22.20978	40.42926	0.54935	0.58806	No		All available between 1991-2015	Normal	
Sulfur	S4	SB	Intercept	1	-41757.60232	38640.37234	-1.08067	0.29811			All available between 1991-2015	Normal	
Sulfur	S4	SB	Year	1	22.34773	19.27790	1.15924	0.26575	No		All available between 1991-2015	Normal	
Sulfur	S4	SD	Intercept	1	73.0287	34.3489	2.1261	0.0440			All available between 1991-2015	Log-normal	
Sulfur	S4	SD	Year	1	-0.0334	0.0171	-1.9464	0.0634			All available between 1991-2015	Log-normal	
Sulfur	S4	SS	Intercept	1	-46.0893	17.3987	-2.6490	0.0158			All available between 1991-2015	Log-normal	
Sulfur	S4	SS	Year	1	0.0256	0.0087	2.9539	0.0082			All available between 1991-2015	Log-normal	
Sulfur	S4	WW	Intercept	1	-29481.63669	20867.13841	-1.41283	0.20742			All available between 1991-2015	Normal	
Sulfur	S4	WW	Year	1	15.30576	10.41010	1.47028	0.19189	No		All available between 1991-2015	Normal	
Sulfur	S5	FC	Intercept	1	-11086.15538	20686.35573	-0.53592	0.61499			All available between 1991-2015	Normal	
Sulfur	S5	FC	Year	1	5.91633	10.31145	0.57376	0.59097	No		All available between 1991-2015	Normal	
Sulfur	S5	NG	Intercept	1	-122047.60870	112829.30770	-1.08170	0.29165			All available between 1991-2015	Normal	
Sulfur	S5	NG	Year	1	62.43142	56.27372	1.10942	0.27979	No		All available between 1991-2015	Normal	
Sulfur	S5	SB	Intercept	1	27261.55138	31284.70188	0.87140	0.40215			All available between 1991-2015	Normal	
Sulfur	S5	SB	Year	1	-11.95896	15.60326	-0.76644	0.45955	No		All available between 1991-2015	Normal	
Sulfur	S5	SS	Intercept	1	-16.9206	18.9658	-0.8922	0.3829			All available between 1991-2015	Log-normal	
Sulfur	S5	SS	Year	1	0.0111	0.0095	1.1700	0.2558			All available between 1991-2015	Log-normal	
Sulfur	W2	NG	Intercept	1	-11199.63785	36071.21658	-0.31049	0.75876			All available between 1991-2015	Normal	
Sulfur	W2	NG	Year	1	7.06761	18.00815	0.39247	0.69804	No		All available between 1991-2015	Normal	
Sulfur	W2	SB	Intercept	1	-20452.83789	30337.48837	-0.67418	0.50877			All available between 1991-2015	Normal	
Sulfur	W2	SB	Year	1	11.69204	15.14064	0.77223	0.45000	No		All available between 1991-2015	Normal	
Sulfur	W2	SS	Intercept	1	16.4924	9.0199	1.8284	0.0824			All available between 1991-2015	Log-normal	
Sulfur	W2	SS	Year	1	-0.0054	0.0045	-1.2022	0.2433			All available between 1991-2015	Log-normal	
Sulfur	W4	FC	Intercept	1	6195.07140	16461.17733	0.37634	0.71961			All available between 1991-2015	Normal	
Sulfur	W4	FC	Year	1	-2.62657	8.19827	-0.32038	0.75954	No		All available between 1991-2015	Normal	
Sulfur	W4	NG	Intercept	1	15252.10253	72596.58481	0.21009	0.83572			All available between 1991-2015	Normal	
Sulfur	W4	NG	Year	1	-5.92868	36.18796	-0.16383	0.87151	No		All available between 1991-2015	Normal	
Sulfur	W4	SB	Intercept	1	-23053.85969	25241.57854	-0.91333	0.38256			All available between 1991-2015	Normal	
Sulfur	W4	SB	Year	1	13.03104	12.58247	1.03565	0.32476	No		All available between 1991-2015	Normal	
Sulfur	W4	SS	Intercept	1	3.0978	12.3955	0.2499	0.8058			All available between 1991-2015	Log-normal	
Sulfur	W4	SS	Year	1	0.0014	0.0062	0.2245	0.8252			All available between 1991-2015	Log-normal	
Thallium	E1	SS	Intercept	1	159.3407	81.0347	1.9663	0.0728			2002-2015	Log-normal	
Thallium	E1	SS	Year	1	-0.0802	0.0403	-1.9872	0.0702			2002-2015	Log-normal	
Thallium	E2	SD	Intercept	1	118.9415	57.7502	2.0596	0.0585			2002-2015	Log-normal	
Thallium	E2	SD	Year	1	-0.0599	0.0288	-2.0821	0.0562			2002-2015	Log-normal	
Thallium	E2	SS	Intercept	1	158.9576	64.3612	2.4698	0.0270			2002-2015	Log-normal	
Thallium	E2	SS	Year	1	-0.0800	0.0320	-2.4958	0.0257			2002-2015	Log-normal	
Thallium	E5	NG	Intercept	1	150.9075	103.5770	1.4570	0.1708			2002-2015	Log-normal	
Thallium	E5	NG	Year	1	-0.0765	0.0516	-1.4839	0.1636			2002-2015	Log-normal	
Thallium	E5	SS	Intercept	1	151.3382	75.5837	2.0023	0.0684			2002-2015	Log-normal	
Thallium	E5	SS	Year	1	-0.0761	0.0376	-2.0234	0.0659			2002-2015	Log-normal	
Thallium	E6	NG	Intercept	1	172.7865	104.7201	1.6500	0.1229			2002-2015	Log-normal	
Thallium	E6	NG	Year	1	-0.0873	0.0521	-1.6748	0.1178			2002-2015	Log-normal	
Thallium	E6	SS	Intercept	1	114.8493	45.1988	2.5410	0.0226			2002-2015	Log-normal	
Thallium	E6	SS	Year	1	-0.0579	0.0225	-2.5734	0.0212			2002-2015	Log-normal	
Thallium	N2	SD	Intercept	1	78.1531	52.9264	1.4766	0.1636			2002-2015	Log-normal	
Thallium	N2	SD	Year	1	-0.0395	0.0263	-1.4979	0.1580			2002-2015	Log-normal	
Thallium	N2	SS	Intercept	1	131.0288	70.9224	1.8475	0.0859			2002-2015	Log-normal	
Thallium	N2	SS	Year	1	-0.0659	0.0353	-1.8683	0.0828			2002-2015	Log-normal	
Thallium	N4	SS	Intercept	1	122.0567	64.2355	1.9001	0.0782			2002-2015	Log-normal	
Thallium	N4	SS	Year	1	-0.0615	0.0320	-1.9237	0.0750			2002-2015	Log-normal	
Thallium	N5	NG	Intercept	1	184.6045	114.9776	1.6056	0.1324			2002-2015	Log-normal	
Thallium	N5	NG	Year	1	-0.0931	0.0572	-1.6270	0.1277			2002-2015	Log-normal	
Thallium	N5	SD	Intercept	1	23.0451	47.6623	0.4835	0.6357			2002-2015	Log-normal	
Thallium	N5	SD	Year	1	-0.0119	0.0237	-0.5017	0.6232			2002-2015	Log-normal	
Thallium	N5	SS	Intercept	1	82.2360	68.2088	1.2057	0.2512			2002-2015	Log-normal	

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Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Thallium	N5	SS	Year	1	-0.0416	0.0340	-1.2250	0.2441			2002-2015	Log-normal	
Thallium	S1	NG	Intercept	1	142.1383	97.8579	1.4525	0.1701			2002-2015	Log-normal	
Thallium	S1	NG	Year	1	-0.0722	0.0487	-1.4812	0.1624			2002-2015	Log-normal	
Thallium	S1	SD	Intercept	1	171.7660	56.6590	3.0316	0.0084			2002-2015	Log-normal	
Thallium	S1	SD	Year	1	-0.0860	0.0282	-3.0485	0.0081			2002-2015	Log-normal	
Thallium	S1	SS	Intercept	1	167.8565	80.8616	2.0759	0.0583			2002-2015	Log-normal	
Thallium	S1	SS	Year	1	-0.0844	0.0403	-2.0952	0.0563			2002-2015	Log-normal	
Thallium	S2	SS	Intercept	1	203.2064	66.8695	3.0389	0.0083			2002-2015	Log-normal	
Thallium	S2	SS	Year	1	-0.1019	0.0333	-3.0589	0.0080			2002-2015	Log-normal	
Thallium	S3	SD	Intercept	1	224.6126	82.5917	2.7196	0.0158			2002-2015	Log-normal	
Thallium	S3	SD	Year	1	-0.1122	0.0411	-2.7271	0.0156			2002-2015	Log-normal	
Thallium	S3	SS	Intercept	1	166.7240	91.3518	1.8251	0.0910			2002-2015	Log-normal	
Thallium	S3	SS	Year	1	-0.0838	0.0455	-1.8418	0.0884			2002-2015	Log-normal	
Thallium	S4	SD	Intercept	1	251.8434	80.2278	3.1391	0.0078			2002-2015	Log-normal	
Thallium	S4	SD	Year	1	-0.1261	0.0400	-3.1566	0.0076			2002-2015	Log-normal	
Thallium	S4	SS	Intercept	1	9.4871	68.2768	0.1390	0.8920			2002-2015	Log-normal	
Thallium	S4	SS	Year	1	-0.0056	0.0340	-0.1633	0.8732			2002-2015	Log-normal	
Thallium	S5	SS	Intercept	1	162.4279	84.1404	1.9304	0.0741			2002-2015	Log-normal	
Thallium	S5	SS	Year	1	-0.0817	0.0419	-1.9497	0.0715			2002-2015	Log-normal	
Thallium	W2	SS	Intercept	1	177.6830	78.8146	2.2544	0.0436			2002-2015	Log-normal	
Thallium	W2	SS	Year	1	-0.0892	0.0392	-2.2745	0.0421			2002-2015	Log-normal	
Thallium	W4	NG	Intercept	1	102.9544	89.2621	1.1534	0.2668			2002-2015	Log-normal	
Thallium	W4	NG	Year	1	-0.0527	0.0444	-1.1850	0.2544			2002-2015	Log-normal	
Thallium	W4	SS	Intercept	1	158.1546	70.7963	2.2339	0.0423			2002-2015	Log-normal	
Thallium	W4	SS	Year	1	-0.0793	0.0352	-2.2508	0.0410			2002-2015	Log-normal	
Titanium	E1	NG	Intercept	1	137.5114	33.9611	4.0491	0.0005			All available between 1991-2015	Log-normal	
Titanium	E1	NG	Year	1	-0.0681	0.0170	-4.0186	0.0005	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Titanium	E1	SB	Intercept	1	-93.9990	80.9659	-1.1610	0.2898			2002-2015	Log-normal	
Titanium	E1	SB	Year	1	0.0463	0.0403	1.1496	0.2940			2002-2015	Log-normal	
Titanium	E1	SS	Intercept	1	-2657.51226	1432.82238	-1.85474	0.07773			All available between 1991-2015	Normal	
Titanium	E1	SS	Year	1	1.37491	0.71507	1.92277	0.06818	No		All available between 1991-2015	Normal	
Titanium	E2	NG	Intercept	1	69.2803	38.2181	1.8128	0.0824			All available between 1991-2015	Log-normal	
Titanium	E2	NG	Year	1	-0.0340	0.0191	-1.7835	0.0872			All available between 1991-2015	Log-normal	
Titanium	E2	SD	Intercept	1	9178.15205	3051.55379	3.00770	0.00593			All available between 1991-2015	Normal	
Titanium	E2	SD	Year	1	-4.49527	1.52317	-2.95126	0.00679	No		All available between 1991-2015	Normal	
Titanium	E2	SS	Intercept	1	2010.08221	2326.20012	0.86411	0.39685			All available between 1991-2015	Normal	
Titanium	E2	SS	Year	1	-0.94346	1.16065	-0.81287	0.42500	No		All available between 1991-2015	Normal	
Titanium	E5	NG	Intercept	1	24.5345	57.1601	0.4292	0.6719			All available between 1991-2015	Log-normal	
Titanium	E5	NG	Year	1	-0.0117	0.0285	-0.4085	0.6868			All available between 1991-2015	Log-normal	
Titanium	E5	SB	Intercept	1	-23.9998	102.4951	-0.2342	0.8216			2002-2015	Log-normal	
Titanium	E5	SB	Year	1	0.0116	0.0510	0.2283	0.8259			2002-2015	Log-normal	
Titanium	E5	SS	Intercept	1	-1654.34600	3168.66305	-0.52210	0.60707			All available between 1991-2015	Normal	
Titanium	E5	SS	Year	1	0.88858	1.58112	0.56199	0.58007	No		All available between 1991-2015	Normal	
Titanium	E6	NG	Intercept	1	28.2796	78.9724	0.3581	0.7253			All available between 1991-2015	Log-normal	
Titanium	E6	NG	Year	1	-0.0134	0.0393	-0.3413	0.7376			All available between 1991-2015	Log-normal	
Titanium	E6	SS	Intercept	1	3550.05741	3365.11729	1.05496	0.30621			All available between 1991-2015	Normal	
Titanium	E6	SS	Year	1	-1.70387	1.67567	-1.01683	0.32349	No		All available between 1991-2015	Normal	
Titanium	N2	NG	Intercept	1	102.2930	33.3477	3.0675	0.0053			All available between 1991-2015	Log-normal	
Titanium	N2	NG	Year	1	-0.0504	0.0166	-3.0295	0.0058			All available between 1991-2015	Log-normal	
Titanium	N2	SB	Intercept	1	62.2107	154.1022	0.4037	0.7031			2002-2015	Log-normal	
Titanium	N2	SB	Year	1	-0.0312	0.0768	-0.4062	0.7014			2002-2015	Log-normal	
Titanium	N2	SD	Intercept	1	5096.98004	2418.73282	2.10729	0.04573			All available between 1991-2015	Normal	
Titanium	N2	SD	Year	1	-2.47634	1.20732	-2.05111	0.05132	No		All available between 1991-2015	Normal	
Titanium	N2	SS	Intercept	1	-1529.74557	3421.44971	-0.44710	0.65898			All available between 1991-2015	Normal	
Titanium	N2	SS	Year	1	0.83574	1.70696	0.48961	0.62905	No		All available between 1991-2015	Normal	
Titanium	N4	NG	Intercept	1	-55.8682	134.1901	-0.4163	0.6840			All available between 1991-2015	Log-normal	
Titanium	N4	NG	Year	1	0.0284	0.0668	0.4250	0.6778			All available between 1991-2015	Log-normal	
Titanium	N4	SS	Intercept	1	6632.68798	4005.14014	1.65604	0.11848			All available between 1991-2015	Normal	
Titanium	N4	SS	Year	1	-3.23653	1.99424	-1.62294	0.12543	No		All available between 1991-2015	Normal	
Titanium	N5	NG	Intercept	1	-24.6522	129.2696	-0.1907	0.8517			All available between 1991-2015	Log-normal	
Titanium	N5	NG	Year	1	0.0130	0.0643	0.2021	0.8430			All available between 1991-2015	Log-normal	
Titanium	N5	SD	Intercept	1	9193.55936	3019.25022	3.04498	0.00819			All available between 1991-2015	Normal	
Titanium	N5	SD	Year	1	-4.52855	1.50277	-3.01347	0.00873	No		All available between 1991-2015	Normal	
Titanium	N5	SS	Intercept	1	-5266.93714	3537.81755	-1.48875	0.16236			All available between 1991-2015	Normal	
Titanium	N5	SS	Year	1	2.68659	1.76142	1.52524	0.15311	No		All available between 1991-2015	Normal	
Titanium	S1	NG	Intercept	1	-7.9858	36.0737	-0.2214	0.8268			All available between 1991-2015	Log-normal	
Titanium	S1	NG	Year	1	0.0048	0.0180	0.2650	0.7934			All available between 1991-2015	Log-normal	
Titanium	S1	SB	Intercept	1	-219.1240	207.0159	-1.0585	0.3250			2002-2015	Log-normal	
Titanium	S1	SB	Year	1	0.1086	0.1030	1.0539	0.3269			2002-2015	Log-normal	
Titanium	S1	SD	Intercept	1	1795.21136	2899.97215	0.61904	0.54127			All available between 1991-2015	Normal	
Titanium	S1	SD	Year	1	-0.81913	1.44731	-0.56597	0.57627	No		All available between 1991-2015	Normal	
Titanium	S1	SS	Intercept	1	-2573.94021	2846.63299	-0.90421	0.37526			All available between 1991-2015	Normal	
Titanium	S1	SS	Year	1	1.35324	1.42098	0.95233	0.35083	No		All available between 1991-2015	Normal	
Titanium	S2	NG	Intercept	1	14.5473	37.3067	0.3899	0.7000			All available between 1991-2015	Log-normal	
Titanium	S2	NG	Year	1	-0.0065	0.0186	-0.3488	0.7303			All available between 1991-2015	Log-normal	
Titanium	S2	SB	Intercept	1	-191.9628	169.6760	-1.1313	0.2872			2002-2015	Log-normal	
Titanium	S2	SB	Year	1	0.0951	0.0844	1.1262	0.2892			2002-2015	Log-normal	
Titanium	S2	SS	Intercept	1	-1517.26710	3005.33350	-0.50486	0.61808			All available between 1991-2015	Normal	
Titanium	S2	SS	Year	1	0.82650	1.50007	0.55097	0.58654	No		All available between 1991-2015	Normal	
Titanium	S3	NG	Intercept	1	160.8456	33.7149	4.7707	<.0001			All available between 1991-2015	Log-normal	
Titanium	S3	NG	Year	1	-0.0799	0.0168	-4.7494	<.0001	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Titanium	S3	SD	Intercept	1	3767.09940	3201.71656	1.17659	0.25002			All available between 1991-2015	Normal	
Titanium	S3	SD	Year	1	-1.78122	1.59817	-1.11454	0.27524	No		All available between 1991-2015	Normal	
Titanium	S3	SS	Intercept	1	-3029.34033	2688.72692	-1.12668	0.27150			All available between 1991-2015	Normal	
Titanium	S3	SS	Year	1	1.57474	1.34189	1.17353	0.25259	No		All available between 1991-2015	Normal	
Titanium	S4	NG	Intercept	1	93.2720	55.8908	1.6688	0.1081			All available between 1991-2015	Log-normal	
Titanium	S4	NG	Year	1	-0.0461	0.0279	-1.6538	0.1112			All available between 1991-2015	Log-normal	
Titanium	S4	SB	Intercept	1	43.6492	165.4469	0.2638	0.7986			2002-2015	Log-normal	
Titanium	S4	SB	Year	1	-0.0220	0.0823	-0.2674	0.7960			2002-2015	Log-normal	
Titanium	S4	SD	Intercept	1	-3052.20837	3441.81068	-0.88680	0.38399			All available between 1991-2015	Normal	
Titanium	S4	SD	Year	1	1.61084	1.71835	0.93743	0.35787	No		All available between 1991-2015	Normal	
Titanium	S4	SS	Intercept	1	2258.30600	3867.99863	0.58384	0.56619			All available between 1991-2015	Normal	
Titanium	S4	SS	Year	1	-1.04821	1.92990	-0.54314	0.59335	No		All available between 1991-2015	Normal	
Titanium	S4	WW	Intercept	1	284.4133	150.1761	1.8939	0.1071			All available between 1991-2015	Log-normal	
Titanium	S4	WW	Year	1	-0.1418	0.0749	-1.8927	0.1072			All available between 1991-2015	Log-normal	
Titanium	S5	NG	Intercept	1	-21.4783	56.7548	-0.3784	0.7089			All available between 1991-2015	Log-normal	
Titanium	S5	NG	Year	1	0.0114	0.0283	0.4017	0.6920			All available between 1991-2015	Log-normal	
Titanium	S5	SB	Intercept	1	70.2833	124.6526	0.5638	0.5905			2002-2015	Log-normal	
Titanium	S5	SB	Year	1	-0.0352	0.0621	-0.5664	0.5888			2002-2015	Log-normal	
Titanium	S5	SS	Intercept	1	2152.96073	2639.04170	0.81581	0.42422			All available between 1991-2015	Normal	
Titanium	S5	SS	Year	1	-1.00230	1.31587	-0.76170	0.45513	No		All available between 1991-2015	Normal	
Titanium	W2	NG	Intercept	1	-7.3759	37.1028	-0.1988	0.8440			All available between 1991-2015	Log-normal	
Titanium	W2	NG	Year	1	0.0044	0.0185	0.2363	0.8151			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Titanium	W2	SB	Intercept	1	-54.6768	60.1692	-0.9087	0.3872			2002-2015	Log-normal	
Titanium	W2	SB	Year	1	0.0269	0.0299	0.8971	0.3930			2002-2015	Log-normal	
Titanium	W2	SS	Intercept	1	920.75635	1828.51605	0.50355	0.62008			All available between 1991-2015	Normal	
Titanium	W2	SS	Year	1	-0.40232	0.91251	-0.44089	0.66402	No		All available between 1991-2015	Normal	
Titanium	W4	NG	Intercept	1	-91.2919	78.7765	-1.1589	0.2602			All available between 1991-2015	Log-normal	
Titanium	W4	NG	Year	1	0.0464	0.0393	1.1810	0.2514			All available between 1991-2015	Log-normal	
Titanium	W4	SB	Intercept	1	-116.9177	112.2420	-1.0417	0.3247			2002-2015	Log-normal	
Titanium	W4	SB	Year	1	0.0579	0.0559	1.0359	0.3273			2002-2015	Log-normal	
Titanium	W4	SS	Intercept	1	11913.29948	4817.53524	2.47290	0.02500			All available between 1991-2015	Normal	
Titanium	W4	SS	Year	1	-5.87534	2.39983	-2.44823	0.02627	No		All available between 1991-2015	Normal	
Vanadium	E1	NG	Intercept	1	-117.8627	59.0198	-1.9970	0.0672			2002-2015	Log-normal	
Vanadium	E1	NG	Year	1	0.0582	0.0294	1.9798	0.0693			2002-2015	Log-normal	
Vanadium	E1	SS	Intercept	1	-541.53920	304.97665	-1.77567	0.09028			All available between 1991-2015	Normal	
Vanadium	E1	SS	Year	1	0.28406	0.15220	1.86636	0.07602	No		All available between 1991-2015	Normal	
Vanadium	E2	NG	Intercept	1	-165.4392	67.7913	-2.4404	0.0297			2002-2015	Log-normal	
Vanadium	E2	NG	Year	1	0.0819	0.0337	2.4258	0.0306			2002-2015	Log-normal	
Vanadium	E2	SB	Intercept	1	389.9688	98.8600	3.9447	0.0028			All available between 1991-2015	Log-normal	
Vanadium	E2	SB	Year	1	-0.1945	0.0494	-3.9369	0.0028	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	E2	SD	Intercept	1	-34.3309	8.3951	-4.0894	0.0004			All available between 1991-2015	Log-normal	
Vanadium	E2	SD	Year	1	0.0188	0.0042	4.4936	0.0001	Yes	pos	All available between 1991-2015	Log-normal	
Vanadium	E2	SS	Intercept	1	-555.01651	255.73331	-2.17029	0.04106			All available between 1991-2015	Normal	
Vanadium	E2	SS	Year	1	0.29003	0.12760	2.27301	0.03314	No		All available between 1991-2015	Normal	
Vanadium	E5	NG	Intercept	1	-259.3765	103.9969	-2.4941	0.0282			2002-2015	Log-normal	
Vanadium	E5	NG	Year	1	0.1287	0.0518	2.4864	0.0286			2002-2015	Log-normal	
Vanadium	E5	SB	Intercept	1	417.5854	86.7804	4.8120	0.0002			All available between 1991-2015	Log-normal	
Vanadium	E5	SB	Year	1	-0.2083	0.0433	-4.8081	0.0002	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	E5	SS	Intercept	1	-700.22284	256.94546	-2.72518	0.01268			All available between 1991-2015	Normal	
Vanadium	E5	SS	Year	1	0.36539	0.12821	2.84984	0.00959	No		All available between 1991-2015	Normal	
Vanadium	E6	NG	Intercept	1	-25.9660	47.3910	-0.5479	0.5930			2002-2015	Log-normal	
Vanadium	E6	NG	Year	1	0.0126	0.0236	0.5339	0.6024			2002-2015	Log-normal	
Vanadium	E6	SS	Intercept	1	-619.24774	425.62315	-1.45492	0.16391			All available between 1991-2015	Normal	
Vanadium	E6	SS	Year	1	0.32327	0.21194	1.52526	0.14558	No		All available between 1991-2015	Normal	
Vanadium	N2	NG	Intercept	1	-22.4920	75.1464	-0.2993	0.7698			2002-2015	Log-normal	
Vanadium	N2	NG	Year	1	0.0108	0.0374	0.2879	0.7784			2002-2015	Log-normal	
Vanadium	N2	SB	Intercept	1	488.9030	102.2969	4.7793	0.0003			All available between 1991-2015	Log-normal	
Vanadium	N2	SB	Year	1	-0.2441	0.0511	-4.7737	0.0003	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	N2	SD	Intercept	1	-61.0837	8.7532	-6.9784	<.0001			All available between 1991-2015	Log-normal	
Vanadium	N2	SD	Year	1	0.0322	0.0044	7.3783	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Vanadium	N2	SS	Intercept	1	-955.08774	304.02988	-3.14143	0.00457			All available between 1991-2015	Normal	
Vanadium	N2	SS	Year	1	0.49538	0.15168	3.26593	0.00340	No		All available between 1991-2015	Normal	
Vanadium	N4	NG	Intercept	1	-54.0491	72.4454	-0.7461	0.4700			2002-2015	Log-normal	
Vanadium	N4	NG	Year	1	0.0266	0.0361	0.7365	0.4756			2002-2015	Log-normal	
Vanadium	N4	SS	Intercept	1	-751.62652	469.76680	-1.60000	0.13045			All available between 1991-2015	Normal	
Vanadium	N4	SS	Year	1	0.39062	0.23391	1.66998	0.11565	No		All available between 1991-2015	Normal	
Vanadium	N5	NG	Intercept	1	-33.5588	51.8019	-0.6478	0.5284			2002-2015	Log-normal	
Vanadium	N5	NG	Year	1	0.0165	0.0258	0.6386	0.5342			2002-2015	Log-normal	
Vanadium	N5	SD	Intercept	1	-99.6848	17.4734	-5.7049	<.0001			All available between 1991-2015	Log-normal	
Vanadium	N5	SD	Year	1	0.0515	0.0087	5.9212	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Vanadium	N5	SS	Intercept	1	-570.04571	417.06239	-1.36681	0.19675			All available between 1991-2015	Normal	
Vanadium	N5	SS	Year	1	0.29846	0.20765	1.43734	0.17618	No		All available between 1991-2015	Normal	
Vanadium	S1	NG	Intercept	1	-205.9122	111.6513	-1.8442	0.0881			2002-2015	Log-normal	
Vanadium	S1	NG	Year	1	0.1023	0.0556	1.8411	0.0885			2002-2015	Log-normal	
Vanadium	S1	SB	Intercept	1	379.4162	90.6050	4.1876	0.0007			All available between 1991-2015	Log-normal	
Vanadium	S1	SB	Year	1	-0.1894	0.0452	-4.1854	0.0007	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	S1	SD	Intercept	1	-14.4708	8.8586	-1.6335	0.1144			All available between 1991-2015	Log-normal	
Vanadium	S1	SD	Year	1	0.0090	0.0044	2.0310	0.0526			All available between 1991-2015	Log-normal	
Vanadium	S1	SS	Intercept	1	-719.90892	285.32238	-2.52314	0.01900			All available between 1991-2015	Normal	
Vanadium	S1	SS	Year	1	0.37787	0.14243	2.65308	0.01421	No		All available between 1991-2015	Normal	
Vanadium	S2	NG	Intercept	1	-78.9608	52.1496	-1.5141	0.1559			2002-2015	Log-normal	
Vanadium	S2	NG	Year	1	0.0390	0.0260	1.5030	0.1587			2002-2015	Log-normal	
Vanadium	S2	SB	Intercept	1	363.2287	83.0977	4.3711	0.0004			All available between 1991-2015	Log-normal	
Vanadium	S2	SB	Year	1	-0.1813	0.0415	-4.3707	0.0004	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	S2	SS	Intercept	1	-575.24229	223.77067	-2.57068	0.01649			All available between 1991-2015	Normal	
Vanadium	S2	SS	Year	1	0.30581	0.11169	2.73798	0.01122	No		All available between 1991-2015	Normal	
Vanadium	S3	NG	Intercept	1	-95.4383	71.7631	-1.3299	0.2034			2002-2015	Log-normal	
Vanadium	S3	NG	Year	1	0.0469	0.0357	1.3137	0.2087			2002-2015	Log-normal	
Vanadium	S3	SD	Intercept	1	0.7597	7.9164	0.0960	0.9243			All available between 1991-2015	Log-normal	
Vanadium	S3	SD	Year	1	0.0014	0.0040	0.3516	0.7280			All available between 1991-2015	Log-normal	
Vanadium	S3	SS	Intercept	1	-682.86146	247.00659	-2.76455	0.01103			All available between 1991-2015	Normal	
Vanadium	S3	SS	Year	1	0.35615	0.12328	2.88906	0.00828	No		All available between 1991-2015	Normal	
Vanadium	S4	NG	Intercept	1	-174.7632	70.6347	-2.4742	0.0258			2002-2015	Log-normal	
Vanadium	S4	NG	Year	1	0.0865	0.0352	2.4602	0.0265			2002-2015	Log-normal	
Vanadium	S4	SB	Intercept	1	394.2506	109.9638	3.5853	0.0030			All available between 1991-2015	Log-normal	
Vanadium	S4	SB	Year	1	-0.1967	0.0549	-3.5862	0.0030	Yes	neg	All available between 1991-2015	Log-normal	Effect of RDL. Ignore
Vanadium	S4	SD	Intercept	1	-13.1565	5.6096	-2.3454	0.0276			All available between 1991-2015	Log-normal	
Vanadium	S4	SD	Year	1	0.0084	0.0028	2.9865	0.0064			All available between 1991-2015	Log-normal	
Vanadium	S4	SS	Intercept	1	-1054.65339	386.66927	-2.72753	0.01337			All available between 1991-2015	Normal	
Vanadium	S4	SS	Year	1	0.54653	0.19292	2.83285	0.01063	No		All available between 1991-2015	Normal	
Vanadium	S5	NG	Intercept	1	-138.4949	57.5598	-2.4061	0.0317			2002-2015	Log-normal	
Vanadium	S5	NG	Year	1	0.0686	0.0287	2.3947	0.0324			2002-2015	Log-normal	
Vanadium	S5	SS	Intercept	1	-633.41110	278.67266	-2.27296	0.03421			All available between 1991-2015	Normal	
Vanadium	S5	SS	Year	1	0.33399	0.13895	2.40368	0.02605	No		All available between 1991-2015	Normal	
Vanadium	W2	NG	Intercept	1	-83.8507	54.4264	-1.5406	0.1457			2002-2015	Log-normal	
Vanadium	W2	NG	Year	1	0.0415	0.0271	1.5292	0.1485			2002-2015	Log-normal	
Vanadium	W2	SS	Intercept	1	-533.50576	220.62624	-2.41814	0.02526			All available between 1991-2015	Normal	
Vanadium	W2	SS	Year	1	0.28116	0.11010	2.55360	0.01893	No		All available between 1991-2015	Normal	
Vanadium	W4	NG	Intercept	1	-147.4262	88.3785	-1.6681	0.1160			2002-2015	Log-normal	
Vanadium	W4	NG	Year	1	0.0733	0.0440	1.6648	0.1167			2002-2015	Log-normal	
Vanadium	W4	SB	Intercept	1	224.7558	184.4399	1.2186	0.2485			All available between 1991-2015	Log-normal	
Vanadium	W4	SB	Year	1	-0.1126	0.0919	-1.2247	0.2463			All available between 1991-2015	Log-normal	
Vanadium	W4	SS	Intercept	1	-359.54774	446.07562	-0.80602	0.43205			All available between 1991-2015	Normal	
Vanadium	W4	SS	Year	1	0.19788	0.22221	0.89053	0.38638	No		All available between 1991-2015	Normal	
Zinc	E1	NG	Intercept	1	44.3993	31.4500	1.4117	0.1709			All available between 1991-2015	Log-normal	
Zinc	E1	NG	Year	1	-0.0204	0.0157	-1.2979	0.2067			All available between 1991-2015	Log-normal	
Zinc	E1	SB	Intercept	1	-308.64989	434.07951	-0.71104	0.48873			All available between 1991-2015	Normal	
Zinc	E1	SB	Year	1	0.17034	0.21682	0.78562	0.44518	No		All available between 1991-2015	Normal	
Zinc	E1	SS	Intercept	1	2.9491	9.8515	0.2994	0.7676			All available between 1991-2015	Log-normal	
Zinc	E1	SS	Year	1	0.0005	0.0049	0.1091	0.9142			All available between 1991-2015	Log-normal	
Zinc	E2	NG	Intercept	1	-17.2472	15.7000	-1.0986	0.2829			All available between 1991-2015	Log-normal	
Zinc	E2	NG	Year	1	0.0102	0.0078	1.2986	0.2064			All available between 1991-2015	Log-normal	
Zinc	E2	SB	Intercept	1	1108.11108	689.76495	1.60651	0.13924			All available between 1991-2015	Normal	
Zinc	E2	SB	Year	1	-0.53525	0.34468	-1.55289	0.15150	No		All available between 1991-2015	Normal	
Zinc	E2	SD	Intercept	1	-49.2917	11.8605	-4.1560	0.0003			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Zinc	E2	SD	Year	1	0.0267	0.0059	4.5066	0.0001	Yes	pos	All available between 1991-2015	Log-normal	
Zinc	E2	SS	Intercept	1	-7.8171	11.1442	-0.7015	0.4904			All available between 1991-2015	Log-normal	
Zinc	E2	SS	Year	1	0.0059	0.0056	1.0640	0.2989			All available between 1991-2015	Log-normal	
Zinc	E5	NG	Intercept	1	-23.5610	29.9872	-0.7857	0.4404			All available between 1991-2015	Log-normal	
Zinc	E5	NG	Year	1	0.0134	0.0150	0.8980	0.3789			All available between 1991-2015	Log-normal	
Zinc	E5	SB	Intercept	1	-209.09328	374.17366	-0.55881	0.58454			All available between 1991-2015	Normal	
Zinc	E5	SB	Year	1	0.11923	0.18679	0.63832	0.53289	No		All available between 1991-2015	Normal	
Zinc	E5	SS	Intercept	1	-12.9202	8.8984	-1.4520	0.1613			All available between 1991-2015	Log-normal	
Zinc	E5	SS	Year	1	0.0084	0.0044	1.9022	0.0710			All available between 1991-2015	Log-normal	
Zinc	E6	NG	Intercept	1	30.1618	58.1817	0.5184	0.6117			All available between 1991-2015	Log-normal	
Zinc	E6	NG	Year	1	-0.0132	0.0290	-0.4569	0.6543			All available between 1991-2015	Log-normal	
Zinc	E6	SS	Intercept	1	29.6726	14.2614	2.0806	0.0529			All available between 1991-2015	Log-normal	
Zinc	E6	SS	Year	1	-0.0126	0.0071	-1.7803	0.0929			All available between 1991-2015	Log-normal	
Zinc	N2	NG	Intercept	1	5.1103	16.8977	0.3024	0.7649			All available between 1991-2015	Log-normal	
Zinc	N2	NG	Year	1	-0.0009	0.0084	-0.1096	0.9136			All available between 1991-2015	Log-normal	
Zinc	N2	SB	Intercept	1	611.68182	602.69367	1.01491	0.32737			All available between 1991-2015	Normal	
Zinc	N2	SB	Year	1	-0.28793	0.30133	-0.95554	0.35551	No		All available between 1991-2015	Normal	
Zinc	N2	SD	Intercept	1	-57.9158	11.4372	-5.0638	<.0001			All available between 1991-2015	Log-normal	
Zinc	N2	SD	Year	1	0.0311	0.0057	5.4513	<.0001	Yes	pos	All available between 1991-2015	Log-normal	
Zinc	N2	SS	Intercept	1	-7.1916	5.0231	-1.4317	0.1657			All available between 1991-2015	Log-normal	
Zinc	N2	SS	Year	1	0.0058	0.0025	2.3059	0.0305			All available between 1991-2015	Log-normal	
Zinc	N4	NG	Intercept	1	6.3695	35.0824	0.1816	0.8587			All available between 1991-2015	Log-normal	
Zinc	N4	NG	Year	1	-0.0016	0.0175	-0.0903	0.9294			All available between 1991-2015	Log-normal	
Zinc	N4	SS	Intercept	1	-38.8756	16.3139	-2.3830	0.0308			All available between 1991-2015	Log-normal	
Zinc	N4	SS	Year	1	0.0214	0.0081	2.6318	0.0189			All available between 1991-2015	Log-normal	
Zinc	N5	NG	Intercept	1	43.8218	33.0011	1.3279	0.2071			All available between 1991-2015	Log-normal	
Zinc	N5	NG	Year	1	-0.0201	0.0164	-1.2254	0.2422			All available between 1991-2015	Log-normal	
Zinc	N5	SD	Intercept	1	-68.4177	21.9446	-3.1178	0.0071			All available between 1991-2015	Log-normal	
Zinc	N5	SD	Year	1	0.0366	0.0109	3.3470	0.0044			All available between 1991-2015	Log-normal	
Zinc	N5	SS	Intercept	1	40.5532	17.0989	2.3717	0.0353			All available between 1991-2015	Log-normal	
Zinc	N5	SS	Year	1	-0.0180	0.0085	-2.1123	0.0563			All available between 1991-2015	Log-normal	
Zinc	S1	NG	Intercept	1	-7.8849	20.0352	-0.3936	0.6974			All available between 1991-2015	Log-normal	
Zinc	S1	NG	Year	1	0.0055	0.0100	0.5497	0.5876			All available between 1991-2015	Log-normal	
Zinc	S1	SB	Intercept	1	-256.42754	372.08192	-0.68917	0.50059			All available between 1991-2015	Normal	
Zinc	S1	SB	Year	1	0.14319	0.18580	0.77068	0.45213	No		All available between 1991-2015	Normal	
Zinc	S1	SD	Intercept	1	-23.9633	16.0048	-1.4973	0.1464			All available between 1991-2015	Log-normal	
Zinc	S1	SD	Year	1	0.0141	0.0080	1.7704	0.0884			All available between 1991-2015	Log-normal	
Zinc	S1	SS	Intercept	1	-12.4610	7.1938	-1.7322	0.0966			All available between 1991-2015	Log-normal	
Zinc	S1	SS	Year	1	0.0083	0.0036	2.3045	0.0306			All available between 1991-2015	Log-normal	
Zinc	S2	NG	Intercept	1	-7.9107	22.8410	-0.3463	0.7321			All available between 1991-2015	Log-normal	
Zinc	S2	NG	Year	1	0.0056	0.0114	0.4880	0.6300			All available between 1991-2015	Log-normal	
Zinc	S2	SB	Intercept	1	-217.89297	309.44717	-0.70414	0.49036			All available between 1991-2015	Normal	
Zinc	S2	SB	Year	1	0.12348	0.15445	0.79946	0.43445	No		All available between 1991-2015	Normal	
Zinc	S2	SS	Intercept	1	-6.3200	9.5845	-0.6594	0.5157			All available between 1991-2015	Log-normal	
Zinc	S2	SS	Year	1	0.0052	0.0048	1.0900	0.2861			All available between 1991-2015	Log-normal	
Zinc	S3	NG	Intercept	1	-97.7956	24.2431	-4.0340	0.0004			All available between 1991-2015	Log-normal	
Zinc	S3	NG	Year	1	0.0506	0.0121	4.1798	0.0003	Yes	pos	All available between 1991-2015	Log-normal	
Zinc	S3	SD	Intercept	1	14.8196	16.2540	0.9117	0.3703			All available between 1991-2015	Log-normal	
Zinc	S3	SD	Year	1	-0.0051	0.0081	-0.6334	0.5320			All available between 1991-2015	Log-normal	
Zinc	S3	SS	Intercept	1	-22.9919	9.2164	-2.4947	0.0202			All available between 1991-2015	Log-normal	
Zinc	S3	SS	Year	1	0.0135	0.0046	2.9431	0.0073			All available between 1991-2015	Log-normal	
Zinc	S4	NG	Intercept	1	-13.5555	28.6636	-0.4729	0.6405			All available between 1991-2015	Log-normal	
Zinc	S4	NG	Year	1	0.0083	0.0143	0.5817	0.5662			All available between 1991-2015	Log-normal	
Zinc	S4	SB	Intercept	1	-227.63737	498.29927	-0.45683	0.65480			All available between 1991-2015	Normal	
Zinc	S4	SB	Year	1	0.12904	0.24860	0.51904	0.61184	No		All available between 1991-2015	Normal	
Zinc	S4	SD	Intercept	1	9.8764	9.4040	1.0502	0.3041			All available between 1991-2015	Log-normal	
Zinc	S4	SD	Year	1	-0.0028	0.0047	-0.6041	0.5515			All available between 1991-2015	Log-normal	
Zinc	S4	SS	Intercept	1	-22.6354	8.4441	-2.6806	0.0148			All available between 1991-2015	Log-normal	
Zinc	S4	SS	Year	1	0.0134	0.0042	3.1786	0.0049			All available between 1991-2015	Log-normal	
Zinc	S4	WW	Intercept	1	7.4923	15.2604	0.4910	0.6409			All available between 1991-2015	Log-normal	
Zinc	S4	WW	Year	1	-0.0022	0.0076	-0.2895	0.7820			All available between 1991-2015	Log-normal	
Zinc	S5	FC	Intercept	1	-89.98418	316.93547	-0.28392	0.78785			All available between 1991-2015	Normal	
Zinc	S5	FC	Year	1	0.05159	0.15798	0.32658	0.75721	No		All available between 1991-2015	Normal	
Zinc	S5	NG	Intercept	1	63.2722	19.1414	3.3055	0.0034			All available between 1991-2015	Log-normal	
Zinc	S5	NG	Year	1	-0.0300	0.0095	-3.1437	0.0049			All available between 1991-2015	Log-normal	
Zinc	S5	SB	Intercept	1	436.05122	343.12560	1.27082	0.23001			All available between 1991-2015	Normal	
Zinc	S5	SB	Year	1	-0.20168	0.17113	-1.17849	0.26347	No		All available between 1991-2015	Normal	
Zinc	S5	SS	Intercept	1	-8.6669	8.2213	-1.0542	0.3044			All available between 1991-2015	Log-normal	
Zinc	S5	SS	Year	1	0.0063	0.0041	1.5470	0.1376			All available between 1991-2015	Log-normal	
Zinc	W2	NG	Intercept	1	20.1381	13.4570	1.4965	0.1470			All available between 1991-2015	Log-normal	
Zinc	W2	NG	Year	1	-0.0084	0.0067	-1.2561	0.2207			All available between 1991-2015	Log-normal	
Zinc	W2	SB	Intercept	1	-350.85564	467.23077	-0.75093	0.46240			All available between 1991-2015	Normal	
Zinc	W2	SB	Year	1	0.18888	0.23318	0.81001	0.42851	No		All available between 1991-2015	Normal	
Zinc	W2	SS	Intercept	1	-11.2415	7.6948	-1.4609	0.1596			All available between 1991-2015	Log-normal	
Zinc	W2	SS	Year	1	0.0076	0.0038	1.9716	0.0626			All available between 1991-2015	Log-normal	
Zinc	W4	FC	Intercept	1	-169.07797	278.36794	-0.60739	0.56585			All available between 1991-2015	Normal	
Zinc	W4	FC	Year	1	0.09277	0.13864	0.66918	0.52827	No		All available between 1991-2015	Normal	
Zinc	W4	NG	Intercept	1	-12.2336	34.4036	-0.3556	0.7259			All available between 1991-2015	Log-normal	
Zinc	W4	NG	Year	1	0.0077	0.0171	0.4503	0.6573			All available between 1991-2015	Log-normal	
Zinc	W4	SB	Intercept	1	486.36554	502.48958	0.96791	0.35389			All available between 1991-2015	Normal	
Zinc	W4	SB	Year	1	-0.22424	0.25050	-0.89517	0.38986	No		All available between 1991-2015	Normal	
Zinc	W4	SS	Intercept	1	-11.7623	10.7532	-1.0938	0.2902			All available between 1991-2015	Log-normal	
Zinc	W4	SS	Year	1	0.0081	0.0054	1.5097	0.1506			All available between 1991-2015	Log-normal	
Zirconium	E1	SS	Intercept	1	-2.2250	12.6830	-0.1754	0.8624			All available between 1991-2015	Log-normal	
Zirconium	E1	SS	Year	1	0.0019	0.0063	0.3042	0.7639			All available between 1991-2015	Log-normal	
Zirconium	E2	SD	Intercept	1	0.8363	27.8319	0.0300	0.9763			All available between 1991-2015	Log-normal	
Zirconium	E2	SD	Year	1	0.0006	0.0139	0.0428	0.9662			All available between 1991-2015	Log-normal	
Zirconium	E2	SS	Intercept	1	-5.8812	17.0951	-0.3440	0.7341			All available between 1991-2015	Log-normal	
Zirconium	E2	SS	Year	1	0.0038	0.0085	0.4409	0.6636			All available between 1991-2015	Log-normal	
Zirconium	E5	SS	Intercept	1	-9.0478	16.8069	-0.5383	0.5960			All available between 1991-2015	Log-normal	
Zirconium	E5	SS	Year	1	0.0053	0.0084	0.6373	0.5308			All available between 1991-2015	Log-normal	
Zirconium	E6	SS	Intercept	1	17.2706	38.8354	0.4447	0.6621			All available between 1991-2015	Log-normal	
Zirconium	E6	SS	Year	1	-0.0077	0.0193	-0.4000	0.6941			All available between 1991-2015	Log-normal	
Zirconium	N2	SD	Intercept	1	-19.4868	24.6422	-0.7908	0.4368			All available between 1991-2015	Log-normal	
Zirconium	N2	SD	Year	1	0.0106	0.0123	0.8653	0.3955			All available between 1991-2015	Log-normal	
Zirconium	N2	SS	Intercept	1	-17.9130	23.1263	-0.7746	0.4465			All available between 1991-2015	Log-normal	
Zirconium	N2	SS	Year	1	0.0100	0.0115	0.8641	0.3965			All available between 1991-2015	Log-normal	
Zirconium	N4	SS	Intercept	1	37.0619	50.4883	0.7341	0.4742			All available between 1991-2015	Log-normal	
Zirconium	N4	SS	Year	1	-0.0175	0.0251	-0.6976	0.4961			All available between 1991-2015	Log-normal	
Zirconium	N5	SD	Intercept	1	95.7799	63.6947	1.5037	0.1534			All available between 1991-2015	Log-normal	
Zirconium	N5	SD	Year	1	-0.0467	0.0317	-1.4734	0.1613			All available between 1991-2015	Log-normal	
Zirconium	N5	SS	Intercept	1	32.7322	57.2847	0.5714	0.5783			All available between 1991-2015	Log-normal	
Zirconium	N5	SS	Year	1	-0.0154	0.0285	-0.5402	0.5990			All available between 1991-2015	Log-normal	

Table E-2
Site Specific Inorganic Regressions
Lambton Facility 2016 Annual Landfill Report Biomonitoring Program
2015 Field Year

Analyte	Site	Matrix	Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	P < 0.003	Slope	Data Set	Normality	Notes/ Interpretation
Zirconium	S1	SD	Intercept	1	-13.2721	23.5910	-0.5626	0.5785			All available between 1991-2015	Log-normal	
Zirconium	S1	SD	Year	1	0.0075	0.0118	0.6381	0.5290			All available between 1991-2015	Log-normal	
Zirconium	S1	SS	Intercept	1	-24.1929	23.3836	-1.0346	0.3116			All available between 1991-2015	Log-normal	
Zirconium	S1	SS	Year	1	0.0130	0.0117	1.1142	0.2767			All available between 1991-2015	Log-normal	
Zirconium	S2	SS	Intercept	1	-20.5264	23.6084	-0.8694	0.3929			All available between 1991-2015	Log-normal	
Zirconium	S2	SS	Year	1	0.0111	0.0118	0.9445	0.3539			All available between 1991-2015	Log-normal	
Zirconium	S3	SD	Intercept	1	-22.8566	27.5696	-0.8290	0.4146			All available between 1991-2015	Log-normal	
Zirconium	S3	SD	Year	1	0.0124	0.0138	0.9000	0.3764			All available between 1991-2015	Log-normal	
Zirconium	S3	SS	Intercept	1	-15.1936	22.1442	-0.6861	0.4995			All available between 1991-2015	Log-normal	
Zirconium	S3	SS	Year	1	0.0085	0.0111	0.7655	0.4518			All available between 1991-2015	Log-normal	
Zirconium	S4	SD	Intercept	1	-29.7051	29.2598	-1.0152	0.3201			All available between 1991-2015	Log-normal	
Zirconium	S4	SD	Year	1	0.0158	0.0146	1.0809	0.2905			All available between 1991-2015	Log-normal	
Zirconium	S4	SS	Intercept	1	-24.8670	27.2694	-0.9119	0.3732			All available between 1991-2015	Log-normal	
Zirconium	S4	SS	Year	1	0.0134	0.0136	0.9825	0.3382			All available between 1991-2015	Log-normal	
Zirconium	S5	SS	Intercept	1	-7.9620	34.8573	-0.2284	0.8216			All available between 1991-2015	Log-normal	
Zirconium	S5	SS	Year	1	0.0049	0.0174	0.2824	0.7806			All available between 1991-2015	Log-normal	
Zirconium	W2	SS	Intercept	1	-8.8098	16.0442	-0.5491	0.5890			All available between 1991-2015	Log-normal	
Zirconium	W2	SS	Year	1	0.0052	0.0080	0.6514	0.5222			All available between 1991-2015	Log-normal	
Zirconium	W4	SS	Intercept	1	35.3687	48.1682	0.7343	0.4734			All available between 1991-2015	Log-normal	
Zirconium	W4	SS	Year	1	-0.0167	0.0240	-0.6948	0.4971			All available between 1991-2015	Log-normal	

APPENDIX F
INORGANIC AND ORGANIC DATABASES
(Please see CD)

APPENDIX G
SUMMARY OF PROPOSED CHANGES TO CLEAN HARBORS BIOMONITORING PROGRAM

Stantec Consulting Ltd.
100-300 Hagey Boulevard, Waterloo ON N2L 0A4

September 6, 2016
File: 122160003

Attention: Erica Carabott
Facility Compliance Manager
Clean Harbors
4090 Telfer Road, R.R. #1
Corruna, ON N0N 1G0

Dear Ms. Carabott,

Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program

Stantec Consulting Ltd. (Stantec) is proposing a number of modifications to the Clean Harbors Biomonitoring Program to streamline the program and accommodate the Landfill Expansion currently underway. The Biomonitoring Program is required under condition 9 of the Lambton Facility's Environmental Compliance Approval (ECA No. A031806).

The proposed changes were presented in a letter prepared by Stantec (July 3, 2015). Comments were received from the Ontario Ministry of the Environment and Climate Change (MOECC) (September 17, 2015), and Neegan Burnside on behalf of First Nations (August 28, 2015). Taking these comments into consideration a Revised Biomonitoring Sampling Program was prepared (Stantec, December 15, 2015) and provided to the MOECC. Since that time, conditions at the Lambton Facility have changed, resulting in additional proposed changes to the Biomonitoring Program.

The purpose of this letter is to summarize the current proposed changes to the Biomonitoring Program. Each change is discussed in detail in the following sections.

Table 1 – Summary of Proposed Changes to the Biomonitoring Program

Type of Change	Proposed Changes
Test Sites	**Sites within Lambton Facility affected by Landfill Expansion** • Site E6 – No change at this time. • Site S3 – Remove from Biomonitoring Program. Site has been replaced by an access road. • New Site S7 – Proposed new site to replace Site S3. **Sites in Surrounding Area of Lambton Facility** • New Site E7 - Proposed new site to increase coverage to northeast of Facility based on predominant wind direction. • Site S5 – Remove from Biomonitoring Program. Sufficient coverage to the south of Facility is provided by remaining sites.
Environmental Media	Discontinue maple leaf sampling
Chemical Analytes	Add fluoride as an analyte to all environmental media sampled in the Biomonitoring Program
Sampling Frequency	Change sediment fertility and characterization sampling to every three years.
Analytical Frequency	Polychlorinated biphenyls, pentachlorophenol and organochlorinated pesticides (PCB, PCP and OCP): Analysis will change to a three-year cycle. Year 1, all samples will be submitted for analysis. Years 2 and 3, two samples per environmental media will be submitted for analytical testing: the site with highest historical concentration and the control. Should concentrations of PCB, PCP or OCP be detected at concentrations greater than 50% of the applicable guidelines, the remaining samples will be submitted for analysis.
Data Analysis	Create isopleth maps only when investigating recurring exceedances (more than three years consecutively) for Group 2 Chemicals.

CHANGE IN TEST SITES ON THE LAMBTON FACILITY

The Clean Harbors Lambton Facility existing landfill occupies 56 hectares of the Clean Harbors licensed property. In order to keep managing hazardous waste over a 25 year period, Clean Harbors has identified the need to expand the landfill capacity. As a result, an environmental assessment was initiated in March 2011 to identify the environment potentially impacted by the expansion (Clean Harbors, 2014a).

Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program

The environmental assessment describes two proposed expansion alternatives to increase the landfill capacity. The first alternative involves a vertical expansion of the existing on-site landfill up to a grade of 9 m above the ground surface, with the exception of the northwest corner. Areas that have not been landfilled in the southeast corner will be excavated and filled (Clean Harbors, 2014a). With this alternative, biomonitoring sites on the facility may be impacted by the expansion. Biomonitoring test site locations are provided on Figures 1 and 2.

Site E6

At this time, Site E6 remains intact, although a new temporary access road has been constructed immediately to the west of the test site. Monitoring at Site E6 will continue and results from samples collected at Site E6 will be closely monitored to determine if traffic from the access road is influencing analyte concentrations.

Site S3 replaced by a New Site S7

Site S3 has been removed and the area replaced by an access road to support construction activities for the landfill expansion. To replace Site S3, it is recommended that a new site (Site S7) be installed at the proposed location directly east of Site S3 (Figure 2). The proposed location will align in a southern direction with the previous location for Site S3 and will allow for the collection of sediment samples from the adjacent drainage ditch which extends from the southwest pond. This will facilitate the continuation of sediment concentration records established at Site S3. Based on the estimated construction schedule, landfilling activities will proceed in a gradual manner and the proposed location for Site S7 will remain viable for up to ten years after being established.

CHANGE IN TEST SITES SURROUNDING THE LAMBTON FACILITY

The locations of test sites surrounding the facility were evaluated based on the current scientific literature and the predominant wind direction. The establishment of a new test site to the northeast of the Facility, and the removal of Site S5 to the south are proposed.

Stantec has generated a wind rose using meteorological data collected from the Lambton Facility from July 2014 to June 2015 (Figure 3). The wind rose indicated that the dominant wind direction came from the south and southwest, and blew to a lesser degree from the north and west. The current program has two sites that are in the maximum deposition area to the north of the incinerator (N2 and N4), and three sites east of the facility (E1, E2 and E5). Sites S1, S2, S4 and S5 are situated to the south of the facility. Sites W2 and W4 are situated in locations opposite from the predominant wind directions.

Site E7 – New Site

The dominant wind direction is toward the northeast from the Facility. The current sites are located to the north and east of the Facility. A new site (Site E7) has been recommended to be added to the northeast of the incinerator approximately 1 km away to provide coverage for areas located downwind from the facility. A map showing the proposed location of the new site has been included as Figure 1. The permanent location of Site E7 will be finalized following consultation with Clean Harbors and associated property owner regarding access to the site.

Site S5 to be Removed

Due to the abundant number of sites located to the south of the facility, and the fact that concentrations reported in samples collected from S5 are similar to or less than concentrations reported at Site S2, Site S5 will be removed from the Biomonitoring Program, as the remaining sites (S1, S2 and S4) will provide sufficient coverage.

ENVIRONMENTAL MEDIA (MAPLE LEAVES)

In an effort to streamline the Biomonitoring Program, a review of the analyzed environmental media has been conducted to determine if any should be added or removed from the program. Based on the past findings of the Maple Leaf Sampling Program, results have shown no significant difference between concentrations measured in maple leaves adjacent to the facility in comparison with the control site. As the maple leaf program does not offer additional meaningful information to supplement the Biomonitoring Program, sampling of maple leaves is proposed to be discontinued.

ADDITION OF FLUORIDE AS A CHEMICAL ANALYTE

A review of the 2014 Landfill Report (Clean Harbors, 2014b) was conducted to determine if the groundwater, surface water, or air quality environmental monitoring programs identified exceedances of analytes that could be added to the current Biomonitoring Program. Potential environmental concerns are limited to those identified in the groundwater. Fluoride was detected at concentrations above the Ontario Drinking Water Standards (ODWS) in the shallow and deep monitoring wells that have been installed on the facility property and off-property. The MOECC has observed that fluoride concentrations within silver maple foliage samples collected in close proximity to the Clean Harbors facility are higher in comparison to samples collected further away (DeBrou, 2010). Due to these high fluoride concentrations in silver maple foliage, and the high fluoride concentrations identified in the groundwater, it is recommended that fluoride be added as an analyte to all environmental media sampled in the Biomonitoring Program.

Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program

SEDIMENT FERTILITY AND CHARACTERIZATION SAMPLING FREQUENCY

Based on a review of historical data, sediment particle size distribution (texture) has shown little variation annually. The majority of the sites in the Biomonitoring Program are described as having silt clay, clay, or clay loam texture and a low organic matter content. Although concentrations of inorganic chemicals have been identified in sediment, the clay soil texture in the vicinity of the Lambton Facility means that inorganic chemicals are often sorbed to the abundant clay particles and are less likely to leach into the groundwater or be transported by surface water runoff. Although the majority of the sites are shown to have low organic matter content, the number of detected concentrations for organic chemicals reported in samples collected from these sites is low, and monitoring of the sorption of these parameters to the organic matter in the sediment is not as essential. As a result, the frequency of sediment fertility and characterization sampling will be changed to every three years.

PCB, PCP, AND OCP ANALYTICAL FREQUENCY

Concentrations of select organic analytes (PCBs, PCPs and OCPs) have been relatively consistent for over twenty years and there have been few concentrations measured above the reportable detection limit since 1991. Samples will continue to be collected from all sites on an annual basis, but analytical frequency will change to a three year cycle. In Year 1 all samples will be submitted for analysis. In Years 2 and 3 only one sample from the site that historically has the highest concentrations and one sample from the control site will be submitted for analysis. If PCB, PCP or OCP are detected at concentrations which exceed 50% of the applicable guidelines in the sample from the site that historically has the highest concentrations, the samples from the other sites can be submitted for analysis. However, if these analytes are not detected in the site that historically has the highest concentrations, it is assumed that the other sites will not have detected concentrations greater than applicable guidelines.

ADDITION OF ISOPLETH MAPS FOR DATA ANALYSIS

Isopleth maps will only be generated and used for visual analysis when an analyte/matrix combination for Group 2 chemicals has been identified as repeatedly exceeding a site-specific or site-wide upper limit (UL) in three consecutive years and additional investigation is warranted. Isopleths illustrating the distribution of UL15 values will be used when investigating analytes that have exceeded site-wide concentrations, while isopleths illustrating year-specific concentrations can be used when investigating exceedances of site-specific concentrations.

CLOSURE

This letter outlined a number of recommendations that can be implemented to streamline the Biomonitoring Program and accommodate the Landfill Expansion at the Lambton Facility. Upon approval by the MOECC, they could be implemented during the next cycle of the Biomonitoring Program beginning in the 2017 Field Year.

Reference: Summary of Proposed Changes to Clean Harbors Biomonitoring Program

Should you have any questions, please don't hesitate to contact the undersigned.

Regards,

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Attachment: Figure 1 – Existing and Proposed Sampling Locations (overview)
Figure 2 – Existing and Proposed Sampling Locations (within and adjacent to Facility)
Figure 3 – Wind Speed Direction (blowing from)

c. Mike Parker, Clean Harbors Canada

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ATTACHMENT
FIGURES

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Revised: 2016-09-05 By: svandamme

N

PLANK ROAD

PETROLIA LINE

ROKEBY LINE

WAUBUNO ROAD

TELFER ROAD

BRIGDEN ROAD

N2
N4
E7
W4
N5
E2
E1
E6
W2
S3
S7
E5
S1
S2
S5
S4

0 440 880 m
1:20,000

September 2016
122160003

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Existing Sampling Locations (Approximate)
- Proposed Sampling Location (Approximate)
- Existing Sampling Station to be Removed (Approximate)
- Watercourse
- Building
- Lambton Facility
- Waterbody
- Wooded Area

Client/Project

Clean Harbors Canada Inc.
Lambton Landfill Expansion

Figure No.

1

Title

Existing and Proposed Sampling Locations

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Revised: 2016-09-05 By: svandamme

September 2016
122160003

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Existing Sampling Locations (Approximate)
- Proposed Sampling Location (Approximate)
- Existing Sampling Station to be Removed (Approximate)
- Watercourse
- Building
- Lambton Facility
- Waterbody
- Wooded Area

Client/Project

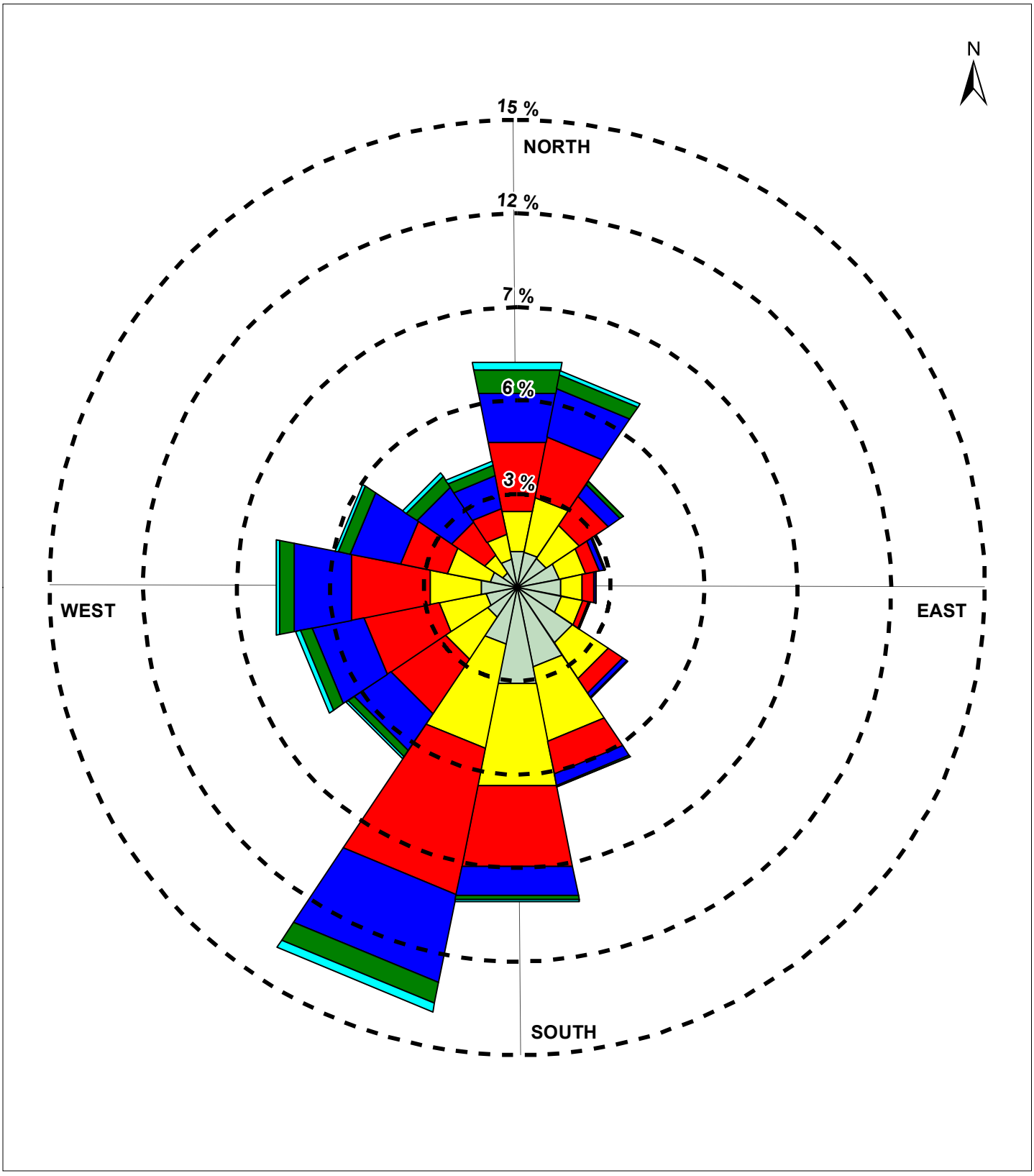
Clean Harbors Canada Inc.
Lambton Landfill Expansion

Figure No.

2

Title

Existing and Proposed Sampling Locations



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Revised: 2016-09-05 By: svandamme

September 2016
122160003

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Notes
1. Not to scale.

Legend

Wind Speed (Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 -7
- 1 - 4

Calms: 3.06%

Client/Project

Clean Harbors Canada Inc.
Lambton Landfill Expansion

Figure No.

3

Title

Wind Speed Direction (blowing from)